TPC Benchmark™ H Full Disclosure Report
for
Langchao SP3000
using
IBM DB2® Universal Database 8.1

Submitted for Review

April 14, 2004

First Edition – April 14, 2004

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Notes

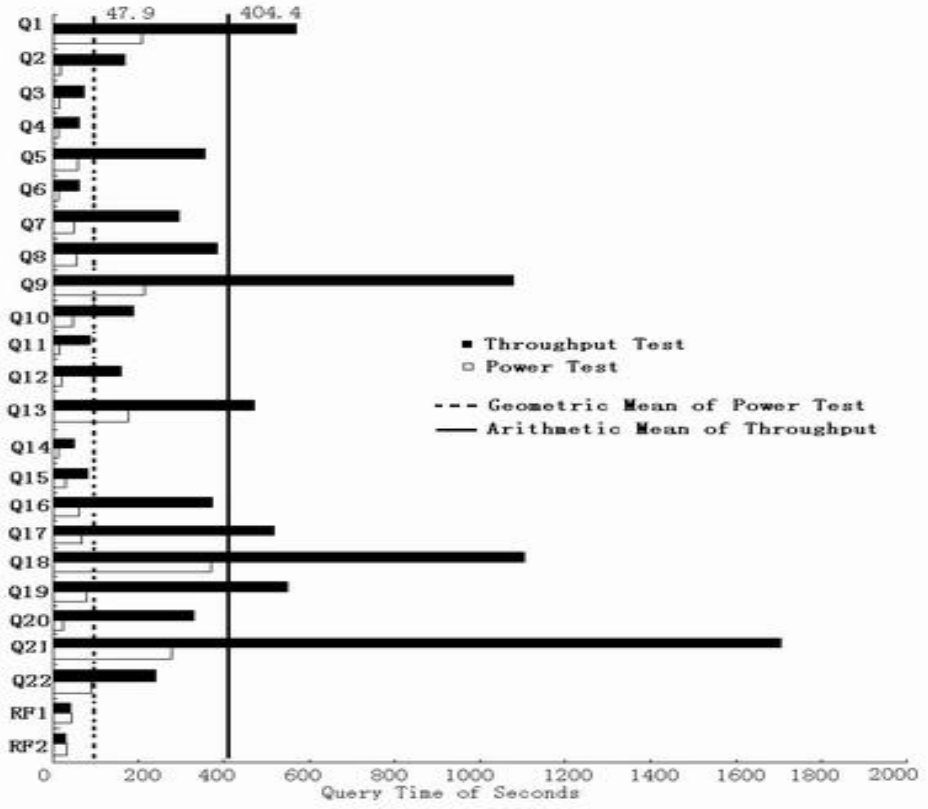
[1] GHz only measures microprocessor internal clock speed, not application performance. Many factors affect application perfomance.

[2] When referring to hard disk capacity, one GB equals one billion bytes. Total user-accessible capacity may be less.

浪潮®	**Langchao SP3000 with IBM DB2 UDB 8.1**	TPC-H Rev 2.0 **Report Date: April 14, 2004**

Total System Cost	Composite Query-per-hour Metric	Price/Performance
RMB 5,041,227	**5618.0 QphH@100GB**	**RMB 897 QphH@100GB**

Database Size	Database Manager	Operating System	Other Software	Availability Date
100GB	**IBM DB2 UDB 8.1**	**Microsoft Windows Server 2003 Enterprise Edition**	**Microsoft Platform SDK**	**April 14, 2004**



Database Load Time: 2:04:25	**Load Included Backup: Y**	**Total Data Storage / Database Size:78.66**
RAID (Base Table only): Y	**RAID (Base Tables and Auxiliary Data Structures): Y**	**RAID (ALL): Only for logs**

Configuration		
Processors	4	Intel Itanium 2 Processor 1.5 GHz / 6 MB L3 Cache
Memory	16	2 GB DDR DIMM
Disk Controllers	8	Emulex LP9002L FibreChannel HBA
Disk Drives	112	73 GB 15K RPM FibreChannel Drives
	2	146 GB 10K RPM Ultra320 SCSI Drives
Total Disk Storage		7865.7GB

Langchao SP3000 with IBM DB2 UDB 8.1

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Description	Part Number	Source	Unit Price	Qty	Ext. Price	3-Yr. Maint.
Server Hardware						
Langchao SP3000	SSP300000003	1	342,600	1	342,600	
4 Itanium 2 Processors		1	91,400	4	365,600	
2GB DDR ECC DIMMs		1	15,000	16	240,000	
Seagate ST3146807LC, 146GB Ultra320 SCSI Disk Drive		1	9,000	2	18,000	
Fiber Optic Cable, MultiMode 2Gb LC to LC 10M		1	1,000	8	8,000	
Emulex LP9002L- PCI64, 2GB, FC, single port		1	15,000	8	120,000	
USB keyboard & Mouse		1	300	1	300	
15” Monitor		1	1,200	1	1,200	
Rack 42U		1	15,000	1	15,000	
3 yr.Maint		1	30,000	1		30,000
			Subtotal		1,371,700	30,000
Server Storage						
Langchao NS8800s - 14-slot Rackmount, single RAID controller , dual PSMs with dual AC inputs, dual ACMs and dual LSMs.	UNS8800S001	1	137,600	8	1,100,800	
Seagate_ST373453LC_73GB_15K_RPM		1	14,000	112	1,568,000	
3 yr.Maint		1	50,000	1		50,000
			Subtotal		2,668,800	50,000
Hardware and maintance Discount						
Large volume discount on Langchao hardware		1	40%	1	1,543,800	32,000
			Hardware subtotal		**2,235,800**	**48,000**
Server Software						
DB2 UDB ESE V8.1 License/1-year Maint.	D518GLL	2	373,315.70	4	1,493,262.80	
DB2 UDB ESE V8.1 Support - 1 Yr/Proc	E00BILL	2	74,663.14	8		597,305.56

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DB2 UDB ESE V8.1 DPF License/1-year Maint.	D518JLL	2	112,135.59	4	448,542.34	
DB2 UDB ESE V8.1 DPF Support - 1 Yr/Proc	E00BJLL	2	22,427.12	8		179,416.92
Microsoft Windows Server 2003 Enterprise Edition		1	39,000	1	39,000	
Operating System Support Package	Included with System			1		
				Subtotal	1,980,805.1	776,722.04
				Total	**4,216,505**	**824,722**

Pricing: 1 – Langchao (Price Contact: Zhen Peng, pengzhen@langchao.com); 2 – IBM
*All discounts are based on China Yuan (RMB) list prices and for similar quantities and configurations

3-Year Cost of Ownership: RMB 5,041,227

QphH @ 100GB: 5618.0

RMB / QphH @ 100GB: RMB 897

Price used in TPC benchmarks reflect a customer woule 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 specification.

If you find that stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

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Measurement Results:

Database Scale Factor	100
Total Data Storage/Database Size	7865.7
Start of Database Load	11:21:40
End of Database Load	13:26:05
Database Load Time	2:04:25
Query Streams for Throughput Test	5
TPC-H Power	7513.1
TPC-H Throughput	4200.7
TPC-H Composite Query-per-Hour (QphH@100GB)	5618.0
Total System Price over 3 Years (RMB)	5,041,227
TPC-H Price/Performance Metric (RMB/QphH@100GB)	897

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 9,427 seconds

Duration of Stream Execution:

	Seed	Query Start Date/Time Query End Date/Time	RF1 Start Date/Time RF1 End Date/Time	RF2 Start Date/Time RF2 End Date/Time	Duration
Stream 00	403132605	04/03/04 13:47:03 04/03/04 14:18:51	04/03/04 13:46:20 04/03/04 13:47:03	04/03/04 14:18:51 04/03/04 14:19:23	0:33:04
Stream 01	403132606	04/03/04 14:19:30 04/03/04 16:50:11	04/03/04 14:19:31 04/03/04 16:51:34	04/03/04 16:51:34 04/03/04 16:52:04	2:32:34
Stream 02	403132607	04/03/04 14:19:30 04/03/04 16:48:56	04/03/04 16:52:04 04/03/04 16:52:42	04/03/04 16:52:42 04/03/04 16:53:11	2:33:41
Stream 03	403132608	04/03/04 14:19:30 04/03/04 16:50:52	04/03/04 16:53:11 04/03/04 16:53:50	04/03/04 16:53:50 04/03/04 16:54:20	2:34:50
Stream 04	403132609	04/03/04 14:19:31 04/03/04 16:49:23	04/03/04 16:54:20 04/03/04 16:54:59	04/03/04 16:54:59 04/03/04 16:55:28	2:35:47
Stream 05	403132610	04/03/04 14:19:31 04/03/04 16:39:36	04/03/04 16:55:28 04/03/04 16:56:07	04/03/04 16:56:07 04/03/04 16:56:37	2:37:06

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TPC-H Timing Intervals (in seconds):

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 00	207.3	18.3	13.4	11.8	58.7	11.6	48.8	53.5	213.5	45.7	15.4	21.3
Stream 01	423.1	227.8	92.4	27.9	318.8	59.9	319.8	481.5	923.6	206	67.7	198
Stream 02	725.3	406.6	81.3	78.7	365.9	47.7	307.6	384.9	1114.7	101.7	90	184.7
Stream 03	622.3	110.1	13.6	61.8	292.1	65	202.6	278.4	1163.7	189.1	94.8	21.4
Stream 04	571.7	31.9	97.4	50.7	274	67.1	319.6	411.4	1210.4	320.3	90.1	173.2
Stream 05	511	65.9	74	81.5	526.8	65.6	328.1	365.9	974.2	124.2	83.8	223.5
Minimum	423.1	31.9	13.6	27.9	274	47.7	202.6	278.4	923.6	101.7	67.7	21.4
Average	570.68	168.46	71.74	60.12	355.52	61.06	295.54	384.42	1077.32	188.26	85.28	160.16
Maximum	725.3	406.6	97.4	81.5	526.8	67.1	328.1	481.5	1210.4	320.3	94.8	223.5

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	176.9	12.4	29.9	61.5	67.1	370.7	78.5	23.4	277.7	90.2	43.4	31.4
Stream 01	555.4	34	61.4	570.1	611.5	1108.9	542.3	488.9	1529.1	192.2	9123.3	30.1
Stream 02	493.3	59.3	82.1	328.2	487.5	1141.4	406.7	242.1	1562.8	273.6	37.6	29
Stream 03	449.6	43.8	82.1	160	473.6	1111.4	639	459.3	2318.2	229.4	39.3	29.9
Stream 04	455.7	74.1	109.3	289.6	435.4	1165.5	687.3	312.6	1572.5	272.1	39.3	28.9
Stream 05	402.5	39.4	76.5	515.6	572.4	990.2	464	144.1	1543.3	232.9	39.1	29.1
Minimum	402.5	34	61.4	160	435.4	990.2	406.7	144.1	1529.1	192.2	37.6	28.9
Average	471.3	50.12	82.28	372.7	516.08	1103.4	547.86	329.4	1705.18	240.04	1855.72	29.4
Maximum	555.4	74.1	109.3	570.1	611.5	1165.5	687.3	488.9	2318.2	273.6	9123.3	30.1

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Preface

TPC Benchmark H Standard Specification was developed by the Transaction Processing Performance Council (TPC). It was released on February 26, 1999, and most recently revised (Revision 2.0) October 29, 2002. This is the full disclosure report for benchmark testing of **Langchao SP3000** according to the TPC Benchmark H Standard Specification.

The TPC Benchmark H is a decision support benchmark. It consists of a suite of business-oriented ad hoc queries and concurrent data modifications. The queries and the data populating the database have been chosen to have broad industrywide relevance while maintaining a sufficient degree of ease of implementation. This benchmark illustrates decision support systems that:

- Examine large volumes of data;
- Execute queries with a high degree of complexity;
- Give answers to critical business questions.

TPC-H evaluates the performance of various decision support systems by the execution of set of queries against a standard database under controlled conditions. The TPC-H queries:

- Give answers to real-world business questions;
- Simulate generated ad-hoc queries (e.g., via a point-and-click GUI interface);
- Are far more complex than most OLTP transactions;
- Include a rich breadth of operators and selectivity constraints;
- Generate intensive activity on the part of the database server component of the system under test;
- Are executed against a database complying with specific population and scaling requirements;
- Are implemented with constraints derived from staying closely synchronized with an on-line production database.

The TPC-H operations are modeled as follows:

- The database is continuously available 24 hours a day, 7 days a week, for ad-hoc queries from multiple end users and data modifications against all tables, exeat possibly during infrequent (e.g., once a month) maintenance sessions.
- The TPC-H database tracks, possibly with some delay, the state of the OLTP database through ongoing refresh functions, which batch together a number of modifications impacting some part of the decision support database.
- Due to the worldwide nature of the business data stored in the TPC-H database, the queries and the refresh functions may be executed against the database at any time, especially in relation to each other. In addition, this mix of queries and refresh functions is subject to specific ACIDity requirements, since queries and refresh functions may execute concurrently.
- To achieve the optimal compromise between performance and operational requirements, the database administrator can set, once and for all, the locking levels and the concurrent scheduling rules for queries and refresh functions.

The minimum database required to run the benchmark holds business data from 10,000 suppliers. It contains almost 10 million rows representing a raw storage capacity of about 1 gigabyte. Compliant benchmark implementations may also use one of the larger permissible database populations (e.g., 100 gigabytes), as defined in Clause 4.1.3).

The performance metrics reported by TPC-H is called the TPC-H Composite Query-per-Hour Performance Metric (QphH@Size), and reflects multiple aspects of the capability of the system to process queries. These aspects include the selected database size against which the queries are executed, the query processing power when queries are submitted by a single stream , and the query throughput when queries are submitted by multiple concurrent users. The TPC-H Price/Performance metric is expressed as $/QphH@Size. To be compliant with the TPC-H standard, all references to TPC-H results for a given configuration must include all required reporting components (see Clause 5.4.6). The TPC believes that comparisons of TPC-H results measured against different database sizes are misleading and discourages such comparisons.

The TPC-H database must be implemented using a commercially available database management system (DBMS), and the queries executed via an interface using dynamic SQL. The specification provides for variants of SQL, as implementers are not required to have implemented a specific SQL standard in full.

Benchmarks results are highly dependent upon workload, specific application requirements, and systems design and implementation. Relative system performance will vary as a result of these and other factors. Therefore, TPC-H should not be used as a substitute for specific customer application benchmarking when critical capacity planning and/or product evaluation decisions are contemplated.

1 General Items

1.1 Benchmark Sponsor

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

Langchao (Beijing) Electronic Information Industry Co.,Ltd. sponsored this TPC-H benchmark.

1.2 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 parameters*
- *Configuration parameters and options for any other software component incorporated into the pricing structure*
- *Compiler optimization options.*

Appendix A, " Tunable Parameters," contains a list of all DB2 parameters and operating system parameters. Session initialization parameters can be set during or immediately after establishing the connection to the database within the tpcdbatch program documented in Appendix D, " Driver Source Code." This result uses the default session initialization parameters established during preprocessing/binding of the tpcdbatch program.

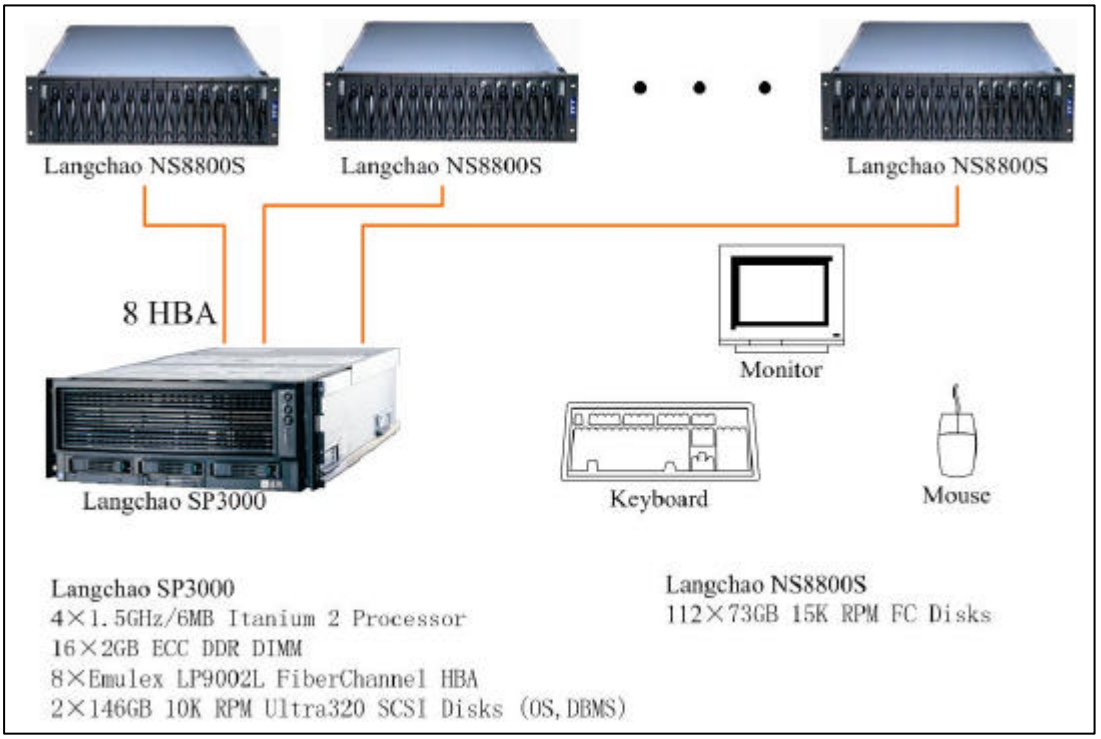
1.3 Configuration Diagrams

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

- *Number and type of processors*
- *Size of allocated memory and any specific mapping/partitioning of memory unique to the test and type of disk units (and controllers, if applicable)*
- *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 run-time execution location of software components (e.g., DBMS, query processing tools/languages, middleware components, software drivers, etc.).*

The configuration diagram for the tested and priced system is provided on the following page.

1.3.1 Priced and Measured Configurations



The priced configuration for the Langchao SP3000 contained:

- Four Intel Itanium 2 processors, 1.5 GHz, each with 6 MB of L3 cache
- 32 GB of memory
- Eight (8) Emulex LP9002L Fiber Channel HBA – 1port
- Eight Langchao NS8800S 14 slot SANbloc – dual port RAID controller
- One hundred twelve (112) 73GB 15K RPM Fibre Channel Disk Drivers
- Two (2) 146GB 10K RPM Ultral320 SCSI Disk Drivers
- One embedded SCSI interface

2 Clause 1: Logical Database Design Related Items

2.1 Database Table Definitions

Listings must be provided for all table definition statements and all other statements used to set up the test and qualification databases. (8.1.2.1)

Appendix B contains the scripts that were used to set up the TPC-H test and qualification databases.

2.2 Database Organization

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

Appendix B contains the scripts that were used to create the indexes on the test and qualification databases.

2.3 Horizontal Partitioning

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

Horizontal partitioning was used for all tables except for the nation and region tables. See Appendix B, " Database Build Scripts."

2.4 Replication

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

No replication was used.

3 Clause 2: Queries and Update Functions Related Items

3.1 Query Language

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

SQL was the query language used.

3.2 Random Number Generation

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

The TPC-supplied DBGEN version 1.3.0 and QGEN version 1.3.0 were used to generate all database populations.

3.3 Substitution Parameters Generation

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

The supplied QGEN version 1.3.0 was used to generate the substitution parameters.

3.4 Query Text and Output Data from Database

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

Appendix C.1, "Qualification Queries," contains the output for each of the queries. The functional query definitions and variants used in this disclosure use the following minor query modifications:

- Table names and view names are fully qualified. For example, the nation table is referred to as "TPCD.NATION."
- The standard IBM SQL date syntax is used for date arithmetic. For example, DATE('1996-01-01')+3 MONTHS.
- The semicolon (;) is used as a command delimiter.

3.5 Query Substitution Parameters and Seeds Used

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

Appendix C contains the seed and query substitution parameters used.

3.6 Query 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 isolation level used to run the queries was " repeatable read."

3.7 Refresh Function Implementation

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

The refresh functions are part of the implementation-specific layer/driver code included in Appendix D, " Driver Source Code."

4 Clause 3: Database System Properties Related Items

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

All ACID tests were conducted according to specifications. The Atomicity, Isolation, Consistency and Durability tests were performed on the **Langchao SP3000**. Appendix E contains the ACID transaction source code.

4.1 Atomicity Requirements

The system under test must guarantee that transactions are atomic; the system will either perform all individual operations on the data, or will assure that no partially completed operations leave any effects on the data.

4.1.1 Atomicity of Completed Transactions

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

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

1. The total price from the ORDER table and the extended price from the LINEITEM table were retrieved for a randomly selected order key. The number of records in the HISTORY table was also retrieved.
2. The ACID Transaction T1 was executed for the order key used in step 1.
3. The total price and extended price were retrieved for the same order key used in step 1 and step 2. It was verified that:
   T1.EXTENDEDPRICE=OLD.EXTENDEDPRICE+((T1.DELTA)*
   (OLD.EXTENDEDPRICE/OLD.QUANTITY)),T1.TOTALPRICE=OLD.TOTALPRICE+
   ((T1.EXTENDEDPRICE-OLD.EXTENDEDPRICE)*(1-DISCOUNT)*(1+TAX)), and that
   the number of records in the History table had increased by 1.

4.1.2 Atomicity of Aborted Transactions

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

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

1. The ACID application is passed a parameter to execute a rollback of the transaction instead of performing the commit.
2. The total price from the ORDER table and the extended price from the LINEITEM table were retrieved for a random order key. The number of records in the HISTORY table was also retrieved.
3. The ACID transaction was executed for the orderkey used in step 2. The transaction was rolled back.
4. The total price and the extended price were retrieved for the same orderkey used in step 2 and step 3. It was verified that the extended price and the total price were the same as in step 2.

4.2 Consistency Requirements

Consistency is the property of the application that requires any execution of transactions to take the database from one consistent state to another.

4.2.1 Consistency Condition

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

O_TOTALPRICE=SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT)*(1+L_TAX)

for each ORDER and LINEITEM defined by (O_ORDERKEY=L_ORDERKEY)

The following queries were executed before and after a measurement to show that the database was always in a consistent state both initially and after a measurement.

SELECT DECIMAL(SUM(DECIMAL(INTEGER(INTEGER(DECIMAL

(INTEGER(100*DECIMAL(L_EXTENDEDPRICE,20,2)),20,3)*

(1-L_DISCOUNT))*(1+L_TAX)),20,3)/100.0),20,3)

FROM TPCD.LINEITEM WHERE L_ORDEYKEY=okey

SELECT DECIMAL(SUM(O_TOTALPRICE,20,3)) from TPCD.ORDERS WHERE O_ORDERKEY = okey

4.2.2 Consistency Tests

Verify that the ORDER and LINEITEM tables are initially consistent as defined in Clause 3.3.2.1, based on a random sample of at least 10 distinct values of O_ORDERKEY.

The queries defined in 4.2.1, " Consistency Condition," were run after initial database build and prior to executing the ACID transaction. The queries showed that the database was in a consistent condition.

After executing 7 streams of 100 ACID transactions each, the queries defined in 4.2.1, " Consistency Condition," were run again. The queries showed that the database was still in a consistent state.

4.3 Isolation Requirements

4.3.1 Isolation Test 1

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

The following steps were performed to satisfy the test of isolation for a read-only and a read-write committed transaction:

1. First session: Start an ACID transaction with a randomly selected O_KEY,L_KEY and DELTA. The transaction is delayed for 60 seconds just prior to the Commit.
2. Second session: Start an ACID query for the same O_KEY as in the ACID transaction.
3. Second session: The ACID query attempts to read the file but is locked out by the ACID transaction waiting to complete.
4. First session: The ACID transaction is released and the Commit is executed releasing the record. With the LINEITEM record now released, the ACID query can now complete.
5. Second session: Verify that the ACID query delays for approximately 60 seconds and that the results displayed for the ACID query match the input for the ACID transaction.

4.3.2 Isolation Test 2

This test demonstrates isolation for the read-write conflict of read-write transaction and read-only transaction when the read-write transaction is rolled back.

The following steps were performed to satisfy the test of isolation for read-only and a rolled back read-write transaction:

1. First session: Perform the ACID transaction for a random O_KEY, L_KEY and DELTA. The transaction is delayed for 60 seconds just prior to the Rollback.
2. Second session: Start an ACID query for the same O_KEY as in the ACID transaction. The ACID query attempts to read the LINEITEM table but is locked out by the ACID transaction.
3. First session: The ACID transaction is released and the Rollback is executed, releasing the read.
4. Second session: With the LINEITEM record now released, the ACID query completes.

4.3.3 Isolation Test 3

This test demonstrates isolation for the write-write conflict of two refresh transactions when the first transaction is committed.

The following steps were performed to verify isolation of two refresh transactions:

1. First session: Start an ACID transaction T1 for a randomly selected O_KEY, L_KEY and DELTA. The transaction is delayed for 60 seconds just prior to the COMMIT.
2. Second session: Start a second ACID transaction T2 for the same O_KEY, L_KEY, and for a randomly selected DELTA2. This transaction is forced to wait while the 1st session holds a lock on the LINEITEM record requested by the second session.
3. First session: The ACID transaction T1 is released and the Commit is executed, releasing the record. With the LINEITEM record now released, the ACID transaction T2 can now complete.
4. Verify that:

   T2.L_EXTENDEDPRICE=T1.L_EXTENDEDPRICE+DELTA*

   (T1.L_EXTENDEDPRICE)/T1.L_QUANTITY)

4.3.4 Isolation Test 4

This test demonstrates isolation for write-write conflict of two ACID transactions when the first transaction is rolled back.

The following steps were performed to verify the isolation of two ACID transactions after the first one is rolled back:

1. First session: Start an ACID transaction T1 for a randomly selected O_KEY, L_KEY, and DELTA. The transaction is delayed for 60 seconds just prior to the rollback.
2. Second session: Start a second ACID transaction T2 for the same O_KEY, L_KEY used by the 1st session. This transaction is forced to wait while the 1st session holds a lock on the LINEITEM record requested by the second session.
3. First session: Rollback the ACID transaction T1. With the LINEITEM record now released, the ACID transaction T2 completes.
4. Verify that T2.L_EXTENDEDPRICE = T1.L_EXTENDEDPRICE

4.3.5 Isolation Test 5

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

1. First session: Start an ACID transaction, T1, for a randomly selected O_KEY, L_KEY and DELTA. The ACID transaction was suspended prior to COMMIT.
2. First session: Start a second ACID transaction, T2, which selects random values of PS_PARTKEY and PS_SUPPKEY and returns all columns of the PARTSUPP table for which PS_PARTKEY and PS_SUPPKEY are equal to the selected values.
3. T2 completed.
4. T1 was allowed to complete.
5. It was verified that the appropriate rows in the ORDERS, LINEITEM and HISTORY tables have been changed.

4.3.6 Isolation Test 6

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

1. First session: A transaction T1, which executes modified TPC-H query 1 with DELTA=0, was started.
2. Second session: Before T1 completed, an ACID transaction T2, with randomly selected values of O_KEY, L_KEY and DELTA, was started.
3. Third session: Before T1 completed, a transaction T3, which executes modified TPC-H query 1 with a randomly selected value of DELTA (not equal to 0), was started.
4. T1 completed.
5. T2 completed.
6. T3 completed.
7. It was verified that the appropriate rows in the ORDERS, LINEITEM and HISTORY tables were changed.

4.4 Durability Requirements

The SUT must guarantee durability: the ability to preserve the effects of committed transactions and ensure database consistency after recovery from any one of the failures listed in Clause 3.5.3.

4.4.1 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 log was stored on Windows mirrored volume. The tables for the database were stored on RAID-0 storage.

The tests were conducted on the qualification database. The steps performed are shown below.

1. The complete database was backed up once . The backup of the data was not on the same drive as the data itself.
2. Six streams of ACID transactions were started. Each stream executed a minimum of 100 transactions.
3. One physical drive of a RAID-0 data volume was removed.
4. The six streams of ACID transactions failed and recorded their number of committed transactions in success files.
5. The failed disk was replaced with a new drive. The database data partitions containing the failed disk were deleted and recreated. The junction points were recreated.
6. A database restore was issued using the backup taken at the beginning of this test.
7. A command was issued causing the database to run through its roll-forward recovery.
8. The counts in the success files and the HISTORY table count were compared and were found to match.

4.4.2 Loss of Log

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.

1. Six streams of ACID transactions were started. Each stream executed a minimum of 100 transactions.
2. While the test was running, one of the disks from the database RAID-1 log on Node 0 was removed.
3. The test continued running for an additional 100 transactions per streams.
4. The success file and the HISTORY table counts were compared and were found to match.

5. The database log disk was replaced and a rebuild function was initiated to restore the RAID-1 log array to its protected status. The rebuild completed successfully.

4.4.3 System Crash

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

1. Six streams of ACID transactions were started. Each stream executed a minimum of 100 transactions.
2. Then the system was powered off.
3. When power was restored, the system rebooted and the database was restarted.
4. The database went through a recovery period.
5. The success file and the HISTORY table counts were compared and were found to match.

4.4.4 Memory Failure

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

See the previous section.

5 Clause 4: Scaling and Database Population Related Items

5.1 Cardinality of Tables

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

Table Name	Rows
Order	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

5.2 Distribution of Tables and Logs

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

The following series of tables show the distribution of tables and logs across all media.

Controller	Disk Enclosure	Disks	Use
Controller 0	1	1~14	Node0
Controller1	2	15~28	Node0
Controller2	3	29~42	Node1
Controller3	4	43~56	Node1
Controller4	5	57~70	Node2
Controller5	6	71~84	Node2
Controller6	7	85~98	Node3
Controller7	8	99~112	Node3

		Disk #	Common Mount Point	TABLE_N_INDEX (2GB)	TEMP_TABLE (2GB)	TMP2_TABLE (2GB)	BACKUP (5GB)	Unused (58GB)
Controller 1	Enclosure 1	**Disk1**	D:\MP\Disk1	Partition1	Partition2	Partition3	Drive F: Part 1 (Backup Storage for Node 3)	Empty
		Disk2	D:\MP\Disk2	Partition1	Partition2	Partition3		Empty
		Disk3	D:\MP\Disk3	Partition1	Partition2	Partition3		Empty
		Disk4	D:\MP\Disk4	Partition1	Partition2	Partition3		Empty
		Disk5	D:\MP\Disk5	Partition1	Partition2	Partition3		Empty
		Disk6	D:\MP\Disk6	Partition1	Partition2	Partition3		Empty
		Disk7	D:\MP\Disk7	Partition1	Partition2	Partition3		Empty
		Disk8	D:\MP\Disk8	Partition1	Partition2	Partition3		Empty

		Disk9	D:\MP\Disk9	Partition1	Partition2	Partition3		Empty
		Disk10	D:\MP\Disk10	Partition1	Partition2	Partition3		Empty
		Disk11	D:\MP\Disk11	Partition1	Partition2	Partition3		Empty
		Disk12	D:\MP\Disk12	Partition1	Partition2	Partition3		Empty
		Disk13	Qualification Database Node 0 (use same disk partition scheme as the main database)					
		Disk14	Drive J: for Node 0 Log (Mirror Drive 1)					
Controller 2	Enclosure 2	**Disk15**	D:\MP\Disk15	Partition1	Partition2	Partition3	Drive F: Part 2 (Backup Storage for Node 3)	Empty
		Disk16	D:\MP\Disk16	Partition1	Partition2	Partition3		Empty
		Disk17	D:\MP\Disk17	Partition1	Partition2	Partition3		Empty
		Disk18	D:\MP\Disk18	Partition1	Partition2	Partition3		Empty
		Disk19	D:\MP\Disk19	Partition1	Partition2	Partition3		Empty
		Disk20	D:\MP\Disk20	Partition1	Partition2	Partition3		Empty
		Disk21	D:\MP\Disk21	Partition1	Partition2	Partition3		Empty
		Disk22	D:\MP\Disk22	Partition1	Partition2	Partition3		Empty
		Disk23	D:\MP\Disk23	Partition1	Partition2	Partition3		Empty
		Disk24	D:\MP\Disk24	Partition1	Partition2	Partition3		Empty
		Disk25	D:\MP\Disk25	Partition1	Partition2	Partition3		Empty
		Disk26	D:\MP\Disk26	Partition1	Partition2	Partition3		Empty
		Disk27	Qualification Database Node 1 (use same disk partition scheme as the main database)					
		Disk28	Drive J: for Node 0 Log (Mirror Drive 2)					
Controller 3	Enclosure 3	**Disk29**	D:\MP\Disk29	Partition1	Partition2	Partition3	Drive G: Part 1 (Backup Storage for Node 0)	Empty
		Disk30	D:\MP\Disk30	Partition1	Partition2	Partition3		Empty
		Disk31	D:\MP\Disk31	Partition1	Partition2	Partition3		Empty
		Disk32	D:\MP\Disk32	Partition1	Partition2	Partition3		Empty
		Disk33	D:\MP\Disk33	Partition1	Partition2	Partition3		Empty
		Disk34	D:\MP\Disk34	Partition1	Partition2	Partition3		Empty
		Disk35	D:\MP\Disk35	Partition1	Partition2	Partition3		Empty
		Disk36	D:\MP\Disk36	Partition1	Partition2	Partition3		Empty
		Disk37	D:\MP\Disk37	Partition1	Partition2	Partition3		Empty
		Disk38	D:\MP\Disk38	Partition1	Partition2	Partition3		Empty
		Disk39	D:\MP\Disk39	Partition1	Partition2	Partition3		Empty
		Disk40	D:\MP\Disk40	Partition1	Partition2	Partition3		Empty
		Disk41	D:\MP\Disk41	Partition1	Partition2	Partition3		Empty
		Disk42	Drive K: for Node 1 Log Files (Mirror Drive 1)					
Controller 4	Enclosure 4	**Disk43**	D:\MP\Disk43	Partition1	Partition2	Partition3	Drive G: Part 2 (Backup Storage for Node 0)	Empty
		Disk44	D:\MP\Disk44	Partition1	Partition2	Partition3		Empty
		Disk45	D:\MP\Disk45	Partition1	Partition2	Partition3		Empty
		Disk46	D:\MP\Disk46	Partition1	Partition2	Partition3		Empty
		Disk47	D:\MP\Disk47	Partition1	Partition2	Partition3		Empty
		Disk48	D:\MP\Disk48	Partition1	Partition2	Partition3		Empty
		Disk49	D:\MP\Disk49	Partition1	Partition2	Partition3		Empty
		Disk50	D:\MP\Disk50	Partition1	Partition2	Partition3		Empty
		Disk51	D:\MP\Disk51	Partition1	Partition2	Partition3		Empty
		Disk52	D:\MP\Disk52	Partition1	Partition2	Partition3		Empty

		Disk53	D:\MP\Disk53	Partition1	Partition2	Partition3		Empty
		Disk54	D:\MP\Disk54	Partition1	Partition2	Partition3		Empty
		Disk55	D:\MP\Disk55	Partition1	Partition2	Partition3		Empty
		Disk56	Drive K: for Node 1 Log Files (Mirror Drive 2)					
Controller 5	Enclosure 5	**Disk57**	**D:\MP\Disk57**	Partition1	Partition2	Partition3	Drive H: Part 1 (Backup Storage for Node 1)	Empty
		Disk58	**D:\MP\Disk58**	Partition1	Partition2	Partition3		Empty
		Disk59	**D:\MP\Disk59**	Partition1	Partition2	Partition3		Empty
		Disk60	**D:\MP\Disk60**	Partition1	Partition2	Partition3		Empty
		Disk61	**D:\MP\Disk61**	Partition1	Partition2	Partition3		Empty
		Disk62	**D:\MP\Disk62**	Partition1	Partition2	Partition3		Empty
		Disk63	**D:\MP\Disk63**	Partition1	Partition2	Partition3		Empty
		Disk64	**D:\MP\Disk64**	Partition1	Partition2	Partition3		Empty
		Disk65	**D:\MP\Disk65**	Partition1	Partition2	Partition3		Empty
		Disk66	**D:\MP\Disk66**	Partition1	Partition2	Partition3		Empty
		Disk67	**D:\MP\Disk67**	Partition1	Partition2	Partition3		Empty
		Disk68	**D:\MP\Disk68**	Partition1	Partition2	Partition3		Empty
		Disk69	**D:\MP\Disk69**	Partition1	Partition2	Partition3		Empty
		Disk70	Drive L: for Node 2 Log Files (Mirror Drive 1)					
Controller 6	Enclosure 6	**Disk71**	**D:\MP\Disk71**	Partition1	Partition2	Partition3	Drive H: Part 2 (Backup Storage for Node 1)	Empty
		Disk72	**D:\MP\Disk72**	Partition1	Partition2	Partition3		Empty
		Disk73	**D:\MP\Disk73**	Partition1	Partition2	Partition3		Empty
		Disk74	**D:\MP\Disk74**	Partition1	Partition2	Partition3		Empty
		Disk75	**D:\MP\Disk75**	Partition1	Partition2	Partition3		Empty
		Disk76	**D:\MP\Disk76**	Partition1	Partition2	Partition3		Empty
		Disk77	**D:\MP\Disk77**	Partition1	Partition2	Partition3		Empty
		Disk78	**D:\MP\Disk78**	Partition1	Partition2	Partition3		Empty
		Disk79	**D:\MP\Disk79**	Partition1	Partition2	Partition3		Empty
		Disk80	**D:\MP\Disk80**	Partition1	Partition2	Partition3		Empty
		Disk81	**D:\MP\Disk81**	Partition1	Partition2	Partition3		Empty
		Disk82	**D:\MP\Disk82**	Partition1	Partition2	Partition3		Empty
		Disk83	**D:\MP\Disk83**	Partition1	Partition2	Partition3		Empty
		Disk84	Drive L: for Node 2 Log Files (Mirror Drive 2)					
Controller 7	Enclosure 7	**Disk85**	**D:\MP\Disk85**	Partition1	Partition2	Partition3	Drive I: Part 1 (Backup Storage for Node 2)	Empty
		Disk86	**D:\MP\Disk86**	Partition1	Partition2	Partition3		Empty
		Disk87	**D:\MP\Disk87**	Partition1	Partition2	Partition3		Empty
		Disk88	**D:\MP\Disk88**	Partition1	Partition2	Partition3		Empty
		Disk89	**D:\MP\Disk89**	Partition1	Partition2	Partition3		Empty
		Disk90	**D:\MP\Disk90**	Partition1	Partition2	Partition3		Empty
		Disk91	**D:\MP\Disk91**	Partition1	Partition2	Partition3		Empty
		Disk92	**D:\MP\Disk92**	Partition1	Partition2	Partition3		Empty
		Disk93	**D:\MP\Disk93**	Partition1	Partition2	Partition3		Empty
		Disk94	**D:\MP\Disk94**	Partition1	Partition2	Partition3		Empty
		Disk95	**D:\MP\Disk95**	Partition1	Partition2	Partition3		Empty
		Disk96	**D:\MP\Disk96**	Partition1	Partition2	Partition3		Empty

		Disk97	**D:\MP\Disk97**	Partition1	Partition2	Partition3		Empty
		Disk98	Drive M: for Node 3 Log Files (Mirror Drive 1)					
Controller 8	Enclosure 8	**Disk99**	**D:\MP\Disk99**	Partition1	Partition2	Partition3	Drive I: Part 2 (Backup Storage for Node 2)	Empty
		Disk100	**D:\MP\Disk100**	Partition1	Partition2	Partition3		Empty
		Disk101	**D:\MP\Disk101**	Partition1	Partition2	Partition3		Empty
		Disk102	**D:\MP\Disk102**	Partition1	Partition2	Partition3		Empty
		Disk103	**D:\MP\Disk103**	Partition1	Partition2	Partition3		Empty
		Disk104	**D:\MP\Disk104**	Partition1	Partition2	Partition3		Empty
		Disk105	**D:\MP\Disk105**	Partition1	Partition2	Partition3		Empty
		Disk106	**D:\MP\Disk106**	Partition1	Partition2	Partition3		Empty
		Disk107	**D:\MP\Disk107**	Partition1	Partition2	Partition3		Empty
		Disk108	**D:\MP\Disk108**	Partition1	Partition2	Partition3		Empty
		Disk109	**D:\MP\Disk109**	Partition1	Partition2	Partition3		Empty
		Disk110	**D:\MP\Disk110**	Partition1	Partition2	Partition3		Empty
		Disk111	**D:\MP\Disk111**	Partition1	Partition2	Partition3		Empty
		Disk112	Drive M: for Node 3 Log Files (Mirror Drive 2)					

5.3 Database Partition / Replication Mapping

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

Database partitioning/replication was not used.

5.4 RAID Implementation

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 must be disclosed for each device.

Windows mirrored volumes were used for log disks. RAID-0 was used for all other database disks and the temporary tablespace.

5.5 DBGEN Modifications

Any modifications to the DBGEN (see Clause 4.2.1) source code must be disclosed. In the event that a program other than DBGEN was used to populate the database, it must be disclosed in its entirety.

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

5.6 Database Load Time

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

See the Executive Summary at the beginning of this report.

5.7 Data Storage Ratio

The data storage ratio must be disclosed. It is computed as the ratio between the total amount of priced disk space and the chosen test database size as defined in Clause 4.1.3.

The calculation of the data storage ratio is shown in the following table.

Disk Type	Number of Disks	Formatted Space per Disk	Total Disk Space	Scale Factor	Storage Ratio
73GB 15K SCSI Drive	112	67.79GB	7592.48GB		
146GB 15K Ultra320 SCSI Drive	2	136.61GB	273.22GB		
Total			7865.7GB	100	78.66

The data storage ratio is 78.66, derived by dividing 7865.7GB by the database size of 100GB.

5.8 Database Load Mechanism Details and Illustration

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

Flat files for each of the tables were created using DBGEN.

The NATION and REGION tables were created on node 0 and then loaded from dbgen output. The other tables were loaded on the four logical nodes.

The tables were loaded as depicted in Figure 4-1.

.

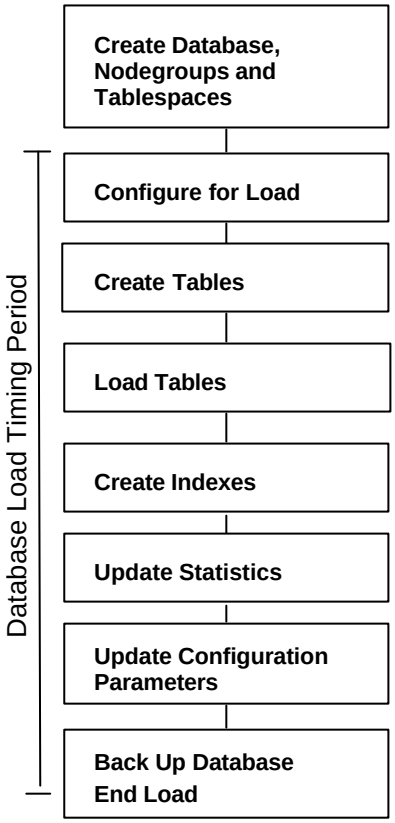


Figure 4-1. Database Load Procedure

5.9 Qualification Database Configuration

Any differences between the configuration of the qualification database and the test database must be disclosed.

The qualification database used identical scripts and disk structure to create and load the data with adjustments for size difference, and fewer logical drives were used. Adjustments were also made so that the test database and the qualification database could exist concurrently. The command " SET DB2INSTANCE=QUAL" was used to change from the test database to the qualification database. This setting persisted for the DB2 command session. See Section 5.2 for details.

6 Clause 5: Performance Metrics and Execution Rules Related Items

6.1 System Activity between Load and Performance Tests

Any system activity on the SUT that takes place between the conclusion of the load test and the beginning of the performance test must be fully disclosed.

The auditor requested that queries be run against the database to verify the correctness of the database load.

6.2 Steps in the Power Test

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

The following steps were used to implement the power test:

1. RF1 Refresh Transaction
2. Stream 00 Execution
3. RF2 Refresh Transaction

6.3 Timing Intervals for Each Query and Refresh Function

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

See the Numerical Quantities Summary in the Executive Summary at the beginning of this report.

6.4 Number of Streams for the Throughput Test

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

Five streams were used for the throughput test.

6.5 Start and End Date/Times for Each Query Stream

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

See the Numerical Quantities Summary in the Executive Summary at the beginning of this report.

6.6 Total Elapsed Time for the Measurement Interval

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

See the Numerical Quantities Summary in the Executive Summary at the beginning of this report..

6.7 Refresh Function Start Date/Time and Finish Date/Time

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

See the Numerical Quantities Summary in the Executive Summary at the beginning of this report.

6.8 Timing Intervals for Each Query and Each Refresh Function for Each Stream

The timing intervals for each query of each stream and for each update function must be reported for the throughput test.

See the Numerical Quantities Summary in the Executive Summary at the beginning of this report.

6.9 Performance Metrics

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

See the Numerical Quantities Summary in the Executive Summary at the beginning of this report.

6.10 Performance Metric and Numerical Quantities from Both Runs

The performance metric and numerical quantities from both runs must be disclosed.

Two consecutive runs of the TPC-H benchmark were performed. The following table contains the results for both runs.

	QppH @ 100GB	QthH @ 100GB	QphH @ 100GB
Run1	7513.1	4200.7	5618.0
Run2	7573.4	4189.6	5632.9

6.11 System Activity between Tests

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

DB2 was restarted between runs.

7 Clause 6: SUT and Driver Implementation Related Items

7.1 Driver

A detailed textual description of how the driver performs its functions, how its various components interact and any product functionality or environmental setting on which it relies must be provided. All related source code, scripts and configurations must be disclosed. The information provided should be sufficient for an independent reconstruction of the driver.

Appendix D, " Driver Source Code," contains the source code used for the driver and all scripts used in connection with it.

The Power test is invoked by calling tpcdbatch with the stream number 0 specified, an indication that the refresh functions must be run, and the SQL file that contains the power stream queries.

The Throughput test is invoked by initiating a call to tpcdbatch for every query stream that will be run. Tpcdbatch gets the stream number for each of the streams, and the SQL file specific to that stream number as the queries to execute. The refresh function is initiated as a separate call to tpcdbatch with the SQL script for the refresh functions and the total number of query streams specified.

7.2 Implementation-Specific Layer

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.

The implementation specific layer is a single executable SQL application that uses embedded dynamic SQL to process the EQT generated by QGEN. The application is called tpcdbatch to indicate that it processes a batch of TPC-H queries, although it is completely capable of processing any arbitrary SQL statement (both DML and DDL).

A separate instance of tpcdbatch is invoked for each stream. Each instance establishes a distinct connection to the database server through which the EQT is transmitted to the database and the results are returned through the implementation specific layer to the driver. When an instance of tpcdbatch is invoked, it is provided with a context of whether it is running a power test, query stream or refresh stream, as well as an input file containing the 22 queries and/or refresh functions. tpcdbatch then connects to the database, performs any session initialization as well as preparing output files required by the auditor. Then it proceeds to read from the input file and processes each query or refresh function in turn.

For queries, each query is prepared, described, and a cursor is opened and used to fetch the required number of rows. After the last row has been retrieved a commit is issued. For the refresh functions, during the database build all data is first split for each node using the db2split utility. For RF1, the data for each node is further split into n equal portions for both the lineitem and orders tables taking care that the records for the same orderkey remain in the same set. For RF2, the data for each node is further split into m equal portions. During the run, when tpcdbatch encounters a call to execute RF1, it first calls a shell script which loads these n sets of data into n sets of temporary tables (one each for lineitem and orders). Then tpcdbatch forks off n children to do an insert with subselect into the original lineitem and orders tables. When tpcdbatch encounters a call to execute RF2, it calls a shell script that loads these data into a single staging table. Then tpcdbatch forks off p children (where p * x = m) to do x sets of deletes from the orders and lineitem tables with a subselect from the staging table.

7.3 Profile-Directed Optimization

Profile-directed optimization was not used.

8 Clause 7: Pricing Related Items

8.1 Hardware and Software Components

A detailed list of the hardware and software used in the priced system must be reported. Each item must have a 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) must also be reported.

A detailed list of all hardware and software, including the 3-year price, is provided in the Executive Summary at the front of this report. The price quotations are included in Appendix F.

8.2 Three-Year Cost of System Configuration

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 must be disclosed.

A detailed list of all hardware and software, including the 3-year price, is provided in the Executive Summary at the front of this report. The price quotations are included in Appendix F.

8.3 Availability Dates

The committed delivery date for general availability (availability date) of products used in the price calculations must be reported. When the priced system includes products with different availability dates, 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 (see Clause 7.3.1.3).

The system as priced will be generally available April 14, 2004.

8.4 Country-Specific Pricing

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

The configuration is priced for China.

Clause 9: Audit Related Items

9.1 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.
This implementation of the TPC Benchmark H was audited by Bradley J. Askins of InfoSizing, Inc. Further information can be downloaded from www.tpc.org.

INFO SIZING

TPC TRANSACTION PROCESSING PERFORMANCE COUNCIL CERTIFIED AUDITOR

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April 7, 2004

I verified the TPC Benchmark™ H performance of the following configuration:

Platform:	**Langchao SP3000**
Database Manager:	**IBM DB2 UDB 8.1**
Operating System:	**Microsoft Windows Server 2003 Enterprise Edition**

The results were:

CPU (Speed)	Memory	Disks	**QphH@100GB**
Langchao SP3000			
4 x Intel Itanium 2 (1.5 GHz)	6MB L3 Cache/cpu 32 GB Main	112 x 73 GB 2 x 146 GB	**5618.0**

In my opinion, this performance result was produced in compliance with the TPC's requirements for the benchmark. The following verification items were given special attention:

- The database records were defined with the proper layout and size

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- The database population was generated using DBGEN
- The database was properly scaled to 100GB and populated accordingly
- The compliance of the database auxiliary data structures was verified
- The database load time was correctly measured and reported
- The required ACID properties were verified and met
- The query input variables were generated by QGEN
- The query text was produced using minor modifications and 1 variant
- The execution of the queries against the SF1 database produced compliant answers
- A compliant implementation specific layer was used to drive the tests
- The throughput tests involved 5 query streams
- The ratio between the longest and the shortest query was such that no query timing was adjusted
- The execution times for queries and refresh functions were correctly measured and reported
- The repeatability of the measured results was verified
- The required amount of database log was configured
- The system pricing was verified for major components and maintenance
- The major pages from the FDR were verified for accuracy

Respectfully Yours,

François Raab, President

Bradley J. Askins, Auditor

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Appendix A: Tunable Parameters and System Configuration

DB2 UDB 8.1 Database and Database Manager Configuration

Database Configuration for Node 0

```
 Database configuration release level            = 0x0a00
 Database release level                          = 0x0a00

 Database territory                              = US
 Database code page                              = 1252
 Database code set                               = IBM-1252
 Database country/region code                    = 1

 Dynamic SQL Query management (DYN_QUERY_MGMT) = DISABLE

 Discovery support for this database  (DISCOVER_DB) = ENABLE

 Default query optimization class  (DFT_QUERYOPT) = 7
 Degree of parallelism  (DFT_DEGREE) = 1
 Continue upon arithmetic exceptions (DFT_SQLMATHWARN) = NO
 Default refresh age  (DFT_REFRESH_AGE) = 0
 Number of frequent values retained (NUM_FREQVALUES) = 0
 Number of quantiles retained  (NUM_QUANTILES) = 600

 Backup pending                                  = NO

 Database is consistent                          = YES
 Rollforward pending                             = NO
 Restore pending                                 = NO

 Multi-page file allocation enabled              = NO

 Log retain for recovery status                  = RECOVERY
 User exit for logging status                    = NO

 Data Links Token Expiry Interval (sec)  (DL_EXPINT) = 60
 Data Links Write Token Init Expiry Intvl(DL_WT_IEXPINT) = 60
 Data Links Number of Copies  (DL_NUM_COPIES) = 1
 Data Links Time after Drop (days)  (DL_TIME_DROP) = 1
 Data Links Token in Uppercase  (DL_UPPER) = NO
 Data Links Token Algorithm  (DL_TOKEN) = MAC0

 Database heap (4KB)  (DBHEAP) = 20000
 Size of database shared memory (4KB) (DATABASE_MEMORY) = AUTOMATIC
 Catalog cache size (4KB)  (CATALOGCACHE_SZ) = 386
 Log buffer size (4KB)  (LOGBUFSZ) = 1048
 Utilities heap size (4KB)  (UTIL_HEAP_SZ) = 40000
 Buffer pool size (pages)  (BUFFPAGE) = 190000
 Extended storage segments size (4KB) (ESTORE_SEG_SZ) = 16000
 Number of extended storage segments (NUM_ESTORE_SEGS) = 0
 Max storage for lock list (4KB)  (LOCKLIST) = 16384

 Max size of appl. group mem set (4KB) (APPGROUP_MEM_SZ) = 40000
 Percent of mem for appl. group heap (GROUPHEAP_RATIO) = 70
 Max appl. control heap size (4KB)  (APP_CTL_HEAP_SZ) = 2048

 Sort heap thres for shared sorts (4KB) (SHEAPTHRES_SHR) = (SHEAPTHRES)
 Sort list heap (4KB)  (SORTHEAP) = 7700
 SQL statement heap (4KB)  (STMTHEAP) = 15000
 Default application heap (4KB)  (APPLHEAPSZ) = 16000
 Package cache size (4KB)  (PCKCACHESZ) = 640
 Statistics heap size (4KB)  (STAT_HEAP_SZ) = 10000

 Interval for checking deadlock (ms)  (DLCHKTIME) = 5000
 Percent. of lock lists per application  (MAXLOCKS) = 5
 Lock timeout (sec)  (LOCKTIMEOUT) = -1

 Changed pages threshold  (CHNGPGS_THRESH) = 80
 Number of asynchronous page cleaners (NUM_IOCLEANERS) = 14
 Number of I/O servers  (NUM_IOSERVERS) = 14
 Index sort flag  (INDEXSORT) = YES
Sequential detect flag  (SEQDETECT) = YES
 Default prefetch size (pages)  (DFT_PREFETCH_SZ) = 16

 Track modified pages  (TRACKMOD) = OFF

 Default number of containers                    = 1
 Default tablespace extentsize (pages)  (DFT_EXTENT_SZ) = 32

 Max number of active applications  (MAXAPPLS) = 150
 Average number of active applications  (AVG_APPLS) = 1
 Max DB files open per application  (MAXFILOP) = 1024

 Log file size (4KB)  (LOGFILSIZ) = 8192
 Number of primary log files  (LOGPRIMARY) = 20
 Number of secondary log files  (LOGSECOND) = 5
 Changed path to log files  (NEWLOGPATH) =
 Path to log files                               = j:\db2tpch\logs\NODE0000\
```

```
 Overflow log path                    (OVERFLOWLOGPATH) =
 Mirror log path                      (MIRRORLOGPATH) =
 First active log file                = S0000002.LOG
 Block log on disk full               (BLK_LOG_DSK_FUL) =
NO
 Percent of max active log space by transaction(MAX_LOG)
= 0
 Num. of active log files for 1 active
UOW(NUM_LOG_SPAN) = 0

 Group commit count                   (MINCOMMIT) = 1
 Percent log file reclaimed before soft chckpt (SOFTMAX) =
1800
 Log retain for recovery enabled      (LOGRETAIN) =
RECOVERY
 User exit for logging enabled        (USEREXIT) = OFF

 Auto restart enabled                 (AUTORESTART) = ON
 Index re-creation time               (INDEXREC) =
SYSTEM (ACCESS)
 Default number of loadrec sessions
(DFT_LOADREC_SES) = 1
 Number of database backups to retain
(NUM_DB_BACKUPS) = 12
 Recovery history retention (days)    (REC_HIS_RETENTN)
= 366

 TSM management class                 (TSM_MGMTCLASS)
=
 TSM node name                        (TSM_NODENAME) =
 TSM owner                            (TSM_OWNER) =
 TSM password                         (TSM_PASSWORD) =
```

Database Configuration for Node 1

```
Database configuration release level            = 0x0a00
 Database release level                 = 0x0a00

 Database territory                     = US
 Database code page                     = 1252
 Database code set                      = IBM-1252
 Database country/region code           = 1

 Dynamic SQL Query management
(DYN_QUERY_MGMT) = DISABLE

 Discovery support for this database    (DISCOVER_DB) =
ENABLE

 Default query optimization class       (DFT_QUERYOPT) =
7
 Degree of parallelism                  (DFT_DEGREE) = 1
 Continue upon arithmetic exceptions
(DFT_SQLMATHWARN) = NO
 Default refresh age                    (DFT_REFRESH_AGE) = 0
 Number of frequent values retained
(NUM_FREQVALUES) = 0
 Number of quantiles retained           (NUM_QUANTILES)
= 600

 Backup pending                         = NO

 Database is consistent                 = YES
 Rollforward pending                    = NO
 Restore pending                        = NO

 Multi-page file allocation enabled     = NO

 Log retain for recovery status         =
RECOVERY
 User exit for logging status           = NO

 Data Links Token Expiry Interval (sec) (DL_EXPINT) =
60
 Data Links Write Token Init Expiry
Intvl(DL_WT_IEXPINT) = 60
 Data Links Number of Copies            (DL_NUM_COPIES)
= 1
 Data Links Time after Drop (days)      (DL_TIME_DROP)
= 1
 Data Links Token in Uppercase          (DL_UPPER) =
NO
 Data Links Token Algorithm             (DL_TOKEN) =
MAC0

 Database heap (4KB)                    (DBHEAP) = 20000
 Size of database shared memory (4KB)
(DATABASE_MEMORY) = AUTOMATIC
 Catalog cache size (4KB)               (CATALOGCACHE_SZ)
= 386
 Log buffer size (4KB)                  (LOGBUFSZ) = 1048
 Utilities heap size (4KB)              (UTIL_HEAP_SZ) =
40000
 Buffer pool size (pages)               (BUFFPAGE) =
190000
 Extended storage segments size (4KB)
(ESTORE_SEG_SZ) = 16000
 Number of extended storage segments
(NUM_ESTORE_SEGS) = 0
 Max storage for lock list (4KB)        (LOCKLIST) =
16384

 Max size of appl. group mem set (4KB)
(APPGROUP_MEM_SZ) = 40000
 Percent of mem for appl. group heap
(GROUPHEAP_RATIO) = 70
 Max appl. control heap size (4KB)      (APP_CTL_HEAP_SZ)
= 2048

 Sort heap thres for shared sorts (4KB)
(SHEAPTHRES_SHR) = (SHEAPTHRES)
 Sort list heap (4KB)                   (SORTHEAP) = 7700
 SQL statement heap (4KB)               (STMTHEAP) =
15000
 Default application heap (4KB)         (APPLHEAPSZ) =
16000
 Package cache size (4KB)               (PCKCACHESZ) =
640
 Statistics heap size (4KB)             (STAT_HEAP_SZ) =
10000

 Interval for checking deadlock (ms)    (DLCHKTIME) =
5000
 Percent. of lock lists per application (MAXLOCKS) = 5
 Lock timeout (sec)                     (LOCKTIMEOUT) = -1

 Changed pages threshold                (CHNGPGS_THRESH)
= 80
 Number of asynchronous page cleaners
(NUM_IOCLEANERS) = 14
 Number of I/O servers                  (NUM_IOSERVERS) =
14
 Index sort flag                        (INDEXSORT) = YES
Sequential detect flag                  (SEQDETECT) = YES
 Default prefetch size (pages)          (DFT_PREFETCH_SZ) =
```

16

Track modified pages (TRACKMOD) = OFF

Default number of containers = 1
Default tablespace extentsize (pages) (DFT_EXTENT_SZ) = 32

Max number of active applications (MAXAPPLS) = 150
Average number of active applications (AVG_APPLS) = 1
Max DB files open per application (MAXFILOP) = 1024

Log file size (4KB) (LOGFILSIZ) = 8192
Number of primary log files (LOGPRIMARY) = 20
Number of secondary log files (LOGSECOND) = 5
Changed path to log files (NEWLOGPATH) =
Path to log files = k:\db2tpch\logs\NODE0001\
Overflow log path (OVERFLOWLOGPATH) =
Mirror log path (MIRRORLOGPATH) =
First active log file = S0000002.LOG
Block log on disk full (BLK_LOG_DSK_FUL) = NO
Percent of max active log space by transaction(MAX_LOG) = 0
Num. of active log files for 1 active UOW(NUM_LOG_SPAN) = 0

Group commit count (MINCOMMIT) = 1
Percent log file reclaimed before soft chckpt (SOFTMAX) = 1800
Log retain for recovery enabled (LOGRETAIN) = RECOVERY
User exit for logging enabled (USEREXIT) = OFF

Auto restart enabled (AUTORESTART) = ON
Index re-creation time (INDEXREC) = SYSTEM (ACCESS)
Default number of loadrec sessions (DFT_LOADREC_SES) = 1
Number of database backups to retain (NUM_DB_BACKUPS) = 12
Recovery history retention (days) (REC_HIS_RETENTN) = 366

TSM management class (TSM_MGMTCLASS) =
TSM node name (TSM_NODENAME) =
TSM owner (TSM_OWNER) =
TSM password (TSM_PASSWORD) =

Database Configuration for Node 2

Database configuration release level = 0x0a00
Database release level = 0x0a00

Database territory = US
Database code page = 1252
Database code set = IBM-1252
Database country/region code = 1

Dynamic SQL Query management (DYN_QUERY_MGMT) = DISABLE

Discovery support for this database (DISCOVER_DB) = ENABLE

Default query optimization class (DFT_QUERYOPT) = 7
Degree of parallelism (DFT_DEGREE) = 1
Continue upon arithmetic exceptions (DFT_SQLMATHWARN) = NO
Default refresh age (DFT_REFRESH_AGE) = 0
Number of frequent values retained (NUM_FREQVALUES) = 0
Number of quantiles retained (NUM_QUANTILES) = 600

Backup pending = NO

Database is consistent = YES
Rollforward pending = NO
Restore pending = NO

Multi-page file allocation enabled = NO

Log retain for recovery status = RECOVERY
User exit for logging status = NO

Data Links Token Expiry Interval (sec) (DL_EXPINT) = 60
Data Links Write Token Init Expiry Intvl(DL_WT_IEXPINT) = 60
Data Links Number of Copies (DL_NUM_COPIES) = 1
Data Links Time after Drop (days) (DL_TIME_DROP) = 1
Data Links Token in Uppercase (DL_UPPER) = NO
Data Links Token Algorithm (DL_TOKEN) = MAC0

Database heap (4KB) (DBHEAP) = 20000
Size of database shared memory (4KB) (DATABASE_MEMORY) = AUTOMATIC
Catalog cache size (4KB) (CATALOGCACHE_SZ) = 386
Log buffer size (4KB) (LOGBUFSZ) = 1048
Utilities heap size (4KB) (UTIL_HEAP_SZ) = 40000
Buffer pool size (pages) (BUFFPAGE) = 190000
Extended storage segments size (4KB) (ESTORE_SEG_SZ) = 16000
Number of extended storage segments (NUM_ESTORE_SEGS) = 0
Max storage for lock list (4KB) (LOCKLIST) = 16384

Max size of appl. group mem set (4KB) (APPGROUP_MEM_SZ) = 40000
Percent of mem for appl. group heap (GROUPHEAP_RATIO) = 70
Max appl. control heap size (4KB) (APP_CTL_HEAP_SZ) = 2048

Sort heap thres for shared sorts (4KB) (SHEAPTHRES_SHR) = (SHEAPTHRES)
Sort list heap (4KB) (SORTHEAP) = 7700
SQL statement heap (4KB) (STMTHEAP) = 15000
Default application heap (4KB) (APPLHEAPSZ) = 16000

```
 Package cache size (4KB)                (PCKCACHESZ) =
640
 Statistics heap size (4KB)              (STAT_HEAP_SZ) =
10000

 Interval for checking deadlock (ms)     (DLCHKTIME) =
5000
 Percent. of lock lists per application  (MAXLOCKS) = 5
 Lock timeout (sec)                      (LOCKTIMEOUT) = -1

 Changed pages threshold                 (CHNGPGS_THRESH)
= 80
 Number of asynchronous page cleaners
(NUM_IOCLEANERS) = 14
 Number of I/O servers                   (NUM_IOSERVERS) =
14
 Index sort flag                         (INDEXSORT) = YES
Sequential detect flag                   (SEQDETECT) = YES
 Default prefetch size (pages)           (DFT_PREFETCH_SZ) =
16

 Track modified pages                    (TRACKMOD) = OFF

 Default number of containers                    = 1
 Default tablespace extentsize (pages)   (DFT_EXTENT_SZ)
= 32

 Max number of active applications       (MAXAPPLS) =
150
 Average number of active applications   (AVG_APPLS) =
1
 Max DB files open per application       (MAXFILOP) =
1024

 Log file size (4KB)                     (LOGFILSIZ) = 8192
 Number of primary log files             (LOGPRIMARY) =
20
 Number of secondary log files           (LOGSECOND) = 5
 Changed path to log files               (NEWLOGPATH) =
 Path to log files                               =
l:\db2tpch\logs\NODE0002\
 Overflow log path                       (OVERFLOWLOGPATH) =
 Mirror log path                         (MIRRORLOGPATH) =
 First active log file                           = S0000002.LOG
 Block log on disk full                  (BLK_LOG_DSK_FUL) =
NO
 Percent of max active log space by transaction(MAX_LOG)
= 0
 Num. of active log files for 1 active
UOW(NUM_LOG_SPAN) = 0

 Group commit count                      (MINCOMMIT) = 1
 Percent log file reclaimed before soft chckpt (SOFTMAX) =
1800
 Log retain for recovery enabled         (LOGRETAIN) =
RECOVERY
 User exit for logging enabled           (USEREXIT) = OFF

 Auto restart enabled
(AUTORESTART) = ON
 Index re-creation time                  (INDEXREC) =
SYSTEM (ACCESS)
 Default number of loadrec sessions
(DFT_LOADREC_SES) = 1
 Number of database backups to retain
(NUM_DB_BACKUPS) = 12
 Recovery history retention (days)       (REC_HIS_RETENTN)
= 366
 TSM management class                    (TSM_MGMTCLASS)
=
 TSM node name                           (TSM_NODENAME) =
 TSM owner                               (TSM_OWNER) =
 TSM password                            (TSM_PASSWORD) =
```

Database Configuration for Node 3

```
Database configuration release level            = 0x0a00
 Database release level                         = 0x0a00

 Database territory                             = US
 Database code page                             = 1252
 Database code set                              = IBM-1252
 Database country/region code                   = 1

 Dynamic SQL Query management
(DYN_QUERY_MGMT) = DISABLE

 Discovery support for this database     (DISCOVER_DB) =
ENABLE

 Default query optimization class        (DFT_QUERYOPT) =
7
 Degree of parallelism                   (DFT_DEGREE) = 1
 Continue upon arithmetic exceptions
(DFT_SQLMATHWARN) = NO
 Default refresh age                     (DFT_REFRESH_AGE) = 0
 Number of frequent values retained
(NUM_FREQVALUES) = 0
 Number of quantiles retained            (NUM_QUANTILES)
= 600

 Backup pending                                 = NO

 Database is consistent                         = YES
 Rollforward pending                            = NO
 Restore pending                                = NO

 Multi-page file allocation enabled             = NO

 Log retain for recovery status                 =
RECOVERY
 User exit for logging status                   = NO

 Data Links Token Expiry Interval (sec)  (DL_EXPINT) =
60
 Data Links Write Token Init Expiry
Intvl(DL_WT_IEXPINT) = 60
 Data Links Number of Copies             (DL_NUM_COPIES)
= 1
 Data Links Time after Drop (days)       (DL_TIME_DROP)
= 1
 Data Links Token in Uppercase           (DL_UPPER) =
NO
 Data Links Token Algorithm              (DL_TOKEN) =
MAC0

 Database heap (4KB)                     (DBHEAP) = 20000
 Size of database shared memory (4KB)
(DATABASE_MEMORY) = AUTOMATIC
 Catalog cache size (4KB)                (CATALOGCACHE_SZ)
= 386
 Log buffer (4KB)                        (LOGBUFSZ) = 1048
 Utilities heap size (4KB)               (UTIL_HEAP_SZ) =
40000
 Buffer pool size (pages)                (BUFFPAGE) =
190000
 Extended storage segments size (4KB)
(ESTORE_SEG_SZ) = 16000
```

Number of extended storage segments (NUM_ESTORE_SEGS) = 0
Max storage for lock list (4KB) (LOCKLIST) = 16384

Max size of appl. group mem set (4KB) (APPGROUP_MEM_SZ) = 40000
Percent of mem for appl. group heap (GROUPHEAP_RATIO) = 70
Max appl. control heap size (4KB) (APP_CTL_HEAP_SZ) = 2048

Sort heap thres for shared sorts (4KB) (SHEAPTHRES_SHR) = (SHEAPTHRES)
Sort list heap (4KB) (SORTHEAP) = 7700
SQL statement heap (4KB) (STMTHEAP) = 15000
Default application heap (4KB) (APPLHEAPSZ) = 16000
Package cache size (4KB) (PCKCACHESZ) = 640
Statistics heap size (4KB) (STAT_HEAP_SZ) = 10000

Interval for checking deadlock (ms) (DLCHKTIME) = 5000
Percent. of lock lists per application (MAXLOCKS) = 5
Lock timeout (sec) (LOCKTIMEOUT) = -1

Changed pages threshold (CHNGPGS_THRESH) = 80
Number of asynchronous page cleaners (NUM_IOCLEANERS) = 14
Number of I/O servers (NUM_IOSERVERS) = 14
Index sort flag (INDEXSORT) = YES
Sequential detect flag (SEQDETECT) = YES
Default prefetch size (pages) (DFT_PREFETCH_SZ) = 16

Track modified pages (TRACKMOD) = OFF

Default number of containers = 1
Default tablespace extentsize (pages) (DFT_EXTENT_SZ) = 32

Max number of active applications (MAXAPPLS) = 150
Average number of active applications (AVG_APPLS) = 1
Max DB files open per application (MAXFILOP) = 1024

Log file size (4KB) (LOGFILSIZ) = 8192
Number of primary log files (LOGPRIMARY) = 20
Number of secondary log files (LOGSECOND) = 5
Changed path to log files (NEWLOGPATH) =
Path to log files = m:\db2tpch\logs\NODE0003\
Overflow log path (OVERFLOWLOGPATH) =
Mirror log path (MIRRORLOGPATH) =
First active log file = S0000002.LOG
Block log on disk full (BLK_LOG_DSK_FUL) = NO
Percent of max active log space by transaction(MAX_LOG) = 0
Num. of active log files for 1 active UOW(NUM_LOG_SPAN) = 0

Group commit count (MINCOMMIT) = 1
Percent log file reclaimed before soft chckpt (SOFTMAX) = 1800
Log retain for recovery enabled (LOGRETAIN) = RECOVERY
User exit for logging enabled (USEREXIT) = OFF

Auto restart enabled (AUTORESTART) = ON
Index re-creation time (INDEXREC) = SYSTEM (ACCESS)
Default number of loadrec sessions (DFT_LOADREC_SES) = 1
Number of database backups to retain (NUM_DB_BACKUPS) = 12
Recovery history retention (days) (REC_HIS_RETENTN) = 366

TSM management class (TSM_MGMTCLASS) =
TSM node name (TSM_NODENAME) =
TSM owner (TSM_OWNER) =
TSM password (TSM_PASSWORD) =

DB2 Database Manager Configuration

Database Manager Configuration

Node type = Enterprise Server Edition with local and remote clients
Database manager configuration release level = 0x0a00

Maximum total of files open (MAXTOTFILOP) = 16000
CPU speed (millisec/instruction) (CPUSPEED) = 2.361721e-007
Communications bandwidth (MB/sec) (COMM_BANDWIDTH) = 1.000000e+002

Max number of concurrently active databases (NUMDB) = 1
Data Links support (DATALINKS) = NO
Federated Database System Support (FEDERATED) = NO
Transaction processor monitor name (TP_MON_NAME) =

Default charge-back account (DFT_ACCOUNT_STR) =

Java Development Kit installation path (JDK_PATH) =

Diagnostic error capture level (DIAGLEVEL) = 0
Notify Level (NOTIFYLEVEL) = 3
Diagnostic data directory path (DIAGPATH) =

Default database monitor switches
Buffer pool (DFT_MON_BUFPOOL) = OFF
Lock (DFT_MON_LOCK) = OFF
Sort (DFT_MON_SORT) = OFF
Statement (DFT_MON_STMT) = OFF
Table (DFT_MON_TABLE) = OFF
Timestamp (DFT_MON_TIMESTAMP) = OFF
Unit of work (DFT_MON_UOW) = OFF
Monitor health of instance and databases (HEALTH_MON)

```
= OFF

 SYSADM group name                       (SYSADM_GROUP)
=
 SYSCTRL group name                   (SYSCTRL_GROUP) =
 SYSMAINT group name                 (SYSMAINT_GROUP) =
 SYSMON group name                     (SYSMON_GROUP) =

 Database manager authentication      (AUTHENTICATION)
= SERVER
 Cataloging allowed without authority
(CATALOG_NOAUTH) = NO
 Trust all clients                    (TRUST_ALLCLNTS) = YES
 Trusted client authentication        (TRUST_CLNTAUTH) =
CLIENT
 Bypass federated authentication         (FED_NOAUTH) =
NO

 Default database path                   (DFTDBPATH) = D:
 Database monitor heap size (4KB)        (MON_HEAP_SZ)
= 46
 Java Virtual Machine heap size (4KB)    (JAVA_HEAP_SZ)
= 1024
 Audit buffer size (4KB)                 (AUDIT_BUF_SZ) = 0
 Size of instance shared memory (4KB)
(INSTANCE_MEMORY) = AUTOMATIC
 Backup buffer default size (4KB)        (BACKBUFSZ) =
1024
 Restore buffer default size (4KB)       (RESTBUFSZ) =
1024

 Agent stack size                        (AGENT_STACK_SZ) = 16

 Minimum committed private memory (4KB)
(MIN_PRIV_MEM) = 32
 Private memory threshold (4KB)
(PRIV_MEM_THRESH) = 20000

 Sort heap threshold (4KB)               (SHEAPTHRES) =
400000

 Directory cache support                 (DIR_CACHE) = YES

 Application support layer heap size (4KB)  (ASLHEAPSZ)
= 15
 Max requester I/O block size (bytes)    (RQRIOBLK) =
32767
 DOS requester I/O block size (bytes)    (DOS_RQRIOBLK)
= 4096
 Query heap size (4KB)                   (QUERY_HEAP_SZ) =
1000
 DRDA services heap size (4KB)           (DRDA_HEAP_SZ)
= 128

 Workload impact by throttled utilities(UTIL_IMPACT_LIM)
= 100

 Priority of agents                      (AGENTPRI) = SYSTEM
 Max number of existing agents           (MAXAGENTS) =
3600
 Agent pool size                      (NUM_POOLAGENTS) = 64
 Initial number of agents in pool        (NUM_INITAGENTS)
= 4
 Max number of coordinating agents
(MAX_COORDAGENTS) = (MAXAGENTS -
NUM_INITAGENTS)
 Max no. of concurrent coordinating agents
(MAXCAGENTS) = MAX_COORDAGENTS
 Max number of client connections
(MAX_CONNECTIONS) = MAX_COORDAGENTS

 Keep fenced process                  (KEEPFENCED) = YES
 Number of pooled fenced processes       (FENCED_POOL)
= MAX_COORDAGENTS
 Initial number of fenced processes   (NUM_INITFENCED)
= 0

 Index re-creation time                  (INDEXREC) =
ACCESS

 Transaction manager database name       (TM_DATABASE)
= 1ST_CONN
 Transaction resync interval (sec)    (RESYNC_INTERVAL)
= 180

 SPM name                                (SPM_NAME) =
 SPM log size                         (SPM_LOG_FILE_SZ) = 256
 SPM resync agent limit               (SPM_MAX_RESYNC) =
20
 SPM log path                         (SPM_LOG_PATH) =

 NetBIOS Workstation name                   (NNAME) =

 TCP/IP Service name                     (SVCENAME) =
 Discovery mode                       (DISCOVER) =
SEARCH
 Discover server instance             (DISCOVER_INST) =
ENABLE

 Maximum query degree of parallelism
(MAX_QUERYDEGREE) = ANY
 Enable intra-partition parallelism   (INTRA_PARALLEL)
= NO
 No. of int. communication
buffers(4KB)(FCM_NUM_BUFFERS) = 30000
 Number of FCM request blocks            (FCM_NUM_RQB)
= AUTOMATIC
 Number of FCM connection entries
(FCM_NUM_CONNECT) = AUTOMATIC
 Number of FCM message anchors
(FCM_NUM_ANCHORS) = AUTOMATIC
 Node connection elapse time (sec)       (CONN_ELAPSE)
= 10
 Max number of node connection retries
(MAX_CONNRETRIES) = 5
 Max time difference between nodes (min)
(MAX_TIME_DIFF) = 60

 db2start/db2stop timeout (min)       (START_STOP_TIME)
= 10
```

DB2 Registry Variables

```
 DB2_SMS_TRUNC_TMPTABLE_THRESH=1024
DB2_EXTENDED_OPTIMIZATION=Y
DB2_ANTIJOIN=ON
DB2BPVARS=d:\home\db2tpch\tpch\ddl\win.mln \scattered_
read
DB2ACCOUNTNAME=LANGCHAO-TPCH\db2tpch
DB2INSTOWNER=LANGCHAO-TPCH
DB2PORTRANGE=60004:60007
DB2MEMMAXFREE=1000000000
DB2OPTIONS=   -t -v +c
DB2NTNOCACHE=ON
DB2INSTPROF=d:\home\db2tpch
```

DB2_PARALLEL_IO=*

Microsoft Windows Server 2003 Enterprise Edition

Configuration Parameters

Boot Options

Timeout: 30
Default: \Device\HarddiskVolume6\WINDOWS
CurrentBootEntryID: 1

Boot Entries

Boot entry ID: 1
OS Friendly Name: Windows Server 2003, Enterprise
OsLoadOptions: N/A
BootFilePath: \Device\HarddiskVolume4\EFI\Microsoft\WINNT50.0\ia64ldr.efi
OsFilePath: \Device\HarddiskVolume6\WINDOWS

Boot entry ID: 2
OS Friendly Name: Floppy/Pci(1F|1)/Ata(Primary,Slave)

Boot entry ID: 3
OS Friendly Name: CD/DVD ROM/Pci(1F|1)/Ata(Primary,Master)

Boot entry ID: 4
OS Friendly Name: Network Boot/Pci(1|0|0)/Mac(000E0C2183E9)

Boot entry ID: 5
OS Friendly Name: EFI Shell [Built-in]

SUT Hardware Information Report

[System Summary]

Item Value
OS Name Microsoft(R) Windows(R) Server 2003, Enterprise Edition
Version 5.2.3790 Build 3790
OS Manufacturer Microsoft Corporation
System Name LANGCHAO-TPCH
System Manufacturer Intel
System Model MP Server
System Type Itanium (TM) -based System
Processor ia64 Family 31 Model 1 Stepping 5 GenuineIntel ~1496 Mhz
Processor ia64 Family 31 Model 1 Stepping 5 GenuineIntel ~1496 Mhz
Processor ia64 Family 31 Model 1 Stepping 5 GenuineIntel ~1496 Mhz
Processor ia64 Family 31 Model 1 Stepping 5 GenuineIntel ~1496 Mhz
BIOS Version/Date Intel Corporation S870BN4A.86B.0897.P01.0305201003, 5/20/2003
SMBIOS Version 2.3
Windows Directory C:\WINDOWS
System Directory C:\WINDOWS\system32
Boot Device \Device\HarddiskVolume4
Locale United States
Hardware Abstraction Layer Version = "5.2.3790.0 (srv03_rtm.030324-2048)"
User Name LANGCHAO-TPCH\db2tpch
Time Zone China Standard Time
Total Physical Memory 32,768.00 MB
Available Physical Memory 31.03 GB
Total Virtual Memory 79.25 GB
Available Virtual Memory 78.08 GB
Page File Space 47.26 GB
Page File C:\pagefile.sys

[Hardware Resources]

[Conflicts/Sharing]

Resource Device
I/O Port 0x00000000-0x00008FFF PCI bus
I/O Port 0x00000000-0x00008FFF Direct memory access controller

IRQ 11 Intel(r) 82870 Hot Plug controller
IRQ 11 Intel(r) 82870 Hot Plug controller
IRQ 11 Intel(r) 82870 Hot Plug controller
IRQ 11 Intel(r) 82870 Hot Plug controller
IRQ 11 Intel(r) 82870 Hot Plug controller
IRQ 11 Intel(r) 82870 Hot Plug controller

I/O Port 0x00009000-0x0000AFFF PCI bus
I/O Port 0x00009000-0x0000AFFF Intel(r) 82870 Hub Interface to PCI Bridges

I/O Port 0x0000B000-0x0000CFFF PCI bus
I/O Port 0x0000B000-0x0000CFFF Intel(r) 82870 Hub Interface to PCI Bridges

Memory Address 0xFEC00000-0xFEC0FFFF PCI bus
Memory Address 0xFEC00000-0xFEC0FFFF Motherboard resources

Memory Address 0xA0000-0xFFFFF PCI bus
Memory Address 0xA0000-0xFFFFF RAGE XL PCI Family (Microsoft Corporation)

I/O Port 0x0000D000-0x0000EFFF PCI bus
I/O Port 0x0000D000-0x0000EFFF Intel(r) 82870 Hub Interface to PCI Bridges

[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
0x00000000-0x00008FFF PCI bus OK
0x00000000-0x00008FFF Direct memory access controller OK
0x00007CC0-0x00007CDF Intel(r) 82801DB/DBM USB Universal Host Controller - 24C2 OK
0x00007CE0-0x00007CFF Intel(r) 82801DB/DBM USB Universal Host Controller - 24C4 OK

0x00008CC0-0x00008CFF Intel(R) PRO/1000 MT Network ConnectionOK
0x00008800-0x000088FF RAGE XL PCI Family (Microsoft Corporation) OK
0x000003B0-0x000003BB RAGE XL PCI Family (Microsoft Corporation) OK
0x000003C0-0x000003DF RAGE XL PCI Family (Microsoft Corporation) OK
0x00001000-0x0000100F Intel(r) 82801DB Ultra ATA Storage Controller-24CB OK
0x000001F0-0x000001F7 Primary IDE ChannelOK

0x000003F6-0x000003F6 Primary IDE ChannelOK

0x00000170-0x00000177 Secondary IDE Channel OK
0x00000376-0x00000376 Secondary IDE Channel OK
0x00000010-0x0000001F Motherboard resources OK
0x00000022-0x0000002D Motherboard resources OK
0x00000030-0x0000003F Motherboard resources OK
0x00000044-0x0000005F Motherboard resources OK
0x00000062-0x00000063 Motherboard resources OK
0x00000065-0x0000006F Motherboard resources OK
0x00000072-0x0000007F Motherboard resources OK
0x00000080-0x00000080 Motherboard resources OK
0x00000084-0x00000086 Motherboard resources OK
0x00000088-0x00000088 Motherboard resources OK
0x0000008C-0x0000008E Motherboard resources OK
0x00000090-0x0000009F Motherboard resources OK
0x000000A2-0x000000BD Motherboard resources OK
0x000000E0-0x000000EF Motherboard resources OK
0x000008A0-0x000008A3 Motherboard resources OK
0x00000CC0-0x00000CCF Motherboard resources OK
0x000004D0-0x000004D1 Motherboard resources OK
0x00000C00-0x00000C07 Motherboard resources OK
0x00000020-0x00000021 Programmable interrupt controller OK
0x000000A0-0x000000A1 Programmable interrupt controller OK
0x00000081-0x00000083 Direct memory access controller OK
0x00000087-0x00000087 Direct memory access controller OK
0x00000089-0x0000008B Direct memory access controller OK
0x0000008F-0x0000008F Direct memory access controller OK
0x000000C0-0x000000DF Direct memory access controller OK
0x00000040-0x00000043 System timer OK

0x00000070-0x00000071 System CMOS/real time clock OK
0x00000061-0x00000061 System speaker OK

0x0000002E-0x0000002F Motherboard resources OK
0x000003F0-0x000003F5 Standard floppy disk controller OK
0x000003F7-0x000003F7 Standard floppy disk controller OK
0x000003F8-0x000003FF Communications Port (COM1) OK
0x000002F8-0x000002FF Communications Port (COM2) OK
0x00009000-0x0000AFFF PCI bus OK
0x00009000-0x0000AFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0x00009C00-0x00009CFF Emulex LP9000 FC HBA <Current Settings> OK
0x00009800-0x000098FF Emulex LP9000 FC HBA <Current Settings> OK
0x0000A000-0x0000AFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0x0000AC00-0x0000ACFF Emulex LP9000 FC HBA <Current Settings> OK
0x0000A400-0x0000A4FF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0x0000A800-0x0000A8FF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0x0000B000-0x0000CFFF PCI bus OK
0x0000B000-0x0000CFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0x0000BC00-0x0000BCFF Emulex LP9000 FC HBA <Current Settings> OK
0x0000C000-0x0000CFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0x0000CC00-0x0000CCFF Emulex LP9000 FC HBA <Current Settings> OK
0x0000C800-0x0000C8FF Emulex LP9000 FC HBA <Current Settings> OK
0x0000D000-0x0000EFFF PCI bus OK
0x0000D000-0x0000EFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0x0000DC00-0x0000DCFF Emulex LP9000 FC HBA <Current Settings> OK
0x0000E000-0x0000EFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0x0000EC00-0x0000ECFF Emulex LP9000 FC HBA <Current Settings> OK

[IRQs]

Resource Device Status
IRQ 9 Microsoft ACPI-Compliant System OK

IRQ 16 Intel(r) 82801DB/DBM USB Universal Host Controller - 24C2 OK
IRQ 19 Intel(r) 82801DB/DBM USB Universal Host Controller - 24C4 OK
IRQ 23 Intel(r) 82801DB/DBM USB 2.0 Enhanced Host Controller - 24CD OK
IRQ 18 Intel(R) PRO/1000 MT Network ConnectionOK

IRQ 14 Primary IDE ChannelOK
IRQ 15 Secondary IDE Channel OK
IRQ 0 System timer OK
IRQ 8 System CMOS/real time clock OK
IRQ 6 Standard floppy disk controller OK
IRQ 4 Communications Port (COM1) OK
IRQ 3 Communications Port (COM2) OK

IRQ 48 Emulex LP9000 FC HBA <Current Settings> OK
IRQ 52 Emulex LP9000 FC HBA <Current Settings> OK
IRQ 11 Intel(r) 82870 Hot Plug controller OK
IRQ 11 Intel(r) 82870 Hot Plug controller OK
IRQ 11 Intel(r) 82870 Hot Plug controller OK
IRQ 11 Intel(r) 82870 Hot Plug controller OK
IRQ 11 Intel(r) 82870 Hot Plug controller OK
IRQ 11 Intel(r) 82870 Hot Plug controller OK
IRQ 24 Emulex LP9000 FC HBA <Current Settings> OK
IRQ 28 LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
IRQ 29 LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
IRQ 96 Emulex LP9000 FC HBA <Current Settings> OK
IRQ 72 Emulex LP9000 FC HBA <Current Settings> OK
IRQ 76 Emulex LP9000 FC HBA <Current Settings> OK
IRQ 144 Emulex LP9000 FC HBA <Current Settings> OK
IRQ 120 Emulex LP9000 FC HBA <Current Settings> OK

[Memory]

Resource Device Status
0xA0000-0xFFFFF PCI bus OK
0xA0000-0xFFFFF RAGE XL PCI Family (Microsoft Corporation) OK
0xF9000000-0xFBFFFFFF PCI bus OK
0xFEC00000-0xFEC0FFFF PCI bus OK
0xFEC00000-0xFEC0FFFF Motherboard resources OK
0xF9FF0000-0xF9FF03FF Intel(r) 82801DB/DBM USB 2.0 Enhanced Host Controller - 24CD OK
0xFBFE0000-0xFBFFFFFF Intel(R) PRO/1000 MT Network Connection OK
0xFA000000-0xFAFFFFFF RAGE XL PCI Family (Microsoft Corporation) OK
0xFBFD0000-0xFBFD0FFF RAGE XL PCI Family (Microsoft Corporation) OK
0xFBFDFC00-0xFBFDFFFF Intel(r) 82801DB Ultra ATA Storage Controller-24CB OK
0xFEE00000-0xFEE00FFF Motherboard resources OK
0xF7000000-0xF8FFFFFF PCI bus OK
0xFEC10000-0xFEC2FFFF PCI bus OK
0xF8BF0000-0xF8BF0FFF Intel(r) 82870 I/OxAPIC Interrupt Controller OK
0xF8C00000-0xF8CFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF7E00000-0xF7EFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF8CF0000-0xF8CF0FFF Emulex LP9000 FC HBA <Current Settings> OK
0xF8CE0000-0xF8CE00FF Emulex LP9000 FC HBA <Current Settings> OK
0xF8CD0000-0xF8CD0FFF Emulex LP9000 FC HBA <Current Settings> OK
0xF8CC0000-0xF8CC00FF Emulex LP9000 FC HBA <Current Settings> OK
0xF7EF0000-0xF7EF00FF Intel(r) 82870 Hot Plug controller OK
0xF8BE0000-0xF8BE0FFF Intel(r) 82870 I/OxAPIC Interrupt Controller OK
0xF8D00000-0xF8FFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF7F00000-0xF7FFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF8FF0000-0xF8FF0FFF Emulex LP9000 FC HBA <Current Settings> OK
0xF8FE0000-0xF8FE00FF Emulex LP9000 FC HBA <Current Settings> OK
0xF8F90000-0xF8F9FFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xF8F80000-0xF8F8FFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xF8FB0000-0xF8FBFFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xF8FA0000-0xF8FAFFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xF7FF0000-0xF7FF00FF Intel(r) 82870 Hot Plug controller OK
0xF5000000-0xF6FFFFFF PCI bus OK
0xFEC30000-0xFEC4FFFF PCI bus OK
0xF6DF0000-0xF6DF0FFF Intel(r) 82870 I/OxAPIC Interrupt Controller OK
0xF6E00000-0xF6EFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF5E00000-0xF5EFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF6EF0000-0xF6EF0FFF Emulex LP9000 FC HBA <Current Settings> OK
0xF6EE0000-0xF6EE00FF Emulex LP9000 FC HBA <Current Settings> OK
0xF5EF0000-0xF5EF00FF Intel(r) 82870 Hot Plug controller OK
0xF6DE0000-0xF6DE0FFF Intel(r) 82870 I/OxAPIC Interrupt Controller OK
0xF6F00000-0xF6FFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF5F00000-0xF5FFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF6FF0000-0xF6FF0FFF Emulex LP9000 FC HBA <Current Settings> OK
0xF6FE0000-0xF6FE00FF Emulex LP9000 FC HBA <Current Settings> OK
0xF6FD0000-0xF6FD0FFF Emulex LP9000 FC HBA <Current Settings> OK
0xF6FC0000-0xF6FC00FF Emulex LP9000 FC HBA <Current Settings> OK
0xF5FF0000-0xF5FF00FF Intel(r) 82870 Hot Plug controller OK
0xF3000000-0xF4FFFFFF PCI bus OK
0xFEC50000-0xFECFFFFF PCI bus OK
0xF4DF0000-0xF4DF0FFF Intel(r) 82870 I/OxAPIC Interrupt Controller OK
0xF4E00000-0xF4EFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF3E00000-0xF3EFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF4EF0000-0xF4EF0FFF Emulex LP9000 FC HBA <Current Settings> OK
0xF4EE0000-0xF4EE00FF Emulex LP9000 FC HBA <Current Settings> OK
0xF3EF0000-0xF3EF00FF Intel(r) 82870 Hot Plug controller OK
0xF4DE0000-0xF4DE0FFF Intel(r) 82870 I/OxAPIC Interrupt Controller OK

0xF4F00000-0xF4FFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF3F00000-0xF3FFFFFF Intel(r) 82870 Hub Interface to PCI Bridges OK
0xF4FF0000-0xF4FF0FFF Emulex LP9000 FC HBA <Current Settings> OK
0xF4FE0000-0xF4FE00FF Emulex LP9000 FC HBA <Current Settings> OK
0xF3FF0000-0xF3FF00FF Intel(r) 82870 Hot Plug controller OK

[Components]

[Multimedia]

[Audio Codecs]

CODEC Manufacturer Description
Status File Version Size
Creation Date
c:\windows\system32\msgsm32.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSGSM32.ACM
5.2.3790.0 (srv03_rtm.030324-2048) 66.50 KB (68,096 bytes) 3/25/2003 8:00 PM
c:\windows\system32\tssoft32.acm DSP GROUP, INC. OK
C:\WINDOWS\system32\TSSOFT32.ACM 1.01
29.00 KB (29,696 bytes) 3/25/2003 8:00 PM
c:\windows\system32\imaadp32.acm Microsoft Corporation OK
C:\WINDOWS\system32\IMAADP32.ACM
5.2.3790.0 (srv03_rtm.030324-2048) 55.00 KB (56,320 bytes) 3/25/2003 8:00 PM
c:\windows\system32\msg711.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSG711.ACM
5.2.3790.0 (srv03_rtm.030324-2048) 33.00 KB (33,792 bytes) 3/25/2003 8:00 PM
c:\windows\system32\msadp32.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSADP32.ACM
5.2.3790.0 (srv03_rtm.030324-2048) 49.00 KB (50,176 bytes) 3/25/2003 8:00 PM

[Video Codecs]

CODEC Manufacturer Description
Status File Version Size
Creation Date
c:\windows\system32\msvidc32.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSVIDC32.DLL
5.2.3790.0 (srv03_rtm.030324-2048) 67.00 KB (68,608 bytes) 3/25/2003 8:00 PM
c:\windows\system32\msrle32.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSRLE32.DLL
5.2.3790.0 (srv03_rtm.030324-2048) 24.50 KB (25,088 bytes) 3/25/2003 8:00 PM

[CD-ROM]

Item Value
Drive E:
Description CD-ROM Drive
Media Loaded No
Media Type CD-ROM
Name MITSUMI CD-ROM SR244W
Manufacturer (Standard CD-ROM drives)
Status OK
Transfer Rate Not Available
SCSI Target ID 0
PNP Device ID IDE\CDROMMITSUMI_CD-ROM_SR244W_____T01A____\5&8C4B7B4&0&0.0.0
Driver c:\windows\system32\drivers\cdrom.sys (5.2.3790.0 (srv03_rtm.030324-2048), 143.50 KB (146,944 bytes), 3/25/2003 8:00 PM)

[Sound Device]

Item Value

[Display]

Item Value
Name RAGE XL PCI Family (Microsoft Corporation)
PNP Device ID PCI\VEN_1002&DEV_4752&SUBSYS_34028086&REV_27\4&29817089&0&08F0
Adapter Type ATI RAGE XL PCI (B41), ATI Technologies Inc. compatible
Adapter Description RAGE XL PCI Family (Microsoft Corporation)
Adapter RAM 8.00 MB (8,388,608 bytes)
Installed Drivers ati2drad.dll
Driver Version 5.10.3663.6013
INF File atiixpad.inf (ati2mpad section)
Color Planes 1
Color Table Entries 4294967296
Resolution 800 x 600 x 75 hertz
Bits/Pixel 32
Memory Address 0xFA000000-0xFAFFFFFF
I/O Port 0x00008800-0x000088FF
Memory Address 0xFBFD0000-0xFBFD0FFF
I/O Port 0x000003B0-0x000003BB
I/O Port 0x000003C0-0x000003DF
Memory Address 0xA0000-0xFFFFF
Driver c:\windows\system32\drivers\ati2mpad.sys (5.10.3663.6013, 1.00 MB (1,051,648 bytes), 3/23/2004 12:46 AM)

[Infrared]

Item Value

[Input]

[Keyboard]

Item Value
Description USB Human Interface Device
Name Enhanced (101- or 102-key)
Layout 00000409
PNP Device ID USB\VID_0D62&PID_700C&MI_00\6&16E71EBF&0&0000
Number of Function Keys 12
Driver c:\windows\system32\drivers\hidusb.sys (5.2.3790.0 (srv03_rtm.030324-2048), 32.00 KB (32,768 bytes), 3/25/2003 8:00 PM)

[Pointing Device]

Item Value
Hardware Type USB Human Interface Device
Number of Buttons 3
Status OK
PNP Device ID
USB\VID_046D&PID_C016\5&2A0413C&0&2

Power Management Supported No
Double Click Threshold 6
Handedness Right Handed Operation
Driver c:\windows\system32\drivers\hidusb.sys (5.2.3790.0 (srv03_rtm.030324-2048), 32.00 KB (32,768 bytes), 3/25/2003 8:00 PM)

[Modem]

Item Value

[Network]

[Adapter]

Item Value
Name [00000001] Intel(R) PRO/1000 MT Network Connection
Adapter Type Ethernet 802.3
Product Type Intel(R) PRO/1000 MT Network Connection
Installed Yes
PNP Device ID
PCI\VEN_8086&DEV_100E&SUBSYS_34028086&REV_02\4&29817089&0&00F0
Last Reset 4/3/2004 5:01 PM
Index 1
Service Name E1000
IP Address 10.0.0.2
IP Subnet 255.255.255.0
Default IP Gateway 10.0.0.1
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:0E:0C:21:83:E9
Memory Address 0xFBFE0000-0xFBFFFFFF
I/O Port 0x00008CC0-0x00008CFF
IRQ Channel IRQ 18
Driver c:\windows\system32\drivers\e1000645.sys (6.3.6.31 built by: WinDDK, 363.00 KB (371,712 bytes), 3/23/2004 12:46 AM)

Name [00000002] RAS Async Adapter
Adapter Type Not Available
Product Type RAS Async Adapter
Installed Yes
PNP Device ID Not Available
Last Reset 4/3/2004 5:01 PM
Index 2
Service Name AsyncMac
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

Name [00000003] WAN Miniport (L2TP)
Adapter Type Not Available
Product Type WAN Miniport (L2TP)
Installed Yes
PNP Device ID ROOT\MS_L2TPMINIPORT\0000

Last Reset 4/3/2004 5:01 PM
Index 3
Service Name Rasl2tp
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

Name [00000004] WAN Miniport (PPTP)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPTP)
Installed Yes
PNP Device ID ROOT\MS_PPTPMINIPORT\0000

Last Reset 4/3/2004 5:01 PM
Index 4
Service Name PptpMiniport
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 50:50:54:50:30:30

Name [00000005] WAN Miniport (PPPOE)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPPOE)
Installed Yes
PNP Device ID ROOT\MS_PPPOEMINIPORT\0000

Last Reset 4/3/2004 5:01 PM
Index 5
Service Name RasPppoe
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 33:50:6F:45:30:30

Name [00000006] Direct Parallel
Adapter Type Not Available
Product Type Direct Parallel
Installed Yes
PNP Device ID ROOT\MS_PTIMINIPORT\0000

Last Reset 4/3/2004 5:01 PM
Index 6
Service Name Raspti
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available

DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

Name [00000007] WAN Miniport (IP)
Adapter Type Not Available
Product Type WAN Miniport (IP)
Installed Yes
PNP Device ID ROOT\MS_NDISWANIP\0000
Last Reset 4/3/2004 5:01 PM
Index 7
Service Name NdisWan
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

[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 23.00 KB (23,552 bytes)
Version 5.2.3790.0 (srv03_rtm.030324-2048)

[Ports]

[Serial]

Item Value
Name Communications Port (COM1)
Status OK
PNP Device ID ACPI\PNP0501\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 (5.2.3790.0 (srv03_rtm.030324-2048), 174.50 KB (178,688 bytes), 3/25/2003 8:00 PM)

Name Communications Port (COM2)
Status OK
PNP Device ID ACPI\PNP0501\2
Maximum Input Buffer Size 0
Maximum Output Buffer Size No
Settable Baud Rate Yes
Settable Data Bits Yes
Settable Flow Control Yes
Settable Parity Yes
Settable Parity Check Yes
Settable Stop Bits Yes
Settable RLSD Yes
Supports RLSD Yes
Supports 16 Bit Mode No
Supports Special Characters No
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity None
Busy No
Abort Read/Write on Error No
Binary Mode Enabled Yes
Continue XMit on XOff No
CTS Outflow Control No
Discard NULL Bytes No
DSR Outflow Control 0
DSR Sensitivity 0
DTR Flow Control Type Enable
EOF Character 0
Error Replace Character 0
Error Replacement Enabled No
Event Character 0
Parity Check Enabled No
RTS Flow Control Type Enable
XOff Character 19
XOffXMit Threshold 512
XOn Character 17
XOnXMit Threshold 2048
XOnXOff InFlow Control 0
XOnXOff OutFlow Control 0
I/O Port 0x000002F8-0x000002FF
IRQ Channel IRQ 3
Driver c:\windows\system32\drivers\serial.sys (5.2.3790.0 (srv03_rtm.030324-2048), 174.50 KB (178,688 bytes), 3/25/2003 8:00 PM)

[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 135.63 GB (145,636,806,656 bytes)
Free Space 6.33 GB (6,794,440,704 bytes)
Volume Name
Volume Serial Number AC3BDED9

Drive D:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 136.61 GB (146,683,195,392 bytes)
Free Space 18.86 GB (20,253,138,944 bytes)
Volume Name
Volume Serial Number 74E7CEB6

Drive E:
Description CD-ROM Disc

Drive F:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 120.00 GB (128,849,014,784 bytes)
Free Space 49.33 GB (52,967,333,888 bytes)
Volume Name New Volume
Volume Serial Number 70920726

Drive G:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 130.00 GB (139,586,433,024 bytes)
Free Space 19.56 GB (21,003,370,496 bytes)
Volume Name New Volume
Volume Serial Number 24A0923D

Drive H:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 130.00 GB (139,586,433,024 bytes)
Free Space 95.65 GB (102,705,287,168 bytes)
Volume Name New Volume
Volume Serial Number 98A8CEFE

Drive I:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 130.00 GB (139,586,433,024 bytes)
Free Space 96.43 GB (103,544,184,832 bytes)
Volume Name New Volume
Volume Serial Number 38AE64E1

Drive J:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 67.67 GB (72,661,069,824 bytes)

Free Space 63.30 GB (67,963,994,112 bytes)
Volume Name New Volume
Volume Serial Number 08AB81E0

Drive K:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 67.67 GB (72,661,069,824 bytes)
Free Space 66.44 GB (71,341,846,528 bytes)
Volume Name New Volume
Volume Serial Number 0CF9C328

Drive L:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 67.67 GB (72,661,069,824 bytes)
Free Space 66.45 GB (71,346,978,816 bytes)
Volume Name New Volume
Volume Serial Number 24C2A6F1

Drive M:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 67.67 GB (72,661,069,824 bytes)
Free Space 66.45 GB (71,345,160,192 bytes)
Volume Name New Volume
Volume Serial Number F4CF63DC

Drive N:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 2.00 GB (2,147,481,600 bytes)
Free Space 1.99 GB (2,133,841,920 bytes)
Volume Name New Volume
Volume Serial Number 7022C464

Drive O:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 2.00 GB (2,147,481,600 bytes)
Free Space 1.99 GB (2,133,876,736 bytes)
Volume Name New Volume
Volume Serial Number 449267B0

Drive P:
Description Removable Disk

[Disks]

Item Value
Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #86, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 1
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #87, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 10
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #96, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 11
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #97, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive

Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 12
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #98, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 13
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #99, Partition #0
Partition Size 1.00 MB (1,048,576 bytes)
Partition Starting Offset 17,408 bytes
Partition Disk #99, Partition #1
Partition Size 67.67 GB (72,662,088,192 bytes)
Partition Starting Offset 134,235,136 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 2
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #88, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 3
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #89, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 4
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #90, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 5
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #91, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 6
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63

Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #92, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 7
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #93, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 8
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #94, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 9
SCSI Port 5
SCSI Target ID 4
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #95, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #44, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 1
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #45, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 10
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #54, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes

Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 11
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #55, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 12
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #56, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 13
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #57, Partition #0
Partition Size 1.00 MB (1,048,576 bytes)
Partition Starting Offset 17,408 bytes
Partition Disk #57, Partition #1
Partition Size 67.67 GB (72,662,088,192 bytes)
Partition Starting Offset 134,235,136 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 2
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #46, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 3
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #47, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 4
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #48, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 5
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750

Tracks/Cylinder 255
Partition Disk #49, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 6
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #50, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 7
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #51, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 8
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #52, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 9
SCSI Port 10
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #53, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #72, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 1
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #73, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 10

SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #82, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 11
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #83, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 12
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #84, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 13
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #85, Partition #0
Partition Size 1.00 MB (1,048,576 bytes)
Partition Starting Offset 17,408 bytes
Partition Disk #85, Partition #1
Partition Size 67.67 GB (72,662,088,192 bytes)
Partition Starting Offset 134,235,136 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 2
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #74, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 3
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #75, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 4
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #76, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 5
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #77, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 6
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #78, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 7
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #79, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 8
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #80, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 9
SCSI Port 4
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #81, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #58, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 1
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)

Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #59, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 10
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #68, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 11
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #69, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 12
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #70, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 13
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #71, Partition #0
Partition Size 1.00 MB (1,048,576 bytes)
Partition Starting Offset 17,408 bytes
Partition Disk #71, Partition #1
Partition Size 67.67 GB (72,662,088,192 bytes)
Partition Starting Offset 134,235,136 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 2
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #60, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 3
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #61, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device

Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 4
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #62, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 5
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #63, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 6
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #64, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 7
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #65, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 8
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #66, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 9
SCSI Port 11
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #67, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255

Partition Disk #30, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 1
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #31, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 10
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #40, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 11
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #41, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 12
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #42, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 13
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #43, Partition #0
Partition Size 1.00 MB (1,048,576 bytes)
Partition Starting Offset 17,408 bytes
Partition Disk #43, Partition #1
Partition Size 67.67 GB (72,662,088,192 bytes)
Partition Starting Offset 134,235,136 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 2
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #32, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1

SCSI Bus 0
SCSI Logical Unit 3
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #33, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 4
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #34, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 5
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #35, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 6
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #36, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 7
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #37, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 8
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #38, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 9
SCSI Port 9
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #39, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #16, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 1
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #17, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 10
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #26, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 11
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #27, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 12
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #28, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 13
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #29, Partition #0
Partition Size 1.00 MB (1,048,576 bytes)
Partition Starting Offset 17,408 bytes
Partition Disk #29, Partition #1
Partition Size 67.67 GB (72,662,088,192 bytes)
Partition Starting Offset 134,235,136 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 2
SCSI Port 8
SCSI Target ID 2

Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #18, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 3
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #19, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 4
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #20, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 5
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #21, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 6
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #22, Partition #0
Partition Size 67.79 GB (72,793,695,744bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 7
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #23, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 8
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #24, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512

Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 9
SCSI Port 8
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #25, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #2, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 1
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #3, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 10
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #12, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 11
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #13, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 12
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #14, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 13
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #15, Partition #0

Partition Size 1.00 MB (1,048,576 bytes)
Partition Starting Offset 17,408 bytes
Partition Disk #15, Partition #1
Partition Size 67.67 GB (72,662,088,192 bytes)
Partition Starting Offset 134,235,136 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 2
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #4, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 3
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #5, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 4
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #6, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 5
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #7, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 6
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #8, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 7
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #9, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0

SCSI Logical Unit 8
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #10, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 9
SCSI Port 6
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #11, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #100, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 1
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #101, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 10
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #110, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 11
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #111, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 12
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #112, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive

Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 13
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #113, Partition #0
Partition Size 1.00 MB (1,048,576 bytes)
Partition Starting Offset 17,408 bytes
Partition Disk #113, Partition #1
Partition Size 67.67 GB (72,662,088,192 bytes)
Partition Starting Offset 134,235,136 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 2
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #102, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 3
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #103, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 4
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #104, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 5
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #105, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 6
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #106, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 7
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63

Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #107, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 8
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #108, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model EUROLOGC FC2502 SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus 0
SCSI Logical Unit 9
SCSI Port 7
SCSI Target ID 2
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #109, Partition #0
Partition Size 67.79 GB (72,793,695,744 bytes)
Partition Starting Offset 32,256 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model SEAGATE ST3146807LC SCSI Disk Device

Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 2
SCSI Target ID 0
Sectors/Track 63
Size 136.73 GB (146,813,022,720 bytes)
Total Cylinders 17,849
Total Sectors 286,744,185
Total Tracks 4,551,495
Tracks/Cylinder 255
Partition Disk #0, Partition #0
Partition Size 996.19 MB (1,044,578,304 bytes)

Partition Starting Offset 32,256 bytes
Partition Disk #0, Partition #1
Partition Size 135.63 GB (145,636,807,680 bytes)

Partition Starting Offset 1,176,215,040 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model SEAGATE ST3146807LC SCSI Disk Device

Bytes/Sector 512
Media Loaded No
Media Type Fixed hard disk
Partitions Not Available
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 2
SCSI Target ID 1
Sectors/Track 63
Size 136.73 GB (146,813,022,720 bytes)
Total Cylinders 17,849
Total Sectors 286,744,185
Total Tracks 4,551,495
Tracks/Cylinder 255
Partition Disk #1, Partition #0
Partition Size 136.61 GB (146,683,199,488 bytes)

Partition Starting Offset 131,604,480 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model MACRODSK USB FLASH DISK USB Device

Bytes/Sector 512
Media Loaded Yes
Media Type Removable media
Partitions 1
SCSI Bus Not Available
SCSI Logical Unit Not Available
SCSI Port Not Available
SCSI Target ID Not Available
Sectors/Track 63
Size 23.53 MB (24,675,840 bytes)
Total Cylinders 3
Total Sectors 48,195
Total Tracks 765
Tracks/Cylinder 255
Partition Disk #114, Partition #0
Partition Size 31.20 MB (32,718,848 bytes)
Partition Starting Offset 16,384 bytes

[SCSI]

Item Value
Name Emulex LP9000 FC HBA <Current Settings>

Manufacturer Emulex
Status OK
PNP Device ID
PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&207C21BC&0&08E8
Memory Address 0xF8CF0000-0xF8CF0FFF
Memory Address 0xF8CE0000-0xF8CE00FF
I/O Port 0x00009C00-0x00009CFF
IRQ Channel IRQ 48
Driver c:\windows\system32\drivers\elxsli2.sys (v6-2.21a8 built by: WinDDK, 546.50 KB (559,616 bytes), 9/23/2003 4:31 PM)

Name Emulex LP9000 FC HBA <Current Settings>

Manufacturer Emulex
Status OK
PNP Device ID
PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&207C21BC&0&10E8
Memory Address 0xF8CD0000-0xF8CD0FFF
Memory Address 0xF8CC0000-0xF8CC00FF
I/O Port 0x00009800-0x000098FF
IRQ Channel IRQ 52
Driver c:\windows\system32\drivers\elxsli2.sys (v6-2.21a8 built by: WinDDK, 546.50 KB (559,616 bytes), 9/23/2003 4:31 PM)

Name Emulex LP9000 FC HBA <Current Settings>

Manufacturer Emulex
Status OK
PNP Device ID
PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&2AAD566B&0&08F8
Memory Address 0xF8FF0000-0xF8FF0FFF
Memory Address 0xF8FE0000-0xF8FE00FF
I/O Port 0x0000AC00-0x0000ACFF
IRQ Channel IRQ 24
Driver c:\windows\system32\drivers\elxsli2.sys (v6-2.21a8 built by: WinDDK, 546.50 KB (559,616 bytes), 9/23/2003 4:31 PM)

Name LSI Logic PCI-X Ultra320 SCSI Host Adapter

Manufacturer LSI Logic Inc.
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0030&SUBSYS_34028086&REV_07\4&2AAD566B&0&10F8
I/O Port 0x0000A400-0x0000A4FF
Memory Address 0xF8F90000-0xF8F9FFFF
Memory Address 0xF8F80000-0xF8F8FFFF
IRQ Channel IRQ 28
Driver c:\windows\system32\drivers\symmpi.sys (1.08.18.00 (NT.021001-2000), 79.38 KB (81,280 bytes), 3/25/2003 8:00 PM)

Name LSI Logic PCI-X Ultra320 SCSI Host Adapter

Manufacturer LSI Logic Inc.
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0030&SUBSYS_34028086&REV_07\4&2AAD566B&0&11F8
I/O Port 0x0000A800-0x0000A8FF
Memory Address 0xF8FB0000-0xF8FBFFFF
Memory Address 0xF8FA0000-0xF8FAFFFF
IRQ Channel IRQ 29
Driver c:\windows\system32\drivers\symmpi.sys (1.08.18.00 (NT.021001-2000), 79.38 KB (81,280 bytes), 3/25/2003 8:00 PM)

Name Emulex LP9000 FC HBA <Current Settings>

Manufacturer Emulex
Status OK
PNP Device ID
PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&1EF5336&0&08E8
Memory Address 0xF6EF0000-0xF6EF0FFF
Memory Address 0xF6EE0000-0xF6EE00FF
I/O Port 0x0000BC00-0x0000BCFF
IRQ Channel IRQ 96
Driver c:\windows\system32\drivers\elxsli2.sys (v6-2.21a8 built by: WinDDK, 546.50 KB (559,616 bytes), 9/23/2003 4:31 PM)

Name Emulex LP9000 FC HBA <Current Settings>

Manufacturer Emulex
Status OK
PNP Device ID
PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&16D68E&0&08F8
Memory Address 0xF6FF0000-0xF6FF0FFF
Memory Address 0xF6FE0000-0xF6FE00FF
I/O Port 0x0000CC00-0x0000CCFF
IRQ Channel IRQ 72
Driver c:\windows\system32\drivers\elxsli2.sys (v6-2.21a8 built by: WinDDK, 546.50 KB (559,616 bytes), 9/23/2003 4:31 PM)

Name Emulex LP9000 FC HBA <Current Settings>

Manufacturer Emulex
Status OK
PNP Device ID
PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&16D68E&0&10F8
Memory Address 0xF6FD0000-0xF6FD0FFF
Memory Address 0xF6FC0000-0xF6FC00FF
I/O Port 0x0000C800-0x0000C8FF
IRQ Channel IRQ 76
Driver c:\windows\system32\drivers\elxsli2.sys (v6-2.21a8 built by: WinDDK, 546.50 KB (559,616 bytes), 9/23/2003 4:31 PM)

Name Emulex LP9000 FC HBA <Current Settings>

Manufacturer Emulex
Status OK
PNP Device ID
PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&1B67A8B9&0&08E8
Memory Address 0xF4EF0000-0xF4EF0FFF
Memory Address 0xF4EE0000-0xF4EE00FF
I/O Port 0x0000DC00-0x0000DCFF
IRQ Channel IRQ 144
Driver c:\windows\system32\drivers\elxsli2.sys (v6-2.21a8 built by: WinDDK, 546.50 KB (559,616 bytes), 9/23/2003 4:31 PM)

Name Emulex LP9000 FC HBA <Current Settings>

Manufacturer Emulex
Status OK
PNP Device ID
PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&22394B12&0&08F8
Memory Address 0xF4FF0000-0xF4FF0FFF
Memory Address 0xF4FE0000-0xF4FE00FF
I/O Port 0x0000EC00-0x0000ECFF
IRQ Channel IRQ 120
Driver c:\windows\system32\drivers\elxsli2.sys (v6-2.21a8 built by: WinDDK, 546.50 KB (559,616 bytes), 9/23/2003 4:31 PM)

[IDE]

Item Value

Name Intel(r) 82801DB Ultra ATA Storage Controller-24CB
Manufacturer Intel
Status OK
PNP Device ID
PCI\VEN_8086&DEV_24CB&SUBSYS_34028086&REV_02\3&267A616A&0&F9
I/O Port 0x00001000-0x0000100F
Memory Address 0xFBFDFC00-0xFBFDFFFF
Driver c:\windows\system32\drivers\intelide.sys (5.2.3790.0 (srv03_rtm.030324-2048), 11.50 KB (11,776 bytes), 3/23/2004 12:44 AM)

Name Primary IDE Channel
Manufacturer (Standard IDE ATA/ATAPI controllers)
Status OK
PNP Device ID
PCIIDE\IDECHANNEL\4&374AF1A0&0&0

I/O Port 0x000001F0-0x000001F7
I/O Port 0x000003F6-0x000003F6
IRQ Channel IRQ 14
Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.0 (srv03_rtm.030324-2048), 281.50 KB (288,256 bytes), 3/25/2003 8:00 PM)

Name Secondary IDE Channel
Manufacturer (Standard IDE ATA/ATAPI controllers)
Status OK
PNP Device ID
PCIIDE\IDECHANNEL\4&374AF1A0&0&1

I/O Port 0x00000170-0x00000177
I/O Port 0x00000376-0x00000376
IRQ Channel IRQ 15
Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.0 (srv03_rtm.030324-2048), 281.50 KB (288,256 bytes), 3/25/2003 8:00 PM)

[Printing]

Name Driver Port NameServer Name

[Problem Devices]

Device PNP Device ID Error Code

[USB]

Device PNP Device ID
Intel(r) 82801DB/DBM USB Universal Host Controller - 24C2
PCI\VEN_8086&DEV_24C2&SUBSYS_34028086&REV_02\3&267A616A&0&E8
USB Root Hub USB\ROOT_HUB\4&1C63DCB&0

USB Composite Device
USB\VID_0D62&PID_700C\5&2A0413C&0&1

USB Human Interface Device
USB\VID_0D62&PID_700C&MI_00\6&16E71EBF&0&0000
HID Keyboard Device
HID\VID_0D62&PID_700C&MI_00\7&21A8074C&0&0000
USB Human Interface Device
USB\VID_0D62&PID_700C&MI_01\6&16E71EBF&0&0001
HID-compliant device
HID\VID_0D62&PID_700C&MI_01&COL01\7&22F3676&0&0000
HID-compliant consumer control device
HID\VID_0D62&PID_700C&MI_01&COL02\7&22F3676&0&0001
USB Human Interface Device
USB\VID_046D&PID_C016\5&2A0413C&0&2

HID-compliant mouse
HID\VID_046D&PID_C016\6&32955FFE&0&0000
Intel(r) 82801DB/DBM USB Universal Host Controller - 24C4
PCI\VEN_8086&DEV_24C4&SUBSYS_34028086&REV_02\3&267A616A&0&E9
USB Root Hub USB\ROOT_HUB\4&3739B9&0

USB Mass Storage Device
USB\VID_0C76&PID_0005\5&C22C2B7&0&2

MACRODSK USB FLASH DISK USB Device
USBSTOR\DISK&VEN_MACRODSK&PROD_USB_FLASH_DISK&REV_1.00\6&7E545D1&0
Generic volume
STORAGE\REMOVABLEMEDIA\7&1BDF09DD&0&RM
Intel(r) 82801DB/DBM USB 2.0 Enhanced Host Controller - 24CD
PCI\VEN_8086&DEV_24CD&SUBSYS_34028086&REV_02\3&267A616A&0&EF
USB Root Hub USB\ROOT_HUB20\4&42A2EA3&0

[Software Environment]

[System Drivers]

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

aic78u2 aic78u2 Not Available Kernel Driver
No Disabled Stopped OK
Normal No No
aic78xx aic78xx Not Available Kernel Driver
No Disabled Stopped OK
Normal No No
aliide AliIde Not Available Kernel Driver
No Disabled Stopped OK
Normal No No
asyncmac RAS Asynchronous Media Driver
c:\windows\system32\drivers\asyncmac.sys
Kernel Driver No Manual
Stopped OK Normal No No

atapi Standard IDE/ESDI Hard Disk Controller
c:\windows\system32\drivers\atapi.sys
Kernel Driver Yes Boot
Running OK Normal No Yes

atdisk Atdisk Not Available Kernel Driver
No Disabled Stopped OK
Ignore No No
ati2mpad ati2mpad
c:\windows\system32\drivers\ati2mpad.sys
Kernel 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

audstub Audio Stub Driver
c:\windows\system32\drivers\audstub.sys
Kernel Driver Yes Manual
Running OK Normal No Yes

beep Beep c:\windows\system32\drivers\beep.sys
Kernel Driver Yes System
Running OK Normal No Yes

cbidf2k cbidf2k
c:\windows\system32\drivers\cbidf2k.sys
Kernel Driver No Disabled
Stopped OK Normal No No

cdfs Cdfs c:\windows\system32\drivers\cdfs.sys
File System Driver Yes Disabled
Running OK Normal No Yes

cdrom CD-ROM Driver
c:\windows\system32\drivers\cdrom.sys
Kernel Driver Yes System
Running OK Normal No Yes

changer Changer Not Available Kernel Driver
No System Stopped OK
Ignore No No
clusdisk Cluster Disk Driver
c:\windows\system32\drivers\clusdisk.sys
Kernel Driver No Disabled
Stopped OK Normal No No

cmdide CmdIde Not Available Kernel Driver
No Disabled Stopped OK
Normal No No
cpqarry2 cpqarry2 Not Available Kernel Driver
No Disabled Stopped OK
Normal No No

cpqcissm cpqcissm Not Available Kernel Driver
No Disabled Stopped OK
Normal No No
cpqfcalm cpqfcalm Not Available Kernel Driver
No Disabled Stopped OK
Normal No No
crcdisk CRC Disk Filter Driver
c:\windows\system32\drivers\crcdisk.sys
Kernel Driver Yes Boot
Running OK Normal No Yes

dfsdriver DfsDriver c:\windows\system32\drivers\dfs.sys
File System Driver Yes Boot
Running OK Normal No Yes

disk Disk Driver
c:\windows\system32\drivers\disk.sys
Kernel Driver Yes Boot
Running OK Normal No Yes

dmboot dmboot
c:\windows\system32\drivers\dmboot.sys
Kernel Driver Yes Disabled
Running OK Normal No Yes

dmio Logical Disk Manager Driver
c:\windows\system32\drivers\dmio.sys
Kernel Driver Yes Boot
Running OK Normal No Yes

dmload dmload
c:\windows\system32\drivers\dmload.sys
Kernel Driver Yes Boot
Running OK Normal No Yes

e1000 Intel(R) PRO/1000 Device Driver
c:\windows\system32\drivers\e1000645.sys
Kernel Driver Yes Manual
Running OK Normal No Yes

elxsli2 elxsli2
c:\windows\system32\drivers\elxsli2.sys
Kernel Driver Yes Boot
Running OK Normal No Yes

fastfat Fastfat
c:\windows\system32\drivers\fastfat.sys File
System Driver Yes Disabled Running OK
Normal No Yes
fdc Floppy Disk Controller Driver
c:\windows\system32\drivers\fdc.sys
Kernel Driver Yes Manual
Running OK Normal No Yes

fips Fips c:\windows\system32\drivers\fips.sys
Kernel Driver Yes System
Running OK Normal No Yes

flpydisk Flpydisk
c:\windows\system32\drivers\flpydisk.sys
Kernel Driver No System
Stopped OK Ignore No No

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

hpn             hpn         Not Available       Kernel Driver
                No          Disabled    Stopped OK
                Normal      No          No
http            HTTP        c:\windows\system32\drivers\http.sys
                Kernel Driver       No      Manual
                Stopped OK          Normal  No      No

i2omgmt         i2omgmt     Not Available       Kernel Driver
                No          System      Stopped OK
                Normal      No          No
imapi           CD-Burning Filter Driver
                c:\windows\system32\drivers\imapi.sys
                Kernel Driver       No      System
                Stopped OK          Normal  No      No

intelide        IntelIde
                c:\windows\system32\drivers\intelide.sys
                Kernel Driver       Yes     Boot
                Running OK          Normal  No      Yes

ipfilterdriver      IP Traffic Filter Driver
                c:\windows\system32\drivers\ipfltdrv.sys
                Kernel Driver       No      Manual
                Stopped OK          Normal  No      No

ipinip          IP in IP Tunnel Driver
                c:\windows\system32\drivers\ipinip.sys
                Kernel Driver       No      Manual
                Stopped OK          Normal  No      No

ipnat           IP Network Address Translator
                c:\windows\system32\drivers\ipnat.sys
                Kernel Driver       No      Manual
                Stopped OK          Normal  No      No

ipsec           IPSEC driver
                c:\windows\system32\drivers\ipsec.sys
                Kernel Driver       Yes     System
                Running OK          Normal  No      Yes

isapnp          PnP ISA/EISA Bus Driver
                c:\windows\system32\drivers\isapnp.sys
                Kernel Driver       Yes     Boot
                Running OK          Critical    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       Yes     System
                Running OK          Ignore  No      Yes

ksecdd          KSecDD
                c:\windows\system32\drivers\ksecdd.sys
                Kernel Driver       Yes     Boot
                Running OK          Normal  No      Yes

lp6nds35        lp6nds35
                c:\windows\system32\drivers\lp6nds35.sys
                Kernel Driver       Yes     Boot
                Running OK          Normal  No      Yes

mnmdd           mnmdd       Not Available       Kernel Driver
                No          System      Stopped OK
                Ignore      No          No
modem           Modem
                c:\windows\system32\drivers\modem.sys
                Kernel Driver       No      Manual
                Stopped OK          Ignore  No      No

mouclass        Mouse Class Driver
                c:\windows\system32\drivers\mouclass.sys
                Kernel Driver       Yes     System
                Running OK          Normal  No      Yes

mouhid          Mouse HID Driver
                c:\windows\system32\drivers\mouhid.sys
                Kernel Driver       Yes     Manual
                Running OK          Ignore  No      Yes

mountmgr        Mount Point Manager
                c:\windows\system32\drivers\mountmgr.sys
                Kernel Driver       Yes     Boot
                Running OK          Normal  No      Yes

mraid35x        mraid35x    Not Available       Kernel Driver
                No          Disabled    Stopped OK
                Normal      No          No
mrxdav          WebDav Client Redirector
                c:\windows\system32\drivers\mrxdav.sys  File
System Driver       No      Manual      Stopped OK
                Normal      No          No
mrxsmb          MRXSMB
                c:\windows\system32\drivers\mrxsmb.sys  File
System Driver       Yes     System      Running OK
                Normal      No          Yes
msfs            Msfs        c:\windows\system32\drivers\msfs.sys
                File System Driver      Yes     System
                Running OK          Normal  No      Yes

mup             Mup         c:\windows\system32\drivers\mup.sys
                File System Driver      Yes     Boot
                Running OK          Normal  No      Yes

ndis            NDIS System Driver
                c:\windows\system32\drivers\ndis.sys
                Kernel Driver       Yes     Boot
                Running OK          Normal  No      Yes

ndistapi        Remote Access NDIS TAPI Driver
                c:\windows\system32\drivers\ndistapi.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

ndisuio         NDIS Usermode I/O Protocol
                c:\windows\system32\drivers\ndisuio.sys
                Kernel Driver       No      Manual
                Stopped OK          Normal  No      No

ndiswan         Remote Access NDIS WAN Driver
                c:\windows\system32\drivers\ndiswan.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

ndproxy         NDIS Proxy
                c:\windows\system32\drivers\ndproxy.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes
```

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netbios    NetBIOS Interface
           c:\windows\system32\drivers\netbios.sys  File
System Driver      Yes       System    Running   OK
           Normal  No        Yes
netbt      NetBios over Tcpip
           c:\windows\system32\drivers\netbt.sys
           Kernel Driver     Yes       System
           Running  OK       Normal    No        Yes

nfrd960    nfrd960   Not Available     Kernel Driver
           No        Disabled  Stopped   OK
           Normal    No        No
npfs       Npfs      c:\windows\system32\drivers\npfs.sys
           File System Driver  Yes     System
           Running  OK       Normal    No        Yes

ntfs       Ntfs      c:\windows\system32\drivers\ntfs.sys
           File System Driver  Yes     Disabled
           Running  OK       Normal    No        Yes

null       Null      c:\windows\system32\drivers\null.sys
           Kernel Driver     Yes       System
           Running  OK       Normal    No        Yes

partmgr    Partition Manager
           c:\windows\system32\drivers\partmgr.sys
           Kernel Driver     Yes       Boot
           Running  OK       Normal    No        Yes

pci        PCI Bus Driver
           c:\windows\system32\drivers\pci.sys
           Kernel Driver     Yes       Boot
           Running  OK       Critical  No        Yes

pciide     PCIIde
           c:\windows\system32\drivers\pciide.sys
           Kernel Driver     Yes       Boot
           Running  OK       Normal    No        Yes

pcmcia     Pcmcia
           c:\windows\system32\drivers\pcmcia.sys
           Kernel Driver     No        Disabled
           Stopped  OK       Normal    No        No

pdcomp     PDCOMP Not Available      Kernel Driver
           No        Manual    Stopped   OK
           Ignore    No        No
pdframe    PDFRAME             Not Available
           Kernel Driver     No        Manual
           Stopped  OK       Ignore    No        No

pdreli     PDRELI    Not Available     Kernel Driver
           No        Manual    Stopped   OK
           Ignore    No        No
pdrframe   PDRFRAME            Not Available
           Kernel Driver     No        Manual
           Stopped  OK       Ignore    No        No

pptpminiport       WAN Miniport (PPTP)
           c:\windows\system32\drivers\raspptp.sys
           Kernel Driver     Yes       Manual
           Running  OK       Normal    No        Yes

processor  Processor Driver
           c:\windows\system32\drivers\processr.sys
           Kernel Driver     Yes       Manual
           Running  OK       Normal    No        Yes

ptilink    Direct Parallel Link Driver
           c:\windows\system32\drivers\ptilink.sys
           Kernel Driver     Yes       Manual
           Running  OK       Normal    No        Yes

ql1080     ql1080    Not Available     Kernel Driver
           No        Disabled  Stopped   OK
           Normal    No        No
ql10wnt    Ql10wnt   Not Available     Kernel Driver
           No        Disabled  Stopped   OK
           Normal    No        No
ql12160    ql12160   Not Available     Kernel Driver
           No        Disabled  Stopped   OK
           Normal    No        No
ql1240     ql1240    Not Available     Kernel Driver
           No        Disabled  Stopped   OK
           Normal    No        No
ql1280     ql1280    Not Available     Kernel Driver
           No        Disabled  Stopped   OK
           Normal    No        No
ql2100     ql2100    Not Available     Kernel Driver
           No        Disabled  Stopped   OK
           Normal    No        No
ql2200     ql2200    Not Available     Kernel Driver
           No        Disabled  Stopped   OK
           Normal    No        No
ql2300     ql2300
           c:\windows\system32\drivers\ql2300.sys
           Kernel Driver     Yes       Boot
           Running  OK       Normal    No        Yes

rasacd     Remote Access Auto Connection Driver
           c:\windows\system32\drivers\rasacd.sys
           Kernel Driver     Yes       System
           Running  OK       Normal    No        Yes

rasl2tp    WAN Miniport (L2TP)
           c:\windows\system32\drivers\rasl2tp.sys
           Kernel Driver     Yes       Manual
           Running  OK       Normal    No        Yes

raspppoe   Remote Access PPPOE Driver
           c:\windows\system32\drivers\raspppoe.sys
           Kernel Driver     Yes       Manual
           Running  OK       Normal    No        Yes

raspti     Direct Parallel
           c:\windows\system32\drivers\raspti.sys
           Kernel Driver     Yes       Manual
           Running  OK       Normal    No        Yes

rdbss      Rdbss     c:\windows\system32\drivers\rdbss.sys
           File System Driver  Yes     System
           Running  OK       Normal    No        Yes

rdpcdd     RDPCDD
           c:\windows\system32\drivers\rdpcdd.sys
           Kernel Driver     Yes       System
           Running  OK       Ignore    No        Yes

rdpdr      Terminal Server Device Redirector Driver
           c:\windows\system32\drivers\rdpdr.sys
           Kernel Driver     Yes       Manual
           Running  OK       Normal    No        Yes

rdpwd      RDPWD
           c:\windows\system32\drivers\rdpwd.sys
           Kernel Driver     Yes       Manual
           Running  OK       Ignore    No        Yes

redbook    Digital CD Audio Playback Filter Driver
           c:\windows\system32\drivers\redbook.sys
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                Kernel Driver       Yes     System
                Running OK          Normal  No      Yes

serenum         Serenum Filter Driver
                c:\windows\system32\drivers\serenum.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

serial          Serial port driver
                c:\windows\system32\drivers\serial.sys
                Kernel Driver       Yes     System
                Running OK          Ignore  No      Yes

sfloppy         High-Capacity Floppy Disk Drive
                c:\windows\system32\drivers\sfloppy.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

simbad          Simbad  Not Available       Kernel Driver
                No      Disabled    Stopped OK
                Normal  No          No
srv             Srv     c:\windows\system32\drivers\srv.sys
                File System Driver  Yes     Manual
                Running OK          Normal  No      Yes

swenum          Software Bus Driver
                c:\windows\system32\drivers\swenum.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

symc8xx         symc8xx Not Available       Kernel Driver
                No      Disabled    Stopped OK
                Normal  No          No
symmpi          symmpi
                c:\windows\system32\drivers\symmpi.sys
                Kernel Driver       Yes     Boot
                Running OK          Normal  No      Yes

sym_hi          sym_hi  Not Available       Kernel Driver
                No      Disabled    Stopped OK
                Normal  No          No
sym_u3          sym_u3  Not Available       Kernel Driver
                No      Disabled    Stopped OK
                Normal  No          No
tcpip           TCP/IP Protocol Driver
                c:\windows\system32\drivers\tcpip.sys
                Kernel Driver       Yes     System
                Running OK          Normal  No      Yes

tdpipe          TDPIPE
                c:\windows\system32\drivers\tdpipe.sys
                Kernel Driver       No      Manual
                Stopped OK          Ignore  No      No

tdtcp           TDTCP   c:\windows\system32\drivers\tdtcp.sys
                Kernel Driver       Yes     Manual
                Running OK          Ignore  No      Yes

termdd          Terminal Device Driver
                c:\windows\system32\drivers\termdd.sys
                Kernel Driver       Yes     System
                Running OK          Normal  No      Yes

toside          TosIde  Not Available       Kernel Driver
                No      Disabled    Stopped OK
                Normal  No          No
udfs            Udfs    c:\windows\system32\drivers\udfs.sys
                File System Driver  No      Disabled
                Stopped OK          Normal  No      No

usbccgp         Microsoft USB Generic Parent Driver
                c:\windows\system32\drivers\usbccgp.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

usbehci         Microsoft USB 2.0 Enhanced Host Controller
Miniport Driver
                c:\windows\system32\drivers\usbehci.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

usbhub          USB2 Enabled Hub
                c:\windows\system32\drivers\usbhub.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

usbstor         USB Mass Storage Driver
                c:\windows\system32\drivers\usbstor.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

usbuhci         Microsoft USB Universal Host Controller
Miniport Driver
                c:\windows\system32\drivers\usbuhci.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

vgasave         VGA Display Controller.
                c:\windows\system32\drivers\vga.sys
                Kernel Driver       Yes     System
                Running OK          Ignore  No      Yes

viaide          ViaIde  Not Available       Kernel Driver
                No      Disabled    Stopped OK
                Normal  No          No
volsnap         Storage volumes
                c:\windows\system32\drivers\volsnap.sys
                Kernel Driver       Yes     Boot
                Running OK          Normal  No      Yes

wanarp          Remote Access IP ARP Driver
                c:\windows\system32\drivers\wanarp.sys
                Kernel Driver       Yes     Manual
                Running OK          Normal  No      Yes

wdica           WDICA   Not Available       Kernel Driver
                No      Manual      Stopped OK
                Ignore  No          No
wlbs            Network Load Balancing
                c:\windows\system32\drivers\wlbs.sys
                Kernel Driver       No      Manual
                Stopped OK          Normal  No      No


[Signed Drivers]

Device Name             Signed      Device Class
                Driver Version      Driver Date
                Manufacturer        INF Name    Driver Name
                Device ID
Not Available           Not Available       Not Available
                Not Available       Not Available       Not
Available       Not Available       Not Available
                HTREE\ROOT\0
ACPI IA64-based PC      Yes         COMPUTER
                5.2.3790.010/1/2002 (Standard computers)
                hal.inf     Not Available
                ROOT\ACPI_HAL\0000
Microsoft ACPI-Compliant System     Yes
                SYSTEM      5.2.3790.010/1/2002 Microsoft
```

acpi.inf Not Available
ACPI_HAL\PNP0C08\0
Processor Yes PROCESSOR 5.2.3790.0
10/1/2002 (Standard processor types)
cpu.inf Not Available
ACPI\GENUINEINTEL_-
_IA64_FAMILY_31_MODEL_1_0
Processor Yes PROCESSOR 5.2.3790.0
10/1/2002 (Standard processor types)
cpu.inf Not Available
ACPI\GENUINEINTEL_-
_IA64_FAMILY_31_MODEL_1_1
Processor Yes PROCESSOR 5.2.3790.0
10/1/2002 (Standard processor types)
cpu.inf Not Available
ACPI\GENUINEINTEL_-
_IA64_FAMILY_31_MODEL_1_2
Processor Yes PROCESSOR 5.2.3790.0
10/1/2002 (Standard processor types)
cpu.inf Not Available
ACPI\GENUINEINTEL_-
_IA64_FAMILY_31_MODEL_1_3
PCI bus Yes SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf
Not Available ACPI\PNP0A03\0
Intel(r) 82801DB/DBM USB Universal Host Controller -
24C2 Yes USB 5.2.3790.0 10/1/2002 Intel
usbport.inf Not Available
PCI\VEN_8086&DEV_24C2&SUBSYS_340280
86&REV_02\3&267A616A&0&E8
USB Root Hub Yes USB 5.2.3790.0
10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available
USB\ROOT_HUB\4&1C63DCB&0
USB Composite Device Yes USB
5.2.3790.0 10/1/2002 (Standard USB Host
Controller) usb.inf Not Available
USB\VID_0D62&PID_700C\5&2A0413C&0&1

USB Human Interface Device Yes HIDCLASS
5.2.3790.0 10/1/2002 (Standard system devices)
input.inf Not Available
USB\VID_0D62&PID_700C&MI_00\6&16E71E
BF&0&0000
HID Keyboard Device Yes KEYBOARD
5.2.3790.0 10/1/2002 (Standard keyboards)
keyboard.inf Not Available
HID\VID_0D62&PID_700C&MI_00\7&21A807
4C&0&0000
USB Human Interface Device Yes HIDCLASS
5.2.3790.0 10/1/2002 (Standard system devices)
input.inf Not Available
USB\VID_0D62&PID_700C&MI_01\6&16E71E
BF&0&0001
HID-compliant device Yes HIDCLASS
5.2.3790.0 10/1/2002 (Standard system devices)
input.inf Not Available
HID\VID_0D62&PID_700C&MI_01&COL01\7
&22F3676&0&0000
HID-compliant consumer control device Yes
HIDCLASS 5.2.3790.0 10/1/2002
Microsoft hidserv.inf Not Available
HID\VID_0D62&PID_700C&MI_01&COL02\7
&22F3676&0&0001
USB Human Interface Device Yes HIDCLASS
5.2.3790.0 10/1/2002 (Standard system devices)
input.inf Not Available
USB\VID_046D&PID_C016\5&2A0413C&0&2

HID-compliant mouse Yes MOUSE 5.2.3790.0
10/1/2002 Microsoft msmouse.inf Not
Available
HID\VID_046D&PID_C016\6&32955FFE&0&0
000
Intel(r) 82801DB/DBM USB Universal Host Controller -
24C4 Yes USB 5.2.3790.0 10/1/2002 Intel
usbport.inf Not Available
PCI\VEN_8086&DEV_24C4&SUBSYS_340280
86&REV_02\3&267A616A&0&E9
USB Root Hub Yes USB 5.2.3790.0
10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available
USB\ROOT_HUB\4&3739B9&0
USB Mass Storage Device Yes USB
5.2.3790.0 10/1/2002 Compatible USB storage
device usbstor.inf Not Available
USB\VID_0C76&PID_0005\5&C22C2B7&0&2

Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives) disk.inf Not
Available
USBSTOR\DISK&VEN_MACRODSK&PROD_
USB_FLASH_DISK&REV_1.00\6&7E545D1&0
Generic volume Yes VOLUME 5.2.3790.0
10/1/2002 Microsoft volume.inf Not Available
STORAGE\REMOVABLEMEDIA\7&1BDF09D
D&0&RM
Intel(r) 82801DB/DBM USB 2.0 Enhanced Host Controller -
24CD Yes USB 5.2.3790.0 10/1/2002 Intel
usbport.inf Not Available
PCI\VEN_8086&DEV_24CD&SUBSYS_340280
86&REV_02\3&267A616A&0&EF
USB Root Hub Yes USB 5.2.3790.0
10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available
USB\ROOT_HUB20\4&42A2EA3&0
Intel(R) 82801DB PCI Bridge - 244E Yes
SYSTEM 5.2.3790.0 10/1/2002 Intel
machine.inf Not Available
PCI\VEN_8086&DEV_244E&SUBSYS_000000
00&REV_82\3&267A616A&0&F0
Intel(R) PRO/1000 MT Network Connection Yes NET
6.3.6.31 10/1/2002 Intel nete1000.inf
Not Available
PCI\VEN_8086&DEV_100E&SUBSYS_ 340280
86&REV_02\4&29817089&0&00F0
RAGE XL PCI Family (Microsoft Corporation) Yes
DISPLAY 5.10.2600.6014 8/8/2001 ATI
Technologies Inc. atiixpad.inf Not Available
PCI\VEN_1002&DEV_4752&SUBSYS_340280
86&REV_27\4&29817089&0&08F0
Plug and Play Monitor Yes MONITOR
5.1.2001.06/6/2001 (Standard monitor types)
monitor.inf Not Available
DISPLAY___D556\5&50A2B46&0&80000001
&01&01
Intel(r) 82801DB LPC Interface Controller - 24C0 Yes
SYSTEM 5.2.3790.0 10/1/2002 Intel
machine.inf Not Available
PCI\VEN_8086&DEV_24C0&SUBSYS_000000
00&REV_02\3&267A616A&0&F8
Intel(r) 82801DB Ultra ATA Storage Controller-24CB Yes
HDC 5.2.3790.0 10/1/2002 Intel
mshdc.inf Not Available
PCI\VEN_8086&DEV_24CB&SUBSYS_340280
86&REV_02\3&267A616A&0&F9
Primary IDE Channel Yes HDC 5.2.3790.0
10/1/2002 (Standard IDE ATA/ATAPI
controllers) mshdc.inf Not Available

PCIIDE\IDECHANNEL\4&374AF1A0&0&0

CD-ROM Drive Yes CDROM 5.2.3790.0 10/1/2002(Standard CD-ROM drives) cdrom.inf Not Available IDE\CDROMMITSUMI_CD-ROM_SR244W_____T01A____\5&8C4B7B4&0&0.0.0

High-Capacity Floppy Disk Drive Yes FLOPPYDISK 5.2.3790.010/1/2002 (Standard floppy disk drives) flpydisk.inf Not Available IDE\DISKMATSHITA_LS-120/240____00_____H050____\32333430484D30413030343820202020202020202020

Secondary IDE Channel Yes HDC 5.2.3790.010/1/2002(Standard IDE ATA/ATAPI controllers) mshdc.inf Not Available PCIIDE\IDECHANNEL\4&374AF1A0&0&1

Generic Bus Yes SYSTEM 5.2.3790.0 10/1/2002(Standard system devices) machine.inf Not Available ACPI\PNP0A05\3&267A616A&0

Motherboard resources Yes SYSTEM 5.2.3790.010/1/2002(Standard system devices) machine.inf Not Available ACPI\PNP0C02\1

Programmable interrupt controller Yes SYSTEM 5.2.3790.010/1/2002(Standard system devices) machine.inf Not Available ACPI\PNP0000\4&1B47357E&0

Direct memory access controller Yes SYSTEM 5.2.3790.010/1/2002(Standard system devices) machine.inf Not Available ACPI\PNP0200\4&1B47357E&0

System timer Yes SYSTEM 5.2.3790.0 10/1/2002(Standard system devices) machine.inf Not Available ACPI\PNP0100\4&1B47357E&0

System CMOS/real time clock Yes SYSTEM 5.2.3790.010/1/2002(Standard system devices) machine.inf Not Available ACPI\PNP0B00\4&1B47357E&0

System speaker Yes SYSTEM 5.2.3790.0 10/1/2002(Standard system devices) machine.inf Not Available ACPI\PNP0800\4&1B47357E&0

Motherboard resources Yes SYSTEM 5.2.3790.010/1/2002(Standard system devices) machine.inf Not Available ACPI\PNP0C02\4

Standard floppy disk controller Yes FDC 5.2.3790.010/1/2002(Standard floppy disk controllers) fdc.inf Not Available ACPI\PNP0700\4&1B47357E&0

Communications Port Yes PORTS 5.2.3790.0 10/1/2002(Standard port types) msports.inf Not Available ACPI\PNP0501\1

Communications Port Yes PORTS 5.2.3790.0 10/1/2002(Standard port types) msports.inf Not Available ACPI\PNP0501\2

PCI bus Yes SYSTEM 5.2.3790.010/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0A03\1

Intel(r) 82870 I/OxAPIC Interrupt Controller Yes SYSTEM 5.2.3790.010/1/2002Intel machine.inf Not Available PCI\VEN_8086&DEV_1461&SUBSYS_ 00000000&REV_04\3&13C0B0C5&0&E0

Intel(r) 82870 Hub Interface to PCI Bridges Yes SYSTEM 5.2.3790.010/1/2002Intel machine.inf Not Available PCI\VEN_8086&DEV_1460&SUBSYS_00000000&REV_04\3&13C0B0C5&0&E8

Emulex LP9000 FC HBA <Current Settings> Yes SCSIADAPTER 6.2.21.8 9/23/2003 Emulex oem0.inf Not Available PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&207C21BC&0&08E8

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&420

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&421

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&422

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&423

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&424

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&425

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&426

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&427

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&428

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&429

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&4210

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002(Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&192BA818&0&4211

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Emulex LP9000 FC HBA <Current Settings> Yes SCSIADAPTER 6.2.21.8 9/23/2003 Emulex oem0.inf Not Available
PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&207C21BC&0&10E8
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&105B0CA1&0&541
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&105B0CA1&0&547
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&105B0CA1&0&5410
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Intel(r) 82870 Hot Plug controller Yes SYSTEM 5.2.3790.010/1/2002 Intel machine.inf Not Available
PCI\VEN_8086&DEV_1462&SUBSYS_03B08086&REV_04\4&207C21BC&0&F8E8
Intel(r) 82870 I/OxAPIC Interrupt Controller Yes SYSTEM 5.2.3790.010/1/2002 Intel machine.inf Not Available
PCI\VEN_8086&DEV_1461&SUBSYS_00000000&REV_04\3&13C0B0C5&0&F0
Intel(r) 82870 Hub Interface to PCI Bridges Yes SYSTEM 5.2.3790.010/1/2002 Intel machine.inf Not Available
PCI\VEN_8086&DEV_1460&SUBSYS_00000000&REV_04\3&13C0B0C5&0&F8
Emulex LP9000 FC HBA <Current Settings> Yes SCSIADAPTER 6.2.21.8 9/23/2003 Emulex oem0.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&623
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&624
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&625
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&626

Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&627
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&628
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&629
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&6210
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&6211
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&6212
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&3EA6B44&0&6213
LSI Logic PCI-X Ultra320 SCSI Host Adapter Yes SCSIADAPTER 5.2.3790.010/1/2002 LSI Logic Inc. pnpscsi.inf Not Available PCI\VEN_1000&DEV_0030&SUBSYS_34028086&REV_07\4&2AAD566B&0&10F8
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_SEAGATE&PROD_ST3146807LC&REV_0007\5&7963D2B&0&000
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_SEAGATE&PROD_ST3146807LC&REV_0007\5&7963D2B&0&010
SCA Hotswap Backplane Yes SYSTEM 5.2.3790.010/1/2002 ESG-SHV scsidev.inf Not Available SCSI\PROCESSOR&VEN_ESG-SHV&PROD_SCA_HSBP_M17&REV_1.03\5&7963D2B&0&060
LSI Logic PCI-X Ultra320 SCSI Host Adapter Yes SCSIADAPTER 5.2.3790.010/1/2002 LSI Logic Inc. pnpscsi.inf Not Available PCI\VEN_1000&DEV_0030&SUBSYS_34028086&REV_07\4&2AAD566B&0&11F8
Intel(r) 82870 Hot Plug controller Yes SYSTEM 5.2.3790.010/1/2002 Intel machine.inf Not Available PCI\VEN_8086&DEV_1462&SUBSYS_03B08086&REV_04\4&2AAD566B&0&F8F8
PCI bus Yes SYSTEM 5.2.3790.010/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0A03\3
Intel(r) 82870 I/OxAPIC Interrupt Controller Yes SYSTEM 5.2.3790.010/1/2002 Intel machine.inf Not Available PCI\VEN_8086&DEV_1461&SUBSYS_00000000&REV_04\3&29E81982&0&E0
Intel(r) 82870 Hub Interface to PCI Bridges Yes SYSTEM 5.2.3790.010/1/2002 Intel machine.inf Not Available PCI\VEN_8086&DEV_1460&SUBSYS_00000000&REV_04\3&29E81982&0&E8
Emulex LP9000 FC HBA <Current Settings> Yes SCSIADAPTER 6.2.21.8 9/23/2003 Emulex oem0.inf Not Available PCI\VEN_10DF&DEV_F900&SUBSYS_F90010DF&REV_01\4&1EF5336&0&08E8
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&720
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&721
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&722
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&723
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&724
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&725
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&726
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&727
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&728
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&729
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&C99FBD5&0&7210
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not

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Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives) disk.inf Not
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Intel(r) 82870 Hot Plug controller Yes
SYSTEM 5.2.3790.010/1/2002 Intel
machine.inf Not Available
PCI\VEN_8086&DEV_1462&SUBSYS_03F080
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Intel(r) 82870 I/OxAPIC Interrupt Controller Yes
SYSTEM 5.2.3790.010/1/2002 Intel
machine.inf Not Available
PCI\VEN_8086&DEV_1461&SUBSYS_000000
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Intel(r) 82870 Hub Interface to PCI Bridges Yes
SYSTEM 5.2.3790.010/1/2002 Intel
machine.inf Not Available
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Emulex oem0.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0
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Disk drive Yes DISKDRIVE 5.2.3790.0
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Disk drive Yes DISKDRIVE 5.2.3790.0
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Disk drive Yes DISKDRIVE 5.2.3790.0
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Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives) disk.inf Not
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Disk drive Yes DISKDRIVE 5.2.3790.0
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Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives) disk.inf Not
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Emulex oem0.inf Not Available
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Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives) disk.inf Not
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Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives) disk.inf Not
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Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives) disk.inf Not
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Disk drive Yes DISKDRIVE 5.2.3790.0
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Disk drive Yes DISKDRIVE 5.2.3790.0
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Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives) disk.inf Not
Available
SCSI\DISK&VEN_EUROLOGC&PROD_FC250
2&REV_7902\5&2578E12D&0&925
Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives) disk.inf Not

Available
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Disk drive Yes DISKDRIVE 5.2.3790.0
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machine.inf Not Available
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PCI bus Yes SYSTEM 5.2.3790.010/1/2002
(Standard system devices) machine.inf
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Intel(r) 82870 I/OxAPIC Interrupt Controller Yes
SYSTEM 5.2.3790.010/1/2002 Intel
machine.inf Not Available
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Intel(r) 82870 Hub Interface to PCI Bridges Yes
SYSTEM 5.2.3790.010/1/2002 Intel
machine.inf Not Available
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Emulex oem0.inf Not Available
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Intel(r) 82870 Hot Plug controller Yes
SYSTEM 5.2.3790.010/1/2002 Intel
machine.inf Not Available
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Intel(r) 82870 I/OxAPIC Interrupt Controller Yes
SYSTEM 5.2.3790.010/1/2002 Intel
machine.inf Not Available

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SCSI\DISK&VEN_EUROLOGC&PROD_FC2502&REV_7902\5&1C4A3BBE&0&11213
Intel(r) 82870 Hot Plug controller Yes SYSTEM 5.2.3790.0 10/1/2002 Intel machine.inf Not Available
PCI\VEN_8086&DEV_1462&SUBSYS_03F08086&REV_04\4&22394B12&0&F8F8
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Terminal Server Keyboard Driver Yes SYSTEM 5.2.3790.010/1/2002(Standard system devices) machine.inf Not Available ROOT\RDP_KBD\0000
Terminal Server Mouse Driver Yes SYSTEM 5.2.3790.010/1/2002(Standard system devices) machine.inf Not Available ROOT\RDP_MOU\0000
Plug and Play Software Device Enumerator Yes SYSTEM 5.2.3790.010/1/2002(Standard system devices) machine.inf Not Available ROOT\SYSTEM\0000

[Environment Variables]

Variable Value User Name
CLASSPATH .;D:\SQLLIB\java\db2java.zip;D:\SQLLIB\java\db2jcc.jar;D:\SQLLIB\java\sqlj.zip;D:\SQLLIB\java\db2jcc_license_cisuz.jar;D:\SQLLIB\java\db2jcc_license_cu.jar;D:\SQLLIB\bin;D:\SQLLIB\java\common.jar <SYSTEM>

ClusterLog C:\WINDOWS\Cluster\cluster.log <SYSTEM>
ComSpec %SystemRoot%system32\cmd.exe <SYSTEM>
INCLUDE D:\SQLLIB\INCLUDE;D:\SQLLIB\LIB;D:\Tools\MSC64\Include;D:\Tools\MSC64\Include\Win64\crt;D:\Tools\MSC64\Include\Win64\crt\sys;D:\Tools\MSC64\Include\Win64\mfc;D:\Tools\MSC64\Include\Win64\atl <SYSTEM>
LIB D:\Tools\MSC64\Lib\IA64;D:\Tools\MSC64\Lib\IA64\mfc;D:\SQLLIB\LIB <SYSTEM>
NUMBER_OF_PROCESSORS 4 <SYSTEM>

OS Windows_NT <SYSTEM>
Path D:\tools\perl\bin;D:\tools\cygwin\bin;D:\tools\bin;D:\Tools\MSC64\Bin\Win64;D:\Tools\MSC64\Bin;D:\Tools\MSC64\Bin\WinNT;%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;D:\SQLLIB\BIN;D:\SQLLIB\FUNCTION;D:\SQLLIB\SAMPLES\REPL <SYSTEM>
PATHEXT .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH <SYSTEM>
PROCESSOR_ARCHITECTURE IA64 <SYSTEM>
PROCESSOR_IDENTIFIER ia64 Family 31 Model 1 Stepping 5, GenuineIntel <SYSTEM>
PROCESSOR_LEVEL 31 <SYSTEM>

PROCESSOR_REVISION 0105 <SYSTEM>

TEMP %SystemRoot%TEMP <SYSTEM>

TMP %SystemRoot%TEMP <SYSTEM>

windir %SystemRoot% <SYSTEM>
DB2TEMPDIR D:\SQLLIB\ <SYSTEM>

DB2INSTANCE DB2 <SYSTEM>
TEMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\SYSTEM
TMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\SYSTEM
TEMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\LOCAL SERVICE

TMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\LOCAL SERVICE
TEMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\NETWORK SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\NETWORK SERVICE
DB2INSTANCE DB2TPCHLANGCHAO-TPCH\db2tpch
TEMP %USERPROFILE%\Local Settings\Temp LANGCHAO-TPCH\db2tpch
TMP %USERPROFILE%\Local Settings\Temp LANGCHAO-TPCH\db2tpch

[Print Jobs]

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

[Network Connections]

Local Name Remote Name Type
Status User Name

[Running Tasks]

Name Path Process ID Priority Min Working Set Max Working Set Start Time Version Size File Date
system idle process Not Available 0 0
Not Available Not Available Not Available Not Available Not Available Not Available Not Available
system Not Available 4 8 0
2826240 Not Available Not Available
Not Available Not Available
smss.exe Not Available 468 11
409600 2826240 4/3/2004 5:03 PM Not Available Not Available Not Available
csrss.exe Not Available 520 13 Not Available Not Available 4/3/2004 5:03 PM Not Available Not Available Not Available
winlogon.exe c:\windows\system32\winlogon.exe
544 13 409600 2826240
4/3/2004 5:03 PM 5.2.3790.0 (srv03_rtm.030324-2048) 618.00 KB (632,832 bytes)
3/25/2003 8:00 PM
services.exe c:\windows\system32\services.exe
588 9 409600 2826240
4/3/2004 5:03 PM 5.2.3790.0 (srv03_rtm.030324-2048) 286.00 KB (292,864 bytes)
3/25/2003 8:00 PM
lsass.exe c:\windows\system32\lsass.exe 600 9
409600 2826240 4/3/2004 5:03 PM
5.2.3790.0 (srv03_rtm.030324-2048) 15.00 KB (15,360 bytes) 3/25/2003 8:00 PM
svchost.exe c:\windows\system32\svchost.exe
764 8 409600 2826240
4/3/2004 5:03 PM 5.2.3790.0 (srv03_rtm.030324-2048) 32.50 KB (33,280 bytes)
3/25/2003 8:00 PM
svchost.exe c:\windows\system32\svchost.exe
816 8 409600 2826240
4/3/2004 5:03 PM 5.2.3790.0 (srv03_rtm.030324-2048) 32.50 KB (33,280 bytes)
3/25/2003 8:00 PM
svchost.exe Not Available 948 8
Not Available Not Available Not Available Not Available Not Available
4/3/2004 5:03 PM Not Available Not Available
svchost.exe Not Available 972 8
Not Available Not Available Not Available Not Available Not Available
4/3/2004 5:03 PM Not Available Not Available
svchost.exe c:\windows\system32\svchost.exe
1028 8 409600 2826240
4/3/2004 5:03 PM 5.2.3790.0 (srv03_rtm.030324-2048) 32.50 KB (33,280 bytes)
3/25/2003 8:00 PM
msdtc.exe Not Available 1108 8 Not Available Not Available 4/3/2004 5:03 PM Not Available Not Available Not Available
svchost.exe c:\windows\system32\svchost.exe
1260 8 409600 2826240
4/3/2004 5:03 PM 5.2.3790.0 (srv03_rtm.030324-2048) 32.50 KB (33,280 bytes)
3/25/2003 8:00 PM
dfssvc.exe c:\windows\system32\dfssvc.exe 1512 8
409600 2826240 4/3/2004 5:03 PM
5.2.3790.0 (srv03_rtm.030324-2048)
442.00 KB (452,608 bytes) 3/25/2003 8:00 PM
explorer.exe c:\windows\explorer.exe 1700
8 409600 2826240 4/3/2004 5:03 PM 6.00.3790.0 (srv03_rtm.030324-2048) 1.63 MB (1,704,960 bytes) 3/25/2003 8:00 PM
wmiprvse.exe Not Available 1976 8
Not Available Not Available
4/3/2004 5:03 PM Not Available Not Available Not Available
cmd.exe c:\windows\system32\cmd.exe 500 8
409600 2826240 4/3/2004 5:05 PM
5.2.3790.0 (srv03_rtm.030324-2048)
493.50 KB (505,344 bytes) 3/25/2003 8:00 PM
helpctr.exec:\windows\pchealth\helpctr\binaries\helpctr.exe
1292 8 409600 2826240
4/3/2004 5:06 PM 5.2.3790.0 (srv03_rtm.030324-2048) 1.97 MB (2,066,432 bytes)
3/22/2004 4:55 PM
wmiprvse.exe Not Available 1408 8
Not Available Not Available
4/3/2004 5:06 PM Not Available Not Available Not Available
helpsvc.exe
c:\windows\pchealth\helpctr\binaries\helpsvc.exe
1528 8 409600 2826240
4/3/2004 5:06 PM 5.2.3790.0 (srv03_rtm.030324-2048) 2.18 MB (2,289,152 bytes)
3/22/2004 4:55 PM

[Loaded Modules]

Name Version Size File Date Manufacturer Path
winlogon 5.2.3790.0 (srv03_rtm.030324-2048)
618.00 KB (632,832 bytes) 3/25/2003 8:00 PM Microsoft Corporation
c:\windows\system32\winlogon.exe
ntdll 5.2.3790.0 (srv03_rtm.030324-2048) 1.45 MB (1,524,224 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\ntdll.dll
kernel32 5.2.3790.0 (srv03_rtm.030324-2048) 1.76 MB (1,850,368 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\kernel32.dll

msvcrt 7.0.3790.0 (srv03_rtm.030324-2048)
873.50 KB (894,464 bytes) 3/25/2003 8:00

PM Microsoft Corporation c:\windows\system32\msvcrt.dll
advapi32 5.2.3790.0 (srv03_rtm.030324-2048) 1.32 MB (1,383,424 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\advapi32.dll

rpcrt4 5.2.3790.59 (srv03_gdr.030614-1005) 2.03 MB (2,127,872 bytes) 7/5/2003 1:05 PM Microsoft Corporation c:\windows\system32\rpcrt4.dll
user32 5.2.3790.0 (srv03_rtm.030324-2048) 1.31 MB (1,372,672 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\user32.dll
gdi32 5.2.3790.0 (srv03_rtm.030324-2048) 783.00 KB (801,792 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\gdi32.dll
userenv 5.2.3790.0 (srv03_rtm.030324-2048) 1.46 MB (1,536,000 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\userenv.dll
nddeapi 5.2.3790.0 (srv03_rtm.030324-2048) 39.50 KB (40,448 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\nddeapi.dll
crypt32 5.131.3790.0 (srv03_rtm.030324-2048) 1.50 MB (1,576,448 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\crypt32.dll
msasn1 5.2.3790.0 (srv03_rtm.030324-2048) 153.50 KB (157,184 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msasn1.dll
secur32 5.2.3790.0 (srv03_rtm.030324-2048) 166.50 KB (170,496 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\secur32.dll
winsta 5.2.3790.0 (srv03_rtm.030324-2048) 138.50 KB (141,824 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\winsta.dll
netapi32 5.2.3790.0 (srv03_rtm.030324-2048) 832.00 KB (851,968 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\netapi32.dll
profmap 5.2.3790.0 (srv03_rtm.030324-2048) 55.50 KB (56,832 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\profmap.dll

regapi 5.2.3790.0 (srv03_rtm.030324-2048) 124.00 KB (126,976 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\regapi.dll
ws2_32 5.2.3790.0 (srv03_rtm.030324-2048) 228.50 KB (233,984 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\ws2_32.dll
ws2help 5.2.3790.0 (srv03_rtm.030324-2048) 49.50 KB (50,688 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\ws2help.dll

imm32 5.2.3790.0 (srv03_rtm.030324-2048) 307.50 KB (314,880 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\imm32.dll
lpk 5.2.3790.0 (srv03_rtm.030324-2048) 54.50 KB (55,808 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\lpk.dll
usp10 1.0421.3790.0 (srv03_rtm.030324-2048) 717.00 KB (734,208 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\usp10.dll

msgina 5.2.3790.0 (srv03_rtm.030324-2048) 1.35 MB (1,417,728 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msgina.dll
shsvcs 6.00.3790.0 (srv03_rtm.030324-2048) 321.50 KB (329,216 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\shsvcs.dll
shlwapi 6.00.3790.0 (srv03_rtm.030324-2048) 722.00 KB (739,328 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\shlwapi.dll
sfc 5.2.3790.0 (srv03_rtm.030324-2048) 7.50 KB (7,680 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\sfc.dll
sfc_os 5.2.3790.0 (srv03_rtm.030324-2048) 257.00 KB (263,168 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\sfc_os.dll
wintrust 5.131.3790.0 (srv03_rtm.030324-2048) 451.50 KB (462,336 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\wintrust.dll
ole32 5.2.3790.68 (srv03_gdr.030614-1005) 3.38 MB (3,549,184 bytes) 7/5/2003 1:05 PM Microsoft Corporation c:\windows\system32\ole32.dll
imagehlp 5.2.3790.0 (srv03_rtm.030324-2048) 128.50 KB (131,584 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\imagehlp.dll
apphelp 5.2.3790.0 (srv03_rtm.030324-2048) 262.50 KB (268,800 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\apphelp.dll
msctfime 5.2.3790.0 (srv03_rtm.030324-2048) 535.00 KB (547,840 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msctfime.ime
comctl32 6.0 (srv03_rtm.030324-2048) 2.18 MB (2,285,056 bytes) 3/23/2004 12:35 AM Microsoft Corporation c:\windows\winsxs\ia64_microsoft.windows.common-controls_6595b64144ccf1df_6.0.100.0_x-ww_b3722bab\comctl32.dll
version 5.2.3790.0 (srv03_rtm.030324-2048) 44.00 KB (45,056 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\version.dll
winscard 5.2.3790.0 (srv03_rtm.030324-2048) 291.50 KB (298,496 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\winscard.dll
wtsapi32 5.2.3790.0 (srv03_rtm.030324-2048) 47.50 KB (48,640 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\wtsapi32.dll

sxs 5.2.3790.0 (srv03_rtm.030324-2048) 1.77 MB (1,860,608 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\sxs.dll
winmm 5.2.3790.0 (srv03_rtm.030324-2048) 404.00 KB (413,696 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\winmm.dll
shell32 6.00.3790.0 (srv03_rtm.030324-2048) 12.35 MB (12,953,088 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\shell32.dll
setupapi 5.2.3790.0 (srv03_rtm.030324-2048) 1.90 MB (1,991,168 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\setupapi.dll

wldap32 5.2.3790.0 (srv03_rtm.030324-2048) 412.50 KB (422,400 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\wldap32.dll
cscdll 5.2.3790.0 (srv03_rtm.030324-2048) 211.00 KB (216,064 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\cscdll.dll
wlnotify 5.2.3790.0 (srv03_rtm.030324-2048) 218.00 KB (223,232 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\wlnotify.dll
winspool 5.2.3790.0 (srv03_rtm.030324-2048) 399.50 KB (409,088 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\winspool.drv
mpr 5.2.3790.0 (srv03_rtm.030324-2048) 163.00 KB (166,912 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\mpr.dll
comctl32 5.82 (srv03_rtm.030324-2048)1.55 MB (1,621,504 bytes) 3/23/2004 12:35 AMMicrosoft Corporation c:\windows\winsxs\ia64_microsoft.windows.common-controls_6595b64144ccf1df_5.82.0.0_x-ww_b9c4a0a5\comctl32.dll
uxtheme 6.00.3790.0 (srv03_rtm.030324-2048) 527.50 KB (540,160 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\uxtheme.dll
samlib 5.2.3790.0 (srv03_rtm.030324-2048) 106.00 KB (108,544 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\samlib.dll
cscui 5.2.3790.0 (srv03_rtm.030324-2048) 574.00 KB (587,776 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\cscui.dll
oleaut32 5.2.3790.03.57 MB (3,739,136 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\oleaut32.dll
clbcatq 2001.12.4720.0 (srv03_rtm.030324-2048)1.23 MB (1,292,800 bytes)3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\clbcatq.dll
comres 2001.12.4720.0 (srv03_rtm.030324-2048) 779.50 KB (798,208 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\comres.dll
ntmarta 5.2.3790.0 (srv03_rtm.030324-2048) 343.50 KB (351,744 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\ntmarta.dll
services 5.2.3790.0 (srv03_rtm.030324-2048) 286.00 KB (292,864 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\services.exe
scesrv 5.2.3790.0 (srv03_rtm.030324-2048) 765.00 KB (783,360 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\scesrv.dll
authz 5.2.3790.0 (srv03_rtm.030324-2048) 202.50 KB (207,360 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\authz.dll
umpnpmgr 5.2.3790.0 (srv03_rtm.030324-2048) 314.50 KB (322,048 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\umpnpmgr.dll
ncobjapi 5.2.3790.0 (srv03_rtm.030324-2048) 118.50 KB (121,344 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\ncobjapi.dll
msvcp60 6.10.2240.8 941.50 KB (964,096 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msvcp60.dll
eventlog 5.2.3790.0 (srv03_rtm.030324-2048) 157.00 KB (160,768 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\eventlog.dll
psapi 5.2.3790.0 (srv03_rtm.030324-2048) 48.00 KB (49,152 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\psapi.dll
cabinet 5.2.3790.0 (srv03_rtm.030324-2048) 168.00 KB (172,032 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\cabinet.dll
rsaenh 5.2.3790.0 (srv03_rtm.030324-2048) 371.83 KB (380,752 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\rsaenh.dll
cryptnet 5.131.3790.0 (srv03_rtm.030324-2048) 153.50 KB (157,184 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\cryptnet.dll
sensapi 5.2.3790.0 (srv03_rtm.030324-2048) 11.50 KB (11,776 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\sensapi.dll
lsass 5.2.3790.0 (srv03_rtm.030324-2048) 15.00 KB (15,360 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\lsass.exe
lsasrv 5.2.3790.0 (srv03_rtm.030324-2048) 1.94 MB (2,033,664 bytes)3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\lsasrv.dll
samsrv 5.2.3790.0 (srv03_rtm.030324-2048) 1,005.00 KB (1,029,120 bytes)3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\samsrv.dll
cryptdll 5.2.3790.0 (srv03_rtm.030324-2048) 61.00 KB (62,464 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\cryptdll.dll
dnsapi 5.2.3790.0 (srv03_rtm.030324-2048) 404.00 KB (413,696 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\dnsapi.dll
ntdsapi 5.2.3790.0 (srv03_rtm.030324-2048) 181.50 KB (185,856 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\ntdsapi.dll
msprivs 5.2.3790.0 (srv03_rtm.030324-2048) 46.00 KB (47,104 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msprivs.dll
kerberos 5.2.3790.0 (srv03_rtm.030324-2048) 876.00 KB (897,024 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\kerberos.dll
msv1_0 5.2.3790.0 (srv03_rtm.030324-2048) 333.50 KB (341,504 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msv1_0.dll
netlogon 5.2.3790.0 (srv03_rtm.030324-2048) 936.50 KB (958,976 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\netlogon.dll
w32time 5.2.3790.0 (srv03_rtm.030324-2048) 540.50 KB (553,472 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\w32time.dll
iphlpapi 5.2.3790.0 (srv03_rtm.030324-2048) 223.00 KB (228,352 bytes) 3/25/2003 8:00

PM Microsoft Corporation
c:\windows\system32\iphlpapi.dll
schannel 5.2.3790.0 (srv03_rtm.030324-2048)
468.50 KB (479,744 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\schannel.dll
wdigest 5.2.3790.0 (srv03_rtm.030324-2048)
161.50 KB (165,376 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\wdigest.dll
rassfm 5.2.3790.0 (srv03_rtm.030324-2048) 56.00
KB (57,344 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\rassfm.dll
kdcsvc 5.2.3790.0 (srv03_rtm.030324-2048)
571.50 KB (585,216 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\kdcsvc.dll
ntdsa 5.2.3790.0 (srv03_rtm.030324-2048) 3.82
MB (4,008,448 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\ntdsa.dll
ntdsatq 5.2.3790.0 (srv03_rtm.030324-2048) 80.50
KB (82,432 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\ntdsatq.dll
mswsock 5.2.3790.0 (srv03_rtm.030324-2048)
671.00 KB (687,104 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\mswsock.dll
esent 5.2.3790.0 (srv03_rtm.030324-2048) 2.48
MB (2,605,056 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\esent.dll
scecli 5.2.3790.0 (srv03_rtm.030324-2048)
467.50 KB (478,720 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\scecli.dll
wshtcpip 5.2.3790.0 (srv03_rtm.030324-2048) 38.00
KB (38,912 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\wshtcpip.dll

ipsecsvc 5.2.3790.0 (srv03_rtm.030324-2048)
410.50 KB (420,352 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\ipsecsvc.dll
oakley 5.2.3790.0 (srv03_rtm.030324-2048)
493.50 KB (505,344 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\oakley.dll
winipsec 5.2.3790.0 (srv03_rtm.030324-2048) 78.50
KB (80,384 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\winipsec.dll

pstorsvc 5.2.3790.0 (srv03_rtm.030324-2048) 56.00
KB (57,344 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\pstorsvc.dll

psbase 5.2.3790.0 (srv03_rtm.030324-2048)
162.50 KB (166,400 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\psbase.dll
dssenh 5.2.3790.0 (srv03_rtm.030324-2048)
319.33 KB (326,992 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\dssenh.dll
wlbsctrl 5.2.3790.0 (srv03_rtm.030324-2048)
194.50 KB (199,168 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\wlbsctrl.dll
svchost 5.2.3790.0 (srv03_rtm.030324-2048) 32.50
KB (33,280 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\svchost.exe

rpcss 5.2.3790.68 (srv03_gdr.030614-1005)
645.50 KB (660,992 bytes) 7/5/2003 1:05
PM Microsoft Corporation
c:\windows\system32\rpcss.dll
termsrv 5.2.3790.0 (srv03_rtm.030324-2048)
607.00 KB (621,568 bytes) 3/22/2004 4:53
PM Microsoft Corporation
c:\windows\system32\termsrv.dll
icaapi 5.2.3790.0 (srv03_rtm.030324-2048) 27.00
KB (27,648 bytes) 3/22/2004 4:53 PM Microsoft
Corporation c:\windows\system32\icaapi.dll
mstlsapi 5.2.3790.0 (srv03_rtm.030324-2048)
311.00 KB (318,464 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\mstlsapi.dll
activeds 5.2.3790.0 (srv03_rtm.030324-2048)
543.50 KB (556,544 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\activeds.dll
adsldpc 5.2.3790.0 (srv03_rtm.030324-2048)
312.00 KB (319,488 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\adsldpc.dll
credui 5.2.3790.0 (srv03_rtm.030324-2048)
288.00 KB (294,912 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\credui.dll
atl 3.00.2282348.00 KB (356,352 bytes)
3/25/2003 8:00 PM Microsoft Corporation
c:\windows\system32\atl.dll
rdpwsx 5.2.3790.0 (srv03_rtm.030324-2048)
256.63 KB (262,792 bytes) 3/22/2004 4:53
PM Microsoft Corporation
c:\windows\system32\rdpwsx.dll
schedsvc 5.2.3790.0 (srv03_rtm.030324-2048)
527.50 KB (540,160 bytes) 3/22/2004 4:55
PM Microsoft Corporation
c:\windows\system32\schedsvc.dll
msidle 6.00.3790.0 (srv03_rtm.030324-2048) 8.50
KB (8,704 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\msidle.dll
wkssvc 5.2.3790.0 (srv03_rtm.030324-2048)
304.00 KB (311,296 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\wkssvc.dll
cryptsvc 5.2.3790.0 (srv03_rtm.030324-2048)
126.00 KB (129,024 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\cryptsvc.dll
certcli 5.2.3790.0 (srv03_rtm.030324-2048)
586.00 KB (600,064 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\certcli.dll
vssapi 5.2.3790.0 (srv03_rtm.030324-2048) 1.28
MB (1,339,904 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\vssapi.dll
dmserver 5.2.3790.0 (srv03_rtm.030324-2048) 45.50
KB (46,592 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\dmserver.dll

es 2001.12.4720.0 (srv03_rtm.030324-2048)
637.50 KB (652,800 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\es.dll
pchsvc 5.2.3790.0 (srv03_rtm.030324-2048) 94.50
KB (96,768 bytes) 3/22/2004 4:55 PM Microsoft
Corporation
c:\windows\pchealth\helpctr\binaries\pchsvc.dll

hidserv 5.2.3790.0 (srv03_rtm.030324-2048) 64.00 KB (65,536 bytes) 3/23/2004 12:49 AM Microsoft Corporation c:\windows\system32\hidserv.dll
hid 5.2.3790.0 (srv03_rtm.030324-2048) 44.00 KB (45,056 bytes) 3/25/2003 9:17 PM Microsoft Corporation c:\windows\system32\hid.dll
srvsvc 5.2.3790.0 (srv03_rtm.030324-2048) 188.00 KB (192,512 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\srvsvc.dll
seclogon 5.2.3790.0 (srv03_rtm.030324-2048) 41.50 KB (42,496 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\seclogon.dll

trkwks 5.2.3790.0 (srv03_rtm.030324-2048) 246.00 KB (251,904 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\trkwks.dll
sens 5.2.3790.0 (srv03_rtm.030324-2048) 90.50 KB (92,672 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\sens.dll
winrnr 5.2.3790.0 (srv03_rtm.030324-2048) 39.00 KB (39,936 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\winrnr.dll
comsvcs 2001.12.4720.0 (srv03_rtm.030324-2048) 2.96 MB (3,106,816 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\comsvcs.dll

browser 5.2.3790.0 (srv03_rtm.030324-2048) 187.00 KB (191,488 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\browser.dll
rasadhlp 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\rasadhlp.dll

netrap 5.2.3790.0 (srv03_rtm.030324-2048) 30.00 KB (30,720 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\netrap.dll
netman 5.2.3790.0 (srv03_rtm.030324-2048) 591.00 KB (605,184 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\netman.dll
mprapi 5.2.3790.0 (srv03_rtm.030324-2048) 238.00 KB (243,712 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\mprapi.dll
rtutils 5.2.3790.0 (srv03_rtm.030324-2048) 81.50 KB (83,456 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\rtutils.dll
rasapi32 5.2.3790.0 (srv03_rtm.030324-2048) 589.50 KB (603,648 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\rasapi32.dll
rasman 5.2.3790.0 (srv03_rtm.030324-2048) 154.50 KB (158,208 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\rasman.dll
tapi32 5.2.3790.0 (srv03_rtm.030324-2048) 493.00 KB (504,832 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\tapi32.dll
wzcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 608.50 KB (623,104 bytes) 3/25/2003 9:19 PM Microsoft Corporation c:\windows\system32\wzcsvc.dll
wmi 5.2.3790.0 (srv03_rtm.030324-2048) 5.00 KB (5,120 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\wmi.dll

dhcpcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 279.50 KB (286,208 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\dhcpcsvc.dll
wzcsapi 5.2.3790.0 (srv03_rtm.030324-2048) 49.50 KB (50,688 bytes) 3/25/2003 9:19 PM Microsoft Corporation c:\windows\system32\wzcsapi.dll
netshell 5.2.3790.0 (srv03_rtm.030324-2048) 2.65 MB (2,779,648 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\netshell.dll
clusapi 5.2.3790.0 (srv03_rtm.030324-2048) 165.50 KB (169,472 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\clusapi.dll
netcfgx 5.2.3790.0 (srv03_rtm.030324-2048) 1.94 MB (2,034,688 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\netcfgx.dll
hnetcfg 5.2.3790.0 (srv03_rtm.030324-2048) 764.00 KB (782,336 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\hnetcfg.dll
wininet 6.00.3790.0 (srv03_rtm.030324-2048) 1.43 MB (1,500,672 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\wininet.dll
wbemprox 5.2.3790.0 (srv03_rtm.030324-2048) 46.00 KB (47,104 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\wbemprox.dll
wbemcomn 5.2.3790.0 (srv03_rtm.030324-2048) 598.50 KB (612,864 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\wbem\wbemcomn.dll
wmisvc 5.2.3790.0 (srv03_rtm.030324-2048) 408.50 KB (418,304 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\wmisvc.dll
wbemcore 5.2.3790.0 (srv03_rtm.030324-2048) 1.64 MB (1,723,904 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\wbemcore.dll
esscli 5.2.3790.0 (srv03_rtm.030324-2048) 919.50 KB (941,568 bytes) 3/22/2004 4:52 PM Microsoft Corporation c:\windows\system32\wbem\esscli.dll
fastprox 5.2.3790.0 (srv03_rtm.030324-2048) 1.51 MB (1,580,544 bytes) 3/22/2004 4:52 PM Microsoft Corporation c:\windows\system32\wbem\fastprox.dll
wbemsvc 5.2.3790.0 (srv03_rtm.030324-2048) 62.50 KB (64,000 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\wbemsvc.dll
wmiutils 5.2.3790.0 (srv03_rtm.030324-2048) 285.00 KB (291,840 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\wmiutils.dll
repdrvfs 5.2.3790.0 (srv03_rtm.030324-2048) 595.50 KB (609,792 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\repdrvfs.dll
wmiprvsd 5.2.3790.0 (srv03_rtm.030324-2048) 1.38 MB (1,443,328 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\wmiprvsd.dll
wbemess 5.2.3790.0 (srv03_rtm.030324-2048) 976.50 KB (999,936 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\wbemess.dll

rasdlg 5.2.3790.0 (srv03_rtm.030324-2048) 1.35 MB (1,420,800 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\rasdlg.dll
ncprov 5.2.3790.0 (srv03_rtm.030324-2048) 133.50 KB (136,704 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\ncprov.dll
wbemcons 5.2.3790.0 (srv03_rtm.030324-2048) 237.50 KB (243,200 bytes) 3/22/2004 4:53 PM Microsoft Corporation c:\windows\system32\wbem\wbemcons.dll
ersvc 5.2.3790.0 (srv03_rtm.030324-2048) 61.00 KB (62,464 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\ersvc.dll
dfssvc 5.2.3790.0 (srv03_rtm.030324-2048) 442.00 KB (452,608 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\dfssvc.exe
resutils 5.2.3790.0 (srv03_rtm.030324-2048) 147.50 KB (151,040 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\resutils.dll
mfc42u 6.00.3014.0 3.34 MB (3,506,176 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\mfc42u.dll
wsock32 5.2.3790.0 (srv03_rtm.030324-2048) 23.00 KB (23,552 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\wsock32.dll

explorer 6.00.3790.0 (srv03_rtm.030324-2048) 1.63 MB (1,704,960 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\explorer.exe
browseui 6.00.3790.0 (srv03_rtm.030324-2048) 2.42 MB (2,536,960 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\browseui.dll

shdocvw 6.00.3790.0 (srv03_rtm.030324-2048) 3.20 MB (3,359,744 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\shdocvw.dll

themeui 6.00.3790.0 (srv03_rtm.030324-2048) 823.00 KB (842,752 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\themeui.dll
msimg32 5.2.3790.0 (srv03_rtm.030324-2048) 7.00 KB (7,168 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msimg32.dll

msimtf 5.2.3790.0 (srv03_rtm.030324-2048) 528.00 KB (540,672 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msimtf.dll
msctf 5.2.3790.0 (srv03_rtm.030324-2048) 924.50 KB (946,688 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msctf.dll
linkinfo 5.2.3790.0 (srv03_rtm.030324-2048) 42.00 KB (43,008 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\linkinfo.dll
ntshrui 6.00.3790.0 (srv03_rtm.030324-2048) 233.50 KB (239,104 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\ntshrui.dll
msi 2.0.3790.04.31 MB (4,524,032 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msi.dll
urlmon 6.00.3790.0 (srv03_rtm.030324-2048) 1.21 MB (1,271,296 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\urlmon.dll

browselc 6.00.3790.0 (srv03_rtm.030324-2048) 61.50 KB (62,976 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\browselc.dll

shdoclc 6.00.3790.0 (srv03_rtm.030324-2048) 588.00 KB (602,112 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\shdoclc.dll
webcheck 6.00.3790.0 (srv03_rtm.030324-2048) 664.50 KB (680,448 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\webcheck.dll
stobject 5.2.3790.0 (srv03_rtm.030324-2048) 178.00 KB (182,272 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\stobject.dll
batmeter 6.00.3790.0 (srv03_rtm.030324-2048) 55.50 KB (56,832 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\batmeter.dll

powrprof 6.00.3790.0 (srv03_rtm.030324-2048) 36.00 KB (36,864 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\powrprof.dll

printui 5.2.3790.0 (srv03_rtm.030324-2048) 1.09 MB (1,142,784 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\printui.dll
cfgmgr32 5.2.3790.0 (srv03_rtm.030324-2048) 16.00 KB (16,384 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\cfgmgr32.dll

actxprxy 6.00.3790.0 (srv03_rtm.030324-2048) 230.00 KB (235,520 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\actxprxy.dll
mydocs 6.00.3790.0 (srv03_rtm.030324-2048) 129.00 KB (132,096 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\mydocs.dll
diskcopy 6.00.3790.0 (srv03_rtm.030324-2048) 1.46 MB (1,530,368 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\diskcopy.dll

dskquoui 5.2.3790.0 (srv03_rtm.030324-2048) 412.00 KB (421,888 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\dskquoui.dll
cmd 5.2.3790.0 (srv03_rtm.030324-2048) 493.50 KB (505,344 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\cmd.exe
helpctr 5.2.3790.0 (srv03_rtm.030324-2048) 1.97 MB (2,066,432 bytes) 3/22/2004 4:55 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\helpctr.exe

hcappres 5.2.3790.0 (srv03_rtm.030324-2048) 6.00 KB (6,144 bytes) 3/22/2004 4:55 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\hcappres.dll

itss 5.2.3790.0 (srv03_rtm.030324-2048) 349.00 KB (357,376 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\itss.dll
msxml3 8.40.9419.0 3.42 MB (3,590,656 bytes) 3/25/2003 8:00 PM Microsoft Corporation c:\windows\system32\msxml3.dll
pchshell 5.2.3790.0 (srv03_rtm.030324-2048) 277.50 KB (284,160 bytes) 3/22/2004 4:55

PM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\pchshell.dll

mlang 6.00.3790.0 (srv03_rtm.030324-2048)
799.00 KB (818,176 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\mlang.dll
mshtml 6.00.3790.0 (srv03_rtm.030324-2048) 7.83
MB (8,208,384 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\mshtml.dll
jscript 5.6.0.85151.21 MB (1,268,736 bytes)
3/25/2003 8:00 PM Microsoft Corporation
c:\windows\system32\jscript.dll
msls31 3.10.349.0448.00 KB (458,752 bytes)
3/25/2003 8:00 PM Microsoft Corporation
c:\windows\system32\msls31.dll
mshtmled 6.00.3790.0 (srv03_rtm.030324-2048) 1.34
MB (1,408,512 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\mshtmled.dll

vbscript 5.6.0.85151.06 MB (1,110,016 bytes)
3/25/2003 8:00 PM Microsoft Corporation
c:\windows\system32\vbscript.dll
mfc42 6.00.3014.0 3.36 MB (3,526,656 bytes)
3/25/2003 8:00 PM Microsoft Corporation
c:\windows\system32\mfc42.dll
msinfo 5.2.3790.0 (srv03_rtm.030324-2048) 1.20
MB (1,257,984 bytes) 3/22/2004 4:55 PM Microsoft
Corporation
c:\windows\pchealth\helpctr\binaries\msinfo.dll

comdlg32 6.00.3790.0 (srv03_rtm.030324-2048)
706.00 KB (722,944 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\comdlg32.dll
riched32 5.2.3790.0 (srv03_rtm.030324-2048) 5.00
KB (5,120 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\riched32.dll

riched20 5.31.23.1218 1.25 MB (1,313,280 bytes)
3/25/2003 8:00 PM Microsoft Corporation
c:\windows\system32\riched20.dll
drprov 5.2.3790.0 (srv03_rtm.030324-2048) 26.50
KB (27,136 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\drprov.dll
ntlanman 5.2.3790.0 (srv03_rtm.030324-2048)
108.00 KB (110,592 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\ntlanman.dll
netui0 5.2.3790.0 (srv03_rtm.030324-2048)
181.50 KB (185,856 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\netui0.dll
netui1 5.2.3790.0 (srv03_rtm.030324-2048)
482.00 KB (493,568 bytes) 3/25/2003 8:00
PM Microsoft Corporation
c:\windows\system32\netui1.dll
davclnt 5.2.3790.0 (srv03_rtm.030324-2048) 59.00
KB (60,416 bytes) 3/25/2003 8:00 PM Microsoft
Corporation c:\windows\system32\davclnt.dll
helpsvc 5.2.3790.0 (srv03_rtm.030324-2048) 2.18
MB (2,289,152 bytes) 3/22/2004 4:55 PM Microsoft
Corporation
c:\windows\pchealth\helpctr\binaries\helpsvc.exe

[Services]

Display Name Name State Start Mode
Service Type Path Error Control
Start Name Tag ID
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 AppMgmt Stopped
Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
Windows Audio AudioSrv Stopped Disabled
Share Process
c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
Background Intelligent Transfer Service BITS
Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
Computer Browser Browser Running Auto
Share Process
c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
Indexing Service CiSvc Stopped Disabled
Share Process
c:\windows\system32\cisvc.exe Normal
LocalSystem 0
ClipBook ClipSrv Stopped Disabled Own Process
c:\windows\system32\clipsrv.exe Normal
LocalSystem 0
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 Running Auto
Share Process
c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
DB2 - DB2-0 DB2-0 Stopped Manual Own
Process d:\sqllib\bin\db2syscs.exe Normal
.\db2admin 0
DB2DAS - DB2DAS00 DB2DAS00
Stopped Manual Own Process
"d:\sqllib\\bin\db2dasrrm.exe" Normal
.\db2admin 0
DB2 Governor DB2GOVERNOR Stopped
Manual Own Process
"d:\sqllib\bin\db2govds.exe" Normal
.\db2admin 0
DB2 JDBC Applet Server DB2JDS Stopped
Manual Own Process
"d:\sqllib\bin\db2jds.exe" Normal
LocalSystem 0
DB2 License Server DB2LICD Stopped Manual Own
Process d:\sqllib\bin\db2licd.exe Ignore
LocalSystem 0
DB2 Registry Reflector DB2NTREGREFLECTOR
Stopped Manual Own Process
"d:\sqllib\bin\db2reg64.exe" Normal
.\db2admin 0
DB2 Security Server DB2NTSECSERVER Stopped
Manual Own Process
"d:\sqllib\bin\db2sec.exe" Normal
LocalSystem 0

```
DB2 - DB2QUAL-0 DB2QUAL-0 Stopped
        Manual  Own Process
        d:\sqllib\bin\db2syscs.exe      Normal
        .\db2qual  0
DB2 - DB2QUAL-1 DB2QUAL-1 Stopped
        Manual  Own Process
        d:\sqllib\bin\db2syscs.exe      Normal
        .\db2qual  0
DB2 Remote Command Server DB2REMOTECMD
        Stopped  Manual  Own Process
        "d:\sqllib\bin\db2rcmd.exe"     Ignore
        .\db2admin          0
DB2 - DB2TPCH-0 DB2TPCH-0 Stopped
        Manual  Own Process
        d:\sqllib\bin\db2syscs.exe      Normal
        .\db2tpch  0
DB2 - DB2TPCH-1 DB2TPCH-1 Stopped
        Manual  Own Process
        d:\sqllib\bin\db2syscs.exe      Normal
        .\db2tpch  0
DB2 - DB2TPCH-2 DB2TPCH-2 Stopped
        Manual  Own Process
        d:\sqllib\bin\db2syscs.exe      Normal
        .\db2tpch  0
DB2 - DB2TPCH-3 DB2TPCH-3 Stopped
        Manual  Own Process
        d:\sqllib\bin\db2syscs.exe      Normal
        .\db2tpch  0
Distributed File System         Dfs     Running  Auto
        Own Process
        c:\windows\system32\dfssvc.exeNormal
        LocalSystem         0
DHCP Client     Dhcp    Running  Auto
        Share Process
        c:\windows\system32\svchost.exe -k
networkservice      Normal   NT
AUTHORITY\NetworkService0
Logical Disk Manager Administrative Service
        dmadmin  Stopped  Manual  Share Process
        c:\windows\system32\dmadmin.exe /com
        Normal   LocalSystem        0
Logical Disk Managerdmserver  Running  Auto
        Share Process
        c:\windows\system32\svchost.exe -k netsvcs
        Normal   LocalSystem        0
DNS Client      Dnscache Running  Auto
        Share Process
        c:\windows\system32\svchost.exe -k
networkservice      Normal   NT
AUTHORITY\NetworkService0
Error Reporting Service         ERSvc   Running  Auto
        Share Process
        c:\windows\system32\svchost.exe -k winerr
        Ignore   LocalSystem        0
Event LogEventlog  Running  Auto     Share Process
        c:\windows\system32\services.exe
        Normal   LocalSystem        0
COM+ Event SystemEventSystem    Running
        Manual  Share Process
        c:\windows\system32\svchost.exe -k netsvcs
        Normal   LocalSystem        0
Mylex Global Array Manager Server       gamscm
        Stopped  Manual  Own Process
        syswow64\gamserv\gamscm.exeNormal
        LocalSystem         0
Help and Support    helpsvc  Running  Auto
        Share Process
        c:\windows\system32\svchost.exe -k netsvcs
        Normal   LocalSystem        0
HID Input Service   HidServ  Running  Auto
        Share Process
        c:\windows\system32\svchost.exe -k netsvcs
        Normal   LocalSystem        0
HTTP SSL HTTPFilter     Stopped  Manual
        Share Process
        c:\windows\system32\lsass.exe  Normal
        LocalSystem         0
IAS Jet Database Access     IASJet  Stopped
        Manual  Share Process
        c:\windows\syswow64\svchost.exe -k iasjet
        Normal   LocalSystem        0
IMAPI CD-Burning COM Service        ImapiService
        Stopped  Disabled  Own Process
        c:\windows\system32\imapi.exeNormal
        LocalSystem         0
Intersite Messaging IsmServ  Stopped  Disabled  Own
Process  c:\windows\system32\ismserv.exe
        Normal   LocalSystem        0
Kerberos Key Distribution Center        kdc
        Stopped  Disabled  Share Process
        c:\windows\system32\lsass.exe  Normal
        LocalSystem         0
Server      lanmanserver    Running  Auto
        Share Process
        c:\windows\system32\svchost.exe -k netsvcs
        Normal   LocalSystem        0
Workstation     lanmanworkstation  Running  Auto
        Share Process
        c:\windows\system32\svchost.exe -k netsvcs
        Normal   LocalSystem        0
License Logging     LicenseService      Stopped
        Disabled  Own Process
        c:\windows\system32\llssrv.exeNormal    NT
AUTHORITY\NetworkService0
TCP/IP NetBIOS Helper       LmHosts  Running  Auto
        Share Process
        c:\windows\system32\svchost.exe -k localservice
        Normal   NT AUTHORITY\LocalService0

Messenger   Messenger  Stopped  Disabled  Share Process
        c:\windows\system32\svchost.exe -k netsvcs
        Normal   LocalSystem        0
Distributed Transaction Coordinator     MSDTC
        Running  Auto     Own Process
        c:\windows\system32\msdtc.exeNormal    NT
AUTHORITY\NetworkService0
Windows Installer   MSIServerStopped  Manual
        Share Process
        c:\windows\system32\msiexec.exe /v
        Normal   LocalSystem        0
Network DDE     NetDDE  Stopped  Disabled
        Share Process
        c:\windows\system32\netdde.exeNormal
        LocalSystem         0
Network DDE DSDMNetDDEdsdm      Stopped
        Disabled  Share Process
        c:\windows\system32\netdde.exeNormal
        LocalSystem         0
Net Logon   Netlogon  Stopped  Manual  Share Process
        c:\windows\system32\lsass.exe  Normal
        LocalSystem         0
Network ConnectionsNetman   Running  Manual
        Share Process
        c:\windows\system32\svchost.exe -k netsvcs
        Normal   LocalSystem        0
Network Location Awareness (NLA)    Nla
        Running  Manual  Share Process
        c:\windows\system32\svchost.exe -k netsvcs
        Normal   LocalSystem        0
```

File Replication NtFrs Stopped Manual Own Process c:\windows\system32\ntfrs.exe Ignore LocalSystem 0
NT LM Security Support Provider NtLmSsp Stopped Manual Share Process c:\windows\system32\lsass.exe Normal LocalSystem 0
Removable Storage NtmsSvc Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Plug and Play PlugPlay Running Auto Share Process c:\windows\system32\services.exe Normal LocalSystem 0
IPSEC Services PolicyAgent Running Auto Share Process c:\windows\system32\lsass.exe Normal LocalSystem 0
Protected Storage ProtectedStorage Running Auto Share Process c:\windows\system32\lsass.exe Normal LocalSystem 0
Remote Access Auto Connection Manager RasAuto Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Access Connection Manager RasMan Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Desktop Help Session Manager RDSessMgr Stopped Manual Own Process c:\windows\system32\sessmgr.exe Normal LocalSystem 0
Routing and Remote Access RemoteAccess Stopped Disabled Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Registry RemoteRegistry Stopped Manual Share Process c:\windows\system32\svchost.exe -k regsvc Normal NT AUTHORITY\LocalService 0

Remote Procedure Call (RPC) Locator RpcLocator Stopped Manual Own Process c:\windows\system32\locator.exe Normal NT AUTHORITY\NetworkService 0
Remote Procedure Call (RPC) RpcSs Running Auto Share Process c:\windows\system32\svchost -k rpcss Normal LocalSystem 0
Resultant Set of Policy Provider RSoPProv Stopped Manual Share Process c:\windows\system32\rsopprov.exe Normal LocalSystem 0
Special Administration Console Helper sacsvr Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Security Accounts Manager SamSs Running Auto Share Process c:\windows\system32\lsass.exe Normal LocalSystem 0
Smart Card SCardSvr Stopped Manual Share Process c:\windows\system32\scardsvr.exe Ignore NT AUTHORITY\LocalService 0
Task Scheduler Schedule Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Secondary Logon seclogon Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs Ignore LocalSystem 0
System Event Notification SENS Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Shell Hardware Detection ShellHWDetection Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Ignore LocalSystem 0
Print Spooler Spooler Stopped Manual Own Process c:\windows\system32\spoolsv.exe Normal LocalSystem 0
Windows Image Acquisition (WIA) stisvc Stopped Disabled Share Process c:\windows\system32\svchost.exe -k imgsvc 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 Manual Own Process c:\windows\system32\smlogsvc.exe Normal NT Authority\NetworkService 0

TelephonyTapiSrv 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 termsvcs Normal LocalSystem 0
Telnet TlntSvr Stopped Disabled Own Process c:\windows\system32\tlntsvr.exe Normal NT AUTHORITY\LocalService 0
Distributed Link Tracking Server TrkSvr Stopped Disabled Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Distributed Link Tracking Client TrkWks Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Terminal Services Session Directory Tssdis Stopped Disabled Own Process c:\windows\system32\tssdis.exe Normal LocalSystem 0
Upload Manager uploadmgr Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 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 Running Auto
Share Process
c:\windows\system32\svchost.exe -k netsvcs
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 Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs
Ignore LocalSystem 0
Windows Management Instrumentation Driver Extensions
Wmi Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
WMI Performance Adapter WmiApSrv
Stopped Manual Own Process
c:\windows\system32\wbem\wmiapsrv.exe
Normal LocalSystem 0
Automatic Updates wuauserv Stopped Manual
Share Process
c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
Wireless Configuration WZCSVC Stopped
Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0

[Program Groups]

Group Name Name User Name
Accessories Default User:Accessories
Default User
Accessories\Accessibility Default
User:Accessories\Accessibility Default User
Accessories\Entertainment Default
User:Accessories\Entertainment Default User
Startup Default User:Startup Default User
Accessories All Users:Accessories All Users
Accessories\Accessibility All
Users:Accessories\Accessibility All Users
Accessories\Communications All
Users:Accessories\Communications All Users
Accessories\Entertainment All
Users:Accessories\Entertainment All Users
Accessories\System Tools All
Users:Accessories\System Tools All Users
Administrative Tools All Users:Administrative Tools All
Users
IBM DB2 All Users:IBM DB2 All Users
IBM DB2\Command Line Tools All Users:IBM
DB2\Command Line Tools All Users
IBM DB2\Development Tools All Users:IBM
DB2\Development Tools All Users
IBM DB2\General Administration Tools All Users:IBM
DB2\General Administration Tools All Users
IBM DB2\Information All Users:IBM
DB2\Information All Users
IBM DB2\Monitoring Tools All Users:IBM
DB2\Monitoring Tools All Users
IBM DB2\Set-up Tools All Users:IBM DB2\Set-up
Tools All Users
Startup All Users:Startup All Users
WinZip All Users:WinZip 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 LANGCHAO-
TPCH\db2tpch:Accessories LANGCHAO-
TPCH\db2tpch
Accessories\Accessibility LANGCHAO-
TPCH\db2tpch:Accessories\Accessibility LANGCHAO-
TPCH\db2tpch
Accessories\Entertainment LANGCHAO-
TPCH\db2tpch:Accessories\Entertainment LANGCHAO-
TPCH\db2tpch
Administrative Tools LANGCHAO-
TPCH\db2tpch:Administrative Tools LANGCHAO-
TPCH\db2tpch
Startup LANGCHAO-TPCH\db2tpch:Startup
LANGCHAO-TPCH\db2tpch

[Startup Programs]

Program Command User Name Location
desktop desktop.ini NT AUTHORITY\SYSTEM
Startup
desktop desktop.ini LANGCHAO-TPCH\db2tpch
Startup
desktop desktop.ini .DEFAULT Startup
desktop desktop.ini All Users Common Startup
WinZip Quick Pick e:\winzip\wzqkpick.exe 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 6.0.3790.0
Build 63790
Application Path C:\Program Files\Internet Explorer

Language English (United States)
Active Printer Not Available

Cipher Strength 128-bit
Content Advisor Disabled
IEAK Install No

[File Versions]

File Version Size Date Path Company

actxprxy.dll 6.0.3790.0230 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
advpack.dll 6.0.3790.0240 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
asctrls.ocx 6.0.3790.0219 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
browselc.dll 6.0.3790.062 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
browseui.dll 6.0.3790.02,478 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
cdfview.dll 6.0.3790.0292 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
comctl32.dll 5.82.3790.0 1,584 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
dxtrans.dll 6.3.3790.0562 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
dxtmsft.dll 6.3.3790.0918 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
iecont.dll <File Missing> Not Available Not Available Not Available Not Available
iecontlc.dll <File Missing> Not Available Not Available Not Available Not Available
iedkcs32.dll 16.0.3790.0 676 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
iepeers.dll 6.0.3790.0652 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
iesetup.dll 6.0.3790.089 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
ieuinit.inf Not Available 20 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Not Available
iexplore.exe 6.0.3790.0102 KB 3/25/2003 8:00:00 PM C:\Program Files\Internet Explorer Microsoft Corporation
imgutil.dll 5.2.3790.0101 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
inetcpl.cpl 6.0.3790.0589 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
inetcplc.dll 6.0.3790.0108 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
inseng.dll 6.0.3790.0213 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
mlang.dll 6.0.3790.0799 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
msencode.dll <File Missing> Not Available Not Available Not Available Not Available
mshta.exe 6.0.3790.059 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
mshtml.dll 6.0.3790.08,016 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
mshtml.tlb 6.0.3790.01,319 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
mshtmled.dll 6.0.3790.01,376 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
mshtmler.dll 6.0.3790.056 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
msident.dll 6.0.3790.0128 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
msidntld.dll 6.0.3790.014 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
msieftp.dll 6.0.3790.0536 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
msrating.dll 6.0.3790.0379 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
mstime.dll 6.0.3790.01,621 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
occache.dll 6.0.3790.0201 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
proctexe.ocx <File Missing> Not Available Not Available Not Available Not Available
sendmail.dll 6.0.3790.097 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
shdoclc.dll 6.0.3790.0588 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
shdocvw.dll 6.0.3790.03,281 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
shfolder.dll 6.0.3790.037 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
shlwapi.dll 6.0.3790.0722 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
tdc.ocx 1.3.0.3130177 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
url.dll 6.0.3790.045 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
urlmon.dll 6.0.3790.01,242 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation

webcheck.dll 6.0.3790.0665 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation
wininet.dll6.0.3790.01,466 KB 3/25/2003 8:00:00 PM C:\WINDOWS\system32 Microsoft Corporation

[Connectivity]

Item Value
Connection Preference Never dial

LAN Settings

AutoConfigProxy Not Available
AutoProxyDetectMode Disabled
AutoConfigURL
Proxy Enabled
ProxyServer 10.152.2.251:80
ProxyOverride <local>

[Cache]

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

Item Value
Page Refresh Type Automatic
Temporary Internet Files FolderC:\Documents and Settings\NetworkService\Local Settings\Temporary Internet Files
Total Disk Space Not Available
Available Disk SpaceNot Available
Maximum Cache SizeNot Available
Available Cache SizeNot Available

[List of Objects]

Program File Status CodeBase
Update Class Installed http://v4.windowsupdate.microsoft.com/CAB/ia64/unicode/iuctl.CAB?38069.844537037

[Content]

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

Item Value
Content Advisor Disabled

[Personal Certificates]

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

[Other People Certificates]

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

[Publishers]

Name
No publisher information available

[Security]

Zone Security Level
My Computer Custom
Local intranet Medium-low
Trusted sites Low
Internet Medium
Restricted sites High

Appendix B: Database Build Scripts

Buildtpcd

```
#!/usr/bin/perl
# usage   buildtpcd [QUAL]

# ASSUMPTIONS: all ddl files have commits in them!
($myName = $0) =~ s@.*/@@; $usage="
Usage: buildtpcd [QUAL]
   where QUAL is the optional parameter saying to build the qualification
            database (sf = .1 = 100MB)\n";
$qual="";
if (@ARGV == 1)
{
   $qual = $ARGV[0];
}

# get TPC-D specific environment variables
require 'getvars';

# Use the macros in here so that they can handle the platform differences.
# macro.pl should be sourced from cmvc, other people wrote and maintain it.
require "macro.pl";
require "tpcdmacro.pl";

# Make output unbuffered.
select(STDOUT);
$| = 1 ;

# verify that necessary environment variables for building the database
# are present.  Default those that aren't necessary
require "version";
$instance=$ENV{"DB2INSTANCE"};
if (length($ENV{"TPCD_PLATFORM"}) <= 0)
{
            die "TPCD_PLATFORM environment variable not set\n";
}
$platform=$ENV{"TPCD_PLATFORM"};
if ( $platform eq "nt" )
{
   $sep="&";
}
else
{
   $sep=";";
}
if ((length($ENV{"TPCD_BUILD_STAGE"}) <= 0) || ($ENV{"TPCD_BUILD_STAGE"}) eq "NULL" )
{
   $ENV{"TPCD_BUILD_STAGE"} = "ALL";
}
if (length($ENV{"TPCD_PRODUCT"}) <= 0)
{
   die "Must set TPCD_PRODUCT env't var.\n";
}
if ( length($ENV{"TPCD_DBNAME"}) <= 0 )
{
            die "TPCD_DBNAME environment variable not set\n";
}
if (length($ENV{"TPCD_MODE"}) <= 0)
{
            die "TPCD_MODE environment variable not set - uni/smp/mln \n";
}
if (length($ENV{"TPCD_SF"}) <= 0)
{
            die "TPCD_SF environment variable not set\n";
}
if (length($ENV{"TPCD_DBPATH"}) <= 1)
{
   # if no db pathname specified, build the db in the home directory
   if ( $platform eq "aix" || $platform eq "sun" || $platform eq "ptx" || $platform eq "hp")
   {
      $ENV{"TPCD_DBPATH"} = $ENV{"HOME"};
   }
   elsif ( $platform eq "nt" )
   {
      $ENV{"TPCD_DBPATH"} = $ENV{"HOMEDRIVE"};
   }
   else
   {
      die "platform $platform not supported yet\n";
```

```
    }
}
if (length($ENV{"TPCD_DDLPATH"}) <= 0)
{
        # if no db pathname specified, use default
        $ENV{"TPCD_DBPATH"} =
"/afs/tor/groups/dbp/perf/benchmark/tpcd/ddl/vanilla";
}
if (length($ENV{"TPCD_GENERATE_SEED_FILE"}) <=
0)
{
        # if no db pathname specified, use default
        $ENV{"TPCD_GENERATE_SEED_FILE"} =
"no";
}
if (length($ENV{"TPCD_DDL"}) <= 0)
{
    $ENV{"TPCD_DDL"} = "dss.ddl";
}
if (length($ENV{"TPCD_STAGING_TABLE_DDL"}) <=
0)
{
    $ENV{"TPCD_STAGING_TABLE_DDL"} = "NULL";
}
if
(length($ENV{"TPCD_PRELOAD_STAGING_TABLE_SC
RIPT"}) <= 0)
{
    $ENV{"TPCD_PRELOAD_STAGING_TABLE_DDL"}
= "NULL";
}
if
(length($ENV{"TPCD_DELETE_STAGING_TABLE_SQL
"}) <= 0)
{
    $ENV{"TPCD_DELETE_STAGING_TABLE_DDL"} =
"NULL";
}
if (length($ENV{"TPCD_TBSP_DDL"}) <= 0)
{
    $ENV{"TPCD_TBSP_DDL"} = "dss.tbsp.ddl";
}
if (length($ENV{"TPCD_INDEXDDL"}) <= 0)
{
    $ENV{"TPCD_INDEXDDL"} = "dss.index";
}
if (length($ENV{"TPCD_RUNSTATS"}) <= 0)
{
    $ENV{"TPCD_RUNSTATS"} = "dss.runstats";
}
if (length($ENV{"TPCD_RUNSTATSH ORT"}) <= 0)
{
    $ENV{"TPCD_RUNSTATSHORT"} = "NULL";
}
if (length($ENV{"TPCD_ADD_RI"}) <= 0)
{
    $ENV{"TPCD_ADD_RI"} = "NULL";
}
if (length($ENV{"TPCD_AST"}) <= 0)
{
    $ENV{"TPCD_AST"} = "NULL";
}
if ( ($ENV{"TPCD_INPUT"}) eq "NULL" )
{
    if (length($ENV{"TPCD_DBGEN"}) <= 0)
    {
       die "Must set TPCD_DBGEN if pregenerated flatfiles
are not provided (TPCD_INPUT=NULL)\n";
    }
}
if ( $qual eq "QUAL" )
{
    if ( ($ENV{"TPCD_QUAL_INPUT"}) eq "NULL" )
    {
       if (length($ENV{"TPCD_DBGEN"}) <= 0)
       {
          die "Must set TPCD_DBGEN if pregenerated flatfiles
are not provided (TPCD_QUAL_INPUT=NULL)\n";
       }
            }
}
if (length($ENV{"TPCD_TEMP"}) <= 1)
{
    $ENV{"TPCD_TEMP"} = "/u/$instance/sqllib/tmp";
}
if (length($ENV{"TPCD_SORT BUF"}) <= 0)
{
    $ENV{"TPCD_SORTBUF"} = 4096;
}
if (length($ENV{"TPCD_LOAD_PARALLELISM"}) <= 0)
{
    $ENV{"TPCD_LOAD_PARALLELISM"} = 0;
}
if (length($ENV{"TPCD_LOADSTATS"}) <= 0)
{
    $ENV{"TPCD_LOADSTATS"} = "no";
}
if (length($ENV{"TPCD_COPY_DIR"}) <= 0)
{
    $ENV{"TPCD_COPY_DIR"} =
"${delim}dev${delim}null";
}
if (length($ENV{"TPCD_FASTPARSE"}) <= 0)
{
```

```
    $ENV{"TPCD_FASTPARSE"} = "no";
}
if (length($ENV{"TPCD_BACKUP_DIR"}) <= 0)
{
    $ENV{"TPCD_BACKUP_DIR"} =
"${delim}dev${delim}null";
}
if (length($ENV{"TPCD_LOG"}) <= 0)
{
    $ENV{"TPCD_LOG"} = "no";
}
if (length($ENV{"TPCD_LOGPRIMARY"}) <= 0)
{
    $ENV{"TPCD_LOGPRIMARY"} = "NULL";
}
if (length($ENV{"TPCD_LOGSECOND"}) <= 0)
{
    $ENV{"TPCD_LOGSECOND"} = "NULL";
}
if (length($ENV{"TPCD_LOGFILSIZ"}) <= 0)
{
    $ENV{"TPCD_LOGFILSIZ"} = "NULL";
}
if (length($ENV{"TPCD_LOG_DIR"}) <= 0)
{
    $ENV{"TPCD_LOG_DIR"} = "NULL";
}
if (length($ENV{"TPCD_LOG_DIR_SETUP_SCRIPT"})
<= 0)
{
    $ENV{"TPCD_LOG_DIR_SETUP_SCRIPT"} =
"NULL";
}
if (length($ENV{"TPCD_CONFIGFILE"}) <= 0)
{
    $ENV{"TPCD_CONFIGFILE"} = "dss.dbconfig";
}
if (length($ENV{"TPCD_DBM_CONFIG"}) <= 0)
{
    $ENV{"TPCD_DBM_CONFIG"} = "NULL";
}
if (length($ENV{"TPCD_MACHINE"}) <= 0)
{
    $ENV{"TPCD_MACHINE"} = "medium";
}
if (length($ENV{"TPCD_SMPDEGREE"}) <= 0)
{
    $ENV{"TPCD_SMPDEGREE"} = 1;
}
if (length($ENV{"TPCD_AGENTPRI"}) <= 0)
{
    $ENV{"TPCD_AGENTPRI"} = NULL;
}
if (length($ENV{"TPCD_ACTIVATE"}) <= 0)
{
    $ENV{"TPCD_ACTIVATE"} = "no";
}
if (length($ENV{"TPCD_AUDIT"}) <= 0)
{
    die "Must set TPCD_AUDIT env't var.  Real audit timing
sequence run if yes\n";
}
if (length($ENV{"TPCD_AUDIT_DIR"}) <= 0)
{
    die "TPCD_AUDIT_DIR environment variable not set\n";
}
if (length($ENV{"TPCD_LOAD_DB2SET_SCRIPT"}) <=
0)
{
    $ENV{"TPCD_LOAD_DB2SET_SCRIPT"}="NULL"
}
if (length($ENV{"TPCD_DB2SET_SCRIPT"}) <= 0)
{
    $ENV{"TPCD_DB2SET_SCRIPT"}="NULL"
}
if (length($ENV{"TPCD_BUFFERPOOL_DEF"}) <= 0)
{
    $ENV{"TPCD_BUFFERPOOL_DEF"}="NULL"
}
if (length($ENV{"TPCD_EXPLAIN_DDL"}) <= 0)
{
    $ENV{"TPCD_EXPLAIN_DDL"}="NULL"
}
if (length($ENV{"TPCD_NODEGROUP_DEF"}) <= 0)
{
    $ENV{"TPCD_NODEGROUP_DEF"}="NULL"
}
if (length($ENV{"TPCD_PHYS_NODE"}) <= 0)
{
    $ENV{"TPCD_NODEGROUP_DEF"}="NULL"
}
if (length($ENV{"TPCD_APPEND_ON"}) <= 0)
{
    $ENV{"TPCD_APPEND_ON"}="yes"
}
#set up local variables
$tpcdVersion=$ENV{"TPCD_VERSION"};
$buildStage=$ENV{"TPCD_BUILD_STAGE"};
$product=$ENV{"TPCD_PRODUCT"};
$dbname=$ENV{"TPCD_DBNAME"};
$mode=$ENV{"TPCD_MODE"};
$sf=$ENV{"TPCD_SF"};
```

```
$sfReal=$sf;            # need a "saved" one for qualification
stuff
$dbpath=$ENV{"TPCD_DBPATH"};
$ddlpath=$ENV{"TPCD_DDLPATH"};
$ddl=$ENV{"TPCD_DDL"};
$stagingTbl=$ENV{"TPCD_STAGING_TABLE_DDL"};
$preloadSampleUF=$ENV{"TPCD_PRELOAD_STAGING
_TABLE_SCRIPT"};
$deleteSampleUF=$ENV{"TPCD_DELETE_STAGING_TA
BLE_SQL"};
$buffpooldef=$ENV{"TPCD_BUFFERPOOL_DEF"};
$nodegroupdef=$ENV{"TPCD_NODEGROUP_DEF"};
$tbspddl=$ENV{"TPCD_TBSP_DDL"};
$indexddl=$ENV{"TPCD_INDEXDDL"};
$extraindex=$ENV{"TPCD_EXTRAINDEX"};
$runstats=$ENV{"TPCD_RUNSTATS"};
$runstatShort=$ENV{"TPCD_RUNSTATSHORT"};
$dbgen=$ENV{"TPCD_DBGEN"};
$input=$ENV{"TPCD_INPUT"};
$earlyindex=$ENV{"TPCD_EARLYINDEX"};
$ldtemp=$ENV{"TPCD_TEMP"};
$sortbuf=$ENV{"TPCD_SORTBUF"};
$load_parallelism=$ENV{"TPCD_LOAD_PARALLELISM
"};
$loadstats=$ENV{"TPCD_LOADSTATS"};
$copydir=$ENV{"TPCD_COPY_DIR"};
$fparse=$ENV{"TPCD_FASTPARSE"};
$addRI=$ENV{"TPCD_ADD_RI"};
$astFile=$ENV{"TPCD_AST"};
$genSeed=$ENV{"TPCD_GENERATE_SEED_FILE"};
$appendOn=$ENV{"TPCD_APPEND_ON"};

if ( $fparse eq "yes" )
{
   $fastparse="FASTPARSE";
}
else
{
   $fastparse=" ";
}
$backupdir=$ENV{"TPCD_BACKUP_DIR"};
$logprimary=$ENV{"TPCD_LOGPRIMARY"};
$logsecond=$ENV{"TPCD_LOGSECOND"};
$logfilsiz=$ENV{"TPCD_LOGFILSIZ"};
$log=$ENV{"TPCD_LOG"};
$logDir=$ENV{"TPCD_LOG_DIR"};
$logDirScript=$ENV{"TPCD_LOG_DIR_SETUP_SCRIPT"
};
$machine=$ENV{"TPCD_MACHINE"};
$configfile=$ENV{"TPCD_CONFIGFILE"};
$dbmconfig=$ENV{"TPCD_DBM_CONFIG"};
$loadconfigfile=$ENV{"TPCD_LOAD_CONFIGFILE"};
$loadDBMconfig=$ENV{"TPCD_LOAD_DBM_CONFIGF
ILE"};
$smpdegree=$ENV{"TPCD_SMPDEGREE"};
$agentpri=$ENV{"TPCD_AGENTPRI"};
$activate=$ENV{"TPCD_ACTIVATE"};
$RealAudit=$ENV{"TPCD_AUDIT"};
$loadscript=$ENV{"TPCD_LOAD_SCRIPT"};
$auditDir=$ENV{"TPCD_AUDIT_DIR"};
$loadsetScript=$ENV{"TPCD_LOAD_DB2SET_SCRIPT"}
;
$setScript=$ENV{"TPCD_DB2SET_SCRIPT"};
$explainDDL=$ENV{"TPCD_EXPLAIN_DDL"};
$user=$ENV{"USER"};


# set up override of some parameters to override for
qualification database
if ( $qual eq "QUAL" )
{
   $loadscript=$ENV{"TPCD_LOAD_SCRIPT_QUAL"};
   if ( length($ENV{"TPCD_QUAL_DBNAME"}) <= 0 )
   {
      die "TPCD_QUAL_DBNAME environment variable
not set \n";
   }
   $dbname=$ENV{"TPCD_QUAL_DBNAME"};


   print "DBNAME= $dbname\n\n";


   $sf=$ENV{"TPCD_QUAL_SF"};
   if ( length($ENV{"TPCD_QUAL_DDL"}) <= 0 )
   {
      die "TPCD_QUAL_DDL environment variable not
set\n";
   }
   $ddl=$ENV{"TPCD_QUAL_DDL"};
   if ( length($ENV{"TPCD_QUAL_TBSP_DDL"}) <= 0 )
   {
      die "TPCD_QUAL_TBSP_DDL environment variable
not set \n";
   }
   $tbspddl=$ENV{"TPCD_QUAL_TBSP_DDL"};
   $input=$ENV{"TPCD_QUAL_INPUT"};
   if ( length($ENV{"TPCD_QUALCONFIGFILE"}) <= 0 )
   {
      die "TPCD_QUALCONFIGFILE environment variable
not set \n";
   }
   $configfile=$ENV{"TPCD_QUALCONFIGFILE"};
   if ( length($ENV{"TPCD_DBM_QUALCONFIG"}) <=
0 )
   {
      die "TPCD_DBM_QUALCONFIG environment
variable not set\n";
```

```
    }
    $dbmconfig=$ENV{"TPCD_DBM_QUALCONFIG"};
    if
( length($ENV{"TPCD_LOAD_QUALCONFIGFILE"}) <=
0 )
    {
       die "TPCD_LOAD_QUALCONFIGFILE environment
variable not set\n";
    }

$loadconfigfile=$ENV{"TPCD_LOAD_QUALCONFIGFIL
E"};
    if
( length($ENV{"TPCD_LOAD_DBM_QUALCONFIGFILE
"}) <= 0 )
    {
       die "TPCD_LOAD_DBM_QUALCONFIGFILE
environment variable not set\n";
    }

$loadDBMconfig=$ENV{"TPCD_LOAD_DBM_QUALCO
NFIGFILE"};
    if (length($ENV{"TPCD_LOG_DIR"}) <= 0)
    {
       $ENV{"TPCD_LOG_DIR"} = "NULL";
    }
    $logDir=$ENV{"TPCD_LOG_QUAL_DIR"};
}

if (( $mode eq "uni" ) || ( $mode eq "smp" ))
{
            $all_ln="once";
            $all_pn="once";
            $once="once";
}
else
{
            $all_ln="all_ln";
            $all_pn="all_pn";
            $once="once";
}

# set up the config parms for the load, indexes and stats
if ($loadconfigfile eq "NULL")
{
            if ( ($machine eq "NULL") )
            {
                        die "Neither a LOAD config file name
not a machine size has been specified!\n";
            }
            $ioclnrs=1;
            $chngpgs=60;

            if ( $machine eq "small" )
            {
                        $buffpage = 5000;
                        $sortheap = 3000;
                        $sheapthres = 8000;
                        $util_heap_sz = 5000;
                        $ioservers = 6;
            }
            elsif ( $machine eq "medium" )
            {
                        $buffpage = 10000;
                        $sortheap =  8000;
                        $sheapthres = 20000;
                        $util_heap_sz = 10000;
                        $ioservers = 10;
            }
            elsif ( $machine eq "big" )
            {
                        $buffpage = 30000;
                        $sortheap = 20000;
                        $sheapthres = 50000;
                        $util_heap_sz = 30000;
                        $ioservers = 20;
            }
            elsif ( $machine eq "sunsmp" )
            {
                        $buffpage = 60000;
                        $sortheap = 20000;
                        $sheapthres = 80000;
                        $util_heap_sz = 30000;
                        $ioservers = 80;
            }
            elsif ( $machine eq "eastwood" )
            {
                        $buffpage = 80000;
                        $sortheap = 50000;
                        $sheapthres = 81000;
                        $ioclnrs = 4;
                        $chngpgs = 30;
                        $ioservers = 21;
                        $util_heap_sz = 50000;
            }
}
# echo parameter settings to acknowledge what is being built
if ( $buildStage ne "ALL" )
{
    print " ***** STARTING the build process at the
$buildStage Stage *****\n";
}
print "Building a TPC-D Version $tpcdVersion $sf GB
database on $dbpath with:\n";
print "   Mode = $mode \n";
```

```
print "   Tablespace ddl in $ddlpath${delim}$tbspddl \n";
if ( $nodegroupdef ne "NULL" )
{
        print "   Nodegroup ddl in
$ddlpath${delim}$nodegroupdef \n";
}
if ( $buffpooldef ne "NULL" )
{
        print "   Bufferpool ddl in
$ddlpath${delim}$buffpooldef \n";
}
print "   Table ddl in $ddlpath${delim}$ddl \n";
print "   Index ddl in $ddlpath${delim}$indexddl\n";
if ( $extraindex ne "no" )
{
        print " Indices to create after the load
$ddlpath${delim}$extraindex\n";
}
if ( $loadscript eq "NULL")
{
   if ( $input eq "NULL" )
   {
      print "   Data generated by DBGEN in $dbgen\n";
   }
   else
   {
      print "   Data loaded from flat files in $input\n";
   }
}
if ( $earlyindex eq "yes" )
{
        print "   Indexes created before loading\n";
}
else
{
        print "   Indexes created after loading\n";
}
if ( $addRI ne "NULL" )
{
   print "   RI being used from $ddlpath${delim}$addRI\n";
}
if ( $astFile ne "NULL" )
{
   print "   AST being used from
$ddlpath${delim}$astFile\n";
}
if ( $loadstats eq "yes" )
{
        if ( $earlyindex eq "yes" )
        {
                print "   Statistics for tables and
indexes gathered during load\n";
        }
        else
        {
                if ( $runstatShort eq "NULL" )
                {
                        print "   Statistics for tables
and indexes gathered after load using
$ddlpath${delim}$runstats \n";
                }
                else
                {
                   print "   Statistics for tables and
indexes gathered after load using $ddlpath${delim}$runstats
and $ddlpath${delim}$runstatShort\n";
                }
        }
}
else
{
        if ( $runstatShort eq "NULL" )
        {
                print "   Statistics for tables and
indexes gathered after load using $ddlpath${delim}$runstats
\n";
        }
        else
        {
                print "   Statistics for tables and
indexes gathered after load using $ddlpath${delim}$runstats
and $ddlpath${delim}$runstatShort\n";
        }
}
if ( $loadconfigfile ne "NULL" )
{
        print "   Database Configuration parameters for
LOAD taken from $ddlpath${delim}$loadconfigfile\n";
}
if ( $loadDBMconfig ne "NULL" )
{
        print "   Database manager Configuration
parameters for LOAD taken from
$ddlpath${delim}$loadDBMconfig\n";
}
if ( $configfile ne "NULL" )
{
        print "   Database Configuration parameters taken
from $ddlpath${delim}$configfile\n";
}
else
{
        print "   Database Configuration paramters taken
from $ddlpath${delim}dss.dbconfig${sfReal}GB\n";
        $configfile="dss.dbconfig${sfReal}GB";
}
```

```
if ( $dbmconfig ne "NULL" )
{
        print "   Database Manager Configuration parameters taken from $ddlpath${delim}$dbmconfig\n";
}
else
{
        print "   Database Manager Configuration paramters taken from $ddlpath${delim}dss.dbmconfig${sfReal}GB\n";
        $configfile="dss.dbmconfig${sfReal}GB";
}
#print "   Copy image for load command created in $copydir\n";
if ( $log eq "yes" )
{
        print "   Backup files placed in $backupdir\n";
}
else
{
        print "   No backup will be taken.\n";
}
print "   Log retain set to $log\n";
if ( $logDir eq "NULL" )
{
   print "   Log files remain in database path\n";
}
else
{
   print "   Log file path set to $logDir\n";
}
if ( $logprimary eq "NULL" )
{
   print "   Log Primary left at default\n";
}
else
{
   print "   Log Primary set to $logprimary\n";
}
if ( $logsecond eq "NULL" )
{
   print "   Log Second left at default\n";
}
else
{
   print "   Log second set to $logsecond\n";
}
if ( $logfilsiz eq "NULL" )
{
   print "   Logfilsiz left at default\n";
}
else
{
   print "   Logfilsiz set to $logfilsiz\n";
}

if (($loadconfigfile eq "") || ($loadconfigfile eq "NULL"))
{
        print "   Machine size set to $machine so the following configuration\n";
        print "   parameters are used for load, create index and runstats: \n";
        print "      BUFFPAGE = $buffpage \n";
        print "      SORTHEAP = $sortheap \n";
        print "      SHEAPTHRES = $sheapthres\n";
        print "      NUM_IOSERVERS = $ioservers\n";
        print "      NUM_IOCLEANERS = $ioclnrs\n";
        print "      CHNGPGS_THRESH = $chngpgs\n";
        print "      UTIL_HEAP_SZ = $util_heap_sz\n";
        print "      Degree of parallelism (dft_degree and max_querydegree) set to $smpdegree\n";
        print "      Parameters for load are: temp file     = $ldtemp\n";
        print "                               sort buf      = $sortbuf\n";
        print "                               ld parallelism = $load_parallelism\n";
        if ( $fparse eq "yes" )
        {
                print "
FASTPARSE used on load\n";
        }
}
if ( $loadscript ne "NULL")
{
        print "   Load commands  in $ddlpath${delim}$loadscript\n";
}

print "   Degree of parallelism (dft_degree and max_querydegree) set to $smpdegree\n";
if ( $agentpri ne "NULL" )
{
   print "   AGENTPRI set to $agentpri\n";
}
if ( $activate eq "yes" )
{
   print "   Database will be activated when build is complete\n";
}
if ( $explainDDL ne "NULL" )
{
   print "   EXPLAIN DDL being used from $ddlpath${delim}$explainDDL\n";
}
else
```

```
{
   print "   EXPLAIN DDL being used from default sqllib
directory\n";
}


print "Sleeping for 15 seconds to give you a chance to
reconsider...\n";
sleep 15;
# getc();


# don't need separate calls for mln/mpp vs uni since the
$all_ln will be
# defined appropriately
if ( $platform eq "nt" )
{
   if (($mode eq "uni") || ($mode eq "smp"))
   {
      #spaces required for NT
      $rc=&dodb_noconn("db2set DB2OPTIONS=\"   -t -v
+c\"",$all_ln);
   }
   else
   {
      $rc=&dodb_noconn("db2set DB2OPTIONS=\\\"  -t -v
+c\\\"",$all_ln);
   }
}
else
{
   if (($mode eq "uni") || ($mode eq "smp"))
   {
                        $rc=&dodb_noconn("db2set
DB2OPTIONS=\"-t -v +c\"",$all_ln);
   }
   else
   {
                        $rc=&dodb_noconn("db2set
DB2OPTIONS=\\\"-t -v +c\\\"",$all_ln);
   }
}


if ( $rc != 0 )
{
            die "failure setting db2 environment variable :
DB2OPTIONS  rc=$rc\n";
}


if ( $platform eq "nt" )
{
   $rc=&dodb_noconn("db2set
DB2NTNOCACHE=ON",$all_ln);
}
if ( $ret != 0 )
{
            die "failure setting db2 environment variable :
DB2NTNOCACHE\n";
}
# @de980723wlc
if (0)
{


# set the db2 env vars for loading, from the
TPCD_LOAD_DB2SET_SCRIPT script
if ( $lo adsetScript ne "NULL" )
{
   if ( $platform eq "nt" )
   {
      #### Mike , th, the- for some reason rah on NT doesn't
like running
      #### a fully qualified file name.  Switch to dir, then run
      ## check CHANGE THIS to have single node and
multinode execution
      if (( $mode eq "uni" ) || ( $mode eq "smp" ))
      {
         $ret=system("${ddlpath}${delim}$loadsetScript");
         #$ret=system("cd ${ddlpath} $sep $loadsetScript");
      }
      else
      {
         $ret=system("db2_all \"call
${ddlpath}${delim}$loadsetScript\" ");
      }
   }
   else
   {
      $ret=system("${ddlpath}${delim}$loadsetScript");
   }
   if ( $ret != 0 )
   {
      die "failure setting load time db2set parms from
$loadsetScript \n";
   }
}
# stopping and starting db2 before we continue
print "Stopping DB2 ...\n";
$rc=system("db2stop");
if ( $rc < 0 )
{
   die "failure during db2stop rc = $rc \n";
}
print "Starting DB2 ...\n";
$rc=system("db2start");
if ( $rc != 0 )
{
```

```
    die "failure during db2start rc = $rc \n";
}

# create the database
if ( $buildStage eq "ALL" )
{
    # build from the beginning
    &outtime("*** Starting to create the database");

    &dodb_noconn("db2 \"create database $dbname on
$dbpath collate using identity with 'TPC-D $sf
GB'\"",$once);
    # remove the update.pair.num file so when setupDir runs,
it doesn't
    # hang waiting for an answer on nt

&rm("$auditDir${delim}$dbname.$user.update.pair.num");

    # reset the db and dbm configuration before we start
    &dodb_noconn("db2 reset database configuration for
$dbname",$all_ln);
    &dodb_conn($dbname,"db2 alter bufferpool ibmdefaultbp
size -1 $sep   \
            db2 grant connect on database to public $sep
\
            db2 grant dbadm on database to $dbname $sep
\
            db2 commit",$once);
    &dodb_noconn("db2 reset database manager
configuration",$once);

    # update the log information first
    # set up the log directory before we do any index creation
    if ($logDirScript ne "NULL")
    {

             system("${ddlpath}${delim}SetLogDir.bat");
#       system("perl $ddlpath${delim}$logDirScript");
    }
    elsif ( $logDir ne "NULL" )
    {
       &dodb_noconn("db2 update database configuration for
$dbname using newl ogpath $logDir",$all_ln);
    }
    $setLogs=0;
    $setLogString="";
    if ( $logprimary ne "NULL" )
    {
       $setLogString.="db2 update db cfg for $dbname using
logprimary $logprimary";
       $setLogs=1;
    }
    if ( $logsecond ne "NULL" )
    {
       if ( $setLogs != 0 )
       {
          $setLogString.=" $sep ";
       }
       $setLogString.="db2 update db cfg for $dbname using
logsecond $logsecond";
       $setLogs=1;
    }
    if ( $logfilsiz ne "NULL" )
    {
       if ( $setLogs != 0 )
       {
          $setLogString.=" $sep ";
       }
       $setLogString.="db2 update db cfg for $dbname using
logfilsiz $logfilsiz";
       $setLogs=1;
    }
    if ( $setLogs != 0 )
    {
       $setLogString.=" $sep ";
    }
    $setLogString.="db2 update db cfg for $dbname using
logbufsz 128";
    &dodb_noconn("$setLogString",$all_ln);



    # setup the load configuration
    &outtime("*** Setting LOAD configuration.");
    if (($loadconfigfile eq "") || ($loadconfigfile eq "NULL"))
    {
      &dodb_noconn("db2 update db cfg for $dbname using
buffpage $buffpage $sep \
            db2 update db cfg for $dbname using sortheap
$sortheap $sep \
            db2 update db cfg for $dbname using
num_iocleaners $ioclnrs $sep \
            db2 update db cfg for $dbname using num_ioservers
$ioservers $sep \
            db2 update db cfg for $dbname using util_heap_sz
$util_heap_sz $sep \
            db2 update db cfg for $dbname using chngpgs_thresh
$chngpgs",
            $all_ln);
      &dodb_noconn("db2 update dbm cfg using sheapthres
$sheapthres",$once);
    }
    else
    {

&dodb2file_noconn("$ddlpath${delim}$loadconfigfile",$all
_ln);
```

```
&dodb2file_noconn("$ddlpath${delim}$loadDBMconfig",$once);
    }
    &dodb_noconn("db2 terminate",$once);
    $rc=system("db2stop");
    if ( $rc != 0 )
    {
      die "failure during db2stop after resetting for load config rc = $rc \n";
    }
    $rc=system("db2start");
    if ( $rc != 0 )
    {
      die "failure during db2start rc = $rc \n";
    }
}  # end of "CREATE DATABASE" phase


if (( $buildStage eq "ALL"   ) || ( $buildStage eq "CRTTBSP" ) ||
    ( $buildStage eq "LOAD"  ) ||
    (($buildStage eq "INDEX" ) && ( $earlyindex eq "yes" )) )
{
    # create the nodegroups is there is a file specified
    if ( $nodegroupdef ne "NULL" )
    {
      #run the create bufferpool ddl
      &outtime("*** Creating the nodegroups");

&dodb2file($dbname,"$ddlpath${delim}$nodegroupdef",$once);
    }
    # create the explain tables - these should go into userspace1 since no
    # other tablespaces exist
    if ( $explainDDL ne "NULL" )
    {
      $explnPathFile="$ddlpath${delim}$explainDDL";
    }
    else
    {
      if ( $platform eq "ptx" )
      {
        $home=$ENV{"HOME"};
        $sqlpath="$home${delim}sqllib";
      }
      if ( $platform ne "nt" )
      {
        $sqlpath="~${delim}sqllib";
      }
      else
      {
        $sqlpath=$ENV{"DB2PATH"};
      }

$explnPathFile="$sqlpath${delim}misc${delim}EXPLAIN.DDL";
    }
    &dodb_conn($dbname,
              "db2 -tvf \"$explnPathFile\" $sep \
               db2 alter table explain_instance locksize table append on $sep \
               db2 alter table explain_statement locksize table append on $sep \
               db2 alter table explain_argument locksize table append on $sep \
              db2 alter table explain_object locksize table append on $sep \
               db2 alter table explain_operator locksize table append on $sep \
               db2 alter table explain_predicate locksize table append on $sep \
               db2 alter table explain_stream locksize table append on",
              $once);


    if ( $buffpooldef ne "NULL" )
    {
      #run the create bufferpool ddl
      &outtime("*** Creating the bufferpools");

&dodb2file($dbname,"$ddlpath${delim}$buffpooldef",$once);
    }
    # create the tablespaces
    &outtime("*** Ready to start creating the tablespaces");
    &dodb2file($dbname,"$ddlpath${delim}$tbspddl",$once);
    # if we are in audit mode, then we must create the the tablespaces and
    # tables for the update functions and we must generate the data for the
    # update functions before we start timing the load.  (All activity
    # on the database after the table creation is started and before the performance
    # tests are run must be included in load time
    # NOTE: we do not have to do this if we are building the qualification database
    &outtime("*** Start of audited Load Time - starting to create tables");


    # create/populate the staging tables
    if ( $stagingTbl ne "NULL" )
    {
      # staging tables must be created for both test and qualification database
      # but they do not need to be populated for the qualification database
```

```
&dodb2file($dbname,"$ddlpath${delim}$stagingTbl",$once)
;
      if ( $qual ne "QUAL" )
      {
         if ( $preloadSampleUF ne "NULL" )
         {
            # preload the sample UF data for statistics
gathering
            $rc = system ("perl
$ddlpath${delim}$preloadSampleUF");
         }
         if ( $deleteSampleUF ne "NULL" )
         {
            # delete the sample rows now that stats have been
gathered

&dodb2file($dbname,"$ddlpath${delim}$deleteSampleUF",
$once);
         }
      }
   }
   &dodb2file($dbname,"$ddlpath${delim}$ddl",$once);


   # update the locksize on the non-updated tables to be table
level locking
   # update the tables for appendmode


   if ($appendOn eq "yes")
   {
                  &dodb_conn($dbname,
                                          "db2 alter
table tpcd.nation locksize table $sep \
                                                db2
alter table tpcd.region locksize table $sep \
                                                db2
alter table tpcd.customer locksize table $sep \
                                                db2
alter table tpcd.supplier locksize table $sep \
                                                db2
alter table tpcd.part locksize table $sep \
                                                db2
alter table tpcd.partsupp locksize table $sep \
                                                db2
alter table tpcd.lineitem append on $sep \
                                                db2
alter table tpcd.orders append on",

            $once);
   }
   else
   {
                  &dodb_conn($dbname,
                                          "db2 alter
table tpcd.nation locksize table $sep \
                                                db2
alter table tpcd.region locksize table $sep \
                                                db2
alter table tpcd.customer locksize table $sep \
                                                db2
alter table tpcd.supplier locksize table $sep \
                                                db2
alter table tpcd.part locksize table $sep \
                                                db2
alter table tpcd.partsupp locksize table",

            $once);
   }


   if ( $mode eq "mpp" )
   {
      #need parallel specific
      print "need to figure parallel specific creation of tmp\n";
   }
   mkdir("${delim}tmp${delim}$instance",0777);
}  # end of "CREATE TABLESPACE and TABLES" phase


if (( $buildStage eq "ALL" ) || ( $buildStage eq
"CRTTBSP" ) ||
   ( $buildStage eq "LOAD" ) ||
   (($buildStage eq "INDEX" ) && ( $earlyindex eq
"yes" )) )
{
            # do the load stage of the build, or if early index is
on do
            # the index creation also
            # setup the load configuration
            if ( $buildStage ne "ALL")
            {
                  # we're restarting a build so reapply
the load config
                  &outtime("*** Setting LOAD
configuration.");
                  if (($lo adconfigfile eq "") ||
($loadconfigfile eq "NULL"))
                  {
                        &dodb_noconn("db2
update db cfg for $dbname using buffpage $buffpage $sep \

            db2 update db cfg for $dbname using sortheap
$sortheap $sep \

            db2 update db cfg for $dbname using
num_iocleaners $ioclnrs $sep \

            db2 update db cfg for $dbname using
num_ioservers $ioservers $sep \

            db2 update db cfg for $dbname using util_heap_sz
$util_heap_sz $sep \
```

```
            db2 update db cfg for $dbname using
chngpgs_thresh $chngpgs",

            $all_ln);
                                &dodb_noconn("db2
update dbm cfg using sheapthres $sheapthres",$once);
                        }
                        else
                        {

&dodb2file_noconn("$ddlpath${delim}$loadconfigfile",$all
_ln);

&dodb2file_noconn("$ddlpath${delim}$loadDBMconfig",$o
nce);
                        }
                        &dodb_noconn("db2
terminate",$once);
                        $rc=system("db2stop");
                        if ( $rc != 0 )
                        {
                                die "failure during db2stop
after resetting for load config rc = $rc \n";
                        }
                        $rc=system("db2start");
                        if ( $rc != 0 )
                        {
                                die "failure during db2start
rc = $rc \n";
                        }
    }

    # if earlyindex requested, create indexes
    if ( $earlyindex eq "yes" )
    {
        &outtime("*** Starting to create indexes");

&dodb2file($dbname,"$ddlpath${delim}$indexddl",$once);
        &outtime("*** Create index completed");
    }

    # start the dbgen and load.....call the specific mode for
loading (uni,smp,mln)
    if (( $mode eq "uni" ) || ( $mode eq "smp" ))
    {
        &outtime("*** Starting the load");
        # call the appropriate dbgen/load for uni/smp
        if (( $loadscript eq "NULL") || ( $loadscript eq "" ))
        {
            $rc = system("perl genloaduni $qual");
            if ( $rc != 0 )
            {
                die "genloaduni failed rc = $rc\n";
            }
        }
        else
        {

&dodb2file_noconn("$ddlpath${delim}$loadscript",$once);
        }
    }
    elsif (( $mode eq "mln" ) || ( $mode eq "mpp" ))
    {
        &outtime("*** Starting the load");
        # call the appropriate dbgen/split/(sort)/load for
mln/mpp

        if (( $loadscript eq "NULL") || ( $loadscript eq "" ))
        {
            $rc = system("perl genloadmpp $qual");
            if ( $rc != 0 )
            {
                die "genloadmpp failed rc = $rc\n";
            }
        }
        else
        {
            $rc =
&dodb2file_noconn("$ddlpath${delim}$loadscript");
#           $rc =
&dodb2file_noconn("$ddlpath${delim}$loadscript $sf");
        }

        if ( $rc != 0 )
        {
            die "doload for $dbname failed rc = $rc. Script is
$ddlpath${delim}$loadscript\n";
        }
    }

    else
    {
        die "TPCD_MODE not set to one of uni, smp, mln or
mpp\n";
    }

    &outtime("*** Load complete");


    # verify that the audit directory exists
    $filename="$auditDir";
    if (-e $filename)
    {
      # set up the $auditDir/$dbname.$user.update.pair.num
file
```

```
    # to start at update pair 1

$filename="$auditDir${delim}$dbname.$user.update.pair.num";
   }
   else
   {
    mkdir ("$auditDir", 0775) || die "cannot mkdir $auditDir";
   }
   print "setting update pair num to 1\n";
   system("echo 1 > $filename");


} # end all and load stage (and create index if early index was specified


if (( $buildStage eq "ALL" ) || ( $buildStage eq "CRTTBSP" ) ||
   ( $buildStage eq "LOAD" ) ||
   ( $buildStage eq "INDEX" ))
{
   if ( $buildStage eq "INDEX")
   { # we're restarting a build so reapply the load config
    &outtime("*** Setting LOAD configuration.");
    if (($loadconfigfile eq "") || ($loadconfigfile eq "NULL"))
    {
     &dodb_noconn("db2 update db cfg for $dbname using buffpage $buffpage $sep \
          db2 update db cfg for $dbname using sortheap $sortheap $sep \
          db2 update db cfg for $dbname using num_iocleaners $ioclnrs $sep \
          db2 update db cfg for $dbname using num_ioservers $ioservers $sep \
          db2 update db cfg for $dbname using util_heap_sz $util_heap_sz $sep \
          db2 update db cfg for $dbname using chngpgs_thresh $chngpgs",
          $all_ln);
     &dodb_noconn("db2 update dbm cfg using sheapthres $sheapthres",$once);
    }
    else
    {

&dodb2file_noconn("$ddlpath${delim}$loadconfigfile",$all_ln);

&dodb2file_noconn("$ddlpath${delim}$loadDBMconfig",$once);
    }
    &dodb_noconn("db2 terminate",$once);
    $rc=system("db2stop");
    if ( $rc != 0 )
    {
     die "failure during db2stop after resetting for load config rc = $rc \n";
    }
    $rc=system("db2start");
    if ( $rc != 0 )
    {
     die "failure during db2start rc = $rc \n";
    }
   }
   # if indexes haven't been created, do so now
   if ( $earlyindex ne "yes" )
   {
      &outtime("*** Create index started");
                  # added on 5/9
      &dodb_conn($dbname,
          "db2 alter table tpcd.lineitem append off $sep \
           db2 alter table tpcd.orders append off",
          $once);

&dodb2file($dbname,"$ddlpath${delim}$indexddl",$once);

      # &dodb_conn($dbname,
      #       "db2 alter table tpcd.lineitem append on $sep \
      #        db2 alter table tpcd.orders append on",
      #       $once);

      &outtime("*** Create index completed");
   }
   if ( $extraindex ne "no" )
   {
      # use this additional file for indexes
      &outtime("*** Create index (part 2) started");

&dodb2file($dbname,"$ddlpath${delim}$extraindex",$once);
      &outtime("*** Create index (part 2) completed");
   }


} # end create/load/index phase of the build


if (( $buildStage eq "ALL" ) ||  ( $buildStage eq "CRTTBSP" ) ||
   ( $buildStage eq "LOAD" ) ||
   ( $buildStage eq "INDEX" ) || ( $buildStage eq "RUNSTATS" ))
{
            if ( $buildStage eq "RUNSTATS")
            {
                  # we're restarting a build so reapply the load config
                  &outtime("*** Setting LOAD configuration.");
```

```
                        if (($loadconfigfile eq "") ||
($loadconfigfile eq "NULL"))
                        {
                                &dodb_noconn("db2
update db cfg for $dbname using buffpage $buffpage $sep \

        db2 update db cfg for $dbname using sortheap
$sortheap $sep \

        db2 update db cfg for $dbname using
num_iocleaners $ioclnrs $sep \

        db2 update db cfg for $dbname using
num_ioservers $ioservers $sep \

        db2 update db cfg for $dbname using util_heap_sz
$util_heap_sz $sep \

        db2 update db cfg for $dbname using
chngpgs_thresh $chngpgs",

        $all_ln);
                                &dodb_noconn("db2
update dbm cfg using sheapthres $sheapthres",$once);
                        }
                        else
                        {

      &dodb2file_noconn("$ddlpath${delim}$loadconf
igfile",$all_ln);

       &dodb2file_noconn("$ddlpath${delim}$loadDB
Mconfig",$once);
                        }
                        &dodb_noconn("db2
terminate",$once);
                        $rc=system("db2stop");
                        if ( $rc != 0 )
                        {
                                die "failure during db2stop
after resetting for load config rc = $rc \n";
                        }
                        $rc=system("db2start");
                        if ( $rc != 0 )
                        {
                                die "failure during db2start
rc = $rc \n";
                        }
    }
    # if statistics not gathered on the load, run runstats (we
have to run the
    # stats at the same time as the index creation whether it be
both during load,
    # or after load)
    # We need to run the runstats as well if we have specifed
an extra index file
    # for "after load" indexes
    if (( $loadstats eq "no" ) || ( $earlyindex eq "no" ) ||
( $extraindex ne "no" ))
    {
      # if loadstats not gathered, then index stats not gathered
either.
       &outtime("*** Runstats started");

       if ( $runstatShort ne "NULL" )
       {
         # we've specified a second runstats file...This runstats
file should do
         # runstats for all table except lineitem. The lineitem
runstats command
         # should be left in the main runstats file.
         if ( $platform eq "aix" || $platform eq "sun" ||
$platform eq "ptx" )
         {
           print "runstats from $ddlpath${delim}$runstatShort
running now\n";
           $rc = system("db2 -tvf
\"$ddlpath${delim}$runstatShort\" >
\"$auditDir${delim}tools${delim}runstatShort.out\" & ");
           print "rc from runstatshort=$rc\n";
         }
         elsif ( $platform eq "nt" )
         {
           system("start db2 -tvf
$ddlpath${delim}$runstatShort");
         }
         else
         {
           print "Don't know how to start in background on
$platform platform\n";
           print "therefore running runstats serially\n";

&dodb2file($dbname,"$ddlpath${delim}$runstatShort",$onc
e);
         }
       }
       # run the full runstats, or the remainder of what wasn't
put into the short
       # runstats file. You should be sure that this runstats will
take longer
       # than the short runstats that is running in the
background, otherwise
       # setting the config will happen before this is done.

&dodb2file($dbname,"$ddlpath${delim}$runstats",$once);
       &outtime("*** Runstats completed");
    }
} # end build phaose all/load/index/runstats


# add the RI
if ( $addRI ne "NULL" )
{
```

```
   &outtime("*** Adding RI contraints started");
   &dodb2file($dbname,"$ddlpath${delim}$addRI",$once);
   &outtime("*** Adding RI contraints completed");
}

#add the AST if it has been requested
if ( $astFile ne "NULL" )
{
   &outtime("*** Adding AST started");
   &dodb2file($dbname,"$ddlpath${delim}$astFile",$once);
   &outtime("*** Adding AST completed");
}

# check tbsp info
&dodb_conn($dbname,"db2 list tablespaces show
detail",$once);

# set the configuration
&outtime("*** Set Configuration started");
&outtime("*** Setting degree of parallelism");
&dodb_noconn("db2 update database configuration for
$dbname using dft_degree $smpdegree",$all_ln);
&dodb_noconn("db2 update database manager configuration
using max_querydegree $smpdegree",$once);

&dodb2file_noconn("${ddlpath}${delim}$configfile",$all_l
n);
&dodb2file_noconn("${ddlpath}${delim}$dbmconfig",$onc
e);

if ( $agentpri ne "NULL" )
{
   &dodb_noconn("db2 update dbm cfg using AGENTPRI
$agentpri",$once);
}

# set the db2 environment variables for running the
benchmark
if ( $setScript ne "NULL" )
{
   if ( $platform eq "aix" || $platform eq "sun" || $platform eq
"ptx")
   {
      $ret=system("${ddlpath}${delim}$setScript");
   }
   elsif ( $platform eq "nt" )
   {
      if (($mode eq "uni" ) || ($mode eq "smp" ))
      {
         $ret = system("${ddlpath}${delim}$setScript");
      }
      else
      {
                              $ret = system(" db2_all \"
call ${ddlpath}${delim}$setScript\" ");
      }
   }
   if ( $ret != 0 )
   {
      die "failure setting runtime db2set parms from
$setScript \n";
   }
}
# if logging is enabled, we must take a backup of the
database
if ( $log eq "yes" )
{
   &dodb_noconn("db2 update database configuration for
$dbname using LOGRETAIN yes",$all_ln);
   print "\n NOTE:  DO NOT RESET THE DATABASE
CONFIGURATION or you will lose logretain\n";
   # force a connection to the database on all nodes to ensure
LOGRETAIN is
   # set in effect.
   # An error message will print to screen if the logretain is
set properly
   # i.e. SQL116N A connection to or activation of database
<database name>
   # cannot  be made.
   # This is expected and the lack of this error message
should be seen as an
   # error in the database build.
   &dodb_conn($dbname,"db2 \"select count(*) from
tpcd.region\"",$all_ln);

   if ( $qual eq "QUAL" )
   {
      &outtime("*** Starting the backup");

      if (( $mode eq "mln" ) || ( $mode eq "mpp"))
      {
         # must back up catalog node first...assume node 00
         $rc=system("db2_all \'}]<<+000< db2 \"backup
database $dbname to $backupdir without prompting\" \'");
         if ( $rc != 0 )
         {
            die "backup of catalog node failed rc = $rc\n";
         }
         # back up remaining nodes
         $rc=system("db2_all \'||}]<<-000< db2 backup
database $dbname to $backupdir without prompting\' ");
         if ( $rc != 0 )
         {
            die "backup of remaining nodes failed rc = $rc\n";
         }
      }
      else
```

```
    {
      &dodb_noconn("db2 backup database $dbname to $backupdir",$once);
    }
    &outtime("*** Finished the backup");
  }
  else
  {
    # This is the test database. Clause 3.1.4 states that "the test sponsor is
    # not required to make or have backup copies of the test database; however
    # all other mechanisms that guarantee durability of the qualification
    # database must be enabled in the same way for the test database".
    # According to this clause we do need to keep the backup of the database.
    # &dodb_noconn("db2dart $dbname /CHST /WHAT DBBP OFF",$all_ln);

                    system("db2start");
                    system("db2 activate db tpcd");
            &dodb_conn($dbname,"db2 \"update db cfg for tpcd using util_heap_sz 200000\"",$all_ln);
                    system("db2 deactivate db tpcd");
                    system("db2stop");

    &outtime("*** Starting the backup");
    $rc = system("backup_tpcd.bat");
                    # ($rc == 0) | die "Test database backup failed, rc = $rc.\n";
    &outtime("*** Finished the backup");

                    system("db2start");
            &dodb_conn($dbname,"db2 \"update db cfg for tpcd using util_heap_sz 40000\"",$all_ln);
  }
}
}
# stop and restart the database to get config parms recognized
$rc=system("db2stop");
#if ( $rc != 0 )
#{
#   die "failure during db2stop rc = $rc \n";
#}
$rc=system("db2start");
if ( $rc != 0 )
{
  die "failure during db2start rc = $rc \n";
}

&outtime("*** Set Configuration completed");
&outtime("*** End of audited Load Time");

#create generated seeds
if ( $genSeed ne "no" )
{
        $rc = system("perl createmseedme.pl 1000");
        if ( $rc != 0 )
        {
                warn "createmseedme failed\n";
        }
}

$rc = system("perl buildtpcdbatch $qual");
if ( $rc != 0 )
{
        die "buildtpcdbatch failed rc=$rc\n";
}

if ( $RealAudit eq "yes" )
{
  # if we are in real audit mode then we have to do a number of things
  # set up the audit directory structure and the run directory structure
  # so that once we have completed the buildtpcd, we are ready to run.
  # first remove any old "update pair number" file so we won't get prompted
  # doing setupDir
  &rm("$auditDir${delim}tools${delim}tpcd.runsetup");
  system("perl setupRun");
  # before we stop the database for the final time
  # if we are in the real audit mode then run dbtables and dbcheck before
  # we print out the final notice that we are ready to run the performance tests
  # if we are building the qualification database then we will bind to both
  # the dbname database and the qualification database
  if ( $qual eq "QUAL" )
  {
    $verifyType="q";
  }
  else
  {
    $verifyType="t";
  }
  system("perl tablesdb $verifyType");

&dodb2file($dbname,"$auditDir${delim}tools${delim}first10rows.sql",$once);
}
# stop, restart and activate the database, if necessary
```

```
#Create Catalog info
$rc = system("perl catinfo.pl b");

if ( $rc != 0 )
{
        warn "catinfo failed!!!  rc = $rc\n";
}

$rc=system("db2stop");
if ( $rc != 0 )
{
   die "failure during db2stop rc = $rc \n";
}

&outtime("*** Ready to run the performance tests once the dbm has restarted");

if ( $RealAudit ne "yes" )
{
   # if we are not in a real audit, then we can restart the database manager
   # if we are in a real audit, then we don't want to do this until the
   # power test starts
   $rc=system("db2start");
   if ( $rc != 0 )
   {
      die "failure during db2start rc = $rc \n";
   }
   if ( $activate eq "yes" )
   {
      &dodb_noconn("activate database $dbname",$once);
   }
}

# finished creating the database
&outtime("*** Finished creating the database");

1;
```

backup_node.bat

```
rd %2\db2tpch\backup /s /q
md %2\db2tpch\backup
set db2node=%1
db2start
db2 backup database tpcd to %2\db2tpch\backup WITH 16 BUFFERS PARALLELISM 4 without prompting
db2stop
```

backup_tpcd.bat

```
call backup_node.bat 0 g:
call backup_node.bat 1 h:
call backup_node.bat 2 i:
call backup_node.bat 3 f:
```

create_bufferpools

```
alter bufferpool IBMDEFAULTBP size 270000;
create bufferpool BP32K size -1 pagesize 32K;
```

create_indexes

```
values(current timestamp);
CREATE UNIQUE INDEX "TPCD  "."R_RK" ON "TPCD  "."REGION"
        ("R_REGIONKEY" ASC)
        PCTFREE 0 ;
commit work;

values(current timestamp);
CREATE UNIQUE INDEX "TPCD  "."N_NK" ON "TPCD  "."NATION"
        ("N_NATIONKEY" ASC)
        PCTFREE 0 ;
commit work;

values(current timestamp);
CREATE      INDEX "TPCD  "."N_RK" ON "TPCD  "."NATION"
        ("N_REGIONKEY" ASC)
        PCTFREE 0 ;
commit work;

values(current timestamp);
CREATE UNIQUE INDEX "TPCD  "."S_SK" ON "TPCD  "."SUPPLIER"
        ("S_SUPPKEY" ASC)
        PCTFREE 0 ;
commit work;

values(current timestamp);
CREATE      INDEX "TPCD  "."S_NK" ON "TPCD  "."SUPPLIER"
        ("S_NATIONKEY" ASC)
        PCTFREE 0 ;
commit work;
values(current timestamp);
```

```
values(current timestamp);
CREATE UNIQUE INDEX "TPCD    "."P_PK" ON "TPCD
"."PART"
            ("P_PARTKEY" ASC)
            PCTFREE 0 ;
commit work;
values(current timestamp);

values(current timestamp);
CREATE       INDEX "TPCD    "."PS_SK" ON "TPCD
"."PARTSUPP"
            ("PS_SUPPKEY" ASC)
            PCTFREE 0 ;
commit work;

values(current timestamp);
CREATE       INDEX "TPCD  "."PS_PK" ON "TPCD
"."PARTSUPP"
            ("PS_PARTKEY" ASC)
            PCTFREE 0 ;
commit work;

values(current timestamp);
CREATE UNIQUE INDEX "TPCD  "."PS_PKSK" ON
"TPCD    "."PARTSUPP"
            ("PS_PARTKEY" ASC,
             "PS_SUPPKEY" ASC)
            PCTFREE 0 ;
commit work;

values(current timestamp);
CREATE UNIQUE INDEX "TPCD  "."PS_SKPK" ON
"TPCD    "."PARTSUPP"
            ("PS_SUPPKEY" ASC,
             "PS_PARTKEY" ASC)
            PCTFREE 0 ;
commit work;

values(current timestamp);
CREATE UNIQUE INDEX "TPCD  "."C_CK" ON "TPCD
"."CUSTOMER"
            ("C_CUSTKEY" ASC)
            PCTFREE 0 ;
commit work;

values(current timestamp);
CREATE     INDEX "TPCD  "."C_NK" ON "TPCD
"."CUSTOMER"
            ("C_NATIONKEY" ASC)
            PCTFREE 0 ;
commit work;
```

```
values(current timestamp);
CREATE UNIQUE INDEX "TPCD  "."O_OK" ON "TPCD
"."ORDERS"
            ("O_ORDERKEY" ASC)
            PCTFREE 6 ;
commit work;

-- values(current timestamp);
-- CREATE       INDEX "TPCD  "."O_CK" ON "TPCD
"."ORDERS"
--              ("O_CUSTKEY" ASC)
--              PCTFREE 6 ;
-- commit work;

-- values(current timestamp);
-- CREATE       INDEX "TPCD  "."O_OD" ON "TPCD
"."ORDERS"
--              ("O_ORDERDATE" ASC)
--              PCTFREE 5 ;
-- commit work;

-- values(current timestamp);
-- CREATE       INDEX "TPCD  "."L_OK" ON "TPCD
"."LINEITEM"
--             ("L_ORDERKEY" ASC)
--              PCTFREE 6 ;
-- commit work;

-- values(current timestamp);

-- CREATE       INDEX "TPCD  "."L_PK" ON "TPCD
"."LINEITEM"
--              ("L_PARTKEY" ASC)
--              PCTFREE 6;
--
-- commit work;
-- values(current timestamp);
--
-- CREATE       INDEX "TPCD  "."L_RD" ON "TPCD
"."LINEITEM"
--              ("L_RECEIPTDATE" ASC)
--              PCTFREE 6 ;
-- commit work;
--
-- values(current timestamp);

values(current timestamp);
create unique index tpcd.l_ok_ln on tpcd.lineitem
(L_orderkey, l_linenumber) pctfree 3;
commit work;
values(current timestamp);
```

```
alter table tpcd.orders add primary key(o_orderkey);
alter table tpcd.lineitem add primary
key(l_orderkey,l_linenumber);
commit work;
```

create_nodegroups

```
create nodegroup catalog_node on node (0);
create nodegroup all_nodes;
```

create_tables

```
CREATE TABLE TPCD.NATION  ( N_NATIONKEY
INTEGER NOT NULL,
                N_NAME       CHAR(25) NOT NULL,
                N_REGIONKEY  INTEGER NOT NULL,
                N_COMMENT    VARCHAR(152) NOT
NULL WITH DEFAULT)
     IN SMALL_TABLE;


CREATE TABLE TPCD.REGION  ( R_REGIONKEY
INTEGER NOT NULL,
                R_NAME       CHAR(25) NOT NULL,
                R_COMMENT    VARCHAR(152) NOT
NULL WITH DEFAULT)
     IN SMALL_TABLE;

CREATE TABLE TPCD.PART  ( P_PARTKEY
INTEGER NOT NULL,
               P_NAME        VARCHAR(55) NOT NULL,
                P_MFGR       CHAR(25) NOT NULL,
                P_BRAND      CHAR(10) NOT NULL,
                P_TYPE       VARCHAR(25) NOT NULL,
                P_SIZE       INTEGER NOT NULL,
               P_CONTAINER   CHAR(10) NOT NULL,
                P_RETAILPRICE FLOAT NOT NULL,
                P_COMMENT    VARCHAR(23) NOT
NULL WITH DEFAULT )
     IN TABLE_N_INDEX
     INDEX IN TABLE_N_INDEX
     PARTITIONING KEY(P_PARTKEY) USING
HASHING;

CREATE TABLE TPCD.SUPPLIER ( S_SUPPKEY
INTEGER NOT NULL,
                S_NAME       CHAR(25) NOT NULL,
                S_ADDRESS    VARCHAR(40) NOT
NULL,
               S_NATIONKEY   INTEGER NOT NULL,
                S_PHONE      CHAR(15) NOT NULL,
                S_ACCTBAL    FLOAT NOT NULL,
                S_COMMENT    VARCHAR(101) NOT
NULL WITH DEFAULT)
     IN TABLE_N_INDEX
     INDEX IN TABLE_N_INDEX
     PARTITIONING KEY(S_SUPPKEY) USING
HASHING
     ORGANIZE BY (
     ( "S_NATIONKEY" ) );


CREATE TABLE TPCD.PARTSUPP ( PS_PARTKEY
INTEGER NOT NULL,
                PS_SUPPKEY    INTEGER NOT NULL,
                PS_AVAILQTY   INTEGER NOT
NULL,
                PS_SUPPLYCOST FLOAT   NOT
NULL,
                PS_COMMENT    VARCHAR(199) NOT
NULL WITH DEFAULT)
     IN TABLE_N_INDEX
     INDEX IN TABLE_N_INDEX
     PARTITIONING KEY(PS_PARTKEY) USING
HASHING;

CREATE TABLE TPCD.CUSTOMER ( C_CUSTKEY
INTEGER NOT NULL,
                C_NAME       CHAR(25) NOT NULL,
                C_ADDRESS    VARCHAR(40) NOT
NULL,
                C_NATIONKEY  INTEGER NOT
NULL,
                C_PHONE      CHAR(15) NOT NULL,
               C_ACCTBAL     FLOAT   NOT NULL,
                C_MKTSEGMENT CHAR(10) NOT
NULL,
                C_COMMENT    VARCHAR(117) NOT
NULL WITH DEFAULT)
     IN TABLE_N_INDEX
     INDEX IN TABLE_N_INDEX
     PARTITIONING KEY(C_CUSTKEY) USING
HASHING
     ORGANIZE BY (
     ( "C_NATIONKEY" ) );

CREATE TABLE TPCD.ORDERS ( O_ORDERKEY
INTEGER NOT NULL,
               O_CUSTKEY      INTEGER NOT NULL,
                O_ORDERSTATUS CHAR(1) NOT
NULL,
                O_TOTALPRICE  FLOAT NOT NULL,
               O_ORDERDATE    DATE NOT NULL,
               O_ORDERPRIORITY CHAR(15) NOT
NULL,
               O_CLERK        CHAR(15) NOT NULL,
                O_SHIPPRIORITY INTEGER NOT
NULL,
```

```
                O_COMMENT       VARCHAR(79) NOT NULL WITH DEFAULT
--                      PRIMARY KEY (O_ORDERKEY)
                )
    IN TABLE_N_INDEX
    INDEX IN TABLE_N_INDEX
    PARTITIONING KEY(O_ORDERKEY) USING HASHING
    ORGANIZE BY ( ( O_ORDERDATE ) );

CREATE TABLE TPCD.LINEITEM ( L_ORDERKEY INTEGER NOT NULL,
                L_PARTKEY     INTEGER NOT NULL,
                L_SUPPKEY     INTEGER NOT NULL,
                L_LINENUMBER  INTEGER NOT NULL,
                L_QUANTITY    FLOAT NOT NULL,
                L_EXTENDEDPRICE  FLOAT NOT NULL,
                L_DISCOUNT    FLOAT NOT NULL,
                L_TAX         FLOAT NOT NULL,
                L_RETURNFLAG  CHAR(1) NOT NULL,
                L_LINESTATUS  CHAR(1) NOT NULL,
                L_SHIPDATE    DATE NOT NULL,
                L_COMMITDATE  DATE NOT NULL,
                L_RECEIPTDATE DATE NOT NULL,
                L_SHIPINSTRUCT CHAR(25) NOT NULL,
                L_SHIPMODE     CHAR(10) NOT NULL,
                L_COMMENT      VARCHAR(44) NOT NULL WITH DEFAULT
--                      PRIMARY KEY (L_ORDERKEY, L_LINENUMBER)
                )
    IN TABLE_N_INDEX
    INDEX IN TABLE_N_INDEX
    PARTITIONING KEY(L_ORDERKEY) USING HASHING
    ORGANIZE BY (  (L_SHIPDATE) );

COMMIT WORK;
```

create_ tablespaces

```
CREATE REGULAR TABLESPACE SMALL_TABLE
  IN NODEGROUP CATALOG_NODE
  MANAGED BY SYSTEM
  USING ('D:\HOME\DB2TPCH\SMALL_TABLE')
  ON NODE (0)
  OVERHEAD 5.3  TRANSFERRATE 0.5;

CREATE REGULAR TABLESPACE TABLE_N_INDEX
  PAGESIZE 32K
  MANAGED BY DATABASE
  USING (
    DEVICE 'D:\MP\Disk002\Partition1' 2048M,
    DEVICE 'D:\MP\Disk003\Partition1' 2048M,
    DEVICE 'D:\MP\Disk004\Partition1' 2048M,
    DEVICE 'D:\MP\Disk005\Partition1' 2048M,
    DEVICE 'D:\MP\Disk006\Partition1' 2048M,
    DEVICE 'D:\MP\Disk007\Partition1' 2048M,
    DEVICE 'D:\MP\Disk008\Partition1' 2048M,
    DEVICE 'D:\MP\Disk009\Partition1' 2048M,
    DEVICE 'D:\MP\Disk010\Partition1' 2048M,
    DEVICE 'D:\MP\Disk011\Partition1' 2048M,
    DEVICE 'D:\MP\Disk012\Partition1' 2048M,
    DEVICE 'D:\MP\Disk013\Partition1' 2048M,
    DEVICE 'D:\MP\Disk016\Partition1' 2048M,
    DEVICE 'D:\MP\Disk017\Partition1' 2048M,
    DEVICE 'D:\MP\Disk018\Partition1' 2048M,
    DEVICE 'D:\MP\Disk019\Partition1' 2048M,
    DEVICE 'D:\MP\Disk020\Partition1' 2048M,
    DEVICE 'D:\MP\Disk021\Partition1' 2048M,
    DEVICE 'D:\MP\Disk022\Partition1' 2048M,
    DEVICE 'D:\MP\Disk023\Partition1' 2048M,
    DEVICE 'D:\MP\Disk024\Partition1' 2048M,
    DEVICE 'D:\MP\Disk025\Partition1' 2048M,
    DEVICE 'D:\MP\Disk026\Partition1' 2048M,
    DEVICE 'D:\MP\Disk027\Partition1' 2048M)
  ON NODE (0)
  USING (
    DEVICE 'D:\MP\Disk030\Partition1' 2048M,
    DEVICE 'D:\MP\Disk031\Partition1' 2048M,
    DEVICE 'D:\MP\Disk032\Partition1' 2048M,
    DEVICE 'D:\MP\Disk033\Partition1' 2048M,
    DEVICE 'D:\MP\Disk034\Partition1' 2048M,
    DEVICE 'D:\MP\Disk035\Partition1' 2048M,
    DEVICE 'D:\MP\Disk036\Partition1' 2048M,
    DEVICE 'D:\MP\Disk037\Partition1' 2048M,
    DEVICE 'D:\MP\Disk038\Partition1' 2048M,
    DEVICE 'D:\MP\Disk039\Partition1' 2048M,
    DEVICE 'D:\MP\Disk040\Partition1' 2048M,
    DEVICE 'D:\MP\Disk041\Partition1' 2048M,
    DEVICE 'D:\MP\Disk042\Partition1' 2048M,
    DEVICE 'D:\MP\Disk044\Partition1' 2048M,
    DEVICE 'D:\MP\Disk045\Partition1' 2048M,
    DEVICE 'D:\MP\Disk046\Partition1' 2048M,
    DEVICE 'D:\MP\Disk047\Partition1' 2048M,
    DEVICE 'D:\MP\Disk048\Partition1' 2048M,
    DEVICE 'D:\MP\Disk049\Partition1' 2048M,
    DEVICE 'D:\MP\Disk050\Partition1' 2048M,
```

```
  DEVICE 'D:\MP\Disk051\Partition1' 2048M,
  DEVICE 'D:\MP\Disk052\Partition1' 2048M,
  DEVICE 'D:\MP\Disk053\Partition1' 2048M,
  DEVICE 'D:\MP\Disk054\Partition1' 2048M,
  DEVICE 'D:\MP\Disk055\Partition1' 2048M,
  DEVICE 'D:\MP\Disk056\Partition1' 2048M)
ON NODE (1)
USING (
  DEVICE 'D:\MP\Disk058\Partition1' 2048M,
  DEVICE 'D:\MP\Disk059\Partition1' 2048M,
  DEVICE 'D:\MP\Disk060\Partition1' 2048M,
  DEVICE 'D:\MP\Disk061\Partition1' 2048M,
  DEVICE 'D:\MP\Disk062\Partition1' 2048M,
  DEVICE 'D:\MP\Disk063\Partition1' 2048M,
  DEVICE 'D:\MP\Disk064\Partition1' 2048M,
  DEVICE 'D:\MP\Disk065\Partition1' 2048M,
  DEVICE 'D:\MP\Disk066\Partition1' 2048M,
  DEVICE 'D:\MP\Disk067\Partition1' 2048M,
  DEVICE 'D:\MP\Disk068\Partition1' 2048M,
  DEVICE 'D:\MP\Disk069\Partition1' 2048M,
  DEVICE 'D:\MP\Disk070\Partition1' 2048M,
  DEVICE 'D:\MP\Disk072\Partition1' 2048M,
  DEVICE 'D:\MP\Disk073\Partition1' 2048M,
  DEVICE 'D:\MP\Disk074\Partition1' 2048M,
  DEVICE 'D:\MP\Disk075\Partition1' 2048M,
  DEVICE 'D:\MP\Disk076\Partition1' 2048M,
  DEVICE 'D:\MP\Disk077\Partition1' 2048M,
  DEVICE 'D:\MP\Disk078\Partition1' 2048M,
  DEVICE 'D:\MP\Disk079\Partition1' 2048M,
  DEVICE 'D:\MP\Disk080\Partition1' 2048M,
  DEVICE 'D:\MP\Disk081\Partition1' 2048M,
  DEVICE 'D:\MP\Disk082\Partition1' 2048M,
  DEVICE 'D:\MP\Disk083\Partition1' 2048M,
  DEVICE 'D:\MP\Disk084\Partition1' 2048M)
ON NODE (2)
USING (
  DEVICE 'D:\MP\Disk086\Partition1' 2048M,
  DEVICE 'D:\MP\Disk087\Partition1' 2048M,
  DEVICE 'D:\MP\Disk088\Partition1' 2048M,
  DEVICE 'D:\MP\Disk089\Partition1' 2048M,
  DEVICE 'D:\MP\Disk090\Partition1' 2048M,
  DEVICE 'D:\MP\Disk091\Partition1' 2048M,
  DEVICE 'D:\MP\Disk092\Partition1' 2048M,
  DEVICE 'D:\MP\Disk093\Partition1' 2048M,
  DEVICE 'D:\MP\Disk094\Partition1' 2048M,
  DEVICE 'D:\MP\Disk095\Partition1' 2048M,
  DEVICE 'D:\MP\Disk096\Partition1' 2048M,
  DEVICE 'D:\MP\Disk097\Partition1' 2048M,
  DEVICE 'D:\MP\Disk098\Partition1' 2048M,
  DEVICE 'D:\MP\Disk100\Partition1' 2048M,
  DEVICE 'D:\MP\Disk102\Partition1' 2048M,
  DEVICE 'D:\MP\Disk103\Partition1' 2048M,
  DEVICE 'D:\MP\Disk104\Partition1' 2048M,
  DEVICE 'D:\MP\Disk105\Partition1' 2048M,
  DEVICE 'D:\MP\Disk106\Partition1' 2048M,
  DEVICE 'D:\MP\Disk107\Partition1' 2048M,
  DEVICE 'D:\MP\Disk108\Partition1' 2048M,
  DEVICE 'D:\MP\Disk109\Partition1' 2048M,
  DEVICE 'D:\MP\Disk110\Partition1' 2048M,
  DEVICE 'D:\MP\Disk111\Partition1' 2048M,
  DEVICE 'D:\MP\Disk112\Partition1' 2048M)
ON NODE (3)
BUFFERPOOL BP32K
EXTENTSIZE 16
OVERHEAD 0.1
PREFETCHSIZE 288
TRANSFERRATE 0.5;

CREATE TEMPORARY TABLESPACE TEMP_TABLE
PAGESIZE 32K
MANAGED BY DATABASE
USING (
  DEVICE 'D:\MP\Disk002\Partition2' 2048M,
  DEVICE 'D:\MP\Disk003\Partition2' 2048M,
  DEVICE 'D:\MP\Disk004\Partition2' 2048M,
  DEVICE 'D:\MP\Disk005\Partition2' 2048M,
  DEVICE 'D:\MP\Disk006\Partition2' 2048M,
  DEVICE 'D:\MP\Disk007\Partition2' 2048M,
  DEVICE 'D:\MP\Disk008\Partition2' 2048M,
  DEVICE 'D:\MP\Disk009\Partition2' 2048M,
  DEVICE 'D:\MP\Disk010\Partition2' 2048M,
  DEVICE 'D:\MP\Disk011\Partition2' 2048M,
  DEVICE 'D:\MP\Disk012\Partition2' 2048M,
  DEVICE 'D:\MP\Disk013\Partition2' 2048M,
  DEVICE 'D:\MP\Disk016\Partition2' 2048M,
  DEVICE 'D:\MP\Disk017\Partition2' 2048M,
  DEVICE 'D:\MP\Disk018\Partition2' 2048M,
  DEVICE 'D:\MP\Disk019\Partition2' 2048M,
  DEVICE 'D:\MP\Disk020\Partition2' 2048M,
  DEVICE 'D:\MP\Disk021\Partition2' 2048M,
  DEVICE 'D:\MP\Disk022\Partition2' 2048M,
  DEVICE 'D:\MP\Disk023\Partition2' 2048M,
  DEVICE 'D:\MP\Disk024\Partition2' 2048M,
  DEVICE 'D:\MP\Disk025\Partition2' 2048M,
  DEVICE 'D:\MP\Disk026\Partition2' 2048M,
  DEVICE 'D:\MP\Disk027\Partition2' 2048M)
ON NODE (0)
USING (
  DEVICE 'D:\MP\Disk030\Partition2' 2048M,
  DEVICE 'D:\MP\Disk031\Partition2' 2048M,
```

```
  DEVICE 'D:\MP\Disk032\Partition2' 2048M,
  DEVICE 'D:\MP\Disk033\Partition2' 2048M,
  DEVICE 'D:\MP\Disk034\Partition2' 2048M,
  DEVICE 'D:\MP\Disk035\Partition2' 2048M,
  DEVICE 'D:\MP\Disk036\Partition2' 2048M,
  DEVICE 'D:\MP\Disk037\Partition2' 2048M,
  DEVICE 'D:\MP\Disk038\Partition2' 2048M,
  DEVICE 'D:\MP\Disk039\Partition2' 2048M,
  DEVICE 'D:\MP\Disk040\Partition2' 2048M,
  DEVICE 'D:\MP\Disk041\Partition2' 2048M,
  DEVICE 'D:\MP\Disk042\Partition2' 2048M,
  DEVICE 'D:\MP\Disk044\Partition2' 2048M,
  DEVICE 'D:\MP\Disk045\Partition2' 2048M,
  DEVICE 'D:\MP\Disk046\Partition2' 2048M,
  DEVICE 'D:\MP\Disk047\Partition2' 2048M,
  DEVICE 'D:\MP\Disk048\Partition2' 2048M,
  DEVICE 'D:\MP\Disk049\Partition2' 2048M,
  DEVICE 'D:\MP\Disk050\Partition2' 2048M,
  DEVICE 'D:\MP\Disk051\Partition2' 2048M,
  DEVICE 'D:\MP\Disk052\Partition2' 2048M,
  DEVICE 'D:\MP\Disk053\Partition2' 2048M,
  DEVICE 'D:\MP\Disk054\Partition2' 2048M,
  DEVICE 'D:\MP\Disk055\Partition2' 2048M,
  DEVICE 'D:\MP\Disk056\Partition2' 2048M)
ON NODE (1)
USING (
  DEVICE 'D:\MP\Disk058\Partition2' 2048M,
  DEVICE 'D:\MP\Disk059\Partition2' 2048M,
  DEVICE 'D:\MP\Disk060\Partition2' 2048M,
  DEVICE 'D:\MP\Disk061\Partition2' 2048M,
  DEVICE 'D:\MP\Disk062\Partition2' 2048M,
  DEVICE 'D:\MP\Disk063\Partition2' 2048M,
  DEVICE 'D:\MP\Disk064\Partition2' 2048M,
  DEVICE 'D:\MP\Disk065\Partition2' 2048M,
  DEVICE 'D:\MP\Disk066\Partition2' 2048M,
  DEVICE 'D:\MP\Disk067\Partition2' 2048M,
  DEVICE 'D:\MP\Disk068\Partition2' 2048M,
  DEVICE 'D:\MP\Disk069\Partition2' 2048M,
  DEVICE 'D:\MP\Disk070\Partition2' 2048M,
  DEVICE 'D:\MP\Disk072\Partition2' 2048M,
  DEVICE 'D:\MP\Disk073\Partition2' 2048M,
  DEVICE 'D:\MP\Disk074\Partition2' 2048M,
  DEVICE 'D:\MP\Disk075\Partition2' 2048M,
  DEVICE 'D:\MP\Disk076\Partition2' 2048M,
  DEVICE 'D:\MP\Disk077\Partition2' 2048M,
  DEVICE 'D:\MP\Disk078\Partition2' 2048M,
  DEVICE 'D:\MP\Disk079\Partition2' 2048M,
  DEVICE 'D:\MP\Disk080\Partition2' 2048M,
  DEVICE 'D:\MP\Disk081\Partition2' 2048M,
  DEVICE 'D:\MP\Disk082\Partition2' 2048M,
  DEVICE 'D:\MP\Disk083\Partition2' 2048M,
  DEVICE 'D:\MP\Disk084\Partition2' 2048M)
ON NODE (2)
USING (
  DEVICE 'D:\MP\Disk086\Partition2' 2048M,
  DEVICE 'D:\MP\Disk087\Partition2' 2048M,
  DEVICE 'D:\MP\Disk088\Partition2' 2048M,
  DEVICE 'D:\MP\Disk089\Partition2' 2048M,
  DEVICE 'D:\MP\Disk090\Partition2' 2048M,
  DEVICE 'D:\MP\Disk091\Partition2' 2048M,
  DEVICE 'D:\MP\Disk092\Partition2' 2048M,
  DEVICE 'D:\MP\Disk093\Partition2' 2048M,
  DEVICE 'D:\MP\Disk094\Partition2' 2048M,
  DEVICE 'D:\MP\Disk095\Partition2' 2048M,
  DEVICE 'D:\MP\Disk096\Partition2' 2048M,
  DEVICE 'D:\MP\Disk097\Partition2' 2048M,
  DEVICE 'D:\MP\Disk098\Partition2' 2048M,
  DEVICE 'D:\MP\Disk100\Partition2' 2048M,
  DEVICE 'D:\MP\Disk102\Partition2' 2048M,
  DEVICE 'D:\MP\Disk103\Partition2' 2048M,
  DEVICE 'D:\MP\Disk104\Partition2' 2048M,
  DEVICE 'D:\MP\Disk105\Partition2' 2048M,
  DEVICE 'D:\MP\Disk106\Partition2' 2048M,
  DEVICE 'D:\MP\Disk107\Partition2' 2048M,
  DEVICE 'D:\MP\Disk108\Partition2' 2048M,
  DEVICE 'D:\MP\Disk109\Partition2' 2048M,
  DEVICE 'D:\MP\Disk110\Partition2' 2048M,
  DEVICE 'D:\MP\Disk111\Partition2' 2048M,
  DEVICE 'D:\MP\Disk112\Partition2' 2048M)
ON NODE (3)
BUFFERPOOL BP32K
EXTENTSIZE 16
OVERHEAD 0.1
PREFETCHSIZE 288
TRANSFERRATE 0.5;

CREATE TEMPORARY TABLESPACE TMP2_TABLE
  PAGESIZE 4K
  MANAGED BY DATABASE
  USING (
  DEVICE 'D:\MP\Disk002\Partition3' 2048M,
  DEVICE 'D:\MP\Disk003\Partition3' 2048M,
  DEVICE 'D:\MP\Disk004\Partition3' 2048M,
  DEVICE 'D:\MP\Disk005\Partition3' 2048M,
  DEVICE 'D:\MP\Disk006\Partition3' 2048M,
  DEVICE 'D:\MP\Disk007\Partition3' 2048M,
  DEVICE 'D:\MP\Disk008\Partition3' 2048M,
  DEVICE 'D:\MP\Disk009\Partition3' 2048M,
  DEVICE 'D:\MP\Disk010\Partition3' 2048M,
  DEVICE 'D:\MP\Disk011\Partition3' 2048M,
```

```
  DEVICE 'D:\MP\Disk012\Partition3' 2048M,
  DEVICE 'D:\MP\Disk013\Partition3' 2048M,
  DEVICE 'D:\MP\Disk016\Partition3' 2048M,
  DEVICE 'D:\MP\Disk017\Partition3' 2048M,
  DEVICE 'D:\MP\Disk018\Partition3' 2048M,
  DEVICE 'D:\MP\Disk019\Partition3' 2048M,
  DEVICE 'D:\MP\Disk020\Partition3' 2048M,
  DEVICE 'D:\MP\Disk021\Partition3' 2048M,
  DEVICE 'D:\MP\Disk022\Partition3' 2048M,
  DEVICE 'D:\MP\Disk023\Partition3' 2048M,
  DEVICE 'D:\MP\Disk024\Partition3' 2048M,
  DEVICE 'D:\MP\Disk025\Partition3' 2048M,
  DEVICE 'D:\MP\Disk026\Partition3' 2048M,
  DEVICE 'D:\MP\Disk027\Partition3' 2048M)
ON NODE (0)
USING (
  DEVICE 'D:\MP\Disk030\Partition3' 2048M,
  DEVICE 'D:\MP\Disk031\Partition3' 2048M,
  DEVICE 'D:\MP\Disk032\Partition3' 2048M,
  DEVICE 'D:\MP\Disk033\Partition3' 2048M,
  DEVICE 'D:\MP\Disk034\Partition3' 2048M,
  DEVICE 'D:\MP\Disk035\Partition3' 2048M,
  DEVICE 'D:\MP\Disk036\Partition3' 2048M,
  DEVICE 'D:\MP\Disk037\Partition3' 2048M,
  DEVICE 'D:\MP\Disk038\Partition3' 2048M,
  DEVICE 'D:\MP\Disk039\Partition3' 2048M,
  DEVICE 'D:\MP\Disk040\Partition3' 2048M,
  DEVICE 'D:\MP\Disk041\Partition3' 2048M,
  DEVICE 'D:\MP\Disk042\Partition3' 2048M,
  DEVICE 'D:\MP\Disk044\Partition3' 2048M,
  DEVICE 'D:\MP\Disk045\Partition3' 2048M,
  DEVICE 'D:\MP\Disk046\Partition3' 2048M,
  DEVICE 'D:\MP\Disk047\Partition3' 2048M,
  DEVICE 'D:\MP\Disk048\Partition3' 2048M,
  DEVICE 'D:\MP\Disk049\Partition3' 2048M,
  DEVICE 'D:\MP\Disk050\Partition3' 2048M,
  DEVICE 'D:\MP\Disk051\Partition3' 2048M,
  DEVICE 'D:\MP\Disk052\Partition3' 2048M,
  DEVICE 'D:\MP\Disk053\Partition3' 2048M,
  DEVICE 'D:\MP\Disk054\Partition3' 2048M,
  DEVICE 'D:\MP\Disk055\Partition3' 2048M,
  DEVICE 'D:\MP\Disk056\Partition3' 2048M)
ON NODE (1)
USING (
  DEVICE 'D:\MP\Disk058\Partition3' 2048M,
  DEVICE 'D:\MP\Disk059\Partition3' 2048M,
  DEVICE 'D:\MP\Disk060\Partition3' 2048M,
  DEVICE 'D:\MP\Disk061\Partition3' 2048M,
  DEVICE 'D:\MP\Disk062\Partition3' 2048M,
  DEVICE 'D:\MP\Disk063\Partition3' 2048M,
  DEVICE 'D:\MP\Disk064\Partition3' 2048M,
  DEVICE 'D:\MP\Disk065\Partition3' 2048M,
  DEVICE 'D:\MP\Disk066\Partition3' 2048M,
  DEVICE 'D:\MP\Disk067\Partition3' 2048M,
  DEVICE 'D:\MP\Disk068\Partition3' 2048M,
  DEVICE 'D:\MP\Disk069\Partition3' 2048M,
  DEVICE 'D:\MP\Disk070\Partition3' 2048M,
  DEVICE 'D:\MP\Disk072\Partition3' 2048M,
  DEVICE 'D:\MP\Disk073\Partition3' 2048M,
  DEVICE 'D:\MP\Disk074\Partition3' 2048M,
  DEVICE 'D:\MP\Disk075\Partition3' 2048M,
  DEVICE 'D:\MP\Disk076\Partition3' 2048M,
  DEVICE 'D:\MP\Disk077\Partition3' 2048M,
  DEVICE 'D:\MP\Disk078\Partition3' 2048M,
  DEVICE 'D:\MP\Disk079\Partition3' 2048M,
  DEVICE 'D:\MP\Disk080\Partition3' 2048M,
  DEVICE 'D:\MP\Disk081\Partition3' 2048M,
  DEVICE 'D:\MP\Disk082\Partition3' 2048M,
  DEVICE 'D:\MP\Disk083\Partition3' 2048M,
  DEVICE 'D:\MP\Disk084\Partition3' 2048M)
ON NODE (2)
USING (
  DEVICE 'D:\MP\Disk086\Partition3' 2048M,
  DEVICE 'D:\MP\Disk087\Partition3' 2048M,
  DEVICE 'D:\MP\Disk088\Partition3' 2048M,
  DEVICE 'D:\MP\Disk089\Partition3' 2048M,
  DEVICE 'D:\MP\Disk090\Partition3' 2048M,
  DEVICE 'D:\MP\Disk091\Partition3' 2048M,
  DEVICE 'D:\MP\Disk092\Partition3' 2048M,
  DEVICE 'D:\MP\Disk093\Partition3' 2048M,
  DEVICE 'D:\MP\Disk094\Partition3' 2048M,
  DEVICE 'D:\MP\Disk095\Partition3' 2048M,
  DEVICE 'D:\MP\Disk096\Partition3' 2048M,
  DEVICE 'D:\MP\Disk097\Partition3' 2048M,
  DEVICE 'D:\MP\Disk098\Partition3' 2048M,
  DEVICE 'D:\MP\Disk100\Partition3' 2048M,
  DEVICE 'D:\MP\Disk102\Partition3' 2048M,
  DEVICE 'D:\MP\Disk103\Partition3' 2048M,
  DEVICE 'D:\MP\Disk104\Partition3' 2048M,
  DEVICE 'D:\MP\Disk105\Partition3' 2048M,
  DEVICE 'D:\MP\Disk106\Partition3' 2048M,
  DEVICE 'D:\MP\Disk107\Partition3' 2048M,
  DEVICE 'D:\MP\Disk108\Partition3' 2048M,
  DEVICE 'D:\MP\Disk109\Partition3' 2048M,
  DEVICE 'D:\MP\Disk110\Partition3' 2048M,
  DEVICE 'D:\MP\Disk111\Partition3' 2048M,
  DEVICE 'D:\MP\Disk112\Partition3' 2048M)
ON NODE (3)
BUFFERPOOL IBMDEFAULTBP
EXTENTSIZE 128
```

```
 OVERHEAD 0.1
 PREFETCHSIZE 1536
 TRANSFERRATE 0.1;

DROP TABLESPACE TEMPSPACE1;
```

create_uf_tables

```
connect to tpcd;

drop table TPCDTEMP.ORDERS_NEW;
drop table TPCDTEMP.ORDERS_DEL;
drop table TPCDTEMP.LINEITEM_NEW;

commit;

CREATE TABLE TPCDTEMP.ORDERS_NEW ( APP_ID
INTEGER NOT NULL,
                O_ORDERKEY       INTEGER NOT
NULL,
                O_CUSTKEY        INTEGER NOT NULL,
                O_ORDERSTATUS    CHAR(1) NOT
NULL,
                O_TOTALPRICE     FLOAT NOT NULL,
                O_ORDERDATE      DATE NOT NULL,
                O_ORDERPRIORITY  CHAR(15) NOT
NULL,
                O_CLERK          CHAR(15) NOT NULL,
                O_SHIPPRIORITY   INTEGER NOT
NULL,
                O_COMMENT        VARCHAR(79) NOT
NULL WITH DEFAULT)
     IN TABLE_N_INDEX
     INDEX IN TABLE_N_INDEX
    PARTITIONING KEY(O_ORDERKEY) USING
HASHING;

CREATE INDEX "TPCDTEMP"."I_ORDERS_NEW" ON
"TPCDTEMP"."ORDERS_NEW"
          ("APP_ID" ASC,
           "O_ORDERKEY" ASC,
           "O_CUSTKEY" ASC,
           "O_ORDERSTATUS" ASC,
           "O_TOTALPRICE" ASC,
           "O_ORDERDATE" ASC,
           "O_ORDERPRIORITY" ASC,
           "O_CLERK" ASC,
           "O_SHIPPRIORITY" ASC,
           "O_COMMENT" ASC) PCTFREE 0 ;

-- create unique index tpcdtemp.i_orders_new
--  on tpcdtemp.orders_new
--  (o_orderkey) include (app_id);

CREAT E TABLE TPCDTEMP.ORDERS_DEL ( APP_ID
INTEGER NOT NULL,
                O_ORDERKEY  INTEGER NOT
NULL)
     IN TABLE_N_INDEX
     INDEX IN TABLE_N_INDEX
     PARTITIONING KEY(O_ORDERKEY) USING
HASHING;

CREATE UNIQUE INDEX
"T PCDTEMP"."I_ORDERS_DEL" ON
"TPCDTEMP"."ORDERS_DEL"
          ("APP_ID" ASC,
           "O_ORDERKEY" ASC) PCTFREE 0 ;

CREATE TABLE TPCDTEMP.LINEITEM_NEW
( APP_ID INTEGER NOT NULL,
                L_ORDERKEY    INTEGER NOT NULL,
                L_PARTKEY     INTEGER NOT NULL,
                L_SUPPKEY     INTEGER NOT NULL,
                L_LINENUMBER  INTEGER NOT
NULL,
                L_QUANTITY    FLOAT NOT NULL,
                L_EXTENDEDPRICE  FLOAT NOT
NULL,
                L_DISCOUNT    FLOAT NOT NULL,
                L_TAX         FLOAT NOT NULL,
                L_RETURNFLAG  CHAR(1) NOT
NULL,
                L_LINESTATUS  CHAR(1) NOT NULL,
                L_SHIPDATE    DATE NOT NULL,
                L_COMMITDATE  DATE NOT NULL,
                L_RECEIPTDATE DATE NOT NULL,
                L_SHIPINSTRUCT CHAR(25) NOT
NULL,
                L_SHIPMODE     CHAR(10) NOT NULL,
                L_COMMENT      VARCHAR(44) NOT
NULL WITH DEFAULT)
     IN TABLE_N_INDEX
     INDEX IN TABLE_N_INDEX
     PARTITIONING KEY(L_ORDERKEY) USING
HASHING;

-- create index TPCDTEMP.I_LINEITEM_NEW on
TPCDTEMP.LINEITEM_NEW (L_ORDERKEY,APP_ID);
CREATE INDEX "TPCDTEMP"."I_LINEITEM_NEW" ON
"TPCDTEMP"."LINEITEM_NEW"
          ("APP_ID" ASC) PCTFREE 0 ;

COMMIT WORK;
```

```
alter table tpcdtemp.orders_new locksize table;
alter table tpcdtemp.orders_del locksize table;
alter table tpcdtemp.lineitem_new locksize table;

COMMIT WORK;

connect reset;
```

db2nodes.cfg

```
0 langchao-tpch LANGCHAO-TPCH 0
1 langchao-tpch LANGCHAO-TPCH 1
2 langchao-tpch LANGCHAO-TPCH 2
3 langchao-tpch LANGCHAO-TPCH 3
```

load_db2set.bat

```
DB2SET DB2_EXTENDED_OPTIMIZATION=Y
DB2SET DB2_ANTIJOIN=ON
DB2SET DB2BPVARS=d:\home\db2tpch\tpch\ddl\win.mln\scattered_read
DB2SET DB2MEMMAXFREE=1000000000
DB2SET DB2OPTIONS=-t -v +c
DB2SET DB2NTNOCACHE=ON
DB2SET DB2INSTPROF=D:\home\db2tpch
DB2SET DB2COMM=
DB2SET DB2_PARALLEL_IO=*
```

run_db2set.bat

```
DB2SET DB2_EXTENDED_OPTIMIZATION=Y
DB2SET DB2_ANTIJOIN=ON
DB2SET DB2BPVARS=d:\home\db2tpch\tpch\ddl\win.mln\scattered_read
DB2SET DB2MEMMAXFREE=1000000000
DB2SET DB2OPTIONS=-t -v +c
DB2SET DB2NTNOCACHE=ON
DB2SET DB2_LIKE_VARCHAR=
DB2SET DB2INSTPROF=d:\home\db2tpch
DB2SET DB2COMM=
DB2SET DB2_PARALLEL_IO=*
DB2SET DB2_SELECTIVITY=
```

runstats_UF.bat

```
db2start
db2 connect to tpcd
db2 runstats on table tpcdtemp.lineitem_new with distribution and detailed indexes all
db2 runstats on table tpcdtemp.orders_new with distribution and detailed indexes all
db2 runstats on table tpcdtemp.orders_del with distribution and detailed indexes all
db2 commit
db2 connect reset
```

dss.runstats

```
values (current timestamp, 'TS*** runstats nation START like ');
RUNSTATS ON TABLE TPCD.NATION    WITH DISTRIBUTION on all columns
  and columns (
    n_name like statistics,
    n_comment like statistics )
  AND  INDEXES ALL;
commit;
values (current timestamp, 'TS*** runstats done nation ');
RUNSTATS ON TABLE TPCD.REGION    WITH DISTRIBUTION on all columns
  and columns (
    r_name like statistics,
    r_comment like statistics )
  AND  INDEXES ALL;
commit;
RUNSTATS ON TABLE TPCD.SUPPLIER  WITH DISTRIBUTION on all columns
  and columns (
    s_name like statistics,
    s_address like statistics,
    s_phone like statistics,
    s_comment like statistics)
  AND  INDEXES ALL;
commit;
values (current timestamp, 'TS*** runstats done part ');
RUNSTATS ON TABLE TPCD.PART      WITH DISTRIBUTION on all columns
  and columns (
    p_name like statistics,
    p_mfgr like statistics,
    p_brand like statistics,
    p_type like statistics,
    p_container like statistics,
    p_comment like statistics)
  AND  INDEXES ALL;
```

```
commit;
values (current timestamp, 'TS*** runstats done partsupp ');
RUNSTATS ON TABLE TPCD.PARTSUPP  WITH
DISTRIBUTION on all columns
  and columns (
    ps_comment like statistics)
  AND  INDEXES ALL;
commit;
values (current timestamp, 'TS*** runstats done customer ');
RUNSTATS ON TABLE TPCD.CUSTOMER  WITH
DISTRIBUTION on all columns
  and columns (
    c_name like statistics,
    c_address like statistics,
    c_phone like statistics,
    c_mktsegment like statistics,
    c_comment like statistics)
  AND  INDEXES ALL;
commit;
values (current timestamp, 'TS*** runstats done orders ');
RUNSTATS ON TABLE TPCD.ORDERS    WITH
DISTRIBUTION on all columns
  and columns (
    o_orderstatus like statistics,
    o_orderpriority like statistics,
    o_clerk like statistics,
    o_comment like statistics)
  AND  INDEXES ALL;
commit;
values (current timestamp, 'TS*** runstats done lineitem ');
RUNSTATS ON TABLE TPCD.LINEITEM  WITH
DISTRIBUTION on all columns
  and columns (
    l_returnflag like statistics,
    l_linestatus like statistics,
    l_shipinstruct like statistics,
    l_shipmode like statistics,
    l_comment like statistics)
  AND  INDEXES ALL;
COMMIT WORK;
values (current timestamp, 'TS*** runstats END like');
```

loaddata_100GB

```
connect to tpcd;

values(current timestamp, 'TS*** Start Loading Flat Data ');

LOAD FROM
   f:\flatdata\4node_100GB \region.tbl
  OF DEL MODIFIED BY COLDEL| FASTPARSE
  MESSAGES d:\home\db2tpch\tmp\region.msg
  REPLACE INTO TPCD.REGION
  STATISTICS NO
  NONRECOVERABLE;
commit work;
values(current timestamp, 'TS*** Done Loading Region ');

LOAD FROM
   f:\flatdata\4node_100GB\nation.tbl
  OF DEL MODIFIED BY COLDEL| FASTPARSE
  MESSAGES d:\home\db2tpch\tmp\nation.msg
  REPLACE INTO TPCD.NATION
  STATISTICS NO
  NONRECOVERABLE;
commit work;
values(current timestamp, 'TS*** Done Loading Nation ');

load from
   supplier.1
  OF DEL MODIFIED BY COLDEL| FASTPARSE
  MESSAGES d:\home\db2tpch\tmp\supplier.msg
  REPLACE INTO TPCD.SUPPLIER
NONRECOVERABLE CPU_PARALLELISM 8
  partitioned db config mode load_only
  output_dbpartnums (0,1,2,3)
  part_file_location f:\flatdata\4node_100GB;
commit work;
values(current timestamp, 'TS*** Done Loading Supplier ');

load from
   customer.1,
   customer.2,
   customer.3,
   customer.4
  OF DEL MODIFIED BY COLDEL| FASTPARSE
  MESSAGES d:\home\db2tpch\tmp\customer.msg
  REPLACE INTO TPCD.customer NONRECOVERABLE
CPU_PARALLELISM 8
  partitioned db config mode load_only
  output_dbpartnums (0,1,2,3)
  part_file_location f:\flatdata\4node_100GB;
commit work;
values(current timestamp, 'TS*** Done Loading Customer ');

values(current timestamp);
load from
   part.1,
   part.2,
   part.3,
   part.4
```

```
  OF DEL MODIFIED BY COLDEL| FASTPARSE
  MESSAGES d:\home\db2tpch\tmp\part.msg
  REPLACE INTO TPCD.part NONRECOVERABLE
CPU_PARALLELISM 8
  partitioned db config mode load_only
  output_dbpartnums (0,1,2,3)
  part_file_location f:\flatdata\4node_100GB;
commit work;
values(current timestamp, 'TS*** Done Loading Part ');

values(current timestamp);
load from
    partsupp.1,
    partsupp.2,
    partsupp.3,
    partsupp.4,
    partsupp.5,
    partsupp.6,
    partsupp.7,
    partsupp.8,
    partsupp.9,
    partsupp.10,
    partsupp.11,
    partsupp.12,
    partsupp.13,
    partsupp.14,
    partsupp.15,
    partsupp.16
  OF DEL MODIFIED BY COLDEL| FASTPARSE
  MESSAGES d:\home\db2tpch\tmp\partsupp.msg
  REPLACE INTO TPCD.partsupp NONRECOVERABLE
CPU_PARALLELISM 8
  partitioned db config mode load_only
  output_dbpartnums (0,1,2,3)
  part_file_location f:\flatdata\4node_100GB;
commit work;
values(current timestamp, 'TS*** Done Loading Partsupp ');

load from
    orders.1,
    orders.2,
    orders.3,
    orders.4,
    orders.5,
    orders.6,
    orders.7,
    orders.8,
    orders.9,
    orders.10,
    orders.11,
    orders.12,
    orders.13,
    orders.14,
    orders.15,
    orders.16
  OF DEL MODIFIED BY COLDEL| FASTPARSE
  MESSAGES d:\home\db2tpch\tmp\orders.msg
  REPLACE INTO TPCD.orders NONRECOVERABLE
CPU_PARALLELISM 8
  partitioned db config mode load_only
  output_dbpartnums (0,1,2,3)
  part_file_location f:\flatdata\4node_100GB;
commit work;
values(current timestamp, 'TS*** Done Loading Orders ');

load from
    lineitem.1,
    lineitem.2,
    lineitem.3,
    lineitem.4,
    lineitem.5,
    lineitem.6,
    lineitem.7,
    lineitem.8,
    lineitem.9,
    lineitem.10,
    lineitem.11,
    lineitem.12,
    lineitem.13,
    lineitem.14,
    lineitem.15,
    lineitem.16,
    lineitem.17,
    lineitem.18,
    lineitem.19,
    lineitem.20,
    lineitem.21,
    lineitem.22,
    lineitem.23,
    lineitem.24,
    lineitem.25,
    lineitem.26,
    lineitem.27,
    lineitem.28,
    lineitem.29,
    lineitem.30,
    lineitem.31,
    lineitem.32,
    lineitem.33,
    lineitem.34,
    lineitem.35,
    lineitem.36,
```

```
  lineitem.37,
  lineitem.38,
  lineitem.39,
  lineitem.40,
  lineitem.41,
  lineitem.42,
  lineitem.43,
  lineitem.44,
  lineitem.45,
  lineitem.46,
  lineitem.47,
  lineitem.48,
  lineitem.49,
  lineitem.50,
  lineitem.51,
  lineitem.52,
  lineitem.53,
  lineitem.54,
  lineitem.55,
  lineitem.56,
  lineitem.57,
  lineitem.58,
  lineitem.59,
  lineitem.60,
  lineitem.61,
  lineitem.62,
  lineitem.63,
  lineitem.64
 OF DEL MODIFIED BY COLDEL| FASTPARSE
 MESSAGES d:\home\db2tpch\tmp\lineitem.msg
 REPLACE INTO TPCD.lineitem NONRECOVERABLE
CPU_PARALLELISM 8
 partitioned db config mode load_only
 output_dbpartnums (0,1,2,3)
 part_file_location g:\flatdata\4node_100GB;
commit work;
values(current timestamp, 'TS*** Done Loading Lineitem ');

connect reset;
```

load_db_cfg

```
update database configuration for tpcd using
NUM_FREQVALUES 0
NUM_QUANTILES 600
buffpage 100000
catalogcache_sz 386
chngpgs_thresh 50
dbheap 6654
locklist 642
logbufsz 1048
logfilsiz 8192
logprimary 10
logsecond 5
maxappls 70
maxlocks 20
mincommit 1
num_iocleaners 14
num_ioservers 14
pckcachesz 320
softmax 600
sortheap 12000
stat_heap_sz 16000
stmtheap 4096
util_heap_sz 524288
applheapsz 768
app_ctl_heap_sz 1024
dft_queryopt 7
dft_degree 1;

get database configuration for tpcd;
```

load_dbm_cfg

```
update database manager configuration using
cpuspeed -1
sheapthres 250000
agent_stack_sz 16
aslheapsz 15
rqrioblk 32767
intra_parallel no
max_querydegree -1
maxagents 200
num_poolagents 4
num_initagents 4
diaglevel 3;

get database manager configuration;
```

scattered_read

```
# 1/2 -> 1/3 of number of prefetchers
NUMPREFETCHQUEUES=4
PREFETCHQUEUESIZE=1000

# turn on scatter read for these types
NT_SCATTER_SMS=1
NT_SCATTER_DMSFILE=1
NT_SCATTER_DMSDEVICE=1
```

SetLogDir.bat

```
db2_all \"|| \"call
D:\home\db2tpch\tpch\ddl\win.mln\SetLogDir.## \" "
```

SetLogDir.0.bat

```
db2 update db cfg for tpcd using newlogpath j:\db2tpch\logs
```

SetLogDir.1.bat

```
db2 update db cfg for tpcd using newlogpath k:\db2tpch\logs
```

SetLogDir.2.bat

```
db2 update db cfg for tpcd using newlogpath l:\db2tpch\logs
```

SetLogDir.3.bat

```
db2 update db cfg for tpcd using newlogpath m:\db2tpch\logs
```

tpcd.setup

```
# NOTE: ALL variable defitions must have a comment at the
end - haven't got
#       the getvars script recognizing the uncommented line yet
TPCD_PLATFORM=nt                    # aix, nt, sun ....
TPCD_VERSION=2                      # 1 or 2 (Version of
tpcd). Default 1
TPCD_DBNAME=TPCD                    # name to create
database under
TPCD_WORKLOAD=H                     # TPC version (R for
TPCR, H for TPCH)
TPCD_AUDIT_DIR=d:\home\db2tpch\tpch  # top level
directory of tar file for
                                    # all the tpcd scripts
TPCD_PRODUCT=v5                     # v5 or pe
                                    # Use pe if you really are using pe
v1.2!
                                    # but I won't guarantee that it will
work!
TPCD_MODE=mln                       # uni/smp/mln/mpp
TPCD_PHYS_NODE=1                    # number of physical
nodes
TPCD_LN_PER_PN=4                    # number of logical
nodes per physical node
TPCD_SF=100                         # size of the database
(1=1GB,...) to
                                    # get test size databases use:
                                    #     0.012 = 12MB
                                    #     0.1   = 100MB
TPCD_BUILD_STAGE=ALL                # where to start
the build - currently the
                                    # following is possible:
                                    #  ALL - do everything (create,load,
                                    #        index,stats,config) (Default)
                                    #  CRTTBSP  - start after create db
and
                                    #      config setting.  Start righ at
                                    #      create tbsp
                                    #  LOAD  - start from the load of the
tables
                                    #  INDEX - start from the index
creation
                                    #       (NOTE if earlyindex is
specified,
                                    #        then this will do the create
index
                                    #        followed by the load...)
                                    #  RUNSTATS  - start from the
runstats
                                    #       (NOTE Do not use this option
if
                                    #        distribution stats are gathered
                                    #        as part of the load, this will
                                    #        start after the load and indices
                                    #        have been created.
                                    #  CONFIG  - start from the setting
up of
                                    #        the benchmark runs config
setup
                                    #
TPCD_DBPATH=d:                      # path for database
(defaults to home)
TPCD_DDLPATH=d:\home\db2tpch\tpch\ddl\win.mln # path for all ddl files and customized
                                    # scripts (load script), config files,etc
TPCD_BUFFERPOOL_DEF=create_bufferpools # name of file with bufferpool definitions
                                    # and sizes
TPCD_NODEGROUP_DEF=create_nodegroups  # name of file in ddlpath with nodegroup
                                    # definitions
TPCD_EXPLAIN_DDL=NULL               # file with DDL
for explains statments
                                    # if this is NULL then uses the
default
                                    # and puts it in USERSPACE1
across all
                                    # nodes...nt 1TB found it was faster
if
                                    # just in a single node nodegroup
```

```
TPCD_TBSP_DDL=create_tablespaces        # ddl file for tablespaces
TPCD_DDL=create_tables                  # ddl file for tables
TPCD_QUAL_TBSP_DDL=create_qual_tablespaces # ddl file for tablespaces for qual
TPCD_QUAL_DDL=create_tables             # ddl file for qualification database
                                        # tablespaces and tables should be identical
                                        # to regular ddl except container names
TPCD_INDEXDDL=create_indexes            # ddl file for indexes
TPCD_EXTRAINDEX=no                      # no = no extra indexes
                                        # filename = If you want to create some
                                        # indices before
                                        # the load, and some indices after, then
                                        # use this additional file to specify the
TPCD_ADD_RI=NULL                        # file name that contains any RI
                                        # constraints to add after index creation
                                        # set to NULL (default) if unused
                                        # indices to create after the load.
TPCD_AST=NULL                           # file name that contains complete AST
                                        # definition including connection to
                                        # the database, summary table creation,
                                        # population, indexing and runstats.
TPCD_RUNSTATS=dss.runstats              # ddl file for runstats.  If you have
                                        # created indices before the load (ie
                                        # TPCD_EARLYINDEX=yes), have specified to
                                        # gather stats on the load command (either
                                        # through your own load script or by using
                                        # TPCD_LOADSTATS=yes, AND you have
                                        # specified a file for TPCD_EXTRAINDEX
                                        # then this runstats file should include
                                        # the runstats commands specifically for
                                        # the extra indices.
TPCD_RUNSTATSHORT=NULL                  # NOTE!! THIS IS BUGGY....I can't get it to
                                        # work on UNI successfully
                                        # ddl file for short runstats that are
                                        # run in the background while the
                                        # TPCD_RUNSTATS are run in the foreground
                                        # of the build.  If this is used, then
                                        # TPCD_RUNSTATS should have the runstats
                                        # command for lineitem and
                                        # TPCD_RUNSTATSHORT should have runstats
                                        # commands for all other tables.
TPCD_DBGEN=d:\home\db2tpch\tpch\appendix.v2\dbgen# path name to data generation code


                                        # Parameters used to specify source of
                                        # data for load scripts
TPCD_INPUT=g:\flatdata_100GB            # NULL - use dbgen generated data  OR
                                        # path name -  to the pre-generated
                                        #              flat files
                                        # /gwl/dss/12MB - path for pregenerated 12MB
                                        # /gwl/dss/100MB - path for pregen'd 100MB
                                        #
TPCD_QUAL_INPUT=NULL                    # NULL - use dbgen generated data  OR
                                        # path name - to the pre-generated
                                        #             flat files


TPCD_TAILOR_DIR=d:\home\db2tpch\data\tailor # path name for the directory used to
                                        # generate split specific config files
                                        # only used for partitioned environment


TPCD_EARLYINDEX=no                      # create indexes before the load


                                        # LOAD specific parameters follow:
TPCD_LOAD_DB2SET_SCRIPT=load_db2set.bat# Script that contains the db2set commands
                                        # for the load process Use NULL if not
                                        # specified
TPCD_LOAD_CONFIGFILE=load_db_cfg        # config file with specific database config
                                        # parms for the load/index/runstats part
                                        # of the build.
                                        # set to NULL if use defaults
TPCD_LOAD_DBM_CONFIGFILE=load_dbm_cfg  # config file with specific
                                        # database manager config parts for the
                                        # load/index/runstats part of the build.
```

```
                        # set to NULL if use defaults
TPCD_LOAD_QUALCONFIGFILE=load_db_cfg  # config file with specific database config
                        # parms for the load/index/runstats part
                        # of the build for qualification db.
                        # set to NULL if use defaults
TPCD_LOAD_DBM_QUALCONFIGFILE=load_dbm_cfg # config file with specific
                        # database manager config parts for the
                        # load/index/runstats part of the build.
                        # set to NULL if use defaults
TPCD_LOADSTATS=yes              # gather statistics during load
                        # ignored if EARLYINDEX is not set
                        # due to runstats limitation
TPCD_TEMP=d:\home\db2tpch\data\tmp     # path for LOAD temp files
                        # defaults to /u/<instance>/sqllib/tmp
                        # used in load script only
TPCD_SORTBUF=8192               # sortbuf size for LOAD
                        # used in load script only
TPCD_LOAD_PARALLELISM=0         # degree of parallelism to use on load
                        # 0 = use the "intelligent default" that
                        # the load will chose at run time
                        # used in load script only
TPCD_COPY_DIR=NULL              # directory where copy image is created
                        # on load command CURRENTLY UNUSED
                        # used in load script only
TPCD_FASTPARSE=yes              # use fastparse on load
                        # used in load script only


                        # Backup and logfile specific parameters follow:
TPCD_BACKUP_DIR=d:\home\db2tpch\data\backup # directory where backup files are placed
TPCD_LOGPRIMARY=NULL            # NULL/value = how many primary log files
                        # to configure.  If NULL is specified then
                        # the default is not changed.
TPCD_LOGFILSIZ=1000             # NULL/value = how 4KB pages to use for
                        # logfilsiz db cfg parameter.  If NULL is
                        # specified then the default is not changed
TPCD_LOGSECOND=NULL             # NULL/value = how many secondary log files
                        # to configure.  If NULL is specified then
                        # the default is not changed.
TPCD_LOG_DIR=d:\home\db2tpch\data\logs # directory where log files stored..
                        # NULL leaves them in the dbpath
TPCD_LOG_QUAL_DIR=d:\home\db2tpch\data\qual_logs # directory where qual log files stored
                        # NULL leaves them in the dbpath
TPCD_LOG=no                     # yes/no - whether to turn LOG_RETAIN on
                        # i.e. are backups needed to be taken



                        # CONFIG specific parameters
TPCD_DB2SET_SCRIPT=run_db2set.bat     # Script that contains the db2set commands
                        # for the benchmark run.  Use NULL if not
                        # specified
TPCD_CONFIGFILE=run_db_cfg            # name of configuration file in ddl path
                        # that will be used for the benchmark run
TPCD_DBM_CONFIG=run_dbm_cfg           # name of config file for database manager
                        # cfg parms
TPCD_QUALCONFIGFILE=run_db_cfg        # name of database cfg file in ddl path
                        # for qualification database
TPCD_DBM_QUALCONFIG=run_dbm_cfg       # name of config file for database
                        # manager cfg parms


TPCD_MACHINE=NULL               # set to NULL if using load config file
                        # big/medium/small  size of machine used to
                        # determine buffpage, sortheap,sheapthres
                        # and ioservers parms for load, create
                        # index and runstats
                        # NOTE that this parameter is ignored if
                        # a TPCD_LOAD_CONFIGFILE


TPCD_SMPDEGREE=4                # 1...# of degrees of parallelism to run
                        # with
TPCD_AGENTPRI=NULL              # set agentpri to this value (default
                        # is SYSTEM)
```

```
TPCD_ACTIVATE=yes                # activate the database upon build
                                 # completion
                                 # run specific parameters
TPCD_AUDIT=no                    # no/yes
                                 # no - don't set up qualification db stuff
                                 # yes - set up qualification db queries
                                 #     - build the update function tables
                                 #       and data before we get into the
                                 #       timing of the creation of the
                                 #       tables and the load.
TPCD_TMP_DIR=d:\home\db2tpch\data\tmp # place to put temp working files

TPCD_SHARED_TEMP_FULL_PATHNAME=d:\home\db2tpch\data\tmp  # just added
TPCD_QUERY_TEMPLATE_DIR=standard.V2  # subdirectory in AUDIT_DIR/queries
                                 # to use as the source of the query
                                 # templates.  Currently there are
                                 # v2 ones and pe ones.  You can make
                                 # your own directory following the same
                                 # form as in the v2 directory using
                                 # any variant you wish
TPCD_QUAL_DBNAME=TPCDQUAL        # name of qualification database
TPCD_NUMSTREAM=5                 # number of streams for the throughput test
TPCD_FLATFILES=g:\flatdata_100GB     # where to generate flat files
                                 # for update functions
TPCD_STAGING_TABLE_DDL=create_uf_tables # contains the ddl for creating
                                 # the staging tables if they are used for
                                 # the update functions
TPCD_PRELOAD_STAGING_TABLE_SCRIPT=LoadSampleUFData # file that contains the sql for preloading
                                 # and gathering stats on sample UF data
                                 # Note that the data used is sample data
                                 # and is not data from any of the applied
                                 # update pairs
TPCD_DELETE_STAGING_TABLE_SQL=DeleteSampleUFData.sql # file that contains the sql for deleting
                                 # the preloaded data from the staging
                                 # tables
TPCD_UPDATE_IMPORT=false         # true = use import for the staging tables
                                 #  for UNI/SMP mode only (code change in
                                 #  tpcdbatch) (if not uni mode then must
                                 #  change load_update)
                                 # false = use load for staging tables
                                 # The default is false if not set.
                                 # NOTE that this parm is only for UNI/SMP
                                 # it is not for multi node invocation

TPCD_SPLIT_UPDATES=256           # number of chunks to split the update
                                 # function into.
TPCD_CONCURRENT_INSERTS=16       # number of insert chunks that are run
                                 # concurrently.
TPCD_SPLIT_UPDATES
                                 # should be evenly divisible by this number
TPCD_CONCURRENT_INSERTS_LOAD=16  # number of insert chunks that are loaded
                                 # concurrently.
TPCD_SPLIT_UPDATES should
                                 # be evenly divisible by this number.
                                 # this controls the load portion of the
                                 # insert routine for partitioned databases
TPCD_SPLIT_DELETES=256           # number of portions to split the delete
                                 # function into.
                                 # this variable is only valid in UNI/SMP
                                 # mode.
TPCD_CONCURRENT_DELETES=16       # number of DELETE chunks that are run
                                 # concurrently.
TPCD_SPLIT_UPDATES
                                 # should be evenly divisible by this number
TPCD_GEN_UPDATEPAIRS=30          # number of pairs of update function data
                                 # to generate
                                 # if 0 the update data generation and
                                 # setup will not be done.  use this if
                                 # you don't want to run the update
                                 # functions  (Update functions not
                                 # fully tested in new env't yet)
TPCD_GENERATE_SEED_FILE=no       # yes/no These are the seed files for
                                 # generating the query substitution values
                                 # yes - generate a seed file base on
                                 #     year/month/day (for audited runs)
                                 # no  - use qgen's default seeds
TPCD_RUN_ON_MULTIPLE_NODES=NULL  # pe V1.2 only - will we be running each
```

```
                        # query stream of throughput starting
at
                        # different nodes or from same node
TPCD_STATS_INTERVAL=5           # timing interval
for vmstats/iostats
TPCD_STATS_THRU_INT=300         # timing interval
for vmstats/iostats for
                        # throughput run
TPCD_GATHER_STATS=off           # on/off - only
implement for AIX yet
                        # on = gather statistics around power
                        #      test run  (vmstat,iostat,netstat)
                        # off = no stats gathered during
power run

TPCD_UFTEMP=UFTEMP              # base name of
tablespace(s) where the
                        # staging tables for the update
functions
                        # are created
                        # this name will be used as the
                        # basename for the tablespaces...eg
                        # UFTEMP1 UFTEMP2 ....
TPCD_HAVECOMPILER=yes           # rebuild
tpcdbatch executable
                        # yes/no
TPCD_SLEEP=5                    # ?
TPCD_INLISTMAX=default          # max num of keys
to delete at a time
                        # for UF2, use "default" for default.
TPCD_LOAD_SCRIPT=load_flatdata_100GB   # script to
run for loading tables
                        # in TPCD_DDLPATH directory
under mln/mpp
                        # leave as NULL if using default
genloaduni
TPCD_LOAD_SCRIPT_QUAL=NULL      # script to
run for loading tables in
                        # TPCD_DDLPATH directory under
mln/mpp
                        # for QUAL db
TPCD_ROOTPRIV=no                # do you have root
privileges to be able
                        # get values of things like schedtune
                        # and vmtune (currently on AIX
only)
                        #  acid test specific information
TPCD_DB2LOG=d:\home\db2tpch\db2tpch    # directory
where the db2diag.log can
                        # be found for the durability tests
TPCD_APPEND_ON=no               # set to no if the
cluster indexes are used
```

Run_db_cfg

```
update database configuration for tpcd using
buffpage 190000
catalogcache_sz 386
dbheap 20000
locklist 16384
maxlocks 5
maxappls 150
mincommit 1
num_iocleaners 14
num_ioservers  14
DLCHKTIME 5000
pckcachesz 640
logprimary 20
softmax 1800
sortheap 7700
stat_heap_sz 10000
stmtheap 15000
util_heap_sz 40000
applheapsz 16000
app_ctl_heap_sz 2048
dft_degree 1
dft_queryopt 7
maxfilop 1024
chngpgs_thresh 80;

get database configuration for tpcd;
```

Run_dbm_cfg

```
update database manager configuration using
cpuspeed 2.361721e-007
sheapthres  400000
agent_stack_sz 16
aslheapsz 15
rqrioblk 32767
intra_parallel no
max_querydegree -1
maxagents 3600
num_poolagents 64
num_initagents 4
fcm_num_buffers 30000
DFT_MON_TIMESTAMP OFF
numdb 1
diaglevel 0;
get database manager configuration;
```

Appendix C: Qualification Query Output

Qualification Queries

Query 1

```
Start timestamp 04/03/04 14:11:11.260
Seed used = 403132605

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

-- Query 01 - Var_0 Rev_01 - Pricing Summary Report Query

Tag: Q1     Stream: 0    Sequence number: 17

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
tpcd.lineitem
where
l_shipdate <= date ('1998-12-01') - 71 day
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              3778930084.000
5666474416866.642    5383150217757.406
5598477876963.508              25.499             38236.129
0.050    148196865
N            F               98651063.000
147917564130.620     140524222697.068
146144695570.551               25.501             38236.808
0.050      3868460
N            O              7524683628.000
11283261433306.148   10719109661454.779
11147885054122.674             25.500             38237.235
0.050    295085701
R            F              3779515164.000
5667277779029.080    5383904284928.300
5599268273176.036              25.500             38236.667
0.050    148215790


Number of rows retrieved is:     4
------------------------------------------------

Stop timestamp 04/03/04 14:14:38.610
Query Time =          207.3 secs
```

Query 2

```
Start timestamp 04/03/04 13:47:16.330
Seed used = 403132605

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

-- Query 02 - Var_0 Rev_02 - Minimum Cost Supplier Query

Tag: Q2     Stream: 0    Sequence number: 2

select
s_acctbal,
s_name,
n_name,
p_partkey,
p_mfgr,
s_address,
s_phone,
s_comment
from
tpcd.part,
tpcd.supplier,
tpcd.partsupp,
tpcd.nation,
tpcd.region
where
p_partkey = ps_partkey
and s_suppkey = ps_suppkey
and p_size = 45
and p_type like '%COPPER'
and s_nationkey = n_nationkey
and n_regionkey = r_regionkey
and r_name = 'AMERICA'
and ps_supplycost = (
select
min(ps_supplycost)
from
tpcd.partsupp,
tpcd.supplier,
tpcd.nation,
tpcd.region
where
p_partkey = ps_partkey
and s_suppkey = ps_suppkey
and s_nationkey = n_nationkey
and n_regionkey = r_regionkey
and r_name = 'AMERICA'
)
order by
s_acctbal desc,
n_name,
s_name,
p_partkey
fetch first 100 rows only

S_ACCTBAL            S_NAME                N_NAME
P_PARTKEY    P_MFGR               S_ADDRESS
S_PHONE         S_COMMENT
```

```
---------- ---------- ---------- ----------
---------- ---------- ---------- ----------
---------- ---------- ---------- ----------
---------- ----------
        9999.470 Supplier#000845595 BRAZIL
9845594 Manufacturer#2 Y8fvlYOR0Z7k5V
12-375-621-4051 ironic theodolites eat furiously about th
        9999.470 Supplier#000845595 BRAZIL
16095546 Manufacturer#4 Y8fvlYOR0Z7k5V
12-375-621-4051 ironic theodolites eat furiously about th
        9999.420 Supplier#000915079 CANADA
19915078 Manufacturer#2 GbIsYZ3ktYA9u,
13-792-114-2589 instructions sleep fluffily against the bold
deposit
        9999.190 Supplier#000414519 BRAZIL
13414518 Manufacturer#3 UXMNq7dFrdeZkDqT1
12-186-469-1020 carefully idle dependencies haggle against
the care
        9999.180 Supplier#000286705 BRAZIL
11036693 Manufacturer#3
LNeuwAqLZyJGgse4k5xvwwkVDQ0wvGfPTftz4q 12-
663-399-6038 regular, even accounts nag among the
furiously ironic foxes. furiously express notornis cajole. care
        9999.070 Supplier#000763845 PERU
17763844 Manufacturer#5 oimZrJiNei9ggUDNT
27-938-601-6843 unusual accounts use carefully across the
carefully re
        9998.880 Supplier#000781398 ARGENTINA
8781397 Manufacturer#5 gx1AuUD,Mcn
7,sU8qs3dMgkphVA,n 11-364-499-9274 instructions
sleep slyly about the fluffily pending pinto beans.
        9998.690 Supplier#000030514 ARGENTINA
12780501 Manufacturer#2 DB6zY3a7rd5
11-174-810-4412 ironically express instructions sleep.
carefully regular theodolites cajole blithely carefully p
        9998.600 Supplier#000431404 UNITED

 … Rows Deleted …

7L3U7hjhXEIQq2XsDfHal78aRC7YcRZLs21783 13-403-
948-3270 special accounts cajole. ironic grouches sleep.
furiously special packages cajol
        9981.270 Supplier#000465340 ARGENTINA
1965337 Manufacturer#1
09uccrM9,uryevqwjLyZeNeWo 11-311-278-8054
bravely special instructions at the b
        9981.270 Supplier#000465340 ARGENTINA
2215337 Manufacturer#4
09uccrM9,uryevqwjLyZeNeWo 11-311-278-8054
bravely special instructions at the b
        9980.690 Supplier#000091469 BRAZIL
17341417 Manufacturer#5 K,qH2
ejAvsdksXuEi,K9x 12-971-490-2210 even, final
accounts cajole carefully around the regular pinto beans.
slyly ironic accounts
        9980.330 Supplier#000607572 UNITED
STATES 14607571 Manufacturer#2 O
zgYu7kJ6uuM HsLS 34-966-364-5710
quickly unusual warthogs wake across the ironic, special
braids. silent ideas sleep never
        9979.780 Supplier#000956443 ARGENTINA
1456440 Manufacturer#4
XroWaHXeeL9zwSE5zG4Lol88t6a 11-783-283-
5244 enticing, regular accounts wake. final, bold foxes boo
        9979.550 Supplier#000844929 BRAZIL
594928 Manufacturer#3 Efx
0SlgmRr7qtexqfQc9CVyMybVd8irDEXO9 12-982-949-
4613 quickly unusual deposits haggle blithely across
        9978.950 Supplier#000978352 UNITED
STATES 13728338 Manufacturer#4
k6xih4bYMlxIwSM 34-412-856-8298
blithely regular grouches und
        9978.950 Supplier#000978352 UNITED
STATES 16228303 Manufacturer#4
k6xih4bYMlxIwSM 34-412-856-8298
blithely regular grouches und
        9978.910 Supplier#000881925 UNITED
STATES 7631917 Manufacturer#5
53IEqr92QY0dT 34-556-272-9454 even,
final instructions wake carefully. carefully final pinto beans
wake fluffily slyly even
        9978.870 Supplier#000924391 PERU
11924390 Manufacturer#1
cfyr8SF4XQdNjJIMaDd5U0BKpJc 27-876-166-
3960 slyly regular requests alongside of the quickly even
foxes cajole blithel
        9978.740 Supplier#000039340 PERU
19539301 Manufacturer#3
tmlKrifVfGql27v4o0RLmzJsRPi35N 27-618-115-
9428 blithely final accounts detect blithely across the slyly
special requests


Number of rows retrieved is:  100
---------- ---------- ---------- ----------


Stop timestamp 04/03/04 13:47:34.600
Query Time =  18.3 secs
```

Query 3

```
Start timestamp 04/03/04 14:07:29.120
Seed used = 403132605

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

-- Query 03 - Var_0 Rev_01 - Shipping Priority Query

Tag: Q3  Stream: 0  Sequence number: 11

select
l_orderkey,
sum(l_extendedprice * (1 - l_discount)) as revenue,
o_orderdate,
o_shippriority
from
tpcd.customer,
tpcd.orders,
tpcd.lineitem
where
c_mktsegment = 'FURNITURE'
and c_custkey = o_custkey
and l_orderkey = o_orderkey
and o_orderdate < date ('1995-03-09')
and l_shipdate > date ('1995-03-09')
group by
l_orderkey,
o_orderdate,
o_shippriority
order by
revenue desc,
o_orderdate
fetch first 10 rows only

L_ORDERKEY  REVENUE  O_ORDERDATE
O_SHIPPRIORITY
---------- ---------- ---------- ----------
 221295395  495280.075 1995-02-25  0
```

```
 221234944        476493.470  1995-02-23        0
  52081729        471869.957  1995-03-02        0
 448765796        467288.078  1995-03-07        0
  20841824        459646.267  1995-03-08        0
  45428128        459241.088  1995-02-09        0
 529180934        458820.346  1995-03-07        0
 540295682        457188.189  1995-02-28        0
 329643078        457156.920  1995-02-26        0
 570360647        454853.468  1995-01-19        0


Number of rows retrieved is:     10
-----------------------------------------------


Stop timestamp 04/03/04 14:07:42.510
Query Time =            13.4 secs
```

Query 4

```
Start timestamp 04/03/04 14:10:14.200
Seed used = 403132605

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

-- Query 04 - Var_0 Rev_01 - Order Priority Checking Query

Tag: Q4     Stream: 0   Sequence number: 14

select
o_orderpriority,
count(*) as order_count
from
tpcd.orders
where
o_orderdate >= date ('1994-06-01')
and o_orderdate < date ('1994-06-01') + 3 month
and exists (
select
*
from
tpcd.lineitem
where
l_orderkey = o_orderkey
and l_commitdate < l_receiptdate
)
group by
o_orderpriority
order by
o_orderpriority

O_ORDERPRIORITY  ORDER_COUNT
-------------------------------
1-URGENT            1054002
2-HIGH              1053240
3-MEDIUM            1054637
4-NOT SPECIFIED     1053227
5-LOW               1051428


Number of rows retrieved is:     5
-----------------------------------------------


Stop timestamp 04/03/04 14:10:25.970
Query Time =            11.8 secs
```

Query 5

```
Start timestamp 04/03/04 14:16:42.760
Seed used = 403132605

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

-- Query 05 - Var_0 Rev_02 Local Supplier Volume Query

Tag: Q5     Stream: 0   Sequence number: 20

select
n_name,
sum(l_extendedprice * (1 - l_discount)) as revenue
from
tpcd.customer,
tpcd.orders,
tpcd.lineitem,
tpcd.supplier,
tpcd.nation,
tpcd.region
where
c_custkey = o_custkey
and o_orderkey = l_orderkey
and l_suppkey = s_suppkey
and c_nationkey = s_nationkey
and s_nationkey = n_nationkey
and n_regionkey = r_regionkey
and r_name = 'AFRICA'
and o_orderdate >= date ('1996-01-01')
and o_orderdate < date ('1996-01-01') + 1 year
group by
n_name
order by
revenue desc

N_NAME                    REVENUE
-----------------------------------------------
ETHIOPIA                5368721956.828
MOROCCO                  5342312018.666
MOZAMBIQUE                5321169232.019
ALGERIA                 5320568354.335
KENYA                   5239628395.304


Number of rows retrieved is:     5
-----------------------------------------------


Stop timestamp 04/03/04 14:17:41.480
Query Time =            58.7 secs
```

Query 6

```
Start timestamp 04/03/04 13:51:31.510
Seed used = 403132605

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

-- Query 06 - Var_0 Rev_01 - Forecasting Revenue Change
Query

Tag: Q6     Stream: 0   Sequence number: 5

select
sum(l_extendedprice * l_discount) as revenue
from
tpcd.lineitem
where
l_shipdate >= date ('1996-01-01')
and l_shipdate < date ('1996-01-01') + 1 year
```

```
and l_discount between 0.08 - 0.01 and 0.08 + 0.01
and l_quantity < 25

REVENUE
----------------------
    17927960773.033


Number of rows retrieved is:      1
-----------------------------------------------


Stop timestamp 04/03/04 13:51:43.120
Query Time =            11.6 secs
```

Query 7

```
Start timestamp 04/03/04 14:17:41.480
Seed used = 403132605

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

-- Query 07 - Var_0 Rev_01 - Volume Shipping Query

Tag: Q7     Stream: 0    Sequence number: 21

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,
year (l_shipdate) as l_year,
l_extendedprice * (1 - l_discount) as volume
from
tpcd.supplier,
tpcd.lineitem,
tpcd.orders,
tpcd.customer,
tpcd.nation n1,
tpcd.nation n2
where
s_suppkey = l_suppkey
and o_orderkey = l_orderkey
and c_custkey = o_custkey
and s_nationkey = n1.n_nationkey
and c_nationkey = n2.n_nationkey
and (
(n1.n_name = 'CHINA' and n2.n_name = 'MOZAMBIQUE')
or (n1.n_name = 'MOZAMBIQUE' and n2.n_name =
'CHINA')
)
and l_shipdate between date('1995-01-01') and date('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
-----------------------------------------------------------------------
---------------
CHINA                    MOZAMBIQUE                1995
5324454907.691
CHINA                    MOZAMBIQUE                1996
5352087657.952
MOZAMBIQUE               CHINA                     1995
5257735750.176
MOZAMBIQUE               CHINA                     1996
5290339806.856


Number of rows retrieved is:      4
-----------------------------------------------


Stop timestamp 04/03/04 14:18:30.280
Query Time =            48.8 secs
```

Query 8

```
Start timestamp 04/03/04 13:59:00.960
Seed used = 403132605

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

-- Query 08 - Var_0 Rev_01 - National Market Share Query

Tag: Q8     Stream: 0    Sequence number: 8

select
o_year,
sum(case
when nation = 'MOZAMBIQUE' then volume
else 0
end) / sum(volume) as mkt_share
from
(
select
year(o_orderdate) as o_year,
l_extendedprice * (1 - l_discount) as volume,
n2.n_name as nation
from
tpcd.part,
tpcd.supplier,
tpcd.lineitem,
tpcd.orders,
tpcd.customer,
tpcd.nation n1,
tpcd.nation n2,
tpcd.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 = 'AFRICA'
and s_nationkey = n2.n_nationkey
and o_orderdate between date('1995-01-01') and date ('1996-
12-31')
and p_type = 'STANDARD ANODIZED BRASS'
) as all_nations
group by
o_year
order by
```

```
o_year

O_YEAR      MKT_SHARE
------------------------------------
     1995           0.040
     1996           0.040

Number of rows retrieved is:     2
-----------------------------------------------

Stop timestamp 04/03/04 13:59:54.450
Query Time =          53.5 secs
```

Query 9

```
Start timestamp 04/03/04 13:47:34.600
Seed used = 403132605

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

-- Query 09 - Var_0 Rev_01 - Product Type Profit Measure
Query

Tag: Q9    Stream: 0   Sequence number: 3

select
nation,
o_year,
sum(amount) as sum_profit
from
(
select
n_name as nation,
year(o_orderdate) as o_year,
l_extendedprice * (1 - l_discount) - ps_supplycost *
l_quantity as amount
from
tpcd.part,
tpcd.supplier,
tpcd.lineitem,
tpcd.partsupp,
tpcd.orders,
tpcd.nation
where
s_suppkey = l_suppkey
and ps_suppkey = l_suppkey
and ps_partkey = l_partkey
and p_partkey = l_partkey
and o_orderkey = l_orderkey
and s_nationkey = n_nationkey
and p_name like '%antique%'
) as profit
group by
nation,
o_year
order by
nation,
o_year desc

NATION                O_YEAR      SUM_PROFIT
-------------------------------------------------------------
ALGERIA                 1998      2906384501.251
ALGERIA                 1997      4943865761.181
ALGERIA                 1996      4992664764.824
ALGERIA                 1995      4942830715.576
ALGERIA                 1994      4975795628.892
ALGERIA                 1993      4960545267.984
ALGERIA                 1992      4964466609.939
ARGENTINA               1998      2890102173.051
ARGENTINA               1997      4945188633.216
ARGENTINA               1996      4976826898.269
ARGENTINA               1995      4928241488.361
ARGENTINA               1994      4926236931.499
ARGENTINA               1993      4934084403.283
ARGENTINA               1992      4943006133.718

…Rows Deleted…

UNITED KINGDOM          1992      5008708361.218
UNITED STATES           1998      2928411655.049
UNITED STATES           1997      5005209412.862
UNITED STATES           1996      5023660250.317
UNITED STATES           1995      4984558778.921
UNITED STATES           1994      5011873252.589
UNITED STATES           1993      4992250596.835
UNITED STATES           1992      4987298947.722
VIETNAM                 1998      2936482859.903
VIETNAM                 1997      5016715127.402
VIETNAM                 1996      5020822255.558
VIETNAM                 1995      5001824977.771
VIETNAM                 1994      5001706446.870
VIETNAM                 1993      5005982501.989
VIETNAM                 1992      4986046852.127


Number of rows retrieved is:     175
-------------------------------------------------

Stop timestamp 04/03/04 13:51:08.120
Query Time =          213.5 secs
```

Query 10

```
Start timestamp 04/03/04 14:14:38.610
Seed used = 403132605

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

-- Query 10 - Var_0 Rev_01 - Returned Item Reporting
Query

Tag: Q10    Stream: 0   Sequence number: 18

select
c_custkey,
c_name,
sum(l_extendedprice * (1 - l_discount)) as revenue,
c_acctbal,
n_name,
c_address,
c_phone,
c_comment
from
tpcd.customer,
tpcd.orders,
tpcd.lineitem,
tpcd.nation
where
c_custkey = o_custkey
and l_orderkey = o_orderkey
and o_orderdate >= date ('1994-02-01')
and o_orderdate < date ('1994-02-01') + 3 month
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
fetch first 20 rows only

C_CUSTKEY  C_NAME                  REVENUE
C_ACCTBAL       N_NAME                    C_ADDRESS
C_PHONE         C_COMMENT
-------------------------------------------------------------------
-------------------------------------------------------------------
-------------------------------------------------------------------
-------------------------------------------------------------------
  14033122 Customer#014033122          931109.809
8630.610 ARGENTINA
tP9EUEuIhBVD6ZPJ0w1xvLrYgpXn4Q      11-953-795-
7156 blithely ironic requests haggle quickly final decoys.
express foxes about the regular theodolites sleep acc
  10538407 Customer#010538407          901522.065
7616.220 VIETNAM                  7IXBBThCfZe2
31-673-929-1915 slyly silent epitaphs doze furiously
according to the slyly express requests. regular theodoli
   2571871 Customer#002571871          847351.031
-981.890 CANADA
QW7dpq8Iu5OGTt2ysMgRLgWDJl6E        13-301-418-
4058 even deposits boost among the requests. instructions
sleep.
  12270070 Customer#012270070          841829.212
2216.060 ROMANIA
oN85noAx66RastrYvyggWBMjCjtz8VzsynsfyQm  29-763-
594-1282 blithely pending deposits ought to maint
   5690557 Customer#005690557          833959.722
1352.710 VIETNAM                  jvwH0IPT7Ds
nrK4jxaXASk                 31-155-192-9599 blithely ironic
platelets above the u
  11071960 Customer#011071960          819314.784
4594.940 UNITED KINGDOM           JPIxG2NJ8z1LjQ9c
yle8y9DV                    33-995-672-5442 deposits above the
regular packages wake furiously alongside of the instructions.
blithely regula
   7904860 Customer#007904860          813095.162
6750.740 BRAZIL                   3qRG70jJscXSW1
12-501-824-2272 pending requests across the furiously
ironic foxes haggle slyly carefully ironic depths. final, special
ins
  12850675 Customer#012850675          810695.924
9926.780 UNITED STATES
YLLBiL24g1e7FlxlGaBZD               34-342-496-6564
ironically even dolphins use. slyly final pinto beans doze.
furiously express ideas solve. flu
  10474669 Customer#010474669          803744.541
2227.450 RUSSIA
xiywkAWDcHW8QgGrjUNgkOnBAJfx        32-725-
970-2725 carefully regular ideas after the final requests
haggle ideas. asympto
   2710684 Customer#002710684          800040.007
-640.850 FRANCE
w8FdvX4rOWFsGbYxgLZ55j,Ny9aFcXpRajwVqe6  16-
758-828-5503 furiously bold packages after the stealthily
bold instructions sleep furiously final platelets-- final
packages ac
   6440347 Customer#006440347          797647.932
2162.420 VIETNAM                  JpPkSfIddXnRxaNEQ9,F
31-412-772-6543 platelets across the accounts run against
the enticin
   9539812 Customer#009539812          795465.552
2554.210 KENYA                    1Bdn2aiTNtWUB
24-261-196-3061 platelets hang blithely among the pend
   1749625 Customer#001749625          791342.570
1948.480 ALGERIA                  i1ct5 yw,O00iVFKkYcK
10-338-549-8461 furiously express pinto beans wake fluffily
carefully bold
   4450192 Customer#004450192          779188.856
3566.900 ETHIOPIA
Ey ,LVq2l6JWzJZrFnuQS25oV,IMk9      15-948-650-
7775 carefully pending pinto beans against the unusua
  11518628 Customer#011518628          778445.729
8422.560 INDONESIA                EFl5jRoKXuO5y0xwkv
19-730-214-9180 final, ironic deposits according to th
  10854376 Customer#010854376          777296.100
9341.550 UNITED STATES
2H2K8RfSFUDtviCoYp4EBV3Y3Gicfol5T Yy  34-714-
809-7878 foxes across the slyly special pinto beans cajole
around the b
   4463983 Customer#004463983          777198.697
1874.750 ALGERIA                  6w2GmTNTt0
10-768-785-2335 slyly unusual theodolites haggle. special,
regular accounts print among the carefully bold theodolites.
   3822901 Customer#003822901          772407.601
5973.110 ALGERIA
Qy50BFjVKwvVZT5GGJh                 10-417-317-9299
requests above the carefully pending dependencies detect
bold, unusual deposits. furiously final acc
   1784110 Customer#001784110          767407.942
1176.880 PERU                     y1,VDooFXp
TAt936C7VMM G P28           27-824-166-2808 deposits
are finally even excuses. ironic accounts mold blithely silent,
pending accounts. furiously bold packag
   7649968 Customer#007649968          767056.921
143.090 IRAN                      GdvzKbNXpgM1oEek2P
jLO7tDEe                    20-429-472-4755 carefully regular
instructions sleep blithely. attainments haggle furiously.
ironically ironic foxes use


Number of rows retrieved is:     20
-----------------------------------------------


Stop timestamp 04/03/04 14:15:24.300
Query Time =          45.7 secs
```

Query 11

```
Start timestamp 04/03/04 14:10:25.970
Seed used = 403132605

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

-- Query 11 - Var_0 Rev_01 - Important Stock Identification
Query

Tag: Q11    Stream: 0   Sequence number: 15

select
ps_partkey,
sum(ps_supplycost * ps_availqty) as value
from
tpcd.partsupp,
tpcd.supplier,
tpcd.nation
where
ps_suppkey = s_suppkey
and s_nationkey = n_nationkey
```

```
and n_name = 'CANADA'
group by
ps_partkey having
sum(ps_supplycost * ps_availqty) > (
select
sum(ps_supplycost * ps_availqty) * 0.0000010000
from
tpcd.partsupp,
tpcd.supplier,
tpcd.nation
where
ps_suppkey = s_suppkey
and s_nationkey = n_nationkey
and n_name = 'CANADA'
)
order by
value desc

PS_PARTKEY   VALUE
-----------------------------------
   8389556         26042207.690
  13436128          22267739.060
   4951689         22251603.020
   6538224         22003355.300
   2770587         21921622.460
  16370216          21808932.920
  16178180         21389753.490
    124703        20914817.760
   2631005         20344353.000
  18217114          19961574.010
  12908678         19635055.440
   5124256         19619654.390
   5352230         19454651.480
```

…Rows Deleted…

```
5444042         8045868.640
  15675375          8045862.610
   7637356         8045859.500
   8403804         8045852.000
   7882312         8045841.800
  10811749          8045841.660
  18285601          8045820.090
  13141898          8045810.400
  16374504          8045802.240


Number of rows retrieved is:  91410
-----------------------------------------------


Stop timestamp 04/03/04 14:10:41.350
Query Time =           15.4 secs
```

Query 12

```
Start timestamp 04/03/04 14:18:30.280
Seed used = 403132605

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

-- Query 12 - Var_0 Rev_02 - Shipping Modes and Order
Priority Query

Tag: Q12    Stream: 0    Sequence number: 22

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
tpcd.orders,
tpcd.lineitem
where
o_orderkey = l_orderkey
and l_shipmode in ('MAIL', 'SHIP')
and l_commitdate < l_receiptdate
and l_shipdate < l_commitdate
and l_receiptdate >= date ('1994-01-01')
and l_receiptdate < date ('1994-01-01') + 1 year
group by
l_shipmode
order by
l_shipmode

L_SHIPMODE  HIGH_LINE_COUNT
LOW_LINE_COUNT
-----------------------------------------------
MAIL             623733        935699
SHIP             623609        935485


Number of rows retrieved is:     2
-----------------------------------------------


Stop timestamp 04/03/04 14:18:51.610
Query Time =           21.3 secs
```

Query 13

```
Start timestamp 04/03/04 14:04:32.190
Seed used = 403132605

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

-- Query 13 - Var_0 Rev_01 - Customer Distribution Query

Tag: Q13    Stream: 0    Sequence number: 10

select
c_count,
count(*) as custdist
from
(
select
c_custkey,
count(o_orderkey)
from
tpcd.customer left outer join tpcd.orders on
c_custkey = o_custkey
and o_comment not like '%express%packages%'
group by
c_custkey
) as c_orders (c_custkey, c_count)
group by
c_count
order by
```

```
custdist desc,
c_count desc

C_COUNT      CUSTDIST
-------------------------
      0      5000188
     10       676590
      9       665666
     11       632504
      8       592494
     12       563407
     13       493781
     19       477436
     18       469633
      7       467031
     20       465353
     17       451811
     14       444276
     21       433353
     16       432530
     15       425946
     22       386878
     23       329300
      6       321071
     24       267290
     25       207586
      5       187970
     26       155360
     27       110944
      4       90714
     28        76449
     29        50466
      3       35024
     30        31975
     31        19361
     32        11629
      2       10159
     33         6470
     34         3485
     35         1969
      1        1868
     36         1022
     37          541
     38          257
     39          111
     40           58
     41           26
     42           12
     44            3
     43            3


Number of rows retrieved is:     45
------------------------------------------------


Stop timestamp 04/03/04 14:07:29.120
Query Time =          176.9 secs
```

Query 14

```
Start timestamp 04/03/04 13:47:03.960
Seed used = 403132605

------------------------------------------------
--#SET ROWS_OUT -1 ROWS_FETCH -1

-- Query 14 - Var_0 Rev_01 - Promotion Effect Query

Tag: Q14    Stream: 0   Sequence number: 1

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
tpcd.lineitem,
tpcd.part
where
l_partkey = p_partkey
and l_shipdate >= date ('1994-02-01')
and l_shipdate < date ('1994-02-01') + 1 month

PROMO_REVENUE
----------------------
          16.629


Number of rows retrieved is:      1
------------------------------------------------


Stop timestamp 04/03/04 13:47:16.330
Query Time =          12.4 secs
```

Query 15

```
Start timestamp 04/03/04 14:10:41.350
Seed used = 403132605

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

-- Query 15 - Var_a Rev_01 - Top Supplier Query

Tag: Q15a   Stream: 0   Sequence number: 16

with revenue (supplier_no, total_revenue) as (
select
l_suppkey,
sum(l_extendedprice * (1-l_discount))
from
tpcd.lineitem
where
l_shipdate >= date ('1996-12-01')
and l_shipdate < date ('1996-12-01') + 3 month
group by
l_suppkey
)
select
s_suppkey,
s_name,
s_address,
s_phone,
total_revenue
from
tpcd.supplier,
revenue
where
s_suppkey = supplier_no
and total_revenue = (
select
max(total_revenue)
from
revenue
)
```

```
order by
s_suppkey

S_SUPPKEY    S_NAME                    S_ADDRESS
S_PHONE         TOTAL_REVENUE
-------------------------------------------------------------------------------
-------------------------------------------------
    158978  Supplier#000158978
yM3Rnm53pQmWIT49lU aAYqbveXvlL6          11-634-
611-6998          2395096.681


Number of rows retrieved is:      1
-------------------------------------------------


Stop timestamp 04/03/04 14:11:11.260
Query Time =            29.9 secs
```

Query 16

```
Start timestamp 04/03/04 14:09:12.680
Seed used = 403132605

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

-- Query 16 - Var_0 Rev_01 - Parts/Supplier Relationship
Query

Tag: Q16    Stream: 0    Sequence number: 13

select
p_brand,
p_type,
p_size,
count(distinct ps_suppkey) as supplier_cnt
from
tpcd.partsupp,
tpcd.part
where
p_partkey = ps_partkey
and p_brand <> 'Brand#35'
and p_type not like 'STANDARD PLATED%'
and p_size in (7, 10, 15, 16, 46, 42, 31, 49)
and ps_suppkey not in (
select
s_suppkey
from
tpcd.supplier
where
s_comment like '%Customer%Complaints%'
)
group by
p_brand,
p_type,
p_size
order by
supplier_cnt desc,
p_brand,
p_type,
p_size

P_BRAND     P_TYPE                    P_SIZE
SUPPLIER_CNT
-------------------------------------------------------------------
Brand#21    ECONOMY BRUSHED BRASS              31
603
Brand#44    PROMO POLISHED NICKEL              49
592
Brand#14    STANDARD ANODIZED NICKEL           15
584
Brand#41    MEDIUM BRUSHED COPPER              15
583
Brand#32    SMALL ANODIZED NICKEL              15
576
Brand#54    STANDARD BRUSHED TIN               49
576
Brand#55    LARGE BURNISHED STEEL              10
576
Brand#13    LARGE PLATED TIN          16       575
Brand#33    LARGE PLATED BRASS              16
575
```

…Rows Deleted…

```
Brand#22    ECONOMY PLATED STEEL               31
292
Brand#23    ECONOMY BRUSHED COPPER             10
292
Brand#54    ECONOMY BURNISHED TIN              46
292
Brand#33    PROMO BURNISHED TIN                31
291
Brand#32    STANDARD POLISHED BRASS            10
287
Brand#22    MEDIUM ANODIZED NICKEL             16
284
Brand#13    STANDARD POLISHED NICKEL           49
276
Brand#15    STANDARD BRUSHED COPPER            46
272
Brand#55    SMALL POLISHED STEEL               49
272
Brand#25    MEDIUM ANODIZED BRASS              10
260


Number of rows retrieved is:  27840
-------------------------------------------------


Stop timestamp 04/03/04 14:10:14.200
Query Time =            61.5 secs
```

Query 17

```
Start timestamp 04/03/04 13:51:43.120
Seed used = 403132605

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

-- Query 17 - Var_0 Rev_01 - Small-Quantity-Order
Revenue Query

Tag: Q17    Stream: 0    Sequence number: 6

select
sum(l_extendedprice) / 7.0 as avg_yearly
from
tpcd.lineitem,
tpcd.part
where
p_partkey = l_partkey
and p_brand = 'Brand#51'
and p_container = 'LG PKG'
and l_quantity < (
select
0.2 * avg(l_quantity)
```

```
from
tpcd.lineitem
where
l_partkey = p_partkey
)

AVG_YEARLY
----------
 32078770.954


Number of rows retrieved is:  1
-----------------------------------------------


Stop timestamp 04/03/04 13:52:50.250
Query Time =  67.1 secs
```

Query 18

```
Start timestamp 04/03/04 13:52:50.250
Seed used = 403132605

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

-- Query 18 - Var_0 Rev_01 - Large Volume Customer
Query

Tag: Q18  Stream: 0  Sequence number: 7

select
c_name,
c_custkey,
o_orderkey,
o_orderdate,
o_totalprice,
sum(l_quantity)
from
tpcd.customer,
tpcd.orders,
tpcd.lineitem
where
o_orderkey in (
select
l_orderkey
from
tpcd.lineitem
group by
l_orderkey having
sum(l_quantity) > 312
)
and c_custkey = o_custkey
and o_orderkey = l_orderkey
group by
c_name,
c_custkey,
o_orderkey,
o_orderdate,
o_totalprice
order by
o_totalprice desc,
o_orderdate
fetch first 100 rows only

C_NAME                C_CUSTKEY    O_ORDERKEY
O_ORDERDATE  O_TOTALPRICE         6
------------------------------------------------------------------------
-----------------------------------
Customer#011472112    11472112    458304292 1998-
02-05        591036.150           322.000
Customer#012090925    12090925    501322081 1995-
02-04        586945.440           319.000
Customer#013458721    13458721    333307747 1997-
12-19        572334.880           319.000
Customer#008643083    8643083     84927619 1997-
06-29        571417.480           316.000
Customer#010543705    10543705    163142919 1996-
06-10        569798.100           313.000
Customer#005914657    5914657     55799200 1996-
02-11        568754.480           327.000
Customer#011461310    11461310    20662370 1992-
07-22        566353.200           315.000
Customer#007682894    7682894     532736640 1993-
07-22        563532.160           316.000
Customer#012070685    12070685    34201984 1997-
06-18        563492.490           322.000

…Rows Deleted…

Customer#011173516    11173516    143875140 1998-
06-09        516258.940           315.000
Customer#004621336    4621336     294701219 1993-
05-10        516081.840           315.000
Customer#009433798    9433798     469098182 1997-
10-17        516024.870           317.000
Customer#011719279    11719279    162040167 1998-
05-04        515755.610           313.000
Customer#009814556    9814556     20971013 1997-
08-12        515684.690           322.000
Customer#008605375    8605375     595511555 1993-
08-12        515645.460           314.000
Customer#014111593    14111593    233925702 1993-
08-23        515501.240           318.000


Number of rows retrieved is:  100
-----------------------------------------------


Stop timestamp 04/03/04 13:59:00.960
Query Time =  370.7 secs
```

Query 19

```
Start timestamp 04/03/04 14:15:24.300
Seed used = 403132605

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

-- Query 19 - Var_0 Rev_01 - Discounted Revenue Query

Tag: Q19  Stream: 0  Sequence number: 19

select
sum(l_extendedprice* (1 - l_discount)) as revenue
from
tpcd.lineitem,
tpcd.part
where
(
p_partkey = l_partkey
and p_brand = 'Brand#23'
and p_container in ('SM CASE', 'SM BOX', 'SM PACK', 'SM
PKG')
and l_quantity >= 8 and l_quantity <= 8 + 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#32'
and p_container in ('MED BAG', 'MED BOX', 'MED PKG',
'MED PACK')
and l_quantity >= 20 and l_quantity <= 20 + 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#55'
and p_container in ('LG CASE', 'LG BOX', 'LG PACK', 'LG
PKG')
and l_quantity >= 28 and l_quantity <= 28 + 10
and p_size between 1 and 15
and l_shipmode in ('AIR', 'AIR REG')
and l_shipinstruct = 'DELIVER IN PERSON'
)

REVENUE
----------------------
      432844143.174


Number of rows retrieved is:      1
-----------------------------------------------


Stop timestamp 04/03/04 14:16:42.760
Query Time =            78.5 secs
```

Query 20

```
Start timestamp 04/03/04 13:51:08.120
Seed used = 403132605

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

-- Query 20 - Var_0 Rev_01 - Potential Part Promotion
Query

Tag: Q20    Stream: 0    Sequence number: 4

select
s_name,
s_address
from
tpcd.supplier,
tpcd.nation
where
s_suppkey in (
select
ps_suppkey
from
tpcd.partsupp
where
ps_partkey in (
select
p_partkey
from
tpcd.part
where
p_name like 'khaki%'
)
and ps_availqty > (
select
0.5 * sum(l_quantity)
from
tpcd.lineitem
where
l_partkey = ps_partkey
and l_suppkey = ps_suppkey
and l_shipdate >= date ('1995-01-01')
and l_shipdate < date ('1995-01-01') + 1 year
)
)
and s_nationkey = n_nationkey
and n_name = 'GERMANY'
order by
s_name

S_NAME                    S_ADDRESS
-----------------------------------------------------------------------
Supplier#000000033
gfeKpYw3400L0SDywXA6Ya1Qmq1w6YB9f3R
Supplier#000000044        kERxlLDnlIZJdN66zAPHklyL
Supplier#000000077
wVtcr0uH3CyrSiWMLsqnB09Syo,UuZxPMeBghlY
Supplier#000000085        Ckls9RtlzKSF
Supplier#000000135        F4Uy ZQNU6ESTmO3mrL,mI
Supplier#000000148        bkCBZzewuerw8xHv
Supplier#000000158        fkjbx7,DYi
Supplier#000000180
JJzFp5wZcS0KpMLM95tYmq5Pv526UBfT8vrfwBk
Supplier#000000232
90YJjotHlfwyieaTfuBJ8kohU5Oc83bESout,p
Supplier#000000272        ywrDqLLTfKUF93
Supplier#000000328        SMm24d WG62
Supplier#000000369        XKLa3tQT7,TgtuLi2Vme8vGyx
Supplier#000000384        zMr51gtJ0Vu83Dk
```

…Rows Deleted…

```
Supplier#000999472        xr33gKkIUh5 uI9oFgQ5,9
Supplier#000999501        7gLmbZJip4duD6egZfJK
Supplier#000999536        7PXcD9BlRwA5ix
Supplier#000999559
xEtXahH,dc8V,gKzDTZoiKuaFbOheBQo
Supplier#000999567        A0IXMrkLfXtO0qdTs69Fi98
Supplier#000999713        PFjwCsbfdlie3d
Supplier#000999803        EGeGeOR
sVpXKiBdhpH50NLvdpRo3gTXMNEhABr
Supplier#000999817
ZdLBgzOy0MAdeP5cTd0lOWqXGX c58RlREc
Supplier#000999897
RCgcYRcdxuePBhyzbqDYufeOZQc0xYVEB
Supplier#000999906
V4vEUke1wY4xlxz1Csp7v38DG6oarR1XX1n
Supplier#000999915        EacxjrRV1MLdE5KginaOrdU
Supplier#000999946        A7JyTkoaY0QfVL3PBigYt
Supplier#000999970
lFhLxtK,IcbX2Z2cH3ROoF83UoRKnBLwImBmAL


Number of rows retrieved is:  18229
-----------------------------------------------


Stop timestamp 04/03/04 13:51:31.510
Query Time =            23.4 secs
```

Query 21

Start timestamp 04/03/04 13:59:54.450
Seed used = 403132605

-- Query 21 - Var_0 Rev_01 - Suppliers Who Kept Orders Waiting Query

Tag: Q21 Stream: 0 Sequence number: 9

```
select
s_name,
count(*) as numwait
from
tpcd.supplier,
tpcd.lineitem l1,
tpcd.orders,
tpcd.nation
where
s_suppkey = l1.l_suppkey
and o_orderkey = l1.l_orderkey
and o_orderstatus = 'F'
and l1.l_receiptdate > l1.l_commitdate
and exists (
select
*
from
tpcd.lineitem l2
where
l2.l_orderkey = l1.l_orderkey
and l2.l_suppkey <> l1.l_suppkey
)
and not exists (
select
*
from
tpcd.lineitem l3
where
l3.l_orderkey = l1.l_orderkey
and l3.l_suppkey <> l1.l_suppkey
and l3.l_receiptdate > l3.l_commitdate
)
and s_nationkey = n_nationkey
and n_name = 'KENYA'
group by
s_name
order by
numwait desc,
s_name
fetch first 100 rows only
```

S_NAME	NUMWAIT
Supplier#000606495	25
Supplier#000800439	25
Supplier#000808402	24
Supplier#000230749	23
Supplier#000282430	23
Supplier#000046573	22
Supplier#000088346	22
Supplier#000101901	22
Supplier#000351080	22
Supplier#000404121	22
Supplier#000460207	22
Supplier#000726275	22
Supplier#000748890	22
Supplier#000766926	22
Supplier#000987975	22
Supplier#000013360	21
Supplier#000044414	21
Supplier#000056997	21

…Rows Deleted…

Supplier#000778652	20
Supplier#000793195	20
Supplier#000840618	20
Supplier#000890739	20
Supplier#000908550	20
Supplier#000914490	20
Supplier#000916515	20
Supplier#000936479	20
Supplier#000940498	20
Supplier#000993537	20

Number of rows retrieved is: 100

Stop timestamp 04/03/04 14:04:32.190
Query Time = 277.7 secs

Query 22

Start timestamp 04/03/04 14:07:42.510
Seed used = 403132605

-- Query 22 - Var_0 Rev_01 - Global Sales Opportunity Query

Tag: Q22 Stream: 0 Sequence number: 12

```
select
cntrycode,
count(*) as numcust,
sum(c_acctbal) as totacctbal
from
(
select
substr(c_phone, 1, 2) as cntrycode,
c_acctbal
from
tpcd.customer
where
substr(c_phone, 1, 2) in
('27', '21', '30', '28', '34', '13', '12')
and c_acctbal > (
select
avg(c_acctbal)
from
tpcd.customer
where
c_acctbal > 0.00
and substr(c_phone, 1, 2) in
('27', '21', '30', '28', '34', '13', '12')
)
and not exists (
select
*
from
tpcd.orders
where
o_custkey = c_custkey
```

)
) as custsale
group by
cntrycode
order by
cntrycode

CNTRYCODE	NUMCUST	TOTACCTBAL
12	90790	681061549.120
13	90720	679386824.460
21	90872	681484814.350
27	90912	681720589.660
28	90916	681635475.830
30	91345	685053396.530
34	91105	682773174.660

Number of rows retrieved is: 7

Stop timestamp 04/03/04 14:09:12.680
Query Time = 90.2 secs

First 10 Rows of the Database

SELECT * FROM TPCD.REGION FETCH FIRST 10 ROWS ONLY

```
R_REGIONKEY R_NAME                   R_COMMENT
----------- ------------------------- --------------------------------------------------------------------------------------------------------------------------------------
          0 AFRICA                    special Tiresias about the furiously even dolphins are furi
          1 AMERICA                   even, ironic theodolites according to the bold platelets wa
          2 ASIA                      silent, bold requests sleep slyly across the quickly sly dependencies. furiously silent instructions alongside
          3 EUROPE                    special, bold deposits haggle foxes. platelet
          4 MIDDLE EAST               furiously unusual packages use carefully above the unusual, exp

  5 record(s) selected.
```

SELECT * FROM TPCD.NATION FETCH FIRST 10 ROWS ONLY

```
N_NATIONKEY N_NAME                    N_REGIONKEY N_COMMENT
----------- ------------------------- ----------- ------------------------------------------------------------------------------------------------------------------------------------------
          0 ALGERIA                             0 final accounts wake quickly. special reques
          5 ETHIOPIA                            0 fluffily ruthless requests integrate fluffily. pending ideas wake blithely acco
         14 KENYA                               0 ironic requests boost. quickly pending pinto beans cajole slyly slyly even deposits. ironic packages
         15 MOROCCO                             0 ideas according to the fluffily final pinto beans sleep furiously
         16 MOZAMBIQUE                          0 ironic courts wake fluffily even, bold deposi
          1 ARGENTINA                           1 idly final instructions cajole stealthily. regular instructions wake carefully blithely express accounts. fluffi
          2 BRAZIL                              1 always pending pinto beans sleep sil
          3 CANADA                              1 foxes among the bold requests
         17 PERU                                1 final, final accounts sleep slyly across the requests.
         24 UNITED STATES                       1 blithely regular deposits serve furiously blithely regular warthogs! slyly fi

  10 record(s) selected.
```

SELECT * FROM TPCD.PART FETCH FIRST 10 ROWS ONLY

```
P_PARTKEY   P_NAME
P_MFGR                    P_BRAND    P_TYPE
P_SIZE      P_CONTAINER P_RETAILPRICE
P_COMMENT
----------- -------------------------------------------------------------------------------------------------------------------- ---------- ------------------------- ----------- ----------- ------------------------ -----------------------
         10 floral moccasin royal powder burnished Manufacturer#5 Brand#54 LARGE BURNISHED STEEL 44 LG CAN +9.10010000000000E+002 bold, ironic
         11 chocolate turquoise sandy snow misty Manufacturer#2 Brand#25 STANDARD BURNISHED NICKEL 43 WRAP BOX +9.11010000000000E+002 furiousl
         14 linen seashell burnished blue gainsboro Manufacturer#1 Brand#13 SMALL POLISHED STEEL 28 JUMBO BOX +9.14010000000000E+002 special, regular
         37 turquoise ivory orange sandy maroon Manufacturer#4 Brand#45 LARGE POLISHED TIN 48 JUMBO BOX +9.37030000000000E+002 blithely regular
         39 rose dodger lace peru floral Manufacturer#5 Brand#53 SMALL POLISHED TIN 43 JUMBO JAR +9.39030000000000E+002 quickly bo
         43 medium khaki chocolate rosy blush Manufacturer#4 Brand#44 PROMO POLISHED STEEL 5 WRAP CASE +9.43040000000000E+002 carefully iro
         47 sky firebrick red linen dim Manufacturer#4 Brand#45 LARGE BURNISHED BRASS 14 JUMBO PACK +9.47040000000000E+002 bold, unusual a
         49 blue tan cornsilk burlywood beige Manufacturer#2 Brand#24 SMALL BURNISHED TIN 31 MED DRUM +9.49040000000000E+002 carefu
         50 yellow cornflower royal blush almond Manufacturer#3 Brand#33 LARGE ANODIZED TIN 25 WRAP PKG +9.50050000000000E+002 regular dinos ar
         55 antique cream pale tomato rose Manufacturer#2 Brand#23 ECONOMY BRUSHED COPPER 9 MED BAG +9.55050000000000E+002 furiously

  10 record(s) selected.
```

SELECT * FROM TPCD.SUPPLIER FETCH FIRST 10 ROWS ONLY

```
S_SUPPKEY   S_NAME                    S_ADDRESS
S_NATIONKEY S_PHONE         S_ACCTBAL
S_COMMENT
```

2408 Supplier#000002408 7EkHfS6Pw0hjOjEPB75flYvg9wAwTbi8k 15 25-832-499-5996 +2.66882000000000E+003 unusual deposits wake fluffily. finally thin deposits according to the stealthily final foxes sl

2456 Supplier#000002456 di5JVO5IIrl6as 15 25-580-375-8992 +6.89110000000000E+002 fluffily regular accounts above t

2505 Supplier#000002505 QgRYtv8XPssUkrih7Pc6Nau9fgHvh01rrp 15 25-666-134-6990 +3.44816000000000E+003 blithely even packages boost. never silent pin

2754 Supplier#000002754 zw8Vl,Lpglqlbu6xAuNu,T 15 25-682-858-7129 +7.35705000000000E+003 furiously pending deposits breach furiously regular platelets. quickly bold

2768 Supplier#000002768 Z5XIwCs200u2A2aA 15 25-753-877-2336 +3.93275000000000E+003 unusual foxes cajole carefully furious frets. sil

2833 Supplier#000002833 TaAJUhGazS 15 25-391-375-6124 +7.36430000000000E+003 slyly even accounts run carefully quickly silent foxes. express requests hang blithely along

2860 Supplier#000002860 fgNgVo75YdY8iaz1gHxxOPuGm0ASGP 15 25-117-806-3906 +1.27482000000000E+003 bold dependencies haggle blithely ironic courts. accounts upon the

2923 Supplier#000002923 CYxD6MjRJYe 15 25-230-259-8699 -3.46470000000000E+002 pending, bold foxes sleep blithely. unusual de

3124 Supplier#000003124 YYHQhbXYOI642fFIjZBhgKBPh1P0Edj 15 25-992-468-6188 +6.53363000000000E+003 furiously regular theodolites are; requests wake. pending, express accounts boost slyl

3164 Supplier#000003164 R3AZwhqjRhH 15 25-326-242-8592 +6.63400000000000E+002 fluffily pending pinto beans wake. furiously regular pinto beans shou

10 record(s) selected.

SELECT * FROM TPCD.PARTSUPP FETCH FIRST 10 ROWS ONLY

PS_PARTKEY PS_SUPPKEY PS_AVAILQTY PS_SUPPLYCOST PS_COMMENT

---

10 11 2952 +9.96120000000000E+002 blithely even foxes nag furiously about the quickly ex

10 250011 3335 +6.73270000000000E+002 final, regular foxes cajole carefully about the blithely express accounts. carefully regular platelets against the silent pinto beans sleep carefully among the blithely regular foxes. final r

10 500011 5691 +1.64000000000000E+002 carefully express accounts wake ruthlessly. carefully ironic frets haggle furi

10 750011 841 +3.74020000000000E+002 pending, pending requests may haggle sometimes. silent pinto beans are blithe

11 12 4540 +7.09870000000000E+002 final packages mold after the carefully unusual requests. quickly fi

11 250012 4729 +8.94900000000000E+002 regular packages sleep carefully fluffily ironic ac

11 500012 3708 +8.18740000000000E+002 slyly pending theodolites wake quickly unusual, express accounts. fluffily regular requests cajole furiously quickly even dugouts. slyly bold platelets

11 750012 3213 +4.71980000000000E+002 ideas nag regular instructions. regular, thin pinto beans unwind furiously ironic accounts. quickly express platele

14 15 5278 +6.50070000000000E+002 quickly even deposits doze quickly pending, bold deposits. carefully regular packages sublate carefully

14 250015 5334 +8.89500000000000E+002 express instructions affix quickly. slyly bold requests use. special, express foxes haggle fluffily express deposits. silently even pinto beans throughout the blithely iron

10 record(s) selected.

SELECT * FROM TPCD.CUSTOMER FETCH FIRST 10 ROWS ONLY

C_CUSTKEY C_NAME C_ADDRESS C_NATIONKEY C_PHONE C_ACCTBAL C_MKTSEGMENT C_COMMENT

---

667 Customer#000000667 oQqeEC,OD9XC1JXyOsHqcpv0fPUdP9ek5KKb70tQ 6 16-917-453-2490 +3.28876000000000E+003 AUTOMOBILE unusual, regular instructions above the unus

683 Customer#000000683 G0, q8c6vBykpiLvcuSJLYvqE 6 16-566-251-5446 +9.12093000000000E+003 MACHINERY quickly regular accounts sleep carefully. special, ironic patt

686 Customer#000000686 1j C80VWHe ITCVCV 6 16-682-293-3599 +5.50336000000000E+003 HOUSEHOLD furiously unusual excuses wake quickly around the fo

712 Customer#000000712 8w2pIiA4wWAhtjAdXR 6 16-843-486-5087 +8.667090000000000E+003 BUILDING bold accounts cajole. quickly unusual instructions across the blithely ironi

906 Customer#000000906 1Uavkms1A5z 6 16-594-569-6627 -6.13450000000000E+002 HOUSEHOLD carefully quiet deposits are furiously among the dependencies. hockey pl

1111 Customer#000001111 gavpg6eW5lEML 6 16-824-312-3537 +2.89221000000000E+003 MACHINERY furiously bold platelets detect furiously above the blithely bold requests. quickly even deposits haggle bli

7219 Customer#000007219 mIzmb6YkWg 6 16-329-315-9893 +2.79539000000000E+003 MACHINERY bold asymptotes across the quickly r

7247 Customer#000007247 7b6HAjAe9vTpxkLFtfgtkUOckl 6 16-751-483-5144 +9.37709000000000E+003 FURNITURE special, stealthy deposits sleep quickly carefully pending deposits. daring

7607 Customer#000007607 8PqELp1J0dlwGQSLmPOM9V1VuBdabpx 6 16-591-416-3072 -1.61080000000000E+002 FURNITURE final asymptotes solve furiously unusual depths. final

7687 Customer#000007687 CnghsaR xSJF9jiZPIfzOaLbPyWwmV9 6 16-367-666-9485 +8.32115000000000E+003 MACHINERY fluffy deposits above the theodolites cajole furiously carefully final

packages. blithely express deposits are caref

10 record(s) selected.

SELECT * FROM TPCD.ORDERS FETCH FIRST 10 ROWS ONLY

O_ORDERKEY O_CUSTKEY O_ORDERSTATUS O_TOTALPRICE O_ORDERDATE O_ORDERPRIORITY O_CLERK O_SHIPPRIORITY O_COMMENT
----------- ----------- ------------- ------------------------ ---------- --------------- --------------- ------------- --
59718 2474884 F +9.11137700000000E+004 01/01/1992 5-LOW Clerk#000089682 0 carefully regular pinto beans across the even grouches dete
183488 11602651 F +2.73218000000000E+005 01/0 1/1992 3-MEDIUM Clerk#000078208 0 slyly regular dependencies sublate furiously. ironic pinto beans wake accor
249668 11578078 F +4.13989400000000E+004 01/01/1992 2-HIGH Clerk#000009012 0 quickly ironic requests sleep after the enticin
302497 13347238 F +2.98668120000000E+005 01/01/1992 1-URGENT Clerk#000060583 0 fluffily final packages haggle. carefully r
334181 2866669 F +9.08873600000000E+004 01/01/1992 2-HIGH Clerk#000020657 0 fluffily pending foxes haggle carefully furiously final pinto beans. s
360261 9374104 F +1.56040000000000E+004 01/01/1992 5-LOW Clerk#000012667 0 express tithes doze stealthily around the final requ
368004 11531287 F +1.00257930000000E+005 01/01/1992 2-HIGH Clerk#000064446 0 slyly unusual theodolites snooze pending instructions! q
391429 12972310 F +2.33916640000000E+005 01/01/1992 5-LOW Clerk#000049202 0 carefully ironic requests affix carefully pend
414725 3497104 F +3.95006600000000E+004 01/01/1992 5-LOW Clerk#000085868 0 sly accounts detect along the slyly express
463072 5425555 F +3.57142130000000E+005 01/01/1992 1-URGENT Clerk#000010196 0 furiously ironic pearls along the slyly bol

10 record(s) selected.

SELECT * FROM TPCD.LINEITEM FETCH FIRST 10 ROWS ONLY

L_ORDERKEY L_PARTKEY L_SUPPKEY L_LINENUMBER L_QUANTITY L_EXTENDEDPRICE L_DISCOUNT L_TAX L_RETURNFLAG L_LINESTATUS L_SHIPDATE L_COMMITDATE L_RECEIPTDATE L_SHIPINSTRUCT L_SHIPMODE L_COMMENT
----------- ----------- ----------- ----------- ------------------------ ------------------------ ------------------------ ------------------------ ------------ ------------ ---------- ---------- ---------- ------------------------- ---------- --
842980 18815585 565640 4 +5.00000000000000E+000 +7.49820000000000E+003 +1.00000000000000E-002 +3.00000000000000E-002 A F 01/02/1992 03/20/1992 01/20/1992 COLLECT COD REG AIR blithely ironic deposits cajole qui
904677 5667759 167770 1 +4.30000000000000E+001 +7.42382100000000E+004 +8.00000000000000E-002 +1.00000000000000E-002 R F 01/02/1992 03/22/1992 01/14/1992 COLLECT COD AIR furiously bold deposits nag
990147 15428936 428937 1 +6.00000000000000E+000 +1.11849600000000E+004 +1.00000000000000E-001 +1.00000000000000E-002 R F 01/02/1992 03/01/1992 01/15/1992 NONE REG AIR fluffily bold instructions after the
1111877 13417648 167688 3 +2.00000000000000E+001 +3.12994000000000E+004 +1.00000000000000E-001 +7.00000000000000E-002 A F 01/02/1992 02/28/1992 01/07/1992 TAKE BACK RETURN FOB blithely unusual packages doze among the
1552449 15930665 180681 2 +2.80000000000000E+001 +4.74563600000000E+004 +8.00000000000000E-002 +6.00000000000000E-002 R F 01/02/1992 03/14/1992 01/05/1992 TAKE BACK RETURN SHIP furiously special request
2167527 1784877 784878 3 +3.90000000000000E+001 +7.65098100000000E+004 +0.00000000000000E+000 +6.00000000000000E-002 R F 01/02/1992 02/18/1992 01/11/1992 TAKE BACK RETURN AIR regular as
2184032 13941960 441987 5 +1.40000000000000E+001 +2.80177800000000E+004 +6.00000000000000E-002 +2.00000000000000E-002 A F 01/02/1992 02/25/1992 01/15/1992 DELIVER IN PERSON RAIL slyly ironic requests doze
3973414 13170253 670280 3 +2.40000000000000E+001 +3.17424000000000E+004 +0.00000000000000E+0 00 +0.00000000000000E+000 R F 01/02/1992 03/05/1992 01/20/1992 TAKE BACK RETURN REG AIR slyly unusual
4363238 9548863 798873 6 +3.50000000000000E+001 +6.68986500000000E+004 +7.00000000000000E-002 +3.00000000000000E-002 R F 01/02/1992 03/05/1992 01/28/1992 TAKE BACK RETURN REG AIR ironic, express deposits nag. furiously
8865731 10154483 904514 1 +3.90000000000000E+001 +5.99422200000000E+004 +3.00000000000000E-002 +2.00000000000000E-002 R F 01/02/1992 02/01/1992 01/15/1992 NONE REG AIR slyly even instruc

10 record(s) selected.

Query Substitution Parameters

"Power stream Seed = 403132605"
-- TPC TPC-H Parameter Substitution (Version 1.3.0)
-- using 403132605 as a seed to the RNG
Q1 DELTA 71
Q2 SIZE 45
TYPE COPPER
REGION AMERICA
Q3 SEGMENT FURNITURE
DATE 1995-03-09
Q4 DATE 1994-06-01
Q5 REGION AFRICA
DATE 1996-01-01
Q6 DATE 1996-01-01
DISCOUNT 0.08

QUANTITY 25
Q7 NATION1 CHINA
NATION2 MOZAMBIQUE
Q8 NATION MOZAMBIQUE
REGION AFRICA
TYPE STANDARD ANODIZED BRASS
Q9 NAME antique
Q10 DATE 1994-02-01
Q11 NATION CANADA
FRACTION 0.0000010000
Q12 SHIPMODE1 MAIL
SHIPMODE2 SHIP
DATE 1994-01-01
Q13 WORD1 express
WORD2 packages
Q14 DATE 1994-02-01
Q15 DATE 1996-12-01
Q16 BRAND Brand#35
TYPE ECONOMY BRUSHED
SIZE1 7
SIZE2 10
SIZE3 15
SIZE4 16
SIZE5 46
SIZE6 42
SIZE7 31
SIZE8 49
Q17 BRAND Brand#51
CONTAINER LG PKG
Q18 QUANTITY 312
Q19 BRAND1 Brand#23
BRAND2 Brand#32
BRAND3 Brand#55
QUANTITY1 8
QUANTITY2 20
QUANTITY3 28
Q20 NAME khaki
DATE 1995-01-01
NATION GERMANY
Q21 NATION KENYA
Q22 I1 27
I2 21
I3 30
I4 28
I5 34
I6 13
I7 12

"Throughput stream 1 = 403132606 "
-- TPC TPC-H Parameter Substitution (Version 1.3.0)
-- using 403132606 as a seed to the RNG
Q1 DELTA 79
Q2 SIZE 33
TYPE STEEL
REGION MIDDLE EAST
Q3 SEGMENT MACHINERY
DATE 1995-03-26
Q4 DATE 1996-12-01
Q5 REGION AMERICA
DATE 1996-01-01
Q6 DATE 1996-01-01
DISCOUNT 0.05
QUANTITY 24
Q7 NATION1 IRAN
NATION2 INDIA
Q8 NATION INDIA
REGION ASIA
TYPE PROMO POLISHED BRASS
Q9 NAME turquoise
Q10 DATE 1994-11-01
Q11 NATION MOZAMBIQUE
FRACTION 0.0000010000
Q12 SHIPMODE1 TRUCK
SHIPMODE2 REG AIR
DATE 1994-01-01
Q13 WORD1 special
WORD2 requests
Q14 DATE 1994-05-01
Q15 DATE 1994-09-01
Q16 BRAND Brand#25
TYPE SMALL ANODIZED
SIZE1 25
SIZE2 13
SIZE3 14
SIZE4 8
SIZE5 39
SIZE6 3
SIZE7 15
SIZE8 46
Q17 BRAND Brand# 53
CONTAINER MED CASE
Q18 QUANTITY 313
Q19 BRAND1 Brand#35
BRAND2 Brand#25
BRAND3 Brand#54
QUANTITY1 3
QUANTITY2 10
QUANTITY3 24
Q20 NAME sky
DATE 1994-01-01
NATION RUSSIA
Q21 NATION FRANCE
Q22 I1 13
I2 14
I3 21
I4 30
I5 18
I6 19
I7 11

"Throughput stream 2 = 403132607 "
-- TPC TPC-H Parameter Substitution (Version 1.3.0)
-- using 403132607 as a seed to the RNG
Q1 DELTA 87
Q2 SIZE 20
TYPE BRASS
REGION AMERICA
Q3 SEGMENT BUILDING
DATE 1995-03-11
Q4 DATE 1994-09-01
Q5 REGION EUROPE
DATE 1996-01-01
Q6 DATE 1996-01-01
DISCOUNT 0.02
QUANTITY 24
Q7 NATION1 BRAZIL
NATION2 ALGERIA
Q8 NATION ALGERIA
REGION AFRICA
TYPE PROMO BURNISHED BRASS
Q9 NAME turquoise

Q10 DATE 1994-11-01
Q11 NATION MOZAMBIQUE
FRACTION 0.0000010000
Q12 SHIPMODE1 TRUCK
SHIPMODE2 REG AIR
DATE 1994-01-01
Q13 WORD1 special
WORD2 requests
Q14 DATE 1994-08-01
Q15 DATE 1997-04-01
Q16 BRAND Brand#55
TYPE LARGE PLATED
SIZE1 24
SIZE2 3
SIZE3 32
SIZE4 25
SIZE5 16
SIZE6 27
SIZE7 41
SIZE8 15
Q17 BRAND Brand#55
CONTAINER MED BAG
Q18 QUANTITY 315
Q19 BRAND1 Brand#32
BRAND2 Brand#53
BRAND3 Brand#43
QUANTITY1 9
QUANTITY2 11
QUANTITY3 20
Q20 NAME dodger
DATE 1997-01-01
NATION JAPAN
Q21 NATION UNITED KINGDOM
Q22 I1 15
I2 29
I3 10
I4 21
I5 17
I6 16
I7 22

"Throughput stream 3 Seed = 403132608"
-- TPC TPC-H Parameter Substitution (Version 1.3.0)
-- using 403132608 as a seed to the RNG
Q1 DELTA 95
Q2 SIZE 8
TYPE NICKEL
REGION MIDDLE EAST
Q3 SEGMENT MACHINERY
DATE 1995-03-28
Q4 DATE 1997-04-01
Q5 REGION MIDDLE EAST
DATE 1997-01-01
Q6 DATE 1997-01-01
DISCOUNT 0.08
QUANTITY 25
Q7 NATION1 ROMANIA
NATION2 PERU
Q8 NATION PERU
REGION AMERICA
TYPE ECONOMY BRUSHED BRASS
Q9 NAME sandy
Q10 DATE 1994-06-01
Q11 NATION PERU
FRACTION 0.0000010000
Q12 SHIPMODE1 REG AIR
SHIPMODE2 RAIL
DATE 1994-01-01
Q13 WORD1 special
WORD2 requests
Q14 DATE 1994-11-01
Q15 DATE 1995-01-01
Q16 BRAND Brand#35
TYPE SMALL PLATED
SIZE1 27
SIZE2 35
SIZE3 29
SIZE4 36
SIZE5 2
SIZE6 19
SIZE7 7
SIZE8 13
Q17 BRAND Brand#52
CONTAINER MED PKG
Q18 QUANTITY 312
Q19 BRAND1 Brand#34
BRAND2 Brand#41
BRAND3 Brand#42
QUANTITY 4
QUANTITY 12
QUANTITY 27
Q20 NAME peru
SHIPDATE 1996-01-01
NATION BRAZIL
Q21 NATION MOROCCO
Q22 I1 12
I2 13
I3 19
I4 15
I5 21
I6 34
I7 26

"Throughput stream 4 = 403132609"
-- TPC TPC-H Parameter Substitution (Version 1.3.0)
-- using 403132609 as a seed to the RNG
Q1 DELTA 103
Q2 SIZE 46
TYPE TIN
REGION ASIA
Q3 SEGMENT BUILDING
DATE 1995-03-13
Q4 DATE 1995-01-01
Q5 REGION AFRICA
DATE 1997-01-01
Q6 DATE 1997-01-01
DISCOUNT 0.05
QUANTITY 24
Q7 NATION1 IRAQ
NATION2 INDONESIA
Q8 NATION INDONESIA
REGION ASIA
TYPE ECONOMY PLATED STEEL
Q9 NAME red
Q10 DATE 1993-03-01
Q11 NATION ETHIOPIA
FRACTION 0.0000010000
Q12 SHIPMODE1 SHIP
SHIPMODE2 REG AIR
DATE 1995-01-01
Q13 WORD1 special

WORD2 requests
Q14 DATE 1995-03-01
Q15 DATE 1997-07-01
Q16 BRAND Brand#25
TYPE LARGE POLISHED
SIZE1 31
SIZE2 6
SIZE3 17
SIZE4 14
SIZE5 32
SIZE6 12
SIZE7 35
SIZE8 18
Q17 BRAND Brand#54
CONTAINER JUMBO CASE
Q18 QUANTITY 314
Q19 BRAND1 Brand#41
BRAND2 Brand#24
BRAND3 Brand#42
QUANTITY1 9
QUANTITY2 13
QUANTITY3 23
Q20 NAME blush
SHIPDATE 1994-01-01
NATION MOZAMBIQUE
Q21 NATION INDIA
Q22 I1 26
I2 12
I3 15
I4 31
I5 18
I6 14
I7 1

"Throughput stream 5 = 403132610"
-- TPC TPC-H Parameter Substitution (Version 1.3.0)
-- using 403132610 as a seed to the RNG
Q1 DELTA 111
Q2 SIZE 34
TYPE STELL
REGION MIDDLE EAST
Q3 SEGMENT HOUSEHOLD
DATE 1995-03-30
Q4 DATE 1997-08-01
Q5 REGION AMERICA
DATE 1997-01-01
Q6 DATE 1997-01-01
DISCOUNT 0.03
QUANTITY 24
Q7 NATION1 CANADA
NATION2 ARGENTINA
Q8 NATION ARGENTINA
REGION AMERICA
TYPE ECONOMY ECONOMY ANODIZED STEEL
Q9 NAME peru
Q10 DATE 1993-12-01
Q11 NATION CHINA
FRACTION 0.0000010000
Q12 SHIPMODE1 FOB
SHIPMODE2 AIR
DATE 1995-01-01
Q13 WORD1 special
WORD2 requests
Q14 DATE 1995-06-01
Q15 DATE 1995-04-01
Q16 BRAND Brand#55
TYPE STANDARD ANODIZED
SIZE1 10
SIZE2 35
SIZE3 2
SIZE4 13
SIZE5 28
SIZE6 14
SIZE7 20
SIZE8 22
Q17 BRAND Brand#51
CONTAINER JUMBO BAG
Q18 QUANTITY 312
Q19 BRAND1 Brand#43
BRAND2 Brand#12
BRAND3 Brand#31
QUANTITY1 4
QUANTITY2 14
QUANTITY3 20
Q20 NAME magenta
SHIPDATE 1993-01-01
NATION FRANCE
Q21 NATION ALGERIA
Q22 I1 27
I2 24
I3 23
I4 19
I5 20
I6 16
I7 11

Appendix D: Driver Source Code

Doutfload_v8.bat

```
REM Takes UFtype and update_pair as parameters.
set RAHSLEEPTIME=999999
perl %1\load_UF%2_data_v8 %3
```

load_UF1_data_V8

```
:  # -*-Perl-*-
eval 'exec perl5 -S $0 ${1+"$@"}' # Horrible kludge to
convert this
   if 0;                    # into a "portable" perl script

# usage  perl loadUFD [update pair number]

push(@INC, split(':', $ENV{'PATH'}));

# Get TPC-D specific environment variables
require 'getvars';

# Use the macros in here so that they can handle the platform
differences.
# macro.pl should be sourced from cmvc, other people wrote
and maintain it.
require "macro.pl";

# Make output unbuffered.
select(STDOUT);
$| = 1 ;

if (length($ENV{"TPCD_AUDIT_DIR"}) <= 0)
{
  die "TPCD_AUDIT_DIR environment variable not set\n";
}
if (length($ENV{"TPCD_DBNAME"}) <= 0)
{
  die "TPCD_DBNAME environment variable not set \n";
}
if (length($ENV{"TPCD_SF"}) <= 0)
{
  die "TPCD_SF environment variable not set\n";
}
if (length($ENV{"TPCD_PLATFORM"}) <= 0)
{
  die "TPCD_PLATFORM environment variable not set\n";
}
if (length($ENV{"TPCD_PATH_DELIM"}) <= 0)
{
  die "TPCD_PATH_DELIM environment variable not set\n";
}
if (length($ENV{"TPCD_PRODUCT"}) <= 0)
{
  die "TPCD_PRODUCT environment variable not set\n";
}
if (length($ENV{"TPCD_AUDIT"}) <= 0)
{
   die "Must set TPCD_AUDIT env't var.  Real audit timing
sequence run if yes\n";
}
if (length($ENV{"TPCD_PHYS_NODE"}) <= 0)
{
   die "TPCD_PHYS_NODE env't var not set\n";
}

#set up local variables
$auditDir=$ENV{"TPCD_AUDIT_DIR"};
$dbname=$ENV{"TPCD_DBNAME"};
$sf=$ENV{"TPCD_SF"};
$platform=$ENV{"TPCD_PLATFORM"};
$delim=$ENV{"TPCD_PATH_DELIM"};
$gatherstats=$ENV{"TPCD_GATHER_STATS"};
$product=$ENV{"TPCD_PRODUCT"};
$RealAudit=$ENV{"TPCD_AUDIT"};
$inlistmax=$ENV{"TPCD_INLISTMAX"};
$pn=$ENV{"TPCD_PHYS_NODE"};
$flatfilepath=$ENV{"TPCD_FLATFILES"};
$tmpPath=$ENV{"TPCD_TEMP"};
$coldel="|";
$dblquote="";

$PairNum=$ARGV[0];
#DJD $current_node=$ARGV[1];
#DJD print("current_node=$current_node \n");
#DJD for ($i=0, $nodestr="000"; $i<$current_node;
$i++,$nodestr++) {};

print "Beginning ....Preload of Update Function Data.
Lineitem \n";
system("db2 connect to tpcd");
$str="db2 \" load from  ";
$str="$str$flatfilepath${delim}lineitem.tbl.new.u" ;
$str="$str$PairNum";
$str="$str of del modified by coldel| fastparse messages
$tmpPath${delim}line.msg.u";
$str="$str$PairNum replace into
TPCDTEMP.LINEITEM_NEW statistics no nonrecoverable
CPU_PARALLELISM 8";
$str="$str partitioned db config mode load_only
partitioning_dbpartnums (0,1,2,3)";
$str="$str part_file_location $flatfilepath \" " ;

print "$str \n";
$ret=system($str);
system("db2 commit");
if ($ret == 0)
{
   print "Preload Lineitem updates completed
successfully.\n";
}
else
{
   print "Preload Lineitem updates failed. ret=$ret\n";
   exit -1;
}

print "Beginning ....Preload of Update Function Data. Orders
\n";
#system("db2 connect to tpcd");
$str="db2 \" load from  ";
$str="$str$flatfilepath${delim}order.tbl.new.u";
$str="$str$PairNum";
$str="$str of del modified by coldel| fastparse messages
$tmpPath${delim}order.msg.u";
$str="$str$PairNum replace into
TPCDTEMP.ORDERS_NEW statistics no nonrecoverable
CPU_PARALLELISM 8";
$str="$str partitioned db config mode load_only
output_dbpartnums (0,1,2,3)";
$str="$str part_file_location $flatfilepath \" " ;
```

```
print "$str \n";
$ret=system($str);
system("db2 commit");
if ($ret == 0)
{
   print "Preload Orders updates completed successfully.\n";
}
else
{
   print "Preload Orders updates failed. ret=$ret\n";
    exit -1;
}
```

load_UF2_data_V8

```
:  # -*-Perl-*-
eval 'exec perl5 -S $0 ${1+"$@"}' # Horrible kludge to
convert this
   if 0;                        # into a "portable" perl script

# usage  perl loadUFD [update pair number] [nodenumber]

push(@INC, split(':', $ENV{'PATH'}));

# Get TPC-D specific environment variables
require 'getvars';

# Use the macros in here so that they can handle the platform
differences.
# macro.pl should be sourced from cmvc, other people wrote
and maintain it.
require "macro.pl";

# Make output unbuffered.
select(STDOUT);
$| = 1 ;

if (length($ENV{"TPCD_AUDIT_DIR"}) <= 0)
{
 die "TPCD_AUDIT_DIR environment variable not set\n";
}
if (length($ENV{"TPCD_DBNAME"}) <= 0)
{
 die "TPCD_DBNAME environment variable not set \n";
}
if (length($ENV{"TPCD_SF"}) <= 0)
{
 die "TPCD_SF environment variable not set\n";
}
if (length($ENV{"TPCD_PLATFORM"}) <= 0)
{
 die "TPCD_PLATFORM environment variable not set\n";
}
if (length($ENV{"TPCD_PATH_DELIM"}) <= 0)
{
 die "TPCD_PATH_DELIM environment variable not set\n";
}
if (length($ENV{"TPCD_PRODUCT"}) <= 0)
{
 die "TPCD_PRODUCT environment variable not set\n";
}
if (length($ENV{"TPCD_AUDIT"}) <= 0)
{
   die "Must set TPCD_AUDIT env't var.  Real audit timing
sequence run if yes\n";
}
if (length($ENV{"TPCD_PHYS_ NODE"}) <= 0)
{
   die "TPCD_PHYS_NODE env't var not set\n";
}

#set up local variables
$auditDir=$ENV{"TPCD_AUDIT_DIR"};
$dbname=$ENV{"TPCD_DBNAME"};
$sf=$ENV{"TPCD_SF"};
$platform=$ENV{"TPCD_PLATFORM"};
$delim=$ENV{"TPCD_PATH_DELIM"};
$gatherstats=$ENV{ "TPCD_GATHER_STATS"};
$product=$ENV{"TPCD_PRODUCT"};
$RealAudit=$ENV{"TPCD_AUDIT"};
$inlistmax=$ENV{"TPCD_INLISTMAX"};
$pn=$ENV{"TPCD_PHYS_NODE"};
$flatfilepath=$ENV{"TPCD_FLATFILES"};
$tmpPath=$ENV{"TPCD_TEMP"};
$coldel="|";
$dblquote="";

$PairNum=$ARGV[0];
#DJD $current_node=$ARGV[1];
#DJD print("current_node=$current_node \n");
#DJD for ($i=0, $nodestr="000"; $i<$current_node;
$i++,$nodestr++) {};

print "Beginning ....Preload of Update Function Data. Deletes
\n";
system("db2 connect to tpcd");
$str="db2 \" load from  ";
$str="$str$flatfilepath${delim}delete.new." ;
$str="$str$PairNum";
$str="$str of del modified by coldel| fastparse messages
$tmpPath${delim}del.msg.u";
$str="$str$PairNum replace into
TPCDTEMP.ORDERS_DEL statistics no nonrecoverable
CPU_PARALLELISM 8";
$str="$str partitioned db config mode load_only
output_dbpartnums (0,1,2,3)";
$str="$str part_file_location $flatfilepath \" " ;

print "$str \n";
$ret=system($str);
system("db2 commit");
if ($ret == 0)
{
   print "Preload Deletes updates completed successfully.\n";
}
else
{
   print "Preload Deletes updates failed. ret=$ret \n";
    exit -1;
}
```

LoadSampleUFData

```
#!/usr/bin/perl
# usage  LoadSampleUFData

($myName = $0) =~ s@.*/@@; $usage="
Usage: loadata [nodenumber] [source dir]
      nodenumber = local node number
      source dir = source dir to load data from\n";

die $usage if (@ARGV > 2);

push(@INC, split(':', $ENV{'PATH'}));

# Get TPC-D specific environment variables
require 'getvars';
```

```
# Use the macros in here so that they can handle the platform
differences.
# macro.pl should be sourced from cmvc, other people wrote
and maintain it.
require "macro.pl";

if (length($ENV{"TPCD_DDLPATH"}) <= 0)
{
   die "TPCD_DDLPATH not set!\n";
}
$ddlpath=$ENV{"TPCD_DDLPATH"};

# Make output unbuffered. I'm not sure why we would want
to do this but many
# of the fvt testcases do it.
select(STDOUT);
$| = 1 ;

open(OUTFILE, ">temp_UF_load.bat");
print OUTFILE "set RAHSLEEPTIME=999999\n";
print OUTFILE "db2 connect to tpcd\n";
print OUTFILE "perl $ddlpath\\load_UF1_data_v8 32\n";
print OUTFILE "perl $ddlpath\\load_UF2_data_v8 32\n";
print OUTFILE "call $ddlpath\\runstats_uf\n";
close(OUTFILE);
system("temp_UF_load.bat");
1;
```

runpower

```
:  # -*-Perl-*-
eval 'exec perl5 -S $0 ${1+"$@"}' # Horrible kludge to
convert this
   if 0;                    # into a "portable" perl script

# usage  runpower [UF] [-emon <counter file>]
# where UF is the optional parameter that says to run the
power test
# with the update functions.  By default, the update functions
are not
# run

push(@INC, split(':', $ENV{'PATH'}));

# Get TPC-D specific environment variables
require 'getvars';

# Use the macros in here so that they can handle the platform
differences.
# macro.pl should be sourced from cmvc, other people wrote
and maintain it.
require "macro.pl";
require "tpcdmacro.pl";

# Make output unbuffered.
select(STDOUT);
$| = 1 ;

if (@ARGV > 0)
{
   $runUF=$ARGV[0];
}
else
{
   $runUF="no";
}

if (length($ENV{"TPCD_AUDIT_DIR"}) <= 0)
{
  die "TPCD_AUDIT_DIR environment variable not set\n";
}
if (length($ENV{"TPCD_RUN_DIR"}) <= 0)
{
  die "TPCD_RUN_DIR environment variable not set\n";
}
if (length($ENV{"TPCD_DBNAME"}) <= 0)
{
  die "TPCD_DBNAME environment variable not set\n";
}
if (length($ENV{"TPCD_RUNNUMBER"}) <= 0)
{
  die "TPCD_RUNNUMBER environment variable not set\n";
}
if (length($ENV{"TPCD_SF"}) <= 0)
{
  die "TPCD_SF environment variable not set\n";
}
if (length($ENV{"TPCD_PLATFORM"}) <= 0)
{
  die "TPCD_PLATFORM environment variable not set\n";
}
if (length($ENV{"TPCD_PATH_DELIM"}) <= 0)
{
  die "TPCD_PATH_DELIM environment variable not set\n";
}
if (length($ENV{"TPCD_PRODUCT"}) <= 0)
{
  die "TPCD_PRODUCT environment variable not set\n";
}
if (length($ENV{"TPCD_AUDIT"}) <= 0)
{
   die "Must set TPCD_AUDIT env't var.  Real audit timing
sequence run if yes\n";
}
if (length($ENV{"TPCD_PHYS_NODE"}) <= 0)
{
   die "TPCD_PHYS_NODE env't var not set\n";
}
if (length($ENV{"TPCD_LOG_DIR"}) <= 0)
{
   $ENV{"TPCD_LOG_DIR"} = "NULL";
}
if (length($ENV{"TPCD_MODE"}) <= 0)
{
  die "TPCD_MODE environment variable not set -
uni/smp/mln \n";
}
if (length($ENV{"TPCD_ROOTPRIV"}) <= 0)
{
  die "TPCD_ROOTPRIV environment variable not set -
yes/no \n";
}

#set up local variables
$runNum=$ENV{"TPCD_RUNNUMBER"};
$runDir=$ENV{"TPCD_RUN_DIR"};
$auditDir=$ENV{"TPCD_AUDIT_DIR"};
$dbname=$ENV{"TPCD_DBNAME"};
$sf=$ENV{"TPCD_SF"};
$platform=$ENV{"TPCD_PLATFORM"};
$delim=$ENV{"TPCD_PATH_DELIM"};
$gatherstats=$ENV{"TPCD_GATHER_STATS"};
$product=$ENV{"TPCD_PRODUCT"};
$RealAudit=$ENV{"TPCD_AUDIT"};
$inlistmax=$ENV{"TPCD_INLISTMAX"};
$pn=$ENV{"TPCD_PHYS_NODE"};
$logDir=$ENV{"TPCD_LOG_DIR"};
$rootPriv=$ENV{"TPCD_ROOTPRIV"};
```

```
$mode=$ENV{"TPCD_MODE"};
if (( $mode eq "uni" ) || ( $mode eq "smp" ))
{
  $all_ln="once";
  $all_pn="once";
  $once="once";
}
else
{
  $all_ln="all_ln";
  $all_pn="all_pn";
  $once="once";
}

if ($inlistmax eq "default")
{
  $inlistmax = 400;
}

# the auditruns directory is where we have already generate
the sql files for the
# updates and the power tests

# append isolation level information about tpcdbatch to the
miso file
# the miso file is created here but appended to for power and
throughput
# information

$misofile="$runDir${delim}miso$runNum";
if ( -e $misofile )
{
    &rm("$misofile");
}
# if we are in real audit mode then we must start the db
manager now since
# there must be no activity on the database between the time
the build script
# has finished and the time the power test is started
if ( $RealAudit eq "yes" )
{
    system("db2start");
    system("db2 activate database $dbname");
            sleep 10;
}

# do not activate the database
#if ( $RealAudit ne "yes" )
#{
#    system("db2 activate database $dbname");
#}

# Report current log info to the run# directory in a file called
startLog.Info

# DJD system("perl getLogInfo.pl startLog");

system("getLog.bat startlog");

open(MISO, ">$misofile") || die "Can't open $misofile: $!\n";
$curTs = `perl gettimestamp "long"`;
print MISO "Timestamp and isolation level of tpcdbatch
before power run at : $curTs\n";
close(MISO);
if ( $product eq "pe" )
{
    system("db2 \"connect to $dbname\"; db2 \"select
name,creator,valid,unique_id,isolation from sysibm.sysplan
where name like 'TPCD%'\"; db2 connect reset; db2
terminate  >> $runDir${delim}miso$runNum ");
}
else
{
    &verifyTPCDbatch("$misofile","$dbname");
}

if ($platform eq "aix")
{

  # Create the sysunused file.  This reports what disks are
attached, and which
  # ones are being used.  Its use spans both the runpower and
runthroughtput tests
  system("echo \"The following disks are assigned to the
indicated volume groups\" > $runDir/sysunused$runNum")
&& die "cannot create $runDir/sysunused$runNum";

  system("lspv >> $runDir/sysunused$runNum");
  system("echo \"The following volume groups are currently
online\" >> $runDir/sysunused$runNum");
  $curTs = `perl gettimestamp "long"`;
  system("echo \"$curTs\" >> $runDir/sysunused$runNum");
  system("lsvg -o >> $runDir/sysunused$runNum");
  # show the disks that are used/unused
  system("getdisks \"Before the start of the Power Test\"");

}
else
{
  # for all other platforms
  system("echo Assume that all portions of the system are
used >> $runDir${delim}sysunused$runNum");
}

&getConfig("p");
if ( $rootPriv eq "yes" )
{
    # get the o/s tuning parameters...currently AIX only and
only if your
    # user has root privileges to run this
    &getOSTune("p");
}

if ($gatherstats eq "on")
{
    # gather vm io and net stats
    if ($platform eq "aix" || $platform eq "sun" || $platform eq
"ptx")
    {
      # gather vmstats and iostats (and net st ats if in mpp mode)
      system("perl getstats p &");
    }
    else
    {
                        # added to activate monitoring
       print "Stats gather not set up for current platform
$platform\n";
    }
}

# print to screen what type of run is running and set variables
to run
# the query and update streams in parallel
if ($runUF ne "UF")
{
    $semcontrol = "off";
    print "Beginning power stream....no update functions\n";

    $streamEx = "";
    $streamExNT = "";
```

```
}
else
{
   $semcontrol = "on";
   print "Beginning power stream....with update functions\n";
   if ( $platform eq "nt" )
   {
     $streamExNT = "start /b";
     $streamEx = "";
   }
   else
   {
     $streamExNT = "";
     $streamEx = "&";
   }
}

system("db2 connect to $dbname");

# bbe This new line (below) runs queries for power test
#printf("$streamExNT
$auditDir${delim}auditruns${delim}tpcdbatch -d $dbname -
f $runDir${delim}qtextpow.sql -r on -b on -s $sf -u p1 -m
$inlistmax -n 0 -l
$auditDir${delim}auditruns${delim}querytext${delim}strea
mpow.list -p $semcontrol $streamEx\n");
$ret=system("$streamExNT
$auditDir${delim}auditruns${delim}tpcdbatch -d $dbname -
f $runDir${delim}qtextpow.sql -r on -b on -s $sf -u p1 -m
$inlistmax -n 0 -l
$auditDir${delim}auditruns${delim}querytext${delim}strea
mpow.list -p $semcontrol $streamEx");

if ( $monitor eq "yes" )
{
   $curTs = `perl gettimestamp "short"`;
   # grab the db and dbm snapshot before we deactivate
   system("db2 get snapshot for all on $dbname >
$runDir${delim}power$runNum.snap.$curTs");
   system("db2 get snapshot for database manager >>
$runDir${delim}power$runNum.snap.$curTs");
}

if ( $runUF eq "UF" )
{
  $ret2 =
system("$auditDir${delim}auditruns${delim}tpcdbatch -d
$dbname -f $runDir${delim}qtextquf.sql -r on -b on -s $sf -u
p2 -m $inlistmax -n 0 -l
$auditDir${delim}auditruns${delim}querytext${delim}strea
mpuf.list");
}
else
{
   $ret2 = 0; # If UFs were not running, then the stream
cannot fail
}

if (($ret2 == 0) && ($ret == 0))
{
   print "Power stream completed succesfully.\n";
}
else
{
   print "Power stream failed. ret=$ret\n";
}

if ($platform eq "aix")
{
   # show that the same disks are still used or unused
   system("getdisks \"After completion of the Power Test\"");

   #clean up
}
if ($gatherstats eq "on")
{
   # gather vm io and net stats
   if ($platform eq "aix" || $platform eq "sun" || $platform eq
"ptx")
   {
     # kill the stats that were being gathered
      if ($platform eq "ptx")
      {
        $rc= `perl5 zap "-f" "sar"`;
        $rc= `perl5 zap "-f" "sadc"`;
      }
      else
      {
        $rc= `perl5 zap "-f" "vmstat"`;
        $rc= `perl5 zap "-f" "iostat"`;
      }
      if ( $pn > 1 )
      {
        $rc= `perl5 zap "-f" "netstat"`;
      }
      $rc= `perl5 zap "-f" "getstats"`;
   }
}

#if ( $RealAudit ne "yes" )
#{
#    $curTs = `perl gettimestamp "short"`;
#    # grab the db and dbm snapshot before we deactivate
#    system("db2 get snapshot for all on $dbname >
$runDir${delim}dbrun$runNum.snap.$curTs");
#    system("db2 get snapshot for database manager >>
$runDir${delim}dbrun$runNum.snap.$curTs");
#}

# TS: Moved from above the previous "if" statement to after.
open(MISO, ">>$misofile") || die "Can't open $misofile:
$!\n";
$curTs = `perl gettimestamp "long"`;
print MISO "Timestamp and isolation level of tpcdbatch after
power run at : $curTs\n";
close(MISO);

if ( $product eq "pe" )
{
   system("db2 \"connect to $dbname\"; db2 \"select
name,creator,valid,unique_id,isolation from sysibm.sysplan
where name like 'TPCD%'\";db2 connect reset;db2 terminate
>> $runDir${delim}miso$runNum");
}
else
{
   &verifyTPCDbatch("$misofile","$dbname");
}

######################

# now copy the reports from the count of streams files into
one final file
&cat("$runDir${delim}pstrcnt*","$runDir${delim}mpstrcnt
$runNum");
#(NOTE: there is a dependancy that this mpstrcnt file exist
before the
# calcmetrics.pl script is called, both because it is used as
input for
```

```
# calcmetrics.pl, and because the output from calcmetrics is
used as
# the trigger for watchstreams to complete, and watchstreams
cats its
# output at the end of the mstrcnt file.

# generate the mpinter?.metrics file in the run directory
#require 'calcmetricsp.pl';
if ( $runUF eq "UF")
{
  system("perl calcmetricsp.pl UF");
}
else
{
   system("perl calcmetricsp.pl");
}

# concatenate all the throughput inter files that were used to
# generate these results into the calcmetrics output file
(mpinterX.metrics)
#cd $TPCD_RUN_DIR
&cat("$runDir${delim}mpqinter*","$runDir${delim}mpinte
r$runNum.metrics");

if ($runUF eq "UF") {

&cat("$runDir${delim}mpufinter*","$runDir${delim}mpint
er$runNum.metrics");
}

#if ($runUF eq "no") {
#  &rm("$runDir${delim}mpuf*");
#}

######################

# no longer activate/deactivate the database
#if ( $RealAudit ne "yes" )
#{
#    # deactivate the database
#    system("db2 deactivate database $dbname");
#}

# do not stop the database after the power test
#if ( $RealAudit ne "yes" )
#{
#    system("db2stop");
#}

1;

sub getConfig
{
  $testtype=$_[0];
  print "Getting database configuration.\n";

$dbtunefile="$runDir${delim}m${testtype}dbtune${runNu
m}";
  open(DBTUNE, ">$dbtunefile") || die "Can't open
$dbtunefile: $!\n";
  $timestamp=`perl gettimestamp "long"`;
  print DBTUNE "Database and Database manager
configuration taken at : $timestamp";
  close(DBTUNE);
  system("db2start >> $dbtunefile");
  system("db2level >> $dbtunefile");
  system("db2 get database configuration for $dbname >>
$dbtunefile");
  system("db2 get database manager configuration >>
$dbtunefile");
  system("db2set >> $dbtunefile");
  if (( $mode eq "mln" ) || ( $mode eq "mpp"))
  {
     $cfgfile="$runDir${delim}dbtune${runNum}.mln";
     system("db2_all db2 get db cfg for $dbname > $cfgfile");
#    system("db2_all db2 terminate");
     system("db2 get dbm cfg >> $cfgfile");
     system("db2set >> $cfgfile");
#    printf("db2_all '||\" typeset -i ln=##; db2 get db cfg for
$dbname > $cfgfile\${ln} ; db2 get dbm cfg >>
$cfgfile\${ln}; db2set >> $cfgfile\${ln}; db2 terminate '");
#    system("db2_all '||\" typeset -i ln=##; db2 get db cfg for
$dbname > $cfgfile\${ln} ; db2 get dbm cfg >>
$cfgfile\${ln}; db2set >> $cfgfile\${ln}; db2 terminate '");
  }
}

sub getOSTune
{
  $testtype=$_[0];
  if ( $platform eq "aix" )
  {
     print "Getting OS and VMdatabase configuration.\n";

$ostunefile="$runDir${delim}m${testtype}ostune${runNum
}";
     open(OSTUNE, ">$ostunefile") || die "Can't open
$ostunefile: $!\n";
     $timestamp=`perl gettimestamp "long"`;
     print OSTUNE "Operating System and Virtual Memory
configuration taken at : $timestamp";
     close(OSTUNE);

system("${delim}usr${delim}samples${delim}kernel${deli
m}schedtune >> $ostunefile");

system("${delim}usr${delim}samples${delim}kernel${deli
m}vmtune >> $ostunefile");
  }
  else
  {
     print "OS parameters retrieval not supported for
$platform \n";
  }
}

sub verifyTPCDbatch
{
  $logfile=$_[0];
  $dbname=$_[1];
  $file="verifytpcdbatch.clp";
  open(VERTBL, ">$file") || die "Can't open $file: $!\n";
  print VERTBL "connect to $dbname;\n";
  print VERTBL "select
name,creator,valid,last_bind_time,isolation from
sysibm.sysplan where name like 'TPCD%';\n";
  print VERTBL "connect reset;\n";
  print VERTBL "terminate;\n";
  close(VERTBL);
  system("db2 -vtf $file >> $logfile");
}
```

runthroughput

```
:   # -*-Perl-*-
eval 'exec perl5 -S $0 ${1+"$@"}' # Horrible kludge to
convert this
    if 0;                    # into a "portable" perl script
```

```
# usage  runthroughput [UF]
# where UF is the optional parameter that says to run the
throughput test
# with the update functions.  By default, the update functions
are not
# run
# If UF is not supplied and a number is supplied, then that
number is taken
# as the number of concurrent throughput streams to run.
This is also optional

push(@INC, split(':', $ENV{'PATH'}));

# Get TPC-D specific environment variables
require 'getvars';

# Use the macros in here so that they can handle the platform
differences.
# macro.pl should be sourced from cmvc, other people wrote
and maintain it.
require "macro.pl";
require "tpcdmacro.pl";

$runUF="no";
if (@ARGV > 0)
{
  if ($ARGV[0] eq "UF")
  {
    $runUF=$ARGV[0];
  }
}

if (length($ENV{"TPCD_AUDIT_DIR"}) <= 0)
{
  die "TPCD_AUDIT_DIR environment variable not set\n";
}
if (length($ENV{"TPCD_RUN_DIR"}) <= 0)
{
  die "TPCD_RUN_DIR environment variable not set \n";
}
if (length($ENV{"TPCD_DBNAME"}) <= 0)
{
  die "TPCD_DBNAME environment variable not set \n";
}
if (length($ENV{"TPCD_RUNNUMBER"}) <= 0)
{
  die "TPCD_RUNNUMBER environment variable not set\n";
}
if (length($ENV{"TPCD_NUMSTREAM"}) <= 0)
{
  die "TPCD_NUMSTREAM environment variable not set\n";
}
if (length($ENV{"TPCD_RUN_ON_MULTIPLE_NODES"})
<= 0)
{
  die "TPCD_RUN_ON_MULTIPLE_NODES environment
variable not set\n";
}
if (length($ENV{"TPCD_SF"}) <= 0)
{
  die "TPCD_SF environment variable not set\n";
}
if (length($ENV{"TPCD_PRODUCT"}) <= 0)
{
  die "TPCD_PRODUCT environment variable not set\n";
}
if (length($ENV{"TPCD_PLATFORM"}) <= 0)
{
  die "TPCD_PLATFORM environment variable not set\n";
}
if (length($ENV{"TPCD_AUDIT"}) <= 0)
{
   die "Must set TPCD_AUDIT env't var.  Real audit timing
sequence run if yes\n";
}
if (length($ENV{"TPCD_LOG_DIR"}) <= 0)
{
   $ENV{"TPCD_LOG_DIR"} = "NULL";
}
if (length($ENV{"TPCD_MODE"}) <= 0)
{
  die "TPCD_MODE environment variable not set -
uni/smp/mln \n";
}
if (length($ENV{"TPCD_ROOTPRIV"}) <= 0)
{
  die "TPCD_ROOTPRIV environment variable not set -
yes/no \n";
}

#set up local variables
$runNum=$ENV{"TPCD_RUNNUMBER"};
$numStream=$ENV{"TPCD_NUMSTREAM"};
$runDir=$ENV{"TPCD_RUN_DIR"};
$auditDir=$ENV{"TPCD_AUDIT_DIR"};
$dbname=$ENV{"TPCD_DBNAME"};
$sf=$ENV{"TPCD_SF"};
$product=$ENV{"TPCD_PRODUCT"};
$multinode=$ENV{"TPCD_RUN_ON_MULTIPLE_NODE
S"};
$platform=$ENV{"TPCD_PLATFORM"};
$delim=$ENV{"TPCD_PATH_DELIM"};
$RealAudit=$ENV{"TPCD_AUDIT"};
$inlistmax=$ENV{"TPCD_INLISTMAX"};
$gatherstats=$ENV{"TPCD_GATHER_STATS"};
$logDir=$ENV{"TPCD_LOG_DIR"};
$rootPriv=$ENV{"TPCD_ROOTPRIV"};
$mode=$ENV{"TPCD_MODE"};

$path="$auditDir${delim}auditruns";

if (( $mode eq "uni" ) || ( $mode eq "smp" ))
{
  $all_ln="once";
  $all_pn="once";
  $once="once";
}
else
{
  $all_ln="all_ln";
  $all_pn="all_pn";
  $once="once";
}

# return 1 if the given pattern(parameter $_[0]) matches any
file
sub existfile {
  if ($platform eq "aix" || $platform eq "sun" || $platform eq
"ptx")
  {
    `ls $_[0] 2> /dev/null | wc -l` + 0 != 0;
  }
  else
  {
    `dir /b $_[0] 2> NUL | wc -l` + 0 != 0;
  }
}

if ($inlistmax eq "default")
{
```

```
  $inlistmax = 400;
}

# no longer stop and start the dbm betwe en runs when not in
realaudit mode
#if ( $RealAudit ne "yes" )
#{
#   # if we are not in real audit mode then we must start the
db manager now
#   system("db2start");
#   # activate the database
#   system("db2 activate database $dbname");
#}

$misofile="$runDir${delim}miso$runNum";
# append isolation level information about tpcdbatch to the
miso file
open(MISO, ">>$misofile") || die "Can't open $misofile:
$!\n";
$curTs = `perl gettimestamp "long"`;
print MISO "Timestamp and isolation level of tpcdbatch
before throughput run at : $curTs\n";
close(MISO);

if ( $product eq "pe" )
{
   system("db2 \"connect to $dbname\"; db2 \"select
name,creator,valid,unique_id,isolation from sysibm.sysplan
where name like 'TPCD%'\" >>
$runDir${delim}miso$runNum ");
}
else
{
   &verifyTPCDbatch("$misofile","$dbname");
}

# kick off the script that will monitor for the database
applications during
# the running of the throughput tests.  This will quit when the
mtinterX.metrics
# (where X=runnumber) file has been created.
# set variables to run streams in parallel
if ( $platform eq "nt" )
{
  $streamExNT = "start /b";
  $streamEx = "";
}
else
{
  $streamExNT = "";
  $streamEx = "&";
}
if ( $platform eq "aix"  || $platform eq "sun" || $platform eq
"nt" || $platform eq "hp")
{
   system("$streamExNT perl watchstreams $streamEx");
}
else
{
   die "platform not supported, can't start watchstreams in
background";
}

# show the disks that are used/unused
if ($platform eq "aix")
{
   system("getdisks \"Before the start of the Throughput
Test\"");
}
if ($gatherstats eq "on")
{
   # gather vm io and net stats
   if ($platform eq "aix" || $platform eq "sun" || $platform eq
"ptx" || $platform eq "hp")
   {
     # gather vmstats and iostats (and net stats if in mpp mode)
      system("perl getstats t &");
   }
   else
   {
      print "Stats gather not set up for current platform
$platform\n";
   }
}

if ( $multinode ne "yes" )
{
  # we are running the query streams and update stream from
the same node or
  # from a serial db....use semaphores for control of the
update stream

  # the auditruns directory is where we have already
generated the sql files
  # for the updates and the power tests

  $loopStream=1;

  for ( $loopStream = 1; $loopStream <= $numStream;
$loopStream++)
  {
    print "starting stream $loopStream\n";
   system("echo Executing stream $loopStream out of
$numStream.");
    # run the queries
   if ($platform eq "aix" || $platform eq "sun" || $platform eq
"nt" ||
            $platform eq "ptx" || $platform eq "hp" )
   {
                        system("$streamExNT
$path${delim}tpcdbatch -d $dbname -f
$runDir${delim}qtextt$loopStream.sql -r on -b on -s$sf-u
t1 -m $inlistmax -n $loopStream -l
$path${delim}querytext${delim}stream$loopStream.list
$streamEx");
    }
    else
    {
                        die "platform $platform not supported
yet";
    }
  }

  # run the update function stream....this will wait until the
queries have
  # completed to kick off the updates
  print "starting update stream\n";

  if ($runUF eq "no")
  {
         $ret=system("$auditDir${delim}auditruns${delim
}tpcdbatch -d $dbname -f $runDir${delim}quft.sql -r on -b
on -s $sf -u t -m $inlistmax -n $numStream -l
$runDir${delim}streamuf.list");
  }
  else
  {
         $ret=system("$auditDir${delim}auditruns${delim
}tpcdbatch -d $dbname -f $runDir${delim}quft.sql -r on -b
```

```
on -s $sf -u t2 -m $inlistmax -n $numStream -l
$runDir${delim}streamuf.list");
  }
  print "update stream done\n";


  &getConfig("t");
  if ( $rootPriv eq "yes" )
  {
     # get the o/s tuning parameters...currently AIX only and
only if your
      # user has root privileges to run this
     &getOSTune("t");
  }
}
else
{
  # we are running the query streams and update stream from
different nodes, use
  # files and rksh to control the update stream
  system("runthru.pe");
}

if ($platform eq "aix")
{
    # show the disks that are used/unused
    system("getdisks \"After the completion of the Throughput
Test\"");
}
if ($gatherstats eq "on")
{
   # gather vm io and net stats
   if ($platform eq "aix" || $platform eq "sun" || $platform eq
"ptx")
    {
      # kill the stats that were being gathered
       if ($platform eq "ptx")
       {
          $rc= `perl5 zap "-f" "sar"`;
          $rc= `perl5 zap "-f" "sadc"`;
       }
       else
       {
          $rc= `perl5 zap "-f" "vmstat"`;
          $rc= `perl5 zap "-f" "iostat"`;
       }
       if ( $pn > 1 )
       {
          $rc= `perl5 zap "-f" "netstat"`;
       }
       $rc= `perl5 zap "-f" "getstats"`;
    }
}

open(MISO, ">>$misofile") || die "Can't open $misofile:
$!\n";
$curTs = `perl gettimestamp "long"`;
print MISO "Timestamp and isolation level of tpcdbatch after
throughput run at : $curTs\n";
close(MISO);

if ( $product eq "pe" )
{
    system("db2 \"connect to $dbname\"; db2 \"select
name,creator,valid,unique_id,isolation from sysibm.sysplan
where name like 'TPCD%'\" >>
$runDir${delim}miso$runNum");
}
else
{
   &verifyTPCDbatch("$misofile","$dbname");
}

if ( $RealAudit ne "yes" )
{
    $curTs = `perl gettimestamp "short"`;
    # grab the db and dbm snapshot before we deactivate
    system("db2 get snapshot for all on $dbname >
$runDir${delim}dbTrun$runNum.snap.$curTs");
    system("db2 get snapshot for database manager >>
$runDir${delim}dbTrun$runNum.snap.$curTs");
}

# now copy the reports from the count of streams files into
one final file
&cat("$runDir${delim}strcnt*","$runDir${delim}mstrcnt$ru
nNum");
#(NOTE: there is a dependancy that this mstrcnt file exist
before the
# calcmetrics.pl script is called, both because it is used as
input for
# calcmetrics.pl, and because the output from calcmetrics is
used as
# the trigger for watchstreams to complete, and watchstreams
cats its
# output at the end of the mstrcnt file.

# generate the mtinter?.metrics file in the run directory
#require 'calcmetrics.pl';

if ( $runUF ne "no")
{
  system("perl calcmetrics.pl $numStream UF");
}
else
{
  system("perl calcmetrics.pl $numStream");
}

# concatenate all the throughput inter files that were used to
# generate these results into the calcmetrics output file
(mtinterX.metrics)
#cd $TPCD_RUN_DIR
&cat("$runDir${delim}mts*inter*","$runDir${delim}mtinter
$runNum.metrics");

if ($runUF ne "no") {

&cat("$runDir${delim}mtufinter*","$runDir${delim}mtinter
$runNum.metrics");
}

if (&existfile("$runDir${delim}mp*")) {
  # generate the mplot stuff
  system("perl gen_mplot");   # kmchan

  # generate the mlog information file
  require 'buildmlog';
}

#if ($runUF eq "no") {
#  &rm("$runDir${delim}mtuf*");
#}

# deactivate the database  this needs to remain at the end of
run throughput so
# asynchronous writing of the log files completes.
system("db2 deactivate database $dbname");
$rc=&dodb_noconn("db2 get db cfg for $dbname | grep -i log
>> $runDir${delim}endLog.Info",$all_ln);
```

```
if ( $logDir ne "NULL" )
{
   $rc=&dodb_noconn("$dircmd $logDir >>
$runDir${delim}endLog.Info",$all_ln);
}

#system("db2_all \']}db2 get db cfg for tpcd | grep -i log >>
$runDir${delim}endLog.Info ; db2 terminate\' ");
#system("ls -ltra /node??vg.log/NODE00* >>
$runDir${delim}endLog.Info");

#Create Catalog info
$rc = system("perl catinfo.pl p");

if ( $rc != 0 )
{
 warn "catinfo failed!!!\n";
}

# Report current log info to the run# directory in a file called
endLog.Info
# system("perl getLogInfo.pl endLog");

system("getLog.bat endlog");

# if we are in audit mode we must do a db2stop at the end of
the power/throughput run
if ( $RealAudit eq "yes" )
{
   system("db2stop");
}

1;

sub getConfig
{
 $testtype=$_[0];
 print "Getting database configuration.\n";

$dbtunefile="$runDir${delim}m${testtype}dbtune${runNu
m}";
 open(DBTUNE, ">$dbtunefile") || die "Can't open
$dbtunefile: $!\n";
 $timestamp=`perl gettimestamp "long"`;
 print DBTUNE "Database and Database manager
configuration taken at : $timestamp";
 close(DBTUNE);
 system("db2level >> $dbtunefile");
 system("db2 get database configuration for $dbname >>
$dbtunefile");
 system("db2 get database manager configuration >>
$dbtunefile");
 system("db2set >> $dbtunefile");

}

sub getOSTune
{
 $testtype=$_[0];
 if ( $platform eq "aix" )
 {
    print "Ge tting OS and VMdatabase configuration.\n";

$ostunefile="$runDir${delim}m${testtype}ostune${runNum
}";
    open(OSTUNE, ">$ostunefile") || die "Can't open
$ostunefile: $!\n";
    $timestamp=`perl gettimestamp "long"`;
    print OSTUNE "Operating System and Virtual Memory
configuration taken at : $timestamp";
    close(OSTUNE);

system("${delim}usr${delim}samples${delim}kernel${deli
m}schedtune >> $ostunefile");

system("${delim}usr${delim}samples${delim}kernel${deli
m}vmtune >> $ostunefile");
 }
 else
 {
    print "OS parameters retrieval not supported for
$platform \n";
 }
}

sub verifyTPCDbatch
{
 $logfile=$_[0];
 $dbname=$_[1];
 $file="verifytpcdbatch.clp";
 open(VERTBL, ">$file") || die "Can't open $file: $!\n";
 print VERTBL "connect to $dbname;\n";
 print VERTBL "select
name,creator,valid,last_bind_time,isolation from
sysibm.sysplan where name like 'TPCD%';\n";
 print VERTBL "connect reset;\n";
 print VERTBL "terminate;\n";
 close(VERTBL);
 system("db2 -vtf $file >> $logfile");
}
```

tpcd_cl.bat

```
erase tpcdUF.c
erase tpcdUF.obj
erase tpcdbatch.c
erase tpcdbatch.obj
erase tpcdbatch.map

set db2options=+c -t +p -v
db2start
db2 connect to %1
db2 prep tpcdbatch.sqc bindfile package isolation rr blocking
all datetime iso
db2 prep tpcdUF.sqc    bindfile package isolation rs blocking
all datetime iso
db2 connect reset
db2 terminate
REM make sure LIBPATH is set to include the compiler
libraries and db2 libraries
cl -c -Z7 -DSQLWINT -W3 -J tpcdbatch.C
cl -c -Z7 -DSQLWINT -W3 -J tpcdUF.C
link -debug -out:tpcdbatch.exe tpcdbatch.obj tpcdUF.obj
user32.lib kernel32.lib db2api.lib -subsystem:console
```

tpcdbatch.h

```
/************************************************
*****************************
*
*   TPCDBATCH.H
*
*  Revision History:
*
*  27 may 99 bbe from (24 nov 98 jen) fixNTtimestamp -
fixed NT timestamp to print millisecond correctly
*  27 may 99 bbe from (10 dec 98 jen) SUN - added Haider's
changes necessary for SUN
*  17 jun 99 jen  Increased version to 5.1
```

```
*  10 aug 99 bbe  Increased version to 5.2
*  13 aug 99 bbe  Increased version to 5.3
************************************************
*****************************/

/** Necessary header files **/

/** System header files **/
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <math.h>
#include <fcntl.h>              /* SUN bbe */

#include <time.h>
#include <ctype.h>
#if (defined(SQLAIX) || defined(SQLPTX) || defined(LINUX)
|| defined(SQLHP))
#include <unistd.h>             /* SUN */
#include <sys/stat.h>           /* SUN */
#endif
#if ((defined(SQLAIX) || defined(SQLPTX))
&& !defined(LINUX))
#include <sys/vnode.h>          /* SUN */
#endif
#ifndef SQLWINT
#include <sys/time.h>                       /*@d33143aha*/
#include <sys/ipc.h>
#include <sy s/sem.h>
#if (!defined(SQLPTX)
&& !defined(LINUX)&& !defined(SQLHP))
#include <sys/mode.h>
#endif
#include <sys/timeb.h>
#include <sys/types.h>
#else
#include <windows.h>
#include <sys\timeb.h>
#endif
#include <errno.h>


/** External header files **/
#include "sqlda.h"
#include "sqlenv.h"
#include "sql.h"
#include "sqlmon.h"
#include "sqlca.h"
#include "sqlutil.h"
#include "sqlcodes.h"

/** Internal header files **/
/** #ifdef __cplusplus **/
/** #include "sqlz.h" **/
/** #include "sqlzcopy.h" **/
/** #endif **/


/************************************************
**********************/
/* Define synonyms here                                 */
/************************************************
**********************/
#define TPCDBATCH_VERSION "5.5"

#define TPCDBATCH_NONSQL      10
/* @d23684 tjg */
#define TPCDBATCH_SELECT      20
#define TPCDBATCH_NONSELECT   30
#define TPCDBATCH_EOBLOCK     40
/* @d30369 tjg */
#define TPCDBATCH_INSERT      50
#define TPCDBATCH_DELETE      60

#define TPCDBATCH_MAX_COLS    100
/* @d30369 tjg */

#define TPCDBATCH_CHAR char

#define TPCDBATCH_PRINT_FLOAT_WIDTH  20
  /* kmw - allow 15 whole digit for %#.3f format */
  /*     - note: use > 18, size of long indentifier so that it will
*/
  /*      be larger than any column heading                    */
#define TPCDBATCH_PRINT_FLOAT_MAX   1e15  /*
kmw */
/* #define TPCD_PREPARETIME 1 */      /* for separate
prep/exec on uf jen 1106 */

#ifdef SQLWINT
#define PATH_DELIM '\\'
#define sleep(a) Sleep((a)*1000)
#else
#define PATH_DELIM '/'
#endif

#define PARALLEL_UPDATES 1

#ifdef PARALLEL_UPDATES
#define UF1OUTSTREAMPATTERN
"%s%cuf1.%02d.%d.out"
#ifdef TPCD_NONPARTITIONED
#define UF2OUTSTREAMPATTERN
"%s%cuf2.%02d.%d.out"
#else
/* kelly add same as NONPART. */
#define UF2OUTSTREAMPATTERN
"%s%cuf2.%02d.%d.out"
/*  kelly ... take this out ... should be same name as for non-
paritioned
#define UF2OUTSTREAMPATTERN
"%s%cuf2.%02d.%d.%d.out"   */     /*DELjen add
delchunk*/
#endif
#define BUFSIZE 1024
#endif


#define T_STAMP_FORM_1 1
#define T_STAMP_FORM_2 2
/* jen TIME_ACC start */
#define T_STAMP_FORM_3 3
#define T_STAMP_1LEN 17
#if defined (SQLUNIX) || defined (SQLAIX)
#define T_STAMP_3LEN 24
#elif (defined (SQLOS2) || defined(SQLWINT) || defined
(SQLWIN) || defined(SQLDOS))
#define T_STAMP_3LEN 21    /* WIN NT timestamp fix
bbe */
#else
#error Unknown operating system
#endif
/* jen TIME_ACC start */


#define BLANKS      "\0"
#define READMODE    "r\0"
#define WRITEMODE   "w\0"
#define APPENDMODE  "a\0"
```

```
#define mem_error(xx)                                   \
{ fprintf(stderr,"\n--Out of memory when %s.\n",xx); }
/* Display out-of-memory and end */

#define     TPCDBATCH_MIN(x,y)      ((x) < (y) ? (x) : (y))
/** Returns the smaller of both x and y **/
#define     TPCDBATCH_MAX(x,y)      ((x) > (y) ? (x) : (y))
/* @d22817 tjg */
/** Returns the larger of both x and y **/



/** Defines needed for decimal conversion **/
#define SQLZ_DYNLINK
#define TRUE 1
#define LEFT 1
#define RIGHT 0
#define FALSE 0
#define sqlrx_get_left_nibble(byte) (((unsigned char)(byte))
>> 4)

#define sqlrx_get_right_nibble(byte) ((unsigned char) (byte
& '\x0f'))
#define SQL_MAXDECIMAL        31
#define  SQLRX_PREFERRED_PLUS  0x0c

/** Timer-necessary defines for portability **/
#if (defined (SQLOS2) || defined(SQLWINT)) ||
defined(SQLWIN) || defined(SQLDOS)
typedef struct timeb Timer_struct;
#elif (defined (SQLUNIX) || defined(SQLAIX))
/*TIMER jen*/
typedef struct timeval Timer_struct;
#else
#error Unknown operating system
#endif

/* sleep time between starting subsequent tpcdbatches
running UF1 and UF2 */
#define UF1_SLEEP 1
#define UF2_SLEEP 1
#define UF_DEADLOCK_SLEEP 1 /* sleep between
deadlock retries in UF1,UF2 */

#define MAXWAIT 50 /* maximum retries for deadlock
encounters */

#define DEBUG 0    /* to be set to 1 for diagnostic purposes
if needed */
/* #define UF1DEBUG 1   */
/* #define UF2DEBUG 1   */
```

tpcdbatch.sqc

```
/************************************************
*****************************
*
*   TPCDBATCH.SQC
*
*  Revision History:
*
*  21 Dec 95 jen  Corrected calculation of geometric mean to
include in the
*               count of statements the update functions.
*  03 Jan 96 jen  Corrected calculation of arithmetic mean to
not include the
*               timings for the update functions. (only want
query timings
*               as part of arithmetic mean)
*  15 Jan 96 jen  Added extra timestamps to the update
functions.
*  22 Jan 96 jen  Get rid of checking of short_time....we
always use the long
*               timings.
*              Fixed timings to print query/uf times rounded up
to 0.1 seconds
*              and uses these rounded time values in subseque nt
calculations
*              Fixed bug where last seed in mseedme file wasn't
getting read
*               correctly - EOF processing done too soon.
*
*  22 Feb 96 kbs  port to NT
*  26 Mar 96 kbs  Fix to avoid countig UFs as queries for min
max
*  27 Jun 97 wlc Temporarily fixed deadlock problems when
doing UF1, UF2
*  30 Jul 97 wlc Add in support for load_update and
TPCD_SPLIT_DELETES
*  13 Aug 97 wlc fixed UF1 log file formatting problem,
*               using TPCD_TMP_DIR for temp files instead of
/tmp,
*               make summary table fit in 80-column,
*               fixed UF2 # of deleted rows reporting problem
*  18 Aug 97 wlc added command line support for inlistmax
*  20 Aug 97 wlc added support for runthroughput without
UF
*  27 Aug 97 aph Replaced hardcoded 'tpcdaudit' with
getenv("TPCD_AUDIT_DIR")
*  05 Sep 97 wlc fixing free() problem in NT
*  26 Sep 97 kmw change FLOAT processing in echo_sqlda
and print_headings
*  10 oct 97 jen  add lock table in share mode for staging
tables
*  21 oct 97 jen added explicit rollback on failure of uf1
*  27 oct 97 jen don't update TPCD.xxxx.update.pair.num if
not running UFs in
*              throughput run
*  01 nov 97 jen temp code to do a prep then execute stmt in
UFs so we can
*               get timings
*  03 nov 97 jen realligned UF code for readablility
*               pushed UF2 commit into loop for inlistmax
*               fixed UF2 code so rollback performed
*  04 nov 97 jen Added code to handle vldb
*  06 nov 97 jen Commented out temp code for prep then
execute stmts using
*               TPCD_PREPARETIME def
*               Updated version number to 2.2
*              send all output during update functiosn to output
files, not
*               stderr
*  10 nov 97 jen jenCI Updated version number to 2.3
*               Added handling of
TPCD_CONCURRENT_INSERTS. Change control of
*               chunk processing to use the concurrent_inserts
value as the
*               control.  Now the inserts will be run in
TPCD_CONCURRENT_INSERTS
*               sets, each having concurrent_inserts/
*  13 nov 97 jen jen DEADLOCK.  FIxed bug that Alex
found where deadlock count
*              (maxwait) was incremented on every execution of
the stmt as
*               opposed to just when deadlock really happened.
*  14 nov 97 jen jenSEM - fix up error reporting on
semaphore failure
*              sem_op now returns failure to caller so caller can
report where
```

```
*               failure has happened.
*               Forced dbname to be upper case, an all other parts
of update
*               pair number to be lowercase
*  15 nov 97 jen SEED Reworked code to grab the seed from
the seed file.  Now
*               reusing seeds between runs, so power run will
always use first
*               seed, throughput will use the 2nd - #stream+1
seeds
*
*  13 jan 98 jen LONG  Increase stmt_str to be able to hold
inlists with larger
*               order key numbers
*  04 mar 98 jen IMPORT added support for
TPCD_UPDATE_IMPORT to chose whether
*               using import or load api's for loading data into the
staging
*               tables
*  04 mar 98 jen TIMER changed from using gettimer to
gettimeofday for unix
*  01 apr 98 jen Fixed IMPORT code to do the proper
checking on strcmp (ie !strcmp)
*  01 apr 98 jen removed code to handle vldb - not needed
*               Upgraded version to 2.4          for ( chunk
*  01 apr 98 jen Fixed up import code on NT so the variable
is recognized in the
*               children
*  25 may 98 sks Reworked some of the environment
variable code so consolidate as
*               much as possible.  Not all complete because of
differences in
*               the way nt and AIX calls (and starts stuff in
background) for UFs
*  29 may 98 jen REUSE_STAGE Changed UF1 so we reuse
the same staging tables
*               instead of having a new set for each update pair
*  06 jul 98 jen Removed locking of staging tables since they
are created with
*               locksize table now
*  06 jul 98 jen 912RETRY - added code to retry query
execution on 912 as well
*               as 911
*  07 jul 98 jen Fixed summary_table() so 1000x adjustment
not based on UF (setting
*               of max and min pointers
*               Added generic SleepSome function to handle NT
vs AIX sleep differences
*  01 apr 98 djd Added change to permit the use of table
functions for UF1.
*               to enable this set TPCD_UPDATE_IMPORT to tf
in TPCD.SETUP file.
*               MERGED this into base copy on Jul 07
*  10 jul 98 jen haider's fix for 'outstream' var for error
processing in
*               runUF1_fn and runUF2_fn
*               Updated version to 2.5
*  25 sep 98 jen Added stream number printing into mpqry*
files and increases
*               accuracy of timestamp in mpqry (and mts*qry*)
files
*  06 oct 98 jen TIME_ACC Added accuracy of timestamp in
mpqry (and mts*qry*)
*               files. Cleaned up misuse of Sleep and flushed
buffers on
*               deadlocks
*  19 oct 98 kbs fix UF2_fn to correctly count rows deleted in
case of deadlock
*  20 oct 98 kbs rewrite UF2 and UF2_fn for static SQL with
staging table
*  23 oct 98 jen Cleaned up retrying of order/lineitem on
lineitem deadlock in UF1
*  24 oct 98 jen Used load_uf1 and load_uf2 instead of
general load_updates
*  26 oct 98 kbs inject the UF1 with a single staging table
*  02 nov 98 jen Fixed processing of multiple chunks in uf2
so don't duplicate
*  21 nov 98 kmw Fixed BIGINT
*  05 dec 98 aph Moved runUF1_fn() and runUF2_fn() into a
separate file tpcdUF.sqc
*               so that it can be bound separately with a different
isolation level.
*  21 dec 98 aph Integrated Jennifer's QppD calculation
(rounding & adjustment) fixes.
*  22 dec 98 aph For UFs during Throughput run, defer
CONNECT until children launched.
*  28 dec 98 aph Removed error_check() call after
CONNECT RESET
*  29 dec 98 aph For UFs do not COMMIT in tpcdbatch.sqc.
COMMITs happen in tpcdUF.sqc.
*  18 jan 99 kal replaced header with #include "tpcdbatch.h"
*  27 may 99 bbeaton from (03 mar 99 jen) Fixed SUN fix
that wasn't compatible with
*               NT (using %D %T instead of %x %X for strftime)
*  16 jun 99 jen Added missing LPCTSTR cast of semaphore
file name for NT
*  17 jun 99 jen SEMA Changes semaphore file for update
functions to look for tpcd.setup
*               not for the orders.***  update data file
*  21 jul 99 bbeaton Added semaphore control that allows
runpower to be run as two
*               separate streams (update and query).  This
involves the use of
*               two semaphores to be used as it executes in three
different
*               sections.  The first is the update inserts.  The next
is the query
*               stream which is started with the update stream,
but waits until
*               the inserts are complete.  The third section is the
update deletes
*               which execute after the queries are complete.
*  21 jul 99 bbeaton Added functions to handle semaphore
creation, control, etc.
*  21 jul 99 bbeaton Modified output to mp*inter files.  It
now only outputs
*               intermediate data that will be calculated by
calcmetricp.pl.  This
*               is a result of the runpower being split into two
streams and thus
*               tpcdbatch not having access to all data.
*  21 jul 99 bbeaton The start time for runpower UF2 now
does not start until after
*               the query stream is complete so that its wait time
is not included
*               NOTE: The wait time that the first UF1 in
runthroughput still
*               includes the wait period that occurs waiting on
queries.
**********************************************
****************************/

/* included in tpcdbatch.sqc and tpcdUF.sqc */

#include "tpcdbatch.h"

/**********************************************
****************************/
/* global structure containing elements passed between
different functions */
```

```
/*************************************************
**************************/
struct global_struct
{
  struct stmt_info    *s_info_ptr;        /* ptr to stmt_info list
*/
  struct stmt_info    *s_info_stop_ptr;    /* ptr to last struct
in list  */
  struct comm_line_opt *c_l_opt;           /* ptr to
comm_line_opt struct */
  struct ctrl_flags   *c_flags;            /* ptr to ctrl_flags
struct   */
  Timer_struct        stream_start_time;   /* start time for
stream  TIME_ACC */
  Timer_struct        stream_end_time;     /* end time for
stream  TIME_ACC  */
  char                file_time_stamp[50]; /* time stamp for
output files */
  double              scale_factor;        /* scale factor of
database   */
  char                run_dir[150];        /* directory for output
files  */
  int                 copy_on_load;        /* indication of whether
or not */
                                           /* to do use a copy directory   */
                                           /* (equiv to COPY YES) on
load  */
                                           /* default is FALSE */
  long                lSeed;               /* seed used to generate the
*/
                                           /* queries for this particular  */
                                           /* run.                         */
  FILE                *stream_list;        /* ptr to query list file
*/
  char                update_num_file[150]; /* name of file that
keeps track */
                                           /* of which update pairs have
run*/
  char                sem_file[150];       /* semaphore name */
  char                sem_file2[150];      /* semaphore name bbe
*/
  FILE                *stream_report_file; /* file to report start
stop */
                                           /* progress of the stream */
};


/*************************************************
**************************/
/* New type declaration to store details about SQL statement
*/
/*************************************************
**************************/

struct stmt_info
{
  long                max_rows_fetch;
  long                max_rows_out;
  int                 query_block;                    /* @d30369 tjg
*/
  unsigned int        stmt_num;                       /* @d24993
tjg */
  double              elapse_time;                    /* @d24993
tjg */
  double              adjusted_time;
  char                start_stamp[50];     /* start time stamp for
block  */
  char                end_stamp[50];       /* end time stamp for
block    */
  char                tag[50];             /* block tag              */
  char                qry_description[100];
  struct stmt_info    *next;                          /* @d24993
tjg */

};


/*************************************************
**************************/
/* Structure containing command line options
*/
/*************************************************
**************************/
struct comm_line_opt
{                                                     /* @d22275 tjg */

  char                str_file_name[256];  /* output filename
*/
  char                infile[256];     /* input filename     */
  int                 intStreamNum;    /* integer version of stream
number */
  int                 a_commit;        /* auto-commit flag   */
  int                 short_time;      /* time interval flag */
  int                 update;
  int                 outfile;
};


/*************************************************
**************************/
/* Structure used to hold precision for decimal numbers
*/
/*************************************************
**************************/
struct declen
{/* kmw */
  unsigned char m;       /* # of digits left of decimal */
  unsigned char n;       /* # of digits right of decimal */
};


/*************************************************
**************************/
/* Structure containing control flags passed between
functions       */
/*************************************************
**************************/
struct ctrl_flags
{                                                     /* @d25594 tjg */
  int eo_infile;
  int time_stamp;
  int eo_block;                                       /* @d30369 tjg
*/
  int select_status;
};


/*************************************************
**************************/
/* Function Prototypes                                */
/*************************************************
**************************/
int SleepSome( int amount );
int get_env_vars(void);
int Get_SQL_stmt(struct global_struct *g_struct);

void print_headings (struct sqlda *sqlda, int *col_lengths);
/* @d22817 tjg */
void echo_sqlda(struct sqlda *sqlda, int *col_lengths);
void allocate_sqlda(struct sqlda *sqlda);
```

```
void get_start_time(Timer_struct *start_time);
double get_elapsed_time (Timer_struct *start_time);

long error_check(void);                          /* @d28763
tjg */
void dumpCa(struct sqlca*);        /*kmw*/

void display_usage(void);
char *uppercase(char *string);
char *lowercase(char *string);
void comm_line_parse(int agrc, char *argv[], struct
global_struct *g_struct);
int sqlrxd2a(char *decptr,char *asciiptr,short prec,short scal);
void init_setup(int argc, char *argv[], struct global_struct
*g_struct);
void runUF1( struct global_struct *g_struct, int updatePair );
void runUF2( struct global_struct *g_struct, int updatePair );

/* These need to be extern because they're in another SQC
file.   aph 981205 */
/*extern void runUF1_fn( int updatePair, int i );*/          /*
aph 981205 */
/*extern void runUF2_fn( int updatePair, int i, int
numChunks );*/ /* aph 981205 */
/* Added four new arguments because SQL host vars can't be
global.  aph 981205 */
extern void runUF1_fn ( int updatePair, int i, char *dbname,
char *userid, char *passwd );
extern void runUF2_fn ( int updatePair, int
thisConcurrentDelete, int numChunks, char *dbname, char
*userid, char *passwd );

int sem_op (int semid, int semnum, int value);

char *get_time_stamp(int form, Timer_struct *timer_pointer);
/* TIME_ACC jen */
void summary_table (struct global_struct *g_struct);
void free_sqlda (struct sqlda *sqlda, int select_status);    /*
@d30369 tjg */
void output_file(struct global_struct *g_struct);
int PreSQLprocess(struct global_struct *g_struct,
Timer_struct *start_time);
void SQLprocess(struct global_struct *g_struct);
int PostSQLprocess(struct global_struct *g_struct,
Timer_struct *start_time);
int cleanup(struct global_struct *g_struct);

/* Semaphore control functions */
void create_semaphores(struct global_struct *g_struct);
void throughput_wait(struct global_struct *g_struct);
void runpower_wait(struct global_struct *g_struct, int
sem_num);
void release_semaphore(struct global_struct *g_struct, int
sem_num);
#ifdef SQLWINT
HANDLE open_semaphore(struct global_struct *g_struct, int
num);
#else
int open_semaphore(struct global_struct *g_struct);
#endif


EXEC SQL INCLUDE SQLCA;

/*************************************************
******************/
/* Declare the SQL host variables.                  */
/*************************************************
******************/

EXEC SQL BEGIN DECLARE SECTION;

char    stmt_str1[4000] = "\0";     /* Assume max SQL
statment
                                    of 4000 char  */
struct {                            /* jen LONG */
       short len;
       char data[32700];
      } stmt_str;                   /* jen LONG */
char    dbname[9] = "\0";
char    userid[9] = "\0";
char    passwd[9] = "\0";
char    sourcefile[256];            /* used for semaphores and
table functions?*/
sqlint32 chunk = 0;                 /* jenCI counter for within the
set of chunks*/

EXEC SQL END DECLARE SECTION;


/*************************************************
******************/
/* Declare the global variables.                    */
/*************************************************
******************/
struct sqlda   *sqlda;              /* SQL Descriptor area  */

/* Global environment variables (sks May 25 98)*/
char env_tpcd_dbname[100];
char env_user[100];
char env_tpcd_audit_dir[150];
char env_tpcd_path_delim[2];
char env_tpcd_tmp_dir[150];
char env_tpcd_run_on_multiple_nodes[10];
char env_tpcd_copy_dir[150];
char env_tpcd_update_import[10];

/* Other globals */
FILE            *instream, *outstream;  /* File pointers
*/
int             verbose = 0;            /* Verbose option flag      */
int             semcontrol = 1;         /* allows/disallows
smaphores usage */
int             updatePairStart;        /* update pair to start at  */
int             currentUpdatePair;      /* update pair running
*/
int             updatePairStop;         /* update pair to stop before
*/
char            newtime[50]=" \0";      /* Des - moved from
get_time_stamp */
char            outstreamfilename[256]; /* store filename of
outstream
                                        wlc 081397 */
int             inlistmax = 400;        /* define # of keys to delete
at a time
                                        wlc 081897 */
int             sqlda_allocated = 0;    /* fixing free() problem in
NT
                                        wlc 090597 */
int             iImportStagingTbl=0;    /* IMPORT use import
or load (default) */
char            temp_time_stamp[50];    /* holds end timestamp
to be copied into start_time_stamp of next query bbeaton */
Timer_struct    temp_time_struct;       /* holds end time
value to be copied into start_time of next query bbeaton */

/* constants for the semaphores used; 1 for throughput and 2
for power */
#define INSERT_POWER_SEM 1
#define QUERY_POWER_SEM 2
```

```
#define THROUGHPUT_SEM 1

/*************************************************
*****************/
/* Start main program processing.                */
/*************************************************
*****************/
int main(int argc, char *argv[])
{
  struct comm_line_opt c_l_opt = { "\0","\0", 0, 1, 0, 0, 0 };
  /* command line options        */
  Timer_struct        start_time;         /* start point for elapsed
time */


  struct stmt_info     s_info = { -1, -1, 0, 1, -1, -1, "\0", "\0",
"\0", "\0", NULL };
  /* first stmt_info structure */

  struct ctrl_flags    c_flags = { 0, 1, 0,
TPCDBATCH_SELECT };
  /* structure holding ctrl flags
     passed between functions  */

  /* TIME_ACC jen start */
#if defined (SQLUNIX) || defined (SQLAIX)
  struct global_struct g_struct =
  { NULL, NULL, NULL, NULL, {0,0}, {0,0}, "\0", 0.1,
"\0", FALSE, 0,
    NULL, "\0", "\0", "\0", NULL };

#elif (defined (SQLOS2) || defined(SQLWINT) || defined
(SQLWIN) || defined(SQLDOS))
  struct global_struct g_struct =
  { NULL, NULL, NULL, NULL, {0,0,0,0}, {0,0,0,0}, "\0",
0.1, "\0", FALSE, 0,
    NULL, "\0", "\0", "\0", NULL };
#else
#error Unknown operating system
#endif
  /* TIME_ACC jen end */

  get_start_time(&start_time);

  /* Get environment variables */
  if (get_env_vars() != 0)
    return -1;


  /* perform setup and initialization and get process id of
agent */
  outstream = stdout;
  g_struct.c_flags = &c_flags;

  g_struct.s_info_ptr = &s_info;
  g_struct.c_l_opt = &c_l_opt;

  init_setup(argc,argv,&g_struct);              /* @d22275 tjg */

  if ((g_struct.c_l_opt->update == 1) && (semcontrol == 1))
  /* runpower: wait for insert function to complete */
  /* waiting on the INSERT_POWER_SEM semaphore */
    runpower_wait(&g_struct, INSERT_POWER_SEM);

  strcpy(temp_time_stamp, "0");

/*************************************************
*****************************
  *                                               *
  *   This is the transition from the "driver" to the "SUT"
*
  *                                               *

*************************************************
*****************************/


/*************************************************
**********************/
  /* Read in each statement, prepare, execute, and send output
to file.  */

/*************************************************
**********************/

  while (!c_flags.eo_infile) {  /* Check to see if there's no
more input */

    c_flags.eo_block = 0;

    if (c_l_opt.outfile)
     output_file(&g_struct); /* determine appropriate name for
output files */
    if ((g_struct.c_l_opt->update != 3) && (g_struct.c_l_opt-
>update != 4))
    {
     if (!strcmp(temp_time_stamp, "0")) /* if first query, get
timestamp */
      {
       get_start_time(&start_time);
       strcpy(g_struct.s_info_ptr->start_stamp,

get_time_stamp(T_STAMP _FORM_3,&start_time ));  /*
TIME_ACC jen*/
      }
     else   /* else get the end timestamp of previous query */
     {
       strcpy(g_struct.s_info_ptr->start_stamp,
temp_time_stamp);
       start_time = temp_time_struct;
     }
     /* write the start timestamp to the file...if this is not a
qualification */
     /* run, then write the seed used as well */

     fprintf( outstream,"Start timestamp %*.*s \n",
          T_STAMP_3LEN,T_STAMP_3LEN,              /*
TIME_ACC jen*/
            g_struct.s_info_ptr->start_stamp);
     if (c_l_opt.intStreamNum >= 0)
     {
       if (g_struct.lSeed == -1)
         {
          fprintf( outstream,"Using default qgen seed file");
         }
       else
         fprintf( outstream,"Seed used = %ld",g_struct.lSeed);

       fprintf( outstream,"\n");
     }
    }
    do {  /* Loop through these statements as long as we
haven't reached
           the end of the input file or the end of a block of
statements
         */

      /** Read in the next statment **/
      c_flags.select_status=Get_SQL_stmt(&g_struct);
```

```
    if (PreSQLprocess(&g_struct, &start_time) == FALSE)
      /* if after reading the next statement we see that we
should
         exit this loop (i.e. eof, update functions, etc...), get out
      */
      break;


/*************************************************
*****************************
     *                                                    *
     *   The SQLprocess function implements the
implementation specific layer.    *
     *   It can handle arbitrary SQL statements.
*
     *                                                    *

*************************************************
****************************/


                         /* If we've got up to here then
processing a regular SQL statement */
                         SQLprocess(&g_struct);

   } while ((!c_flags.eo_block) && (!c_flags.eo_infile));    /*
@d30369 tjg */

    if (PostSQLprocess(&g_struct,&start_time) == FALSE)
     /* if we've reached the end of the input file, then get out
       of this loop (i.e. no more statements).  Otherwise get
        elapsed times and display info about rows */
     break;

  }  /* end of for loop for multiple SQL statements  */

  g_struct.s_info_ptr = &s_info;  /* set the global pointer to
start of
                             linked list */

  cleanup(&g_struct); /* finish some semaphore stuff, cleanup
files,
                    and print out summary table */


/*************************************************
*****************************
  *                                                   *
  *   In cleanup we make the transition back from the "SUT"
to the "driver"     *
  *                                                   *

*************************************************
****************************/

  return(0);

}  /* end of main  */

/*************************************************
**********************/
/* Generic form of Sleep */
int SleepSome( int amount)
{
#ifndef SQLWINT
  sleep (amount);
#else
//   Sleep (amount*1000);          /* 10x for NT DJD Changed
"sleep" to "Sleep" */
  Sleep (amount);          /* 10x for NT DJD Changed "sleep"
to "Sleep" */
#endif
  return 0;
}

/*************************************************
**********************/

/*************************************************
******************/
/* Get environment variables.  (sks May 25 98)
*/
/*************************************************
******************/
int get_env_vars(void) {
  if (strcpy(env_tpcd_dbname, getenv("TPCD_DBNAME"))
== NULL) {
     fprintf(stderr, "\n The environment variable
$TPCD_DBNAME is not setup correctly.\n");
     return -1;
   }
   if (strcpy(env_user, getenv("USER")) == NULL) {
     fprintf(stderr, "\n The environment variable $USER is not
setup correctly.\n");
     return -1;
   }
   if (strcpy(env_tpcd_audit_dir,
getenv("TPCD_AUDIT_DIR")) == NULL) {
     fprintf(stderr, "\n The environment variable
$TPCD_AUDIT_DIR is not setup correctly.\n");
     return -1;
   }
   if (strcpy(env_tpcd_tmp_dir, getenv("TPCD_TMP_DIR"))
== NULL) {
     fprintf(stderr, "\n The environment variable
$TPCD_TMP_DIR is not setup correctly.\n");
     return -1;
   }
#if 0
   if (strcpy(env_tpcd_path_delim,
getenv("TPCD_PATH_DELIM")) == NULL ||
      (strcmp(env_tpcd_path_delim, "/") &&
strcmp(env_tpcd_path_delim, "\\"))){
    fprintf(stderr, "\n The environment variable
$TPCD_PATH_DELIM is not setup correctly ,
env_tpcd_path_delim'%s'.\n", env_tpcd_path_delim);

    return -1;
   }
#endif
   strcpy( env_tpcd_path_delim , "/" );  /*kmw*/
   if (strcpy(env_tpcd_run_on_multiple_nodes,
getenv("TPCD_RUN_ON_MULTIPLE_NODES")) ==
NULL) {
    fprintf(stderr, "\n The environment variable
$TPCD_RUN_ON_MULTIPLE_NODES");
    fprintf(stderr, "\n is not setup correctly.\n");
    return -1;
   }
   if (strcpy(env_tpcd_copy_dir,
getenv("TPCD_COPY_DIR")) == NULL) {
     fprintf(stderr, "\n The environment variable
$TPCD_COPY_DIR is not setup correctly.\n");
     return -1;
   }
   /* If TPCD_UPDATE_IMPORT is not set then, the default
is set to false, */
   /* which is done in init_setup subroutine
*/
```

```
  strcpy(env_tpcd_update_import,
getenv("TPCD_UPDATE_IMPORT"));

  return 0;
}

/*************************************************
******************/
/* Get the SQL statement and any control statements from
input.    */
/*************************************************
******************/
int Get_SQL_stmt(struct global_struct *g_struct)

{
  char input_ln[256]    = "\0";    /* buffer for 1 line of text
*/
  char temp_str[4000]   = "\0";    /* temp string for SQL stmt
*/
  char control_str[256] = "\0";    /* control string
*/

  char *test_semi;               /* ptr to test for semicolon
*/
  char *control_opt;              /* ptr used in control_str
parsing  */
  char *select_status;            /* ptr to first word in query
*/
  char *temp_ptr;                 /* general purpose temp ptr
*/

  int good_sql = 0;              /* good-sql stmt flag  @d23684
tjg */
  int stmt_num_flag = 1;          /* first line of SQL stmt flag
*/
  int eostmt = 0;                /* flag to signal end of statement
*/


  stmt_str.data[0]='\0';          /* Initialize statement buffer
*/

  if (verbose)
    fprintf (stderr,"\n----------------------------------------
\n");
  fprintf (outstream,"\n----------------------------------------
\n");

  do {
    /** Read in lines from input one at a time **/
    fscanf(instream, "\n%[^\n]\n", input_ln);
    if (strstr(input_ln,"--") == input_ln) {    /* Skip all --
comments */

      if (strstr(input_ln,"--#SET") == input_ln) {
                          /* Store control string but
                            keep going to find SQL stmt */
        strcpy(control_str,input_ln);
        if (verbose)
          fprintf(stderr,"%s\n", uppercase(control_str));
        fprintf(outstream,"%s\n", uppercase(control_str));

        /** Start parsing control str. and update appropriate
vars. **/
        control_opt = strtok(control_str," ");
        while (control_opt != NULL) {
          if (strcmp(control_opt,"--#SET")) { /* Skip the
#SET token */
            if (!strcmp(control_opt,"ROWS_FETCH"))
              g_struct->s_info_ptr->max_rows_fetch =
atoi(strtok(NULL," "));

            if (!strcmp(control_opt,"ROWS_OUT"))
              g_struct->s_info_ptr->max_rows_out =
atoi(strtok(NULL," "));
          }

          control_opt = strtok(NULL," ");
        }
      }

      /* if the block option has been set, then check if we've
        reached the end of a block of statements */
      if (g_struct->s_info_ptr->query_block)          /*
@d30369 tjg */
        if (strstr(input_ln,"--#EOBLK") == input_ln) {
          g_struct->c_flags->eo_block = 1;
          return TPCDBATCH_EOBLOCK;
        }
      if (strstr(input_ln, "-- Query") == input_ln)
        strcpy(g_struct->s_info_ptr-
>qry_description,input_ln);

      if (strstr(input_ln, "--#TAG") == input_ln)
        strcpy(g_struct->s_info_ptr->tag,(input_ln+sizeof("--
#TAG")));

      /* if we're using update functions, return that info
        appropriately */
      if (g_struct->c_l_opt->update != 0) {
        if (strstr(input_ln, "--#INSERT") == input_ln)
          return TPCDBATCH_INSERT;

        if (strstr(input_ln, "--#DELETE") == input_ln)
          return TPCDBATCH_DELETE;
      }

      if (strstr(input_ln, "--#COMMENT") == input_ln)
{    /* @d25594 tjg */
        temp_ptr = (input_ln + 11);   /* User-specified
comments go to
                                      the outfile */
        if (verbose)
          fprintf (stderr,"%s\n",temp_ptr);
        fprintf (outstream,"%s\n",temp_ptr);
      }

      eostmt=0;
    }

    /* Need this hack here to check if there's any more empty
lines left
      in the input file.  Continue only if there are aren't any */
    else if (strcmp(input_ln, "\0")) /* HACK */ {    /* A
regular SQL statement */
      if (stmt_num_flag) {  /* print this out only if it's the
first line
                               of the SQL statement.  We only want
this
                               line to appear once per statement */
        if (verbose)
          fprintf(stderr,"\n%s\n", g_struct->s_info_ptr-
>qry_description);
        fprintf(outstream,"\n%s\n", g_struct->s_info_ptr-
>qry_description);

        if (verbose)
          fprintf(stderr,"\nTag: %-5.5s  Stream: %d
Sequence number: %d\n",
```

```
                g_struct->s_info_ptr->tag,g_struct->c_l_opt-
>intStreamNum,
                g_struct->s_info_ptr->stmt_num);
/*jen0925*/
        fprintf(outstream,"\nTag: %-5.5s  Stream: %d
Sequence number: %d\n",
                g_struct->s_info_ptr->tag,g_struct->c_l_opt-
>intStreamNum,
                g_struct->s_info_ptr->stmt_num);
/*jen0925*/


        /* Turn off this flag once the number has been printed
*/
        stmt_num_flag = 0;

      } /** Print out this heading the first time you encounter
a
          non-comment statement **/

      /* Test to see if we've reached the end of a statement */
      good_sql = TRUE;                          /* @d23684
tjg */
      test_semi = strstr (input_ln,";");
      if (test_semi == NULL) {   /* if there's no semi-colon
keep on going */
        strcat (stmt_str.data,input_ln);              /* jen
LONG */
        strcat (stmt_str.data," ");                   /* jen LONG
*/
       stmt_str.len = (short)strlen( stmt_str.data );         /*
jen LONG */
        eostmt = 0;
      }

      else {                  /* else replace the ; with a \0 and
continue */
        *test_semi = '\0';
        strcat (stmt_str.data,input_ln);              /* jen
LONG */
       stmt_str.len = (short)strlen( stmt_str.data );         /*
jen LONG */
        eostmt = 1;
      }

      fprintf(outstream, "\n%s", input_ln);
      if (verbose)
        fprintf(stderr,"\n%s", input_ln);
    }

    /** Test to see if we've reached the EOF.  Get out if that's
the case **/
    if (feof(instream)) {
      eostmt = TRUE;
      g_struct->c_flags->eo_infile = TRUE;            /*
@d22275 tjg */
    }

  }  while (!eostmt);

  fprintf(outstream, "\n");
  if (verbose)
    fprintf(stderr,"\n");

  /** erase the old control string **/
  strcpy(control_str,"\0");

  /** Determine whether statement is a SELECT or other
SQL **/
  if (good_sql) {
    strcpy(temp_str,stmt_str.data);               /* jen
LONG */
    uppercase(temp_str);  /* Make sure that select is made to
SELECT */
    select_status=strtok(temp_str," ");
    if ( (stmt_str.data[0] == '(') ||
(!strcmp(select_status,"SELECT")) ||
        (!strcmp(select_status,"VALUES")) ||
        (!strcmp(select_status,"WITH")) )
      return TPCDBATCH_SELECT;
    else
      return TPCDBATCH_NONSELECT;
  }

  /** If you go through a file with just comments or control
statments
    with no SQL, there's nothing to process...Exit
TPCDBATCH **/

  else                                        /* @d23684 tjg */
    return TPCDBATCH_NONSQL;

}  /*  Get_SQL_stmt */



/***********************************************
*******************/
/* allocate_sqlda -- This routine allocates space for the
SQLDA.   */
/***********************************************
*******************/

void allocate_sqlda(struct sqlda *sqlda)
{
  int   loopvar;                        /* Loop counter */

  for (loopvar=0; loopvar<sqlda->sqld; loopvar++)
  {
    switch (sqlda->sqlvar[loopvar].sqltype)
    {
    case SQL_TYP_INTEGER:                       /*
INTEGER */
     case SQL_TYP_NINTEGER:
      if ((sqlda->sqlvar[loopvar].sqldata=
              (TPCDBATCH_CHAR
*)malloc(sizeof(sqlint32))) == NULL)
        mem_error("allocating INTEGER");
      break;
    case SQL_TYP_BIGINT:                    /* BIGINT */
/*kmwBIGINT*/
     case SQL_TYP_NBIGINT:
/*#ifdef SQLWINT */
/*       if ((sqlda->sqlvar[loopvar].sqldata= */
/*               (TPCDBATCH_CHAR
*)malloc(sizeof(__int64))) == NULL)*/
/* #else */
       if ((sqlda->sqlvar[loopvar].sqldata=
              (TPCDBATCH_CHAR
*)malloc(sizeof(sqlint64))) == NULL)
/* #endif*/
        mem_error("allocating BIGINT");
      break;
    case SQL_TYP_CHAR:                      /* CHAR */
     case SQL_TYP_NCHAR:
      if ((sqlda->sqlvar[loopvar].sqldata=
              (TPCDBATCH_CHAR
*)calloc(256,sizeof(char))) == NULL)
        mem_error("allocating CHAR/VARCHAR");
      break;
```

```
      case SQL_TYP_VARCHAR:                    /*
VARCHAR */
      case SQL_TYP_NVARCHAR:
        if ((sqlda->sqlvar[loopvar].sqldata=
                (TPCDBATCH_CHAR
*)calloc(4002,sizeof(char))) == NULL)
          mem_error("allocating CHAR/VARCHAR");
        break;
      case SQL_TYP_LONG:                       /* LONG
VARCHAR */
      case SQL_TYP_NLONG:
        if ((sqlda->sqlvar[loopvar].sqldata=
                (TPCDBATCH_CHAR
*)calloc(32702,sizeof(char))) == NULL)
          mem_error("allocating VARCHAR/LONG
VARCHAR");
        break;
      case SQL_TYP_FLOAT:                      /* FLOAT */
      case SQL_TYP_NFLOAT:
        if ((sqlda->sqlvar[loopvar].sqldata=
                (TPCDBATCH_CHAR
*)malloc(sizeof(double))) == NULL)
          mem_error("allocating FLOAT");
        break;
      case SQL_TYP_SMALL:                      /*
SMALLINT */
      case SQL_TYP_NSMALL:
        if ((sqlda->sqlvar[loopvar].sqldata=
                 (TPCDBATCH_CHAR *)malloc(sizeof(short)))
== NULL)
          mem_error("allocating SMALLINT");
        break;
      case SQL_TYP_DECIMAL:                    /*
DECIMAL */
      case SQL_TYP_NDECIMAL:
        if ((sqlda->sqlvar[loopvar].sqldata=
                 (TPCDBATCH_CHAR *)malloc(20)) ==
NULL)
          mem_error("allocating DECIMAL");
        break;
      case SQL_TYP_CSTR:                       /* VARCHAR
(null terminated) */
      case SQL_TYP_NCSTR:
        if ((sqlda->sqlvar[loopvar].sqldata=
                (TPCDBATCH_CHAR
*)calloc(4001,sizeof(char))) == NULL)
          mem_error("allocating CHAR/VARCHAR");
        break;
      case SQL_TYP_DATE:                       /* DATE */
      case SQL_TYP_NDATE:
        if ((sqlda->sqlvar[loopvar].sqldata=
               (TPCDBATCH_CHAR *)calloc(13,sizeof(char)))
== NULL)
          mem_error("allocating DATE");
        break;
      case SQL_TYP_TIME:                       /* TIME */
      case SQL_TYP_NTIME:
        if ((sqlda->sqlvar[loopvar].sqldata=
               (TPCDBATCH_CHAR *)calloc(11,sizeof(char)))
== NULL)
          mem_error("allocating TIME");
        break;
      case SQL_TYP_STAMP:                      /*
TIMESTAMP */
      case SQL_TYP_NSTAMP:
        if ((sqlda->sqlvar[loopvar].sqldata=
               (TPCDBATCH_CHAR *)calloc(29,sizeof(char)))
== NULL)
          mem_error("allocating TIMESTAMP");
        break;
      }
     if ((sqlda->sqlvar[loopvar].sqlind=
              (short *)calloc(1,sizeof(short))) == NULL)
       mem_error("allocating indicator");

   }
   sqlda_allocated = 1; /* fix free() problem on NT
                        wlc 090597 */
   return;    /* allocate_sqlda  */
}


/*********************************************
**************************/
/* echo_sqlda -- This routine displays the contents of an
SQLDA.          */
/*********************************************
**************************/


void echo_sqlda(struct sqlda *sqlda, int *col_lengths)
{
   int    col;                    /* Column counter          */

   int    col_type;                /* Type of column          */

   char   temp_string[100] = "\0";       /* Temporary string
*/
   char   decimal_string[100] = "\0";    /* String holding
decimals    */
   char   *temp_ptr;

   TPCDBATCH_CHAR   m,n;               /* precision and
accuracy
                                       for decimal conversion    */


   for (col=0; col<sqlda->sqld; col++)    /* Loop through
column count  */
   {
     col_type=sqlda->sqlvar[col].sqltype;                /*
@d22817 tjg */

     if (*(sqlda->sqlvar[col].sqlind))                   /*
@d30369 tjg */
       fprintf(outstream, "%* n/a  ",(col_lengths[col]-3));
     else
       switch (col_type)
       {
        case SQL_TYP_INTEGER:
        case SQL_TYP_NINTEGER:

          fprintf(outstream, "%*ld  ",col_lengths[col],
                *(sqlint32 *)(sqlda->sqlvar[col].sqldata));
          break;

        case SQL_TYP_BIGINT:  /*kmwBIGINT*/
        case SQL_TYP_NBIGINT:
/*#ifdef SQLWINT*/
/*          fprintf(outstream, "%*I64d ",col_lengths[col],*/
/*                *(__int64 *)(sqlda->sqlvar[col].sqldata));*/
/*#else*/
          fprintf(outstream, "%*lld  ",col_lengths[col],
                *(sqlint64 *)(sqlda->sqlvar[col].sqldata));
/*#endif*/
          break;

        case SQL_TYP_CHAR:
        case SQL_TYP_NCHAR:
```

```
        fprintf(outstream, "%-*s  ",col_lengths[col],sqlda-
>sqlvar[col].sqldata);
        break;
      case SQL_TYP_VARCHAR:
      case SQL_TYP_NVARCHAR:
      case SQL_TYP_LONG:
      case SQL_TYP_NLONG:                          /*
@d30369 tjg */
        ((struct sqlchar *)sqlda->sqlvar[col].sqldata)->
          data[((struct sqlchar *)sqlda->sqlvar[col].sqldata)-
>length] = '\0';
        fprintf(outstream, "%-*s  ",
              col_lengths[col],
              ((struct sqlchar *)sqlda->sqlvar[col].sqldata)-
>data);
        break;
      case SQL_TYP_FLOAT:
      case SQL_TYP_NFLOAT:
      { /* kmw */
        if ( fabs(*(double *)(sqlda->sqlvar[col].sqldata))
                          <
TPCDBATCH_PRINT_FLOAT_MAX  )
          fprintf(outstream, "%#*.3f  ",col_lengths[col],
                *(double *)(sqlda->sqlvar[col].sqldata));
        else
          fprintf(outstream, "%*e  ",col_lengths[col],
                *(double *)(sqlda->sqlvar[col].sqldata));
        break;
      }

      case SQL_TYP_SMALL:
      case SQL_TYP_NSMALL:

        fprintf(outstream, "%*hd  ",col_lengths[col],
              *(short *)(sqlda->sqlvar[col].sqldata));
        break;
      case SQL_TYP_DECIMAL:
      case SQL_TYP_NDECIMAL:

        m=(*(struct declen *)&sqlda->sqlvar[col].sqllen).m;
        n=(*(struct declen *)&sqlda->sqlvar[col].sqllen).n;
        if (sqlrxd2a((char *)sqlda-
>sqlvar[col].sqldata,temp_string,m,n) != 0)
        {
          fprintf(stderr, "\nThe decimal value could not be
converted.\n");
          exit (-1);
        }
        else {

          temp_ptr = temp_string;

          if (*temp_ptr == '-')
            strcpy(decimal_string, "-");

          else
            strcpy(decimal_string, " ");

         for (temp_ptr = temp_string + 1; *temp_ptr == '0';
temp_ptr++)
            ;

          strcat(decimal_string,temp_ptr);
          fprintf(outstream, "%*s
",col_lengths[col],decimal_string);
        }

        break;

      case SQL_TYP_CSTR:
      case SQL_TYP_NCSTR:
      case SQL_TYP_DATE:
      case SQL_TYP_NDATE:
      case SQL_TYP_TIME:
      case SQL_TYP_NTIME:
      case SQL_TYP_STAMP:
      case SQL_TYP_NSTAMP:
        sqlda->sqlvar[col].sqldata[sqlda-
>sqlvar[col].sqllen+1]='\0';
        strcpy(temp_string,(char *)sqlda->sqlvar[col].sqldata);
        fprintf(outstream, "%-*s
",(col_lengths[col]),temp_string);
        break;

      default:
        fprintf(stderr,"--Unknown column type (%d).
Aborting.\n",col_type);
        break;
      }
  }

  fprintf(outstream, "\n");

  return;
}


/*********************************************************
*********/
/* Calculate the elapsed time.                           */
/*********************************************************
*********/

void get_start_time(Timer_struct *start_time)
{
  int rc = 0;

#if defined (SQLOS2) || defined (SQLWINT)  || defined
(SQLWIN) || defined (SQLDOS)
  /*@d33143aha*/
  ftime (start_time);
#elif defined(SQLSNI)
  rc = gettimeofday(start_time);
#elif defined(SQLPTX)
  gettimeofday_mapped(start_time);
  rc = 0;       /* gettimeofday_mapped returns void */
#elif defined (SQLUNIX) || defined (SQLAIX)
/*TIMER jen*/
  rc = gettimeofday(start_time,NULL);
#else
#error Unknown operating system
#endif

  if (rc != 0) {
    fprintf(stderr,"Timer call failed, aborting test\nExiting
tpcdbatch..\n");
    exit(-1);
  }
}



/*********************************************************
**********************/
/* Calculate and return the elapsed time given a starting time.
*/
/*********************************************************
**********************/
double get_elapsed_time ( Timer_struct *start_time)
{
```

```
  int               status = 0;
  Timer_struct      end_time;
  double            result = -1.0;
#ifndef SQLWINT
  long int          result_sec;
  long int          result_usec;
#endif


#if defined(SQLSNI)
  status = gettimeofday(&end_time);
#elif defined(SQLPTX)
  gettimeofday_mapped(&end_time);
  status = 0;   /* gettimeofday_mapped returns void */
#elif defined (SQLUNIX) || defined (SQLAIX)
  status = gettimeofday(&end_time,NULL);
/*TIMER jen*/
#elif defined (SQLOS2) || defined (SQLWINT) || defined
(SQLWIN) || defined(SQLDOS)
  ftime(&end_time);
#else                       /** If another operating system **/
#error Unknown operating system
#endif

  if (status != 0)
    fprintf(stderr,"Bad return from gettimeofday, don't trust
timer results...\n");

  else
  {
#if defined (SQLUNIX) || defined (SQLAIX)
    result_sec = end_time.tv_sec - start_time->tv_sec;
    result = (double) result_sec;
    /* TIMER used micro seconds with timeval (not
nanoseconds) */
    if ((start_time->tv_usec > 0) && \
       (start_time->tv_usec < 1000000) && \
       (end_time.tv_usec > 0) && \
       (end_time.tv_usec < 1000000))
    {
      result_usec = end_time.tv_usec - start_time->tv_usec;
      result = (double) result_sec + ((double)
result_usec/1000000);
    }
#elif (defined (SQLOS2) || defined(SQLWINT) || defined
(SQLWIN) || defined(SQLDOS))
    result = (double) (end_time.time - start_time->time);
    result = result * 1000 + (end_time.millitm - start_time-
>millitm);
    result = result/1000;
#else
#error Unknown operating system
#endif

  }

  /*
   * translate the time to that rounded to the CLOSEST 0.1
seconds as
   * required by the TPC-D spec.   ROUNDING
   */
  /*   result = (double)(((long)((result + 0.099999) *
10))/10.0);*/
  result = (double)(((long)((result + 0.05) * 10))/10.0);
  return (result);
}


void dumpCa(struct sqlca *ca)
{
  int i;
  fprintf(outstream,"********************* DUMP OF
SQLCA  *********************\n");
  fprintf(outstream,"SQLCAID   : %.8s\n", ca->sqlcaid);
  fprintf(outstream,"SQLCABC   : %d\n", ca->sqlcabc);
  fprintf(outstream,"SQLCODE   : %d\n", ca->sqlcode);
  fprintf(outstream,"SQLERRML  : %d\n", ca->sqlerrml);
  fprintf(outstream,"SQLERRMC  : %.*s\n", ca->sqlerrml,
ca->sqlerrmc);
  fprintf(outstream,"SQLERRP   : %.8s\n", ca->sqlerrp);

  for (i = 0; i < 6; i++)
  {
  fprintf(outstream,"SQLERRD[%d]: %d\n", i, ca-
>sqlerrd[i] );
  }
  fprintf(outstream,"SQLWARN   : %.11s\n", ca->sqlwarn);
  fprintf(outstream,"SQLSTATE  : %.5s\n", ca->sqlstate);
  fprintf(outstream,"********************  END OF
SQLCA DUMP  *****************\n");
  return;
}


/************************************************
*****************************/
/* error_check                                          */
/* This function prints the contents of the sqlca error
information        */
/* structure.                                           */
/************************************************
*****************************/
long error_check(void)
{
  char          buffer[512]="\0";
  unsigned short i;
  struct sqlca   temp_sqlca;      /* temporary sqlca */    /*
@d30369 tjg */

  temp_sqlca.sqlcode = 0;         /* initialize the temporary
sqlca to
                                   avoid any memory problems */

  if (sqlca.sqlcode != 0) {
    sqlaintp(buffer, sizeof(buffer), 80, &sqlca);
    fprintf(stderr, "\n%0.200s\n", buffer);
    fprintf(outstream, "\n%0.200s\n", buffer);

    /* Decode the SQLCA in more detail  KBS 98/09/28 */
    if ((sqlca.sqlerrml)   /*  there's one or more tokens   */
       && (sqlca.sqlerrml < sizeof(sqlca.sqlerrmc)) /* and
field not full */
       )
    {
      char *tokptr;
      int  tokl;
      *(sqlca.sqlerrmc + sqlca.sqlerrml) = '\0';  /*  prevent
strtok from scanning beyond end */
      fprintf(stderr,"\n     SQLCA:   tokens:\n");
      fprintf(outstream,"\n     SQLCA:   tokens:\n");
      tokptr=strtok(sqlca.sqlerrmc, "\xff");
      while (  tokptr                          &&
            ( (tokl = (int)(sizeof(sqlca.sqlerrmc) - (tokptr-
sqlca.sqlerrmc))) > 0)
           )
      {
        fprintf(stderr, "%.*s\n", tokl, tokptr);
        fprintf(outstream, "%.*s\n", tokl, tokptr);
        tokptr=strtok(NULL, "\xff");
      }
```

```
    }
    fprintf(stderr, "\n    SQLCA:  errp= %.8s, errd 1-6=%d
%d %d %d %d %d\n",
          sqlca.sqlerrp, sqlca.sqlerrd[0], sqlca.sqlerrd[1],
sqlca.sqlerrd[2],
          sqlca.sqlerrd[3], sqlca.sqlerrd[4], sqlca.sqlerrd[5]);
    fprintf(outstream, "\n    SQLCA:  errp= %.8s, errd 1-6=
%d %d %d %d %d %d\n",
          sqlca.sqlerrp, sqlca.sqlerrd[0], sqlca.sqlerrd[1],
sqlca.sqlerrd[2],
          sqlca.sqlerrd[3], sqlca.sqlerrd[4], sqlca.sqlerrd[5]);

    temp_sqlca = sqlca; /* Make a copy of sqlca in case it
gets changed
                        in the next statement below */   /*
@d30369 tjg */

    /** Determine if the error is critical or a connection can
be made **/

    EXEC SQL CONNECT ;                                  /*
@d28763 tjg */

    if (sqlca.sqlcode == SQLE_RC_NOSUDB ) { /* no
connection exists */

      /*Print out header for DUMP*/
      fprintf(outstream,
"*************************************\n");
      fprintf(outstream, "*       CONTENTS OF SQLCA
*\n");
      fprintf(outstream,
"*************************************\n\n");

      /*Print out contents of SQLCA variables*/
      fprintf(outstream, "SQLCABC  = %ld\n",
temp_sqlca.sqlcabc);
      fprintf(outstream, "SQLCODE  = %ld\n",
temp_sqlca.sqlcode);
      fprintf(outstream, "SQLERRMC = %0.70s\n",
temp_sqlca.sqlerrmc);
      fprintf(outstream, "SQLERRP  =  %0.8s\n",
temp_sqlca.sqlerrp);

      for (i = 0; i < 6; i++)
      {
        fprintf(outstream, "sqlerrd[%d] = %lu \n", i,
temp_sqlca.sqlerrd[i]);
      }

      fprintf(outstream, "SQLWARN  = %0.11s\n",
temp_sqlca.sqlwarn);
      fprintf(outstream, "SQLSTATE = %0.5s\n",
temp_sqlca.sqlstate);

      fprintf(stderr, "\nCritical SQLCODE.  Exiting
TPCDBATCH\n");
      exit(-1);

    }
  }
  return (temp_sqlca.sqlcode);

}  /* error_check */



/************************************************
**/
/* Displays a help screen                       */
/************************************************
**/
void display_usage()
{
  printf("\ntpcdbatch  --  version
%s",TPCDBATCH_VERSION);
  printf("\n\nSyntax is:\n");
  printf("tpcdbatch [-d dbname] [-f file_name] [-l file_name]
[-r on/off]");
  printf("\n       [-v on/off] [-b on/off] [-u p/t/t1/t2]");
  printf("\n       [-s scale_factor] [-n stream_num] [-m
inlistmax] [-h]\n");
  printf("\n where: -d  Database name");
  printf("\n              Default - dbname set in
$DB2DBDFT");
  printf("\n       -f  Input file containing SQL statements");
  printf("\n              Default - stdin ");
  printf("\n       -l  Input file containing list of statement
numbers");
  printf("\n       -r  Create set of output files containing query
results");
  printf("\n              Default - off");
  printf("\n       -v  Verbose.  Sends information to stderr
during");
  printf("\n           query processing");
  printf("\n              Default - off");
  printf("\n       -b  Process groups of statements as blocks ");
  printf("\n           instead of individually.");
  printf("\n              Default - off");
  printf("\n       -u  Update streams: p    - for power test");
  printf("\n                           t    - for throughput test
without");
  printf("\n                                  UFs (run this instead of
t2)");
  printf("\n                          t1   - for throughput test step 1");
  printf("\n                                 only running queries");
  printf("\n                          t2   - for throughput test step 2");
  printf("\n                                 running update functions");
  printf("\n       -s  Scale factor");
  printf("\n              Default - 0.1");
  printf("\n       -n  Stream number");
  printf("\n                    Default - 0");
  printf("\n                 Qualification - -1");
  printf("\n                       Power - 0");
  printf("\n                  Throughput - >= 1 (actual number
depends on the current query stream");
  printf("\n       -m  Maximum number of keys to delete at a
time");
  printf("\n              Default - 400");
  printf("\n       -h  Display this help screen");
  printf("\n       -p  turns smeaphores on or off");
  printf("\n              Default - off");

  printf("\n\nControl statements specifying output and
performance details");
  printf("\ncan be included before SQL statements; they will
apply for");
  printf("\nthat and subsequent statements until updated.");

  printf("\n\nSyntax:   --#SET <control option> <value>");
  printf("\n\n  option     value    default");
  printf("\nROWS_FETCH   -1 to n     -1  (all rows fetched
from answer set)");
  printf("\nROWS_OUT     -1 to n     -1  (all fetched rows
sent to output)");
  printf("\n\n--#TAG      tag          (user specified tag name
for sequence#)");
  printf("\n--#COMMENT   comment      (user specified
comments for output)");
```

```
  printf("\nNote:  All statements executed with ISOLATION
LEVEL RR");
  printf("\n       and must be terminated with semi-colons.\n");
  exit (1);
}


/*************************************************/
/* Converts a string to upper case characters   */
/*************************************************/
char *uppercase( char *string )
{
  char   *c;      /* temp char used to convert word to upper
case */

  for ( c = string; *c != '\0'; c++)
    *c = (char) toupper( (int) *c );

  return (string);
}

/*************************************************/
/* Converts a string to lower case characters   */
/*************************************************/
char *lowercase( char *string )
{
  char   *c;      /* temp char used to convert word to lower
case */

  for ( c = string; *c != '\0'; c++)
    *c = (char) tolower( (int) *c );

  return (string);
}


/*************************************************
***/
/* Parses and processes command line options.      */
/*************************************************
***/

void comm_line_parse(int argc, char *argv[], struct
global_struct *g_struct)
{
  char authent_info[40] = "\0";
  char *testptr;
  int loopvar = 0;

  int comm_opt = 0;
#ifdef PARALLEL_UPDATES
  int running_updates=0;
  int updatePair=-1;
  int updateStream=-1;
  int function;
  int copyOnOrOff;
  int deleteChunk=0;         /*DELjen */
#endif

  while ((loopvar < argc) && (argc != 1)) {

    if (*argv[loopvar] == '-') {

      switch(*(argv[loopvar]+1)) {

       case 'f' :                                  /* @d26350 tjg */
       case 'F' :
                  strcpy(g_struct->c_l_opt-
>infile,argv[++loopvar]);
                  break;

       case 'l' :                                  /* @d26350 tjg */
       case 'L' :    strcpy(g_struct->c_l_opt-
>str_file_name,argv[++loopvar]);
                  break;

       case 'r' :                                  /* @d26350 tjg */
       case 'R' :
         if (!strcmp(uppercase(argv[++loopvar]),"ON"))
           g_struct->c_l_opt->outfile=1;
         else
           g_struct->c_l_opt->outfile=0;
         break;

       case 'd' :                                  /* @d26350 tjg */
       case 'D' :
                  strcpy(dbname,argv[++loopvar]);
                  break;

       case 'v' :                                  /* @d26350 tjg */
       case 'V' :
         if (!strcmp(uppercase(argv[++loopvar]),"ON"))
           verbose=1;
         else
           verbose=0;
         break;

       case 'u' :                                  /* @d26350 tjg */
       case 'U' :
         g_struct->c_l_opt->update=-1; /* init to invalid
number */
         if (!strcmp(uppercase(argv[++loopvar]),"P1"))
           g_struct->c_l_opt->update=1; /* power query
stream*/
         if (!strcmp(uppercase(argv[loopvar]),"P2"))
             g_struct->c_l_opt->update=3; /* power update
with updates*/
         if (!strcmp(uppercase(argv[loopvar]),"P"))
           g_struct->c_l_opt->update=4; /* power update
without updates*/
         if (!strcmp(uppercase(argv[loopvar]),"T1"))
             g_struct->c_l_opt->update=0; /*throughput query
stream */
         if (!strcmp(uppercase(argv[loopvar]),"T2"))
             g_struct->c_l_opt->update=2; /* throughput
update with updates */
         if (!strcmp(uppercase(argv[loopvar]),"T"))
             g_struct->c_l_opt->update=5; /* throughput
update without updates */

         break;

       case 'b' :                                  /* @d26350 tjg */
       case 'B' :
         if (!strcmp(uppercase(argv[++loopvar]),"ON"))
           g_struct->s_info_ptr->query_block=1;
         else
           g_struct->s_info_ptr->query_block=0;
         break;

       case 'n' :                                  /* @d26350 tjg */
       case 'N' :
         g_struct->c_l_opt->intStreamNum =
atoi(argv[++loopvar]);
         break;

       case 's' :                                  /* @d26350 tjg */
       case 'S' :    g_struct-
>scale_factor=atof(argv[++loopvar]); break;
```

```
        case 'h':
        case 'H' :                                  /* @d26350 tjg */
          display_usage();
          break;

        case 'm' :
        case 'M' :
          inlistmax = atoi(argv[++loopvar]); /* wlc 081897 */
          break;

        case 'p' :
        case 'P' :
          if (!strcmp(uppercase(argv[++loopvar]),"ON")) /*
bbe 072599 */
            semcontrol = 1;
          else
            semcontrol = 0;
          break;


#ifdef PARALLEL_UPDATES
        case 'i':
          updatePair = atoi (argv[++loopvar]);
#ifdef UF2DEBUG
          fprintf (stderr, "updatePair = %d\n",updatePair);
          fflush(stderr);
#endif
          break;

        case 'j':
          function = atoi (argv[++loopvar]);
#ifdef UF2DEBUG
          fprintf (stderr, "function = %d\n",function);
          fflush(stderr);
#endif
          break;

        case 'k':
          updateStream = atoi (argv [++loopvar]);
#ifdef UF2DEBUG
          fprintf (stderr, "updateStream = %d\n",updateStream);
          fflush(stderr);
#endif
          break;

        case 'x':                                   /*DEL jen -x is chunk*/
          deleteChunk = atoi (argv[++loopvar]);     /* to delete
for this */
#ifdef UF2DEBUG
          fprintf (stderr, "DelChunk = %d\n",deleteChunk);
          fflush(stderr);
#endif
          break;                                    /* invocation */

        case 'z':
          running_updates = 1;
          break;
#endif
        default :
          fprintf(stderr,"An invalid option has been set\n");
          display_usage();
          break;

        }  /** end switch **/
      } /** end if **/

      loopvar ++;
    } /** end while **/

    /* checking if -u option is set */
    if (g_struct->c_l_opt->update == -1) {
      fprintf(stderr, "-u option is not set, exiting ...\n");
      exit(-1);
    }


#ifdef PARALLEL_UPDATES
    if (running_updates) {
      if (updatePair == -1) {
        fprintf (stderr, "The parameters to tpcdbatch have not
been passed correctly \n");
        exit (-1);
      }
      else {
        /* check to see if we are to use copy on for the load */
        if (( getenv("TPCD_LOG") != NULL ) &&
          (!strcmp(uppercase(getenv("TPCD_LOG")),"YES")))
        {
          /* okay, we have set LOG_RETAIN on so we need to
use copy directory */
          copyOnOrOff = TRUE;
        }
        else
        {
          /* log retain off don't use copy directory */
          copyOnOrOff = FALSE;
        }

        if (function == 1)
          /* runUF1_fn (updatePair, updateStream);  aph
981205 */
          runUF1_fn (updatePair, updateStream, dbname,
userid, passwd);
        else
          if (function == 2) {
            fprintf(stderr, "A-Calling runUF2_fn  %d   %d
%d ...\n",
                                updatePair, updateStream,
deleteChunk);
            /* runUF2_fn (updatePair, updateStream,
deleteChunk);   aph 981205 */
            runUF2_fn (updatePair, updateStream, deleteChunk,
dbname, userid, passwd);
          }
        else {
          fprintf (stderr, "Wrong function to tpcdbatch\n");
          exit (-1);
        }
        exit (0);
      }
    }
#endif /* PARALLEL_UPDATES */

    /* If no database name is given, then use the one specified
in the
       environment variable DB2DBDFT, otherwise error */
    if (!strcmp(dbname,"\0")) {
      testptr = getenv("DB2DBDFT");
      if (testptr == NULL) {
        fprintf(stderr, "\nNo database name has been specified
on command ");
        fprintf(stderr, "line\nnor in environment variable
DB2DBDFT.");
        display_usage();
      }
      else
        strcpy(dbname,testptr);

    }
```

```
  if (g_struct->c_l_opt->outfile &&
      !strcmp(g_struct->c_l_opt->str_file_name,"\0")) {
     fprintf(stderr, "\nMust specify input file for statement
list.\n");
     display_usage();
   }

}



/***********************************************
***/
/* Converts DECIMAL values to ASCII text          */
/***********************************************
***/
int sqlrxd2a(                                  /*kmw*/
                                    /* C++ */char *decptr,
                                    /* C++ */char *asciiptr,
                                    short prec,
                                    short scal)
{/* */
  int allzero = TRUE;
  /* C++ */char *srcptr;
  unsigned char sign;
  /* C++ */char *targptr, decimal_point = '.';
  int rc = 0;                                  /*kmw*/
  int tmpint, src_nibble;
  int count, j, limit[3];

  targptr = &asciiptr[ prec + 1];
  *(1 + targptr) = '\0';
  srcptr = decptr + prec/2;


  /* Validity check sign nibble */
  if (((sign = sqlrx_get_right_nibble( *srcptr )) < 0x0a)
     || (prec > SQL_MAXDECIMAL) || (prec < scal ))
  {
    goto exit;
  }/** end end if invalid sign value **/


  limit[ 0 ] = scal; limit[ 1 ] = prec - scal; limit[ 2 ] = 0;
  src_nibble = LEFT;
  for( j = 0 ; j < 2 ; j++ )
  {
    for( count = limit[ j ] ; count > 0 ; count-- )
    {
      tmpint = ( (src_nibble == LEFT)?
               sqlrx_get_left_nibble( *srcptr-- ) :
               sqlrx_get_right_nibble( *srcptr ) );
      if( tmpint > 9 )
      {
        goto exit;
      }
      else
        *targptr-- = (/* C++ */char)tmpint + '0';
      src_nibble = ((src_nibble == LEFT) ? RIGHT : LEFT);
      if ( tmpint != 0 ) allzero = FALSE;
    } /** end for scal > 0 **/

    if( j == 0 )
      *targptr-- = decimal_point;
    else
      *targptr = (/* C++ */char)((allzero
                          || (sign ==
SQLRX_PREFERRED_PLUS)
                          || (sign == 0x0a)
                          || (sign == 0x0e)
                          || (sign == 0x0f)) ?
                         '+' : '-' );
  } /** end for limit[ j++ ] > 0 **/

  exit :
  if( rc < 0 )
  {
    printf ("The decimal conversion has failed\n");
    exit (-1);

  }

  return(rc);
} /** sqlrxd2a **/


/***********************************************
*****************/
/* Does some setup and initialization like parsing command
line  */
/* and connecting to database.  Returns process id of agent.
*/
/***********************************************
*****************/

void init_setup(int argc, char *argv[], struct global_struct
*g_struct)
{
  int connect=0;
#ifndef SQLWINT
  char *pid;
#endif
  char temparray[256]="\0";
  int loopvar=0;
  FILE *updateFP;
  FILE *fpSeed;
  char file_name[256] = "\0";
  short seedEntry;
  long  lSeed;
  int i;

  /** Parse and process command line options **/
  comm_line_parse (argc,argv,g_struct);

/***********************************************
***********************/
/* Start the mainline report processing.                */
/***********************************************
***********************/
  if (!strcmp(g_struct->c_l_opt->infile,"\0")) {
    instream=stdin;
  }
  else {
    instream=NULL;
    if ( (instream = fopen(g_struct->c_l_opt->infile,
READMODE)) == NULL ) {
      fprintf(outstream, "The input file could not be
opened.\n\n");
      fprintf(stdout,"Make sure that the filename is
correct.\n");
      fprintf(stdout,"filename = %s\n",g_struct->c_l_opt-
>infile);
      exit(-1);

    }  /* open the input file if specified  */
  }

  /* IMPORT (begin) - determine whether we should use the
IMPORT api or */
```

```
  /* LOAD api for loading into the staging tables, default is
load      */
  if (env_tpcd_update_import != NULL)
  {
    if
(!strcmp(uppercase(env_tpcd_update_import),"TRUE"))
    {
      iImportStagingTbl = 1;   /* use import */
    }
    /* DJD */
    else if
(!strcmp(uppercase(env_tpcd_update_import),"TF"))
    {
      iImportStagingTbl = 2;   /* Table Functions */
    }
  }



  /* IMPORT (end) */

  /* we want to print the seed in the output files to show what
seed was */
  /* used to generate the queries.  */
  /* if intStreamNum is -1 then we are running a qualification
database */
  /* and the default seed has been used so skip this section */
  if (g_struct->c_l_opt->intStreamNum >= 0)
  {
    /* check to make sure the TPCD_RUNNUMBER
environment variable is set. We */
    /* use this and the stream number to determine which
seed was used to    */
    /* generate the current set of queries */
    if (getenv("TPCD_RUNNUMBER") == NULL)
    {
      fprintf(stderr,"\nThe TPCD_RUNNUMBER
environment variable is not set");
      fprintf(stderr,"....exiting\n");
      exit(-1);
    }
    if (getenv("TPCD_NUMSTREAM") == NULL)
    {
      fprintf(stderr,"\nThe TPCD_NUMSTREAM
environment variable is not set");
      fprintf(stderr,"....exiting\n");
      exit(-1);
    }


/*************************************************
*************************
     * SEED jen
     * we want to print the seed used in the output files.  For
the seed usage
     * we can now reuse the seeds from run to run, therefore
all the power runs
     * will use the 1st seed in the file, and the throughput
streams will use
     * the 2nd to #streams+1 seeds.
     * determine the seed to use...e.g. given 3 streams will
have the following:
     *                          Entry in seed file
     *    TEST      Stream Number    Run 1    Run 2
     *    power      0            1      1
     *    throughput  1            2      2
     *               2            3      3
     *               3            4      4
*************************************************
************************/
    seedEntry = g_struct->c_l_opt->intStreamNum + 1;
    /* end SEED jen */
    /* open the generated seed file...if not there, try the
default */

    sprintf(file_name, "%s%sauditruns%smseedme",
env_tpcd_audit_dir,
          env_tpcd_path_delim, env_tpcd_path_delim);

    if ((fpSeed = fopen(file_name,READMODE)) == NULL )
    {
      fprintf(stderr,"\nCannot open the seed file, please
ensure that\n");
      fprintf(stderr,"the file exists.  filename =
%s\n",file_name);
      exit(-1);
    }
    for (i = 1; i <= seedEntry; i++)
    {
      if (feof(fpSeed))
      {
        lSeed = -1;   /* seed not available for some reason */
      }
      fscanf(fpSeed,"%ld\n",&lSeed);
    }
    g_struct->lSeed = lSeed;
    fclose(fpSeed);
  }

  /* check to see if we are to use copy on for the load */
  if (( getenv("TPCD_LOG") != NULL ) &&
     (!strcmp(uppercase(getenv("TPCD_LOG")),"YES")))
  {
    /* okay, we have set LOG_RETAIN on so we need to use
copy directory */
    g_struct->copy_on_load = TRUE;
  }
  else
  {
    /* log retain off don't use copy directory */
    g_struct->copy_on_load = FALSE;
  }

/*************************************************
*****************/
/* Make sure that DB2 is started.                          */
/* CONNECT now unless this is a UF stream for a
Throughput test. */
/* (aph 98/12/22)                                          */
/*************************************************
*****************/

  if (g_struct->c_l_opt->update > 1)
  {
    /* This is an update function stream in a throughput run.
*/
    /* Just make sure that DB2 is started.  Each UF child will
CONNECT itself. */
    if (verbose) fprintf(stderr,"\nStarting the DB2 Database
Manager Now\n");
    sqlestar ();
  }
  else
  { /* In all other cases, CONNECT to the target database. */
    do
    {
```

```
        if (!strcmp(userid,"\0"))   /** No authentication
provided **/
          EXEC SQL CONNECT TO :dbname;
        else EXEC SQL CONNECT TO :dbname
USER :userid USING :passwd;
        if (sqlca.sqlcode == SQLE_RC_NOSTARTG) {
          if (verbose)
            fprintf(stderr,"\nStarting the DB2 Database
Manager Now\n");
          sqlestar ();
          connect=0;
        }
        else connect=1;
      } while (!connect);
      error_check();
    }


/***********************************************
**************************
 *  All session initialization is performed at connect time or
immediately *
 *  following and is complete before starting the stream.
*

***********************************************
**************************/

    /** Get start timestamp for stream **/
    get_start_time(&(g_struct->stream_start_time));     /*
TIME_ACC jen*/
    strcpy(g_struct->file_time_stamp,
          get_time_stamp(T_STAMP_FORM_2,&(g_struct-
>stream_start_time))); /* TIME_ACC jen*/

    if (getenv("TPCD_RUN_DIR") != NULL)
      strcpy(g_struct->run_dir,getenv("TPCD_RUN_DIR"));
    else
      strcpy(g_struct->run_dir,".");

    /* if we are running a throughput test, then we must report
the */
    /* stream count information...we will report one file per
stream */
    /* and amalgamate them after all streams have completed
*/
    /* if the number of streams is greater than 0 then this is a
throughput test*/
    switch (g_struct->c_l_opt->update)
    {
        case (2):
        case (5):
              /* update throughput function stream */
              sprintf(file_name,"%s%sstrcntuf.%s",g_struct-
>run_dir,
                      env_tpcd_path_delim, g_struct-
>file_time_stamp);
              break;
        case (3):
        case (4):
              /* update power function stream */
              sprintf(file_name,"%s%spstrcntuf.%s",g_struct-
>run_dir,
                      env_tpcd_path_delim, g_struct-
>file_time_stamp);
              break;
        case (1):
              /* power query stream */
              sprintf(file_name, "%s%spstrcnt%d.%s",g_struct-
>run_dir, env_tpcd_path_delim,
                      g_struct->c_l_opt->intStreamNum,g_struct-
>file_time_stamp);
              break;
        case (0):
              /* throughput query stream */
              sprintf(file_name, "%s%sstrcnt%d.%s",g_struct-
>run_dir, env_tpcd_path_delim,
                      g_struct->c_l_opt->intStreamNum,g_struct-
>file_time_stamp);
              break;
    }

    if( (g_struct->stream_report_file = fopen(file_name,
WRITEMODE)) == NULL )
    {
      fprintf(stderr,"\nThe output file for the stream count
information\n");
      fprintf(stderr,"could not be opened, make sure the
filename is correct\n");
      fprintf(stderr,"filename = %s\n",file_name);
      exit(-1);
    }

    if (g_struct->c_l_opt->update > 1)
    {
      /* update function stream */
      fprintf(g_struct->stream_report_file,
            "Update function stream starting at %*.*s\n",
            T_STAMP_3LEN,T_STAMP_3LEN, /*
TIME_ACC jen*/
            get_time_stamp(T_STAMP_FORM_3,&(g_struct-
>stream_start_time))); /* TIME_ACC jen*/
    }
    else
    {
      /* query stream */
      fprintf(g_struct->stream_report_file,
            "Stream number %d starting at %*.*s\n",
            g_struct->c_l_opt->intStreamNum,
            T_STAMP_3LEN,T_STAMP_3LEN,          /*
TIME_ACC jen*/
            get_time_stamp(T_STAMP_FORM_3,&(g_struct-
>stream_start_time))); /* TIME_ACC jen*/
    }

#ifndef LINUX

    fclose(g_struct->stream_report_file);

#endif

    /* set up the update_num_file name so that if we do use
semaphores, */
    /* we will have a filename to generate the semkey */

    sprintf(g_struct->update_num_file,
"%s%s%s.%s.update.pair.num", env_tpcd_audit_dir,
          env_tpcd_path_delim, uppercase(env_tpcd_dbname),
lowercase(env_user));
    sprintf(g_struct->sem_file, "%s.%s.semfile",
env_tpcd_dbname, env_user);
    if (g_struct->c_l_opt->intStreamNum == 0)
    {
      sprintf(g_struct->sem_file2, "%s.%s.semfile2",
env_tpcd_dbname, env_user);
    }
    if (verbose) {   /* print out the update pair number file for
debugging */
      fprintf(stderr,"\n init_setup: strem %d update pair numb
file = %s\n",
```

```
          g_struct->c_l_opt->intStreamNum,g_struct-
>update_num_file);
   }

   /* update the
$TPCD_AUDIT_DIR/$TPCD_DBNAME.$USER.update.pai
r.num file */
   /* update pairs have been run */
   if (( g_struct->c_l_opt->update >= 1 ) && ( g_struct-
>c_l_opt->update < 4 ))
        /* on or onl, but not  */ /* bbe or > 1 */
   {
     updateFP  = fopen(g_struct->update_num_file,"r");
     if (updateFP != NULL )
     {
       fscanf(updateFP,"%d",&updatePairStart);
       fclose(updateFP);
       if (g_struct->c_l_opt->intStreamNum == 0)  /* on, 1
update pair */
          updatePairStop = updatePairStart + 1;
       else       /* only, multiple update pairs, stream number
will be total */
          updatePairStop = updatePairStart + g_struct-
>c_l_opt->intStreamNum;
       currentUpdatePair = updatePairStart;

       if (updatePairStart <= 0)
       {
         fprintf(stderr,"updatePairStart is bogus!");
         exit(-1);
       }
     }
     else
     {
       fprintf(stderr,"\n %s not set up, set this \n",g_struct-
>update_num_file);
       fprintf(stderr,"file to contain the number of the update
pair to  \n");
       fprintf(stderr,"run and resubmit\n");
       exit(-1);
     }
   }

   return ;

}

/*************************************************
*********************/
/* A function to print out the column titles for a returned set
*/
/*************************************************
*********************/
void print_headings (struct sqlda *sqlda, int *col_lengths)
{
   int col = 0;                    /* Column number          */
   int col_width = 0;              /* width of column        */
   int max_col_width = 0;          /* maximum column width
*/
   int col_name_length = 0;        /* sizeof column name
string */
   int col_type = 0;               /* column type            */

   int total_length = 0;           /* accumulator var. for
                                   length of column headings */
   int loopvar = 0;

   char col_name[256] = "\0";
   unsigned char m,n;              /* precision and accuracy
                                   for decimal conversion    */

   fprintf (outstream,"\n");

   /** loop through for each column in solution set
     and determine the maximum column width  **/

   for (col = 0; col < sqlda->sqld; col++) {
     col_name_length=sqlda->sqlvar[col].sqlname.length;
     col_type = sqlda->sqlvar[col].sqltype;
     col_width = sqlda->sqlvar[col].sqllen;
     strncpy(col_name,(char *)sqlda-
>sqlvar[col].sqlname.data,col_name_length) ;

     switch (col_type)
     {
      case SQL_TYP_SMALL:
      case SQL_TYP_NSMALL:                          /*
@d30369 tjg */
        col_lengths[col] = TPCDBATCH_MAX
(col_name_length,6);
        break;
      case SQL_TYP_INTEGER:
      case SQL_TYP_NINTEGER:
        col_lengths[col] = TPCDBATCH_MAX
(col_name_length,11);
        break;
      case SQL_TYP_BIGINT:   /*kmwBIGINT*/
      case SQL_TYP_NBIGINT:
        col_lengths[col] = TPCDBATCH_MAX
(col_name_length,19);
        break;
      case SQL_TYP_CSTR:
      case SQL_TYP_NCSTR:
      case SQL_TYP_DATE:
      case SQL_TYP_NDATE:
      case SQL_TYP_TIME:
      case SQL_TYP_NTIME:
      case SQL_TYP_STAMP:
      case SQL_TYP_NSTAMP:
      case SQL_TYP_CHAR:
      case SQL_TYP_NCHAR:
      case SQL_TYP_VARCHAR:
      case SQL_TYP_NVARCHAR:
      case SQL_TYP_LONG:
      case SQL_TYP_NLONG:
        col_lengths[col] = TPCDBATCH_MAX
(col_name_length,col_width);
        break;

      case SQL_TYP_FLOAT:
      case SQL_TYP_NFLOAT:
       /* kmw  - note:
TPCDBATCH_PRINT_FLOAT_WIDTH > max long
identifier */
        col_lengths[col] =
TPCDBATCH_PRINT_FLOAT_WIDTH;
        break;

      case SQL_TYP_DECIMAL:
      case SQL_TYP_NDECIMAL:

        m=(*(struct declen *)&sqlda->sqlvar[col].sqllen).m;
        n=(*(struct declen *)&sqlda->sqlvar[col].sqllen).n;

        col_lengths[col] = TPCDBATCH_MAX ((int)(m+n),
col_name_length);
       /* Special handling for DECIMAL */   /* @d26350 tjg
*/
        break;
```

```
      default:
        fprintf(stderr,"--Unknown column type (%d).
Aborting.\n",col_type);
        break;
      }

     fprintf(outstream,"%-*.*s
",col_lengths[col],col_name_length,col_name);

     total_length += (col_lengths[col] + 2);  /* 2 is from
padding spaces */
   }

   fprintf(outstream,"\n");
   for (loopvar=0; loopvar < total_length; loopvar++)
     fprintf(outstream,"-");
   fprintf(outstream,"\n");

}


/************************************************
*******************/
/* Gets the current system time and prints it out               */
/************************************************
*******************/
char *get_time_stamp(int form, Timer_struct *time_pointer)
{
   Timer_struct temp_stamp;  /* TIME_ACC jen */
   struct tm *tp;
   size_t timeLength = 0;

   /* TIME_ACC jen start */
   if (time_pointer == (Timer_struct *)NULL)
     get_start_time(&temp_stamp);
   else
     temp_stamp = *time_pointer;

#if defined (SQLUNIX) || defined (SQLAIX)
   tp = localtime((time_t *)&(temp_stamp.tv_sec));
#elif (defined (SQLOS2) || defined(SQLWINT) || defined
(SQLWIN) || defined(SQLDOS))
   tp = localtime(&(temp_stamp.time));
#else
#error Unknown operating system
#endif
   /* TIME_ACC jen stop*/

   if ((form == T_STAMP_FORM_1) || (form ==
T_STAMP_FORM_3))
   {
   /* SUN fix bbe start */
#if (defined (SQLWINT) || defined (SQLWIN) || defined
(SQLOS2) || defined(SQLDOS))
     timeLength = strftime(newtime,50,"%x %X",tp);
#elif (defined (SQLUNIX) || defined (SQLAIX))
     timeLength = strftime(newtime,50,"%D %T",tp);  /*
SUN  ...test this */
#else
#error Unknown operating system
#endif
   /* SUN fix bbe stop */
     /* TIME_ACC jen start*/
     if (form == T_STAMP_FORM_3)
     {
       /* concatenate the microsecond/milliseconds  on the
end of the */
       /*timestamp jen1006 */
#if defined (SQLUNIX) || defined (SQLAIX)
sprintf(newtime+timeLength,".%0.6d",temp_stamp.tv_usec);
#elif (defined (SQLOS2) || defined(SQLWINT) || defined
(SQLWIN) || defined(SQLDOS))

sprintf(newtime+timeLength,".%0.3d",temp_stamp.millitm);
#else
#error Unknown operating system
#endif
       /* TIME_ACC jen stop*/
     }
   }
   else
     if (form == T_STAMP_FORM_2)
       strftime(newtime,50,"%y%m%d-%H%M%S",tp);

   return (newtime);

}



/************************************************
*******************/
/* Handle all the processing for the summary table
*/
/************************************************
*******************/

void summary_table (struct global_struct *g_struct)
{
   double arith_mean = 0;
   double geo_mean  = 0;
   int    num_stmt  = 0;
   int    num_stmt_for_geo_mean  = 0;

   double adjusted_a_mean = 0;
   double adjusted_g_mean = 0;
   double adjusted_g_mean_intern;
   double adjusted_max_time = 0;

   double Ts   = 0;                  /* different TPC-D metrics */
   double Ts1;
   double Ts2;
/* double QppD = 0;                    MARK
   double QthD = 0;
   double QphD = 0; */

   double db_size_frac_part = 0;       /* stores the fractional
part of db size */
   double db_size = 0;                 /* size in numbers */
   char db_size_qualifier[3] = "\0";   /* MB, GB or TB */

   struct stmt_info
     *s_info_ptr,
     *s_info_head_ptr,
     *max,
     *min;


   /* Determine the size of the database from the scale factor
(1 SF = 1GB) */
   if (g_struct->scale_factor < 1.0) {
       db_size = g_struct->scale_factor * 1000;
       strcpy(db_size_qualifier, "MB");
   } else if (g_struct->scale_factor >= 1000.0) {
       db_size = g_struct->scale_factor / 1000;
       strcpy(db_size_qualifier, "TB");
   } else {
       db_size = g_struct->scale_factor;
```

```
      strcpy(db_size_qualifier, "GB");
   }


   /* computes the fractional part of db_size */
   db_size_frac_part = db_size - (int) db_size;

   s_info_ptr = g_struct->s_info_ptr;  /* Just use a local copy
*/
   s_info_head_ptr = s_info_ptr;

   max = s_info_head_ptr;
   /* ensure that we are not already setting max to the UF
timings */
   while ( strstr(max->tag, "UF") != NULL )
     max = max->next;
   min = max;

  if (g_struct->c_l_opt->outfile)     /* create the appropriate
output file */
      output_file(g_struct);

   /* write the seed used for this run unless it is a qualification
run */
   /* (qualification runs use the default seed for their queries)
or  */
   /* unless it is the update function stream (no seeds used for
this) */
   /* (this is an update stream iff update is 2) */
   if ((g_struct->c_l_opt->intStreamNum >=0) &&
       (g_struct->c_l_opt->update != 2) )
   {
     if (g_struct->lSeed == -1)
     {
       fprintf( outstream,"\nUsing default qgen seed file");
     }
     else
       fprintf (outstream, "\nSeed used for current run =
%ld",g_struct->lSeed);
     fprintf( outstream,"\n");
   }

   /* print out the stream number if we are in a throughput
stream and if */
   /* this is not the update stream portion of the throughput
test */
   if ( (g_struct->c_l_opt->intStreamNum > 0) &&
        (g_struct->c_l_opt->update != 2)  )
   {
     fprintf( outstream, "Stream number = %d\n",g_struct-
>c_l_opt->intStreamNum);
   }
   /* print the stream start timestamp to the inter file */
   fprintf (outstream, "Stream start time stamp %*.*s\n",
           T_STAMP_3LEN,T_STAMP_3LEN,  /*
TIME_ACC jen*/
           get_time_stamp(T_STAMP_FORM_3,&(g_struct-
>stream_start_time))); /* TIME_ACC jen*/
   /* print the stream stop timestamp to the inter file */
   fprintf (outstream, "Stream stop time stamp %*.*s\n",
           T_STAMP_3LEN,T_STAMP_3LEN,  /*
TIME_ACC jen*/
           get_time_stamp(T_STAMP_FORM_3,&(g_struct-
>stream_end_time)));  /* TIME_ACC jen*/

   fprintf (outstream, "\n\n\nSummary of
Results\n==================\n");
   fprintf (outstream,
           "\nSequence #     Elapsed Time   Adjusted Time Start
Timestamp   End Timestamp\n\n");

   /* Go through the linked list and determine which
statement had the
      highest and lowest elapsed times */
   while ( (s_info_ptr != NULL) && (s_info_ptr != g_struct-
>s_info_stop_ptr) ) {

     /* check if we are in an update function...if so, we do not
want to */
      /* consider the update function times as the min or max
time */
      if ( strstr(s_info_ptr->tag,"UF") == NULL )
      {
        /* we are not in an update function */
        if (s_info_ptr->elapse_time > max->elapse_time)
          max = s_info_ptr;
        else
          if ((s_info_ptr->elapse_time < min->elapse_time)
              && (s_info_ptr->elapse_time > -1))
            min = s_info_ptr;
      }

      s_info_ptr = s_info_ptr->next;

   }

   s_info_ptr = s_info_head_ptr;

   /** Start from the first structure and go through until the
stop
     pointer is reached **/
   while ( (s_info_ptr != NULL) && (s_info_ptr != g_struct-
>s_info_stop_ptr) ) {

      if (s_info_ptr->elapse_time != -1)  {
        s_info_ptr->adjusted_time = s_info_ptr->elapse_time;
        /* determine whether the elapsed times have to be
adjusted or not */
        /* if this is an update function, we do not adjust the
elapsed time*/
        if ( strstr(s_info_ptr->tag,"UF") == NULL )
        {
          /* this is not an update function, adjust time if
necessary */
          if (max->elapse_time/min->elapse_time > 1000)
          {
            /* jmc fix geo_mean calculation...round adjusted
time properly ROUNDING*/
            adjusted_max_time = max->elapse_time/1000;
            if (s_info_ptr->elapse_time < adjusted_max_time)
            {
              s_info_ptr->adjusted_time =
                (double)(((long)((adjusted_max_time + 0.05) *
10))/10.0);
              if (s_info_ptr->adjusted_time < 0.1)
                s_info_ptr->adjusted_time = 0.1;
            }
           /*jmc fix geo_mean calculation...round adjusted
time properly ROUNDING end*/
          }
        }

                                    /* a value was calculated */
        fprintf (outstream,
              "%-5d %-5.5s %15.1f %15.1f %*.*s %*.*s\n",
              s_info_ptr->stmt_num,s_info_ptr->tag,
              s_info_ptr->elapse_time,s_info_ptr-
>adjusted_time,
              T_STAMP_1LEN,T_STAMP_1LEN,s_info_ptr-
>start_stamp, /* TIME_ACC jen*/
```

```
            T_STAMP_1LEN,T_STAMP_1LEN,s_info_ptr-
>end_stamp); /* TIME_ACC jen*/

       /* Only update arithmetic mean for queries not update
functions */
       if ( strstr(s_info_ptr->tag,"UF") == NULL )
       {
         arith_mean += s_info_ptr->elapse_time;
         adjusted_a_mean += s_info_ptr->adjusted_time;
       }

       if (s_info_ptr->elapse_time > 0) {  /* don't bother
finding log of
                                    numbers < 0 */
         geo_mean += log(s_info_ptr->elapse_time);
         adjusted_g_mean += log(s_info_ptr->adjusted_time);
       }


       /* Only update num_stmt for queries not update
functions */
       if ( strstr(s_info_ptr->tag,"UF") == NULL )
         num_stmt ++;
       num_stmt_for_geo_mean++;
     }

     else
       fprintf (outstream,"%-5d %-5.5s %-15s %-15s\n",
              s_info_ptr->stmt_num,
             s_info_ptr->tag,"Not Collected", "Not Collected");


     if (s_info_ptr != g_struct->s_info_stop_ptr)
       s_info_ptr=s_info_ptr->next;
   }

   fprintf(outstream, "\n\nNumber of statements: %d\n\n",
s_info_ptr->stmt_num - 1);
   /* Calculate the arithmetic and geometric means */

   if (geo_mean != 0) {     /*Used to test if arith_mean != 0
                        Don't bother doing any of this if the
                         elapsed time mean is 0 */
     arith_mean = arith_mean / num_stmt;
     adjusted_a_mean = adjusted_a_mean / num_stmt;
     geo_mean = exp(geo_mean / num_stmt_for_geo_mean);
     adjusted_g_mean_intern = adjusted_g_mean; /*MARK*/
     adjusted_g_mean = exp(adjusted_g_mean /
num_stmt_for_geo_mean);

   }


   /* print out all the appropriate information including the
      different TPC-D metrics */
   /* do not bother with this if we are in an update only stream
*/
   fprintf (outstream, "\nGeom.  mean queries %7.3f
%15.3f\n",\
            geo_mean,adjusted_g_mean);
   if (g_struct->c_l_opt->update < 2)
   {
     fprintf (outstream, "Arith. mean queries %7.3f
%15.3f\n",\
            arith_mean,adjusted_a_mean);


     fprintf (outstream,
            "\n\nMax Qry %-3.3s %15.1f %15.1f %*.*s
%*.*s\n",
            max->tag,max->elapse_time,max->adjusted_time,
            T_STAMP_1LEN,T_STAMP_1LEN,max-
>start_stamp,  /* TIME_ACC jen*/
            T_STAMP_1LEN,T_STAMP_1LEN,max-
>end_stamp);  /* TIME_ACC jen*/
     fprintf (outstream,
            "Min Qry %-3.3s %15.1f %15.1f %*.*s %*.*s\n",
            min->tag,min->elapse_time,min->adjusted_time,
            T_STAMP_1LEN,T_STAMP_1LEN,min-
>start_stamp,  /* TIME_ACC jen*/
            T_STAMP_1LEN,T_STAMP_1LEN,min-
>end_stamp);  /* TIME_ACC jen*/
   }

   if (g_struct->c_l_opt->intStreamNum == 0) {
     /* fprintf (outstream, "\n\nMetrics\n=======\n\n"); */

     /* Increase the Ts measurement by one second since the
accuracy of our */
     /* timestamps is only to 1 second and if the start was at
1.01 seconds, */
     /* and the end was at 5.99 seconds, we get a free second ...
this will */
     /* be made explicit in the upcoming revision of the spec
(after 1.0.1) */
       /* TIME_ACC jen start*/
     /* NOTE this can probably be better coded by changing
get_elapsed_time */
     /* to just calculate the elapsed time give a start and an
end time, and */
     /* to also give a precision for the calculation (sec,
10ths....).  The */
     /* call then will grab a timestamp before calling. THen
we can get rid */
     /* of the if def...and just call get_elapsed_time (whcih can
handle the */
      /* os differences on its own */

#if defined (SQLUNIX) || defined (SQLAIX)
     Ts = g_struct->stream_end_time.tv_sec - g_struct-
>stream_start_time.tv_sec + 1;
     Ts1 = (double)g_struct->stream_start_time.tv_sec +
((double)g_struct->stream_start_time.tv_usec/1000000);
     Ts2 = (double)g_struct->stream_end_time.tv_sec +
((double)g_struct->stream_end_time.tv_usec/1000000);

#elif (defined (SQLOS2) || defined(SQLWINT) || defined
(SQLWIN) || defined(SQLDOS))
     Ts = (double)(g_struct->stream_end_time.time - g_struct-
>stream_start_time.time + 1);
     Ts1 = (double)g_struct->stream_start_time.time +
((double)g_struct->stream_start_time.millitm/1000);
     Ts2 = (double)g_struct->stream_end_time.time +
((double)g_struct->stream_end_time.millitm/1000);

#else
#error Unknown operating system
#endif

     /* TIME_ACC jen stop*/

    /* MARK
     ##Now do in calcmetricsp.pl##
     QppD = (3600 * g_struct->scale_factor) /
adjusted_g_mean;
     QthD = (num_stmt * 3600 * g_struct->scale_factor) / Ts;
     QphD = sqrt(QppD*QthD);
    */
     /* if the decimal part has some meaningful value then
print the database size
```

```
    with decimal part; otherwise just print the integer part */

        fprintf (outstream,
            "\nGeometric mean interim value  =
%10.3f\n\nStream Ts %11 = %10.0f\n\nStream start int
representation %11 = %f\n\nStream stop int representation
%11 = %f",
            adjusted_g_mean_intern,Ts,Ts1,Ts2);
  }

}


/************************************************
***************/
/* free up all the elements of the sqlda after done processing
*/
/************************************************
***************/
void free_sqlda (struct sqlda *sqlda, int select_status)    /*
@d30369 tjg */
{
  int loopvar;

  if (select_status == TPCDBATCH_SELECT)
    for (loopvar=0; loopvar<sqlda->sqld; loopvar++) {
      free(sqlda->sqlvar[loopvar].sqldata);
      free(sqlda->sqlvar[loopvar].sqlind);
    }

  free(sqlda);
  sqlda_allocated = 0; /* fix free() problem on NT
                       wlc 090597 */
}


/************************************************/
/* processing to run the insert update function */
/************************************************/
void runUF1 ( struct global_struct *g_struct, int updatePair )
{

  char statement[3000];
  char sourcedir[256];


  int split_updates = 2;       /* no. of ways update records are
split */
  int concurrent_inserts = 2;  /* jenCI no of concurrent
updates to be */
                       /* jenCI run at once*/
  int loop_updates = 1;        /* jenCI no of updates to be run
in one  */
                       /* jenCI "concurrent" invocation.
should*/
                       /* jenCI be split_updates /
concurrent_inserts*/
  int i;
  int streamNum;
#ifdef SQLWINT
  /* PROCESS_INFORMATION childprocess[100]; */
  char commandline[256];
  HANDLE               su_hSem;
  char                 UF1_semfile[256];
#else
  int childpid[100];
  int                  su_semid; /* semaphore for controlling split
updates*/
  key_t                su_semkey; /* key to generate semid */
#endif
  if (g_struct->c_l_opt->intStreamNum == 0)
     streamNum = 0;
  else
     streamNum = currentUpdatePair - updatePairStart + 1;

  fprintf( outstream,"UF1 for update pair %d, stream %d,
starting\n",updatePair, streamNum);

  /* Start by loading the data into the staging table at each
node */
  /* The orderkeys were split earlier by the split_updates
program */
  if (env_tpcd_audit_dir != NULL)
    strcpy(sourcedir,env_tpcd_audit_dir);
  else
    strcpy(sourcedir,".");

  /* Load the orderkeys into the staging table */
  /* In SMP environments one could use a load command but
by using a */
  /* script we can keep the code common */
#ifdef SQLWINT
  sprintf (statement, "perl %s\\tools\\ploaduf1 %d\n",
sourcedir, updatePair);
#else
  sprintf (statement, "perl %s/tools/ploaduf1 %d 1", sourcedir,
updatePair);
#endif
  if (system(statement))
  {
    fprintf (stderr, "ploaduf1 failed for UF1, examine
UF1.log for cause. Exiting.\n");
    if (verbose)
      fprintf (stderr,
          "ploaduf1 failed for UF1, examine UF1.log for
cause. Exiting.\n");
    exit (-1);
  }

  fprintf (outstream, "load_update finished for UF1.\n");

  if (getenv ("TPCD_SPLIT_UPDATES") != NULL)
    split_updates = atoi (getenv
("TPCD_SPLIT_UPDATES"));
  if (getenv ("TPCD_CONCURRENT_INSERTS") !=
NULL)                  /*jenCI*/
    concurrent_inserts = atoi (getenv
("TPCD_CONCURRENT_INSERTS"));  /*jenCI*/
  loop_updates = split_updates / concurrent_inserts;
/*jenCI*/

#ifndef SQLWINT
  /*    we will use the tpcd.setup file to generate the
semaphore key */
  if (getenv("TPCD_AUDIT_DIR") != NULL)
/*begin SEMA */
  {
    /* this is assuming that you will be running this from 0th
node */
    sprintf(sourcefile, "%s%ctools%ctpcd.setup",
        getenv("TPCD_AUDIT_DIR"),
PATH_DELIM,PATH_DELIM);
  }
  else
  {
    fprintf (stderr, "runUF1 Can't open UF1 semaphore
file,TPCD_AUDIT_DIR is not defined.\n");
    exit (-1);
  }
  /*end SEMA */
```

```
  su_semkey = ftok (sourcefile, 'J');
  if ( (su_semid = semget (su_semkey, 1,
IPC_CREAT |S_IRUSR|S_IWUSR)) < 0)
  {
    fprintf (stderr, "Cannot get semaphore! semget failed:
errno = %d\n",errno);
    exit (-1);
  }
#else  /* SQLWINT */
  sprintf (UF1_semfile, "%s.%s.UF1.semfile",
env_tpcd_dbname, env_user);
  su_hSem = CreateSemaphore(NULL, 0,
                    concurrent_inserts,                /*jenCI*/
                     (LPCTSTR)(UF1_semfile));
  if (su_hSem == NULL)
  {
    fprintf(stderr,
          "CreateSemaphore (ready semaphore) failed,
GetLastError: %d, quitting\n",
          GetLastError());
    exit(-1);
  }
#endif /* SQLWINT */
  if (verbose) fprintf(stderr,"Semaphore created
successfully!\n");

  fclose(outstream); /* to prevent multiple header caused by
forking
                    wlc 081397 */

  for (i=0; i < concurrent_inserts; i++)
/*jenCI*/
  {
#ifndef SQLWINT
    if ((childpid[i] = fork()) == 0)
    {
      /* runUF1_fn (updatePair, i);   aph 981205 */
      runUF1_fn (updatePair, i, dbname, userid, passwd);
    }
    else
    {
      /* This is the parent */
      if (verbose)
        fprintf (stderr, "stream #%d started with pid %d\n", i,
childpid[i]);
    }
#else  /* SQLWINT */
    sprintf (commandline,
          "start /b %s\\auditruns\\tpcdbatch.exe -z -d %s -i
%d -j 1 -k %d",
          env_tpcd_audit_dir, dbname, updatePair, i ); /* aph
082797 */

    system (commandline);
#endif /* SQLWINT */
    sleep (UF1_SLEEP);
  }

  /* All children have been created, now wait for them to
finish */
#ifndef SQLWINT
  if (sem_op (su_semid, 0, concurrent_inserts * -1) != 0)
/*jenCI*/
  {                                                    /*jenSEM*/
    fprintf(stderr,
          "Failure to wait on insert semaphone with %d of
children\n",
          concurrent_inserts);
    exit(1);
  }                                                    /*jenSEM*/
  semctl (su_semid, 0, IPC_RMID, 0);
#else
  for (i = 0; i < concurrent_inserts; i++)
/*jenCI*/
  {
    if (verbose)
    {
      fprintf(stderr,"About to wait again ...Sets to wait for
%d\n",
            concurrent_inserts - i);                   /*jenCI*/
    }
    if (WaitForSingleObject(su_hSem, INFINITE) ==
WAIT_FAILED)
    {
      fprintf(stderr,
          "WaitForSingleObject (su _hSem) failed in
runUF1 on set %d, error: %d, quitting\n",
          i, GetLastError());
      exit(-1);
    }
  }
  if (! CloseHandle(su_hSem))
  {
    fprintf(stderr,
        "RunUF1 Close Sem failed - Last Error: %d\n",
GetLastError());
    /* no exit here */
  }
#endif

  if( (outstream = fopen(outstreamfilename,
APPENDMODE)) == NULL )
  {
    fprintf(stderr,"\nThe output file could not be opened. ");
    fprintf(stderr,"Make sure that the filename is correct.\n");
    fprintf(stderr,"filename = %s\n",outstreamfilename);
    exit(-1);
  }

  fprintf( outstream,"UF1 for update pair %d
complete\n",updatePair);
}


/* runUF1_fn() moved to another SQC file                aph
981205 */


/*************************************************/
/* processing to run the delete update function */
/*************************************************/
void runUF2 ( struct global_struct *g_struct, int updatePair )
{
  char statement[3000];
  char sourcedir[256];

  int split_deletes = 1;   /*  no. of ways update records are
split  @dxxxxxhar */
  int concurrent_deletes  = 1;   /* number of database
partitions DELjen */
  int chunks_per_concurrent_delete = 1;

  int i;
  int streamNum;
#ifdef SQLWINT
  char commandline[256];
  HANDLE          su_hSem;
  char            UF2_semfile[256];
#else
  int childpid[100];
```

```
   char sourcefile[256];
   int               su_semid; /* semaphore for controlling split
updates*/
   key_t             su_semkey; /* key to generate semid */
#endif
    if (g_struct->c_l_opt->intStreamNum == 0)
      streamNum = 0;
   else
      streamNum = currentUpdatePair - updatePairStart + 1;

   fprintf( outstream,"UF2 for update pair %d, stream %d,
starting\n",updatePair, streamNum);

   /* We need to know both how many chunks there are and
how many chunks*/
   /* are to be executed by each concurrent UF2 process.
More chunks means */
   /* both smaller transactions (less deadlock) and more
potential concurrency */

   /* How many "chunks" have the orderkeys been divided
into? */
   if (getenv ("TPCD_SPLIT_DELETES") != NULL)
      split_deletes = atoi (getenv
("TPCD_SPLIT_DELETES"));
   /* How many deletes should run concurrently */
   if (getenv ("TPCD_CONCURRENT_DELETES") !=
NULL)
      concurrent_deletes = atoi (getenv
("TPCD_CONCURRENT_DELETES"));
   /* How many chunks in each concurrently running delete
process */
   chunks_per_concurrent_delete = split_deletes /
concurrent_deletes;


   /* Start by loading the data into the staging table at each
node */
   /* The orderkeys were split earlier by the split_updates
program */
   if (env_tpcd_audit_dir != NULL)
      strcpy(sourcedir,env_tpcd_audit_dir);
   else
      strcpy(sourcedir,".");

   /* Load the orderkeys into the staging table */
   /* In SMP environments one could use a load command but
by using a */
   /* script we can keep the code common */


#ifdef SQLWINT
   sprintf (statement, "perl %s\\tools\\ploaduf2 %d\n",
sourcedir, updatePair);
#else
   sprintf (statement, "perl %s/tools/ploaduf2 %d 2", sourcedir,
updatePair);
#endif
   if (system(statement))
   {
      fprintf (stderr, "ploaduf2 failed for UF2, examine
UF2.log for cause. Exiting.\n");
      exit (-1);
   }
   fprintf (outstream, "ploaduf2 finished for UF2.\n");

   fclose(outstream); /* to prevent multiple header caused by
forking
                      wlc 081397 */

   /* Next we need to get ready to launch a bunch of
concurrent processes */
#ifndef SQLWINT
   /*    we will use the tpcd.setup file to generate the
semaphore key    begin SEMA */
   if (getenv("TPCD_AUDIT_DIR") != NULL)
   {
      sprintf(sourcefile, "%s%ctools%ctpcd.setup",
            getenv("TPCD_AUDIT_DIR"), PATH_DELIM,
PATH_DELIM);
   }
   else
   {
      fprintf (stderr, "runUF2 Can't open UF2 semaphore file,
TPCD_AUDIT_DIR is not defined.\n");
      exit (-1);
   }

   su_semkey = ftok (sourcefile, 'D');   /* use D for deletes
*/
   /* end SEMA */
   if ( (su_semid = semget (su_semkey, 1,
IPC_CREAT|S_IRUSR|S_IWUSR)) < 0)
   {
      fprintf (stderr, "UF2 Can't get semaphore! semget failed:
errno = %d\n",
               errno);
      exit (-1);
   }
#else
   sprintf (UF2_semfile, "%s.%s.UF2.semfile",
env_tpcd_dbname, env_user);
   fprintf(stderr,"UF2 semfile = %s\n",UF2_semfile);
   su_hSem = CreateSemaphore(NULL, 0,
                        concurrent_deletes,
                        (LPCTSTR)(UF2_semfile));
   if (su_hSem == NULL)
   {
      fprintf(stderr,
            "CreateSemaphore (ready semaphore) failed,
GetLastError: %d, quitting\n",
            GetLastError());
      exit(-1);
   }
   fprintf(stderr,"Semaphore created successfully!\n");
#endif

   for (i=0; i < concurrent_deletes; i++)
   {
#ifndef SQLWINT
      if ((childpid[i] = fork()) == 0)
      {
        fprintf(stderr, "B-Calling runUF2_fn  %d   %d
%d ...\n",
                           updatePair,
i,chunks_per_concurrent_delete);
        /* runUF2_fn (updatePair, i,
chunks_per_concurrent_delete);   aph 981205 */
        runUF2_fn (updatePair, i,
chunks_per_concurrent_delete, dbname, userid, passwd);
      }
      else
      {
        /* This is the parent */
        if (verbose)
          fprintf (stderr, "stream #%d started with pid %d\n",i,
childpid[i]);
      }
#else
      {
```

```
        /*  SECURITY_ATTRIBUTES sec_process;
            SECURITY_ATTRIBUTES sec_thread; */
        /* NEED TO FIX THIS UP - KBS 98/10/20 */

        sprintf (commandline,
            "start /b %s\\auditruns\\tpcdbatch.exe -z -d%s -i%d
-j 2 -k %d -x %d",
            env_tpcd_audit_dir, dbname, updatePair, i,
chunks_per_concurrent_delete  ); /* aph */
        /* the -x parm should be passed at 0...not 100% sure of
this jen */
        fprintf(stderr, "commandline= %s\n", commandline);
        system (commandline);
        sleep (UF2_SLEEP);
      }
#endif
    }

    /* All children have been created, now wait for them to
finish */
#ifndef SQLWINT
    fprintf(stderr, "About to wait on the semaphore...\n");
    if (sem_op (su_semid, 0, concurrent_deletes * -1) != 0)
/*jenSEM*/
    {                                                   /*jenSEM*/
      fprintf(stderr,
            "Failure to update wait on delete semaphone with
%d children\n",
            concurrent_deletes);
      exit(1);
    }                                                   /*jenSEM*/
    semctl (su_semid, 0, IPC_RMID, 0);
#else
// for (i = 0; i < split_deletes; i++)   //DJD Waits
forever.....
    for (i = 0; i < concurrent_deletes; i++)
    {
      if (verbose)
      {
//        fprintf(stderr,"About to wait again ...Sets to wait for
%d\n",
//                split_deletes - i);
        fprintf(stderr,"About to wait again ...Sets to wait for
%d\n",
                concurrent_deletes - i);
      }
      if (WaitForSingleObject(su_hSem, INFINITE) ==
WAIT_FAILED)
      {
        fprintf(stderr,
              "WaitForSingleObject (su_hSem) failed on set %d,
error: %d, quitting\n",
                i, GetLastError());
        exit(-1);
      }
    }
    if (! CloseHandle(su_hSem))
    {
      fprintf(stderr, "Close Sem failed - Last Error: %d\n",
GetLastError());
      /* no exit here */
    }
#endif

    if( (outstream = fopen(outstreamfilename,
APPENDMODE)) == NULL )
    {
      fprintf(stderr,"\nThe output file could not be opened. ");
      fprintf(stderr,"Make sure that the filename is correct.\n");
      fprintf(stderr,"filename = %s\n",outstreamfilename);
      exit(-1);
    }

    fprintf( outstream,"UF2 for update pair %d
complete\n",updatePair);

}


/* runUF2_fn() moved to another SQC file                aph
981205 */


/*----------------------------------------------------------*/
/*       General semaphore function.                        */
/*----------------------------------------------------------*/
#ifndef SQLWINT
int sem_op (int semid, int semnum, int value)
{
  struct sembuf sembuf;    /* = {semnum ,value,0}; */
  sembuf.sem_num = semnum;
  sembuf.sem_op  = value;
  sembuf.sem_flg = 0;

  if (semop(semid,&sembuf,1) < 0)
  {
    fprintf(stderr,"ERROR*** sem_op errorno = %d\n",
errno);
    return(-1);
    /*  exit(1); */
  }
  return (0);        /* successful return  jenSEM */
}
#endif

/************************************************
*****************/
/* Determines the proper name for the output file to
  be generated for a particular TPC-D query, update function,
or
  interval summary                                    */
/************************************************
*****************/
void output_file(struct global_struct *g_struct)
{
  char file_name[256] = "\0";
  char run_dir[150]   = "\0";
  char time_stamp[50] = "\0";
  char delim[2]       = "\0";
  int qnum;


  strcpy(run_dir,g_struct->run_dir);
  sprintf(delim,"%s",env_tpcd_path_delim);
  strcpy(time_stamp,g_struct->file_time_stamp);

  if (g_struct->stream_list == NULL)
    if ((g_struct->stream_list =
              fopen(g_struct->c_l_opt->str_file_name,
READMODE)) == NULL)
    {
      fprintf(stderr,"\nThe stream list file could not be
opened.");
      fprintf(stderr,"Make sure that the filename is
correct.\n");
      exit(-1);
    }

  fscanf(g_struct->stream_list,"%d",&qnum);
```

```
  switch (g_struct->c_l_opt->intStreamNum)
  {
   case -1: /* qualifiying */
     sprintf(file_name,
"%s%sqryqual%02d.%s",run_dir,delim,qnum,time_stamp);
     break;
   case 0: /* power tests */
      if (qnum < 0) /* update functions */
        sprintf(file_name,
"%s%smps00uf%d.%02d.%s",run_dir,delim,abs(qnum), \
              currentUpdatePair,time_stamp);
     else
        sprintf(file_name,
"%s%smpqry%02d.%s",run_dir,delim,qnum,time_stamp);
     break;

   default:
     /*      if (qnum < 0)  - replaced by berni 96/03/26 */
     if (g_struct->c_l_opt->update == 2 ||
         g_struct->c_l_opt->update == 5)
        sprintf(file_name,
"%s%smts%02duf%d.%02d.%s",run_dir,delim, \
             currentUpdatePair - updatePairStart + 1,abs(qnum),
currentUpdatePair,time_stamp);
     else
        sprintf(file_name,
"%s%smts%dqry%02d.%s",run_dir,delim, \
              g_struct->c_l_opt-
>intStreamNum,qnum,time_stamp);
     break;

  }

  if (g_struct->c_flags->eo_infile)
     if (g_struct->c_l_opt->update == 2 ||
         g_struct->c_l_opt->update == 5)
        sprintf(file_name,
"%s%smtufinter.%s",run_dir,delim,time_stamp);
     else
        switch (g_struct->c_l_opt->intStreamNum) {
         case -1:
           sprintf(file_name,
"%s%sqryqualinter.%s",run_dir,delim,time_stamp);
           break;
         case 0:
           /*sprintf(file_name,
"%s%smpinter.%s",run_dir,delim,time_stamp);*/
           if (g_struct->c_l_opt->update == 1)
             sprintf(file_name,
"%s%smpqinter.%s",run_dir,delim,time_stamp);
           else
             sprintf(file_name,
"%s%smpufinter.%s",run_dir,delim,time_stamp);
           break;
         default:
           if (g_struct->c_l_opt->intStreamNum > 0)
              sprintf(file_name,
                    "%s%smts%dinter.%s",
                    run_dir,delim,g_struct->c_l_opt-
>intStreamNum,time_stamp);
           else
              fprintf(stderr,"Invalid stream number specified\n");
           break;
        }

  strcpy(outstreamfilename, file_name); /* wlc 081397 */

  if (!feof(instream) || g_struct->c_flags->eo_infile)
     /* Only create an output file if there are input
        statements left to process, or if we're all done
        and want to print out the summary table file */
     if( (outstream = fopen(file_name, WRITEMODE)) ==
NULL ) {
        fprintf(stderr,"\nThe output file could not be opened.  ");
        fprintf(stderr,"Make sure that the filename is
correct.\n");
        fprintf(stderr,"filename = %s\n",file_name);
        exit(-1);
      }

  return;
}


/*************************************************
*****************/
/* Determine whether or not we should break out of the block
loop
   because of an end of file, end of block, or update function.
   Also handle some semaphore stuff for update functions
*/
/*************************************************
*****************/
int PreSQLprocess(struct global_struct *g_struct,
Timer_struct *start_time)
{
  int               rc = 1;
  FILE              *updateFP;
#ifndef SQLWINT
  int               semid;              /* semaphore for controlling
UFs*/
  key_t             semkey;             /* key to generate semid */
#else
  int               SemTimeout = 600000;    /* Des time out
period of 1 minute */
#endif

  switch (g_struct->c_flags->select_status)
  {
   case TPCDBATCH_NONSQL:
     g_struct->s_info_stop_ptr = g_struct->s_info_ptr;
     /* if we're at the end of the input file, set the stop
        pointer to this structure */
     rc = FALSE;
     break;
   case TPCDBATCH_EOBLOCK:
     rc = FALSE;
     break;
   case TPCDBATCH_INSERT:
     /* we have to check whether or not this is a throughput */
     /* test, and if it is, we have to set up a semaphore to */
     /* control when the update functions are run.  We want
*/
     /* them to be run after all the query streams have finished.
*/
     /* What we do is set up the semaphore here, decrement it
*/
     /* in the query streams, and wait for it to get cleared */
     /* before we allow the UFs to run.                      */
     /* Note: we only set up the semaphore if:               */
     /*       1. we are running the throughput test (num of */
     /*          streams > 0)                               */
     /*       2. we are at the first UF1 (i.e. this is the  */
     /*          case where currentUpdatePair = updatePairStart
*/
     /* we also want to check the sem_on element in the
global */
     /* structure to see if we want to use semaphores or let */
     /* the calling script do the synchronization of the update
*/
```

```
    /* stream                                   */
    if ( semcontrol == 1 )
    {
      /* yes we are to be using semaphores */
      /* is this the 1st time into update function 1 (uf1)? */
      if (currentUpdatePair == updatePairStart )
      {
           /* create the semaphores */
           create_semaphores(g_struct);
           if (g_struct->c_l_opt->intStreamNum != 0)
           /* wait period for runthroughput updates */
                throughput_wait(g_struct);
      }
      /* otherwise continue to run*/
    }
    if ((g_struct->c_l_opt->update == 3) || (g_struct-
>c_l_opt->update == 4))
    {
      get_start_time(start_time);
      strcpy(g_struct->s_info_ptr->start_stamp,
           get_time_stamp(T_STAMP_FORM_3,start_time ));
/* TIME_ACC jen*/
      /* write the start timestamp to the file...if this is not a
qualification */
      /* run, then write the seed used as well */
      fprintf( outstream,"Start timestamp %*.*s \n",
            T_STAMP_3LEN,T_STAMP_3LEN,
/* TIME_ACC jen*/
            g_struct->s_info_ptr->start_stamp);
      if (g_struct->c_l_opt->intStreamNum >= 0)
      {
        if (g_struct->lSeed == -1)
        {
          fprintf( outstream,"Using default qgen seed file");
        }
        else
          fprintf( outstream,"Seed used = %ld",g_struct-
>lSeed);
        fprintf( outstream,"\n");
      }
    }
    if (g_struct->c_l_opt->update < 4){
    /* run only if updates are enabled */
      runUF1(g_struct, currentUpdatePair);
    }

    rc = FALSE;
    if ((g_struct->c_l_opt->intStreamNum == 0) &&
(semcontrol == 1))
    /* RUNPOWER: release first semaphore so the queries
can run */
      release_semaphore(g_struct, INSERT_POWER_SEM);
    break;
   case TPCDBATCH_DELETE:
    if ((g_struct->c_l_opt->intStreamNum == 0) &&
(semcontrol == 1))
    {
    /* RUNPOWER: wait for queries to finish */
    /* waiting on QUERY_POWER_SEM semaphore */
      runpower_wait(g_struct, QUERY_POWER_SEM);
    }
    if ((g_struct->c_l_opt->update == 3) || (g_struct-
>c_l_opt->update == 4))
    {
      get_start_time(start_time);
      strcpy(g_struct->s_info_ptr->start_stamp,
           get_time_stamp(T_STAMP_FORM_3,start_time ));
/* TIME_ACC jen*/
      /* write the start timestamp to the file...if this is not a
qualification */
      /* run, then write the seed used as well */
      fprintf( outstream,"Start timestamp %*.*s \n",
            T_STAMP_3LEN,T_STAMP_3LEN,
/* TIME_ACC jen*/
            g_struct->s_info_ptr->start_stamp);
      if (g_struct->c_l_opt->intStreamNum >= 0)
      {
        if (g_struct->lSeed == -1)
        {
          fprintf( outstream,"Using default qgen seed file");
        }
        else
          fprintf( outstream,"Seed used = %ld",g_struct-
>lSeed);
        fprintf( outstream,"\n");
      }
    }
    if (g_struct->c_l_opt->update < 4){
    /* run only if updates are enabled */
      runUF2(g_struct, currentUpdatePair);
      if (g_struct->c_l_opt->intStreamNum == 0)
      {/* RUNPOWER */
        fprintf(stderr, "UF2 completed\n");
      }
    }
    currentUpdatePair += 1;
    /* update the update.pair.num file to reflect the
successfully completed */
    /* update pair */
    if (g_struct->c_l_opt->update < 4)
    {    /*jen*/
#ifndef NO_INCREMENT
      /* don't update the pair, only for my testing - Haider */
      updateFP = fopen(g_struct->update_num_file,"w");
      fprintf(updateFP,"%d\n",currentUpdatePair);
      fclose(updateFP);
#endif
    } /*jen*/
    rc = FALSE;
    break;

  }
  return(rc);
}

/*************************************************
*********************/
/* Handles actual processing of SQL statement.  Initializes
the SQLDA
  for returned rows, does PREPARE, DECLARE, and OPEN
statements and
  executed multiple FETCHes as needed.  If not a SELECT
statement,
  goes into EXECUTE IMMEDIATE section
*/
/*************************************************
*********************/
void SQLprocess(struct global_struct *g_struct)
{
  int rc = 0;                        /* 912RETRY */
  int rows_fetch = 0;
  long sqlcode = SQL_RC_E911;             /* Temporary
sqlcode to test
                                     for deadlocks */
  int max_wait = 1;                  /* Maximum number of
retries
                                     for deadlock scenario */

  int col_lengths[TPCDBATCH_MAX_COLS];    /* array
containing widths of
```

```
                                        columns in returned set  */
  struct stmt_info *s_info_ptr;

  s_info_ptr = g_struct->s_info_ptr;
/************************************************
**********************/
/* grab storage for the SQLDA                    */
/************************************************
**********************/
  if ((sqlda=(struct sqlda *)malloc(SQLDASIZE(100))) ==
NULL)
    mem_error("allocating sqlda");

  sqlda->sqln = TPCDBATCH_MAX_COLS;
/* @d30369 tjg */


  /* Error-recovery code for errors resulting from multi-
stream errors */

  while (((sqlcode == SQL_RC_E911) ||
       (sqlcode == SQL_RC_E912) ||
       (sqlcode == SQL_RC_E901)) &&
      (max_wait < MAXWAIT) &&
      (rc==0) )
  {

    sqlcode = 0;          /* Re-initialize sqlcode to avoid
infinite-loop */
    if (g_struct->c_flags->select_status ==
TPCDBATCH_SELECT)
    {
      /* Enter this loop if SQL stmt is a SELECT   */
      EXEC SQL PREPARE STMT1 INTO :*sqlda
FROM :stmt_str;

      sqlcode = error_check();
      if (sqlcode < 0)
      {
        fprintf (stderr,"\nPrepare failed. Stopping this
query.\n");
        rc = -1;
      }
      else  /* print out the column headings for the answer set
*/
      {
        print_headings(sqlda,col_lengths);              /*
@d22817 tjg */

        allocate_sqlda(sqlda);      /* This is where we set
storage for the */
                          /* SQLDA based on the column
types in   */
                          /* the answer set table.          */

        EXEC SQL DECLARE DYNCUR CURSOR FOR
STMT1;

        EXEC SQL OPEN DYNCUR;
        sqlcode = error_check();

        if (sqlcode < 0)      /* we ran into an error of some
kind KBS 98/09/28 */
        {
          max_wait ++;
          fprintf (stderr, "\nAn error has been detected on
open...Retrying...\n");
          SleepSome(10);
        }
        else
        {

/************************************************
**********************/
          /* Fetch appropriate number of rows and determine
whether or not to    */
          /* send them to file.
*/

/************************************************
**********************/

          rows_fetch = 0;

          do
          {
            /* Keep fetching as long as we haven't finished
reading
            all the rows and we haven't gone past the limits
set
            in the control string */

            EXEC SQL FETCH DYNCUR USING
DESCRIPTOR :*sqlda;
            if (sqlca.sqlcode == 100)
            {
              sqlcode = sqlca.sqlcode;
            }
            else
            {
              sqlcode = error_check();
            }
            if (sqlcode == 0)
            {
              rows_fetch++;
              if ( (rows_fetch <= s_info_ptr->max_rows_out)
||
                   (s_info_ptr->max_rows_out == -1) )
                echo_sqlda(sqlda,col_lengths);
            }
            else if (sqlcode < 0)
            {
              max_wait++;
              fprintf (stderr, "\nAn error has been detected on
fetch...Retrying...\n");
              SleepSome(10);
            }
          }  while ( (sqlcode == 0) && \
                ( (s_info_ptr->max_rows_fetch == -1)||\
                  (rows_fetch < s_info_ptr-
>max_rows_fetch) ) );
        } /* end of successful open */
      } /* end of successful prepare */
    } /** End of block for handling SELECT statements **/

    else
    {        /** SQL statement is not a SELECT **/
      EXEC SQL EXECUTE IMMEDIATE :stmt_str;
      sqlcode = error_check();

      if (sqlcode < 0 )
      {
        max_wait ++;
        fprintf (stderr, "\nAn error has been detected on
execute immediate...Retrying...\n");
        SleepSome(10);
      }
    } /* end of block for handling NON-select statements */

    if ( (sqlcode >= 0 ) &&
```

```
        (g_struct->c_flags->select_status ==
TPCDBATCH_SELECT))
    {
      /* we opened a cursor before */
      EXEC SQL CLOSE DYNCUR;
      sqlcode = error_check();

      if ((s_info_ptr->max_rows_fetch == -1) ||
          (rows_fetch < s_info_ptr->max_rows_fetch))
#ifndef SQLPTX
      fprintf (outstream, "\n\nNumber of rows retrieved is:
%6d",
              rows_fetch);
      else
        fprintf (outstream, "\n\nNumber of rows retrieved is:
%6d",
                s_info_ptr->max_rows_fetch);
#else
      fprintf (outstream, "\n\nNumber of rows retrieved is:
%6d",
              rows_fetch);
      else
        fprintf (outstream, "\n\nNumber of rows retrieved is:
%6d",
                s_info_ptr->max_rows_fetch);
#endif
    }                                       /* @d28763 tjg */

    if (s_info_ptr->query_block == FALSE)  /* if block is off
don't loop */
      g_struct->c_flags->eo_block = TRUE;

  } /* end of while loop to retry if neede d */

} /* end of SQLprocess */

/**********************************************
*****************/
/* performs some operations after a statement has been
processed,
  including doing a COMMIT if necessary, and calculating
the
  elapsed time.  Also initializes a new stmt_info structure
  for the next block of statements                    */
/**********************************************
*****************/
int PostSQLprocess(struct global_struct *g_struct,
Timer_struct *start_time)
{
  struct stmt_info *s_info_ptr;
  Timer_struct      end_t;        /* end point for elapsed time
*/

#if DEBUG
  fprintf (outstream, "In PostSQLprocess\n");
#endif

  s_info_ptr = g_struct->s_info_ptr;


  if (g_struct->c_flags->select_status ==
TPCDBATCH_NONSQL)
    return FALSE;  /* get out if we've reached the end of
input file */

  if (g_struct->c_l_opt->update > 1)
  {
    /* This is an update function stream.  There is no need to
COMMIT.  */
    /* Each UF child will COMMIT its own transactions.*/
    ;
  }
  else
  {  /* For non-UF cases, COMMIT now. */
    if (g_struct->c_l_opt->a_commit) {
      EXEC SQL COMMIT WORK;
      error_check();                        /* @d22275 tjg
*/
    }
  }

  fflush(outstream);

  s_info_ptr->elapse_time = get_elapsed_time(start_time);

  if (g_struct->c_flags->time_stamp == TRUE)          /*
@d25594 tjg */
    get_start_time(&end_t); /* Get the end time */
    strcpy(s_info_ptr->end_stamp,
    get_time_stamp(T_STAMP_FORM_3,&end_t) );

/*get_time_stamp(T_STAMP_FORM_3,(time_t)NULL) );*/

  /* BBE: Pass on time stamp values for the next query */
  temp_time_struct = end_t;
  strcpy(temp_time_stamp, s_info_ptr->end_stamp);

  /* write the start timestamp to the file */
  fprintf( outstream,"\n\nStop timestamp %*.*s \n",
          T_STAMP_3LEN,T_STAMP_3LEN,  /*
TIME_ACC jen*/
          s_info_ptr->end_stamp);

  /* DJD print elapsed time in seconds  */
  fprintf( outstream,"Query Time = %15.1f secs\n",
s_info_ptr->elapse_time);


  /** Allocate space for a new stmt_info structure **/   /*
@d24993 tjg */
  s_info_ptr->next =
    (struct stmt_info *) malloc(sizeof(struct stmt_info));
  if (s_info_ptr->next != NULL)  {
    memset(s_info_ptr->next, '\0', sizeof(struct stmt_info));
    /** Transfer details from one structure to another for
      to apply for the next statement **/
    s_info_ptr->next->stmt_num = s_info_ptr->stmt_num +
1;
    s_info_ptr->next->max_rows_fetch = s_info_ptr-
>max_rows_fetch;
    s_info_ptr->next->max_rows_out = s_info_ptr-
>max_rows_out;

    s_info_ptr->next->query_block = s_info_ptr-
>query_block;
    s_info_ptr->next->elapse_time = -1;

    s_info_ptr = s_info_ptr->next;

  }
  else {
    mem_error("allocating next stmt structure. Exiting\n");
    exit(-1);
  }

  /** Set the stop and travelling pointer to the current info
structure **/
  g_struct->s_info_stop_ptr = g_struct->s_info_ptr =
s_info_ptr;
```

```
  if (sqlda_allocated)
    free_sqlda(sqlda,g_struct->c_flags->select_status);
    /* fix free() problem on NT
       wlc 090597 */

  if (g_struct->c_l_opt->outfile != 0)
    fclose(outstream);

  return (TRUE);
}

/**********************************************
*****************************/
/* Does some cleaning up once all the statements are
processed.  Disconnects
  from the database, cleans up some semaphore stuff from
the update functions,
  prints out the summary table, and closes all file handles.
*/
/**********************************************
*****************************/
int cleanup(struct global_struct *g_struct)
{
#ifndef SQLWINT
  int             semid;          /* semaphore for controlling
UFs*/
  key_t           semkey;         /* key to generate semid */
#endif
  char file_name[256] = "\0";

  /** End timestamp for stream **/
  /*g_struct->stream_end_time = time(NULL);*/
  get_start_time(&(g_struct->stream_end_time));  /*
TIME_ACC jen */

  switch (g_struct->c_l_opt->update)
  {
      case (2):
      case (5):
           /* update throughput function stream */
           sprintf(file_name,"%s%sstrcntuf.%s",g_struct-
>run_dir,
                   env_tpcd_path_delim, g_struct-
>file_time_stamp);
           break;
      case (3):
      case (4):
           /* update power function stream */
           sprintf(file_name,"%s%spstrcntuf.%s",g_struct-
>run_dir,
                   env_tpcd_path_delim, g_struct-
>file_time_stamp);
           break;
      case (1):
           /* power query stream */
           sprintf(file_name, "%s%spstrcnt%d.%s",g_struct-
>run_dir, env_tpcd_path_delim,
                   g_struct->c_l_opt->intStreamNum,g_struct-
>file_time_stamp);
           break;
      case (0):
           /* throughput query stream */
           sprintf(file_name, "%s%sstrcnt%d.%s",g_struct-
>run_dir, env_tpcd_path_delim,
                   g_struct->c_l_opt->intStreamNum,g_struct-
>file_time_stamp);
           break;
  }

#ifndef LINUX
  if( (g_struct->stream_report_file = fopen(file_name,
APPENDMODE)) == NULL )
  {
    fprintf(stderr,"\nThe output file for the stream count
information\n");
    fprintf(stderr,"could not be opened, make sure the
filename is correct\n");
    fprintf(stderr,"filename = %s\n",file_name);
    exit(-1);
  }

#endif

  /* print out the stream stop time in the stream count
information file*/
  if (g_struct->c_l_opt->update > 1)
  {
    /* update function stream */
    fprintf(g_struct->stream_report_file,
          "Update function stream stopping at %*.*s\n",
          T_STAMP_3LEN,T_STAMP_3LEN,  /*
TIME_ACC jen*/
          get_time_stamp(T_STAMP_FORM_3,&(g_struct-
>stream_end_time)));  /* TIME_ACC jen*/
  }
  else
  {
    /* query stream(s) */
    fprintf(g_struct->stream_report_file,
          "Stream number %d stopping at %*.*s\n",
          g_struct->c_l_opt->intStreamNum,
          T_STAMP_3LEN,T_STAMP_3LEN,  /*
TIME_ACC jen*/
          get_time_stamp(T_STAMP_FORM_3,&(g_struct-
>stream_end_time)));  /* TIME_ACC jen*/
  }
  fclose(g_struct->stream_report_file);

  /* No need to check for errors here.
    Also, the UF stream in a Throughput run
    has no connection in tpcdbatch.sqc.          aph 98/12/26
  error_check();
  */

  /* if we are in a query stream AND this is a throughput test,
then need */
  /* do to some semaphore stuff   (0 implies update functions
are off) */
  /* AND we are supposed to be using semaphores */

  if ( ( semcontrol == 1 ) &&
       ( g_struct->c_l_opt->update < 2))
    /* only queries need to release the semaphore at this point
*/
  {
    if (g_struct->c_l_opt->intStreamNum == 0)
      release_semaphore(g_struct, QUERY_POWER_SEM);
/* power stream */
     else
      release_semaphore(g_struct, THROUGHPUT_SEM); /*
throughput stream */

  EXEC SQL CONNECT RESET;

#ifndef SQLWINT
    if (verbose)
    {
      fprintf(stderr,
```

```
            "cleanup: semkey = %ld, semid = %d, file = %s,
stream = %d\n",
            semkey,semid,g_struct->update_num_file,
            g_struct->c_l_opt->intStreamNum);
    }
#endif
  }

  /** Summary table processing **/                    /*
@d24993 tjg */
  summary_table(g_struct);

  fprintf (outstream, "\n\n");

  fclose(outstream);          /* Close the output data stream.
*/
  fclose(instream);           /* Close the SQL input stream.
*/

  return (TRUE);
}

void create_semaphores(struct global_struct *g_struct)
{

#ifndef SQLWINT
  int             semid;          /* semaphore for controlling
UFs*/
  key_t           semkey;         /* key to generate semid */
#else
  HANDLE          hSem;
  HANDLE          hSem2;
  int             SemTimeout = 600000;    /* Des time out
period of 1 minute */
#endif
      fprintf(stderr,"numstreams = %d\n",g_struct->c_l_opt-
>intStreamNum);
      fprintf(stderr,"Update stream creating semaphore(s) for
update and query sequencing\n");
#ifdef SQLWINT

      fprintf(stderr,"semfile = %s\n",g_struct->sem_file);
      if (g_struct->c_l_opt->intStreamNum == 0)
      /*RUNPOWER*/
      {
          fprintf(stderr,"semfile2 = %s\n",g_struct-
>sem_file2);
          hSem = CreateSemaphore(NULL,
0,1,(LPCTSTR)(g_struct->sem_file));
          hSem2 = CreateSemaphore(NULL,
0,1,(LPCTSTR)(g_struct->sem_file2));
          if ((hSem == NULL) || (hSem2 == NULL))
          {
            fprintf(stderr,
                "CreateSemaphores (ready semaphore)
failed, GetLastError: %d, quitting\n",
                GetLastError());
            exit(-1);
          }
          fprintf(stderr,"Semaphores created
successfully!\n");
      }
      else
      {
      /* RUNTHROUGHPUT creates semaphores based on
the number of query streams while the number of streams for
runpower is constant */
          hSem = CreateSemaphore(NULL, 0,
                      g_struct->c_l_opt->intStreamNum,
                      (LPCTSTR)(g_struct->sem_file));
          if (hSem == NULL)
          {
              fprintf(stderr,
                  "CreateSemaphore (ready semaphore)
failed, GetLastError: %d, quitting\n",
                  GetLastError());
              exit(-1);
          }
          fprintf(stderr,"Semaphore created successfully!\n");

      }
#else           /* AIX, SUN, etc. */
     /* create a semaphore key...use the name of a file that */
      /* you know exists */
      fprintf(stderr,"semfile = %s\n", g_struct-
>update_num_file);
      semkey = ftok(g_struct->update_num_file,'J');
      if (g_struct->c_l_opt->intStreamNum == 0)
      /* RUNPOWER */
      {

          if ( (semid =
semget(semkey,2,IPC_CREAT|S_IRUSR|S_IWUSR)) < 0)
          {
              fprintf(stderr,
                  "Throughput can't get initial semaphore!
semget failed errno = %d\n",
                  errno);
              exit(1);
          }
      }
      else
      /* THROUGHPUT */
      {

          if ( (semid =
semget(semkey,1,IPC_CREAT|S_IRUSR|S_IWUSR)) < 0)
          {
              fprintf(stderr,
                  "Throughput can't get initial semaphore!
semget failed errno = %d\n",
                  errno);
              exit(1);
          }
          if (verbose)
          {
              fprintf(stderr,
                  "insert: semkey = %ld, semid = %d, file
= %s, value = %d\n",
                  semkey,semid,g_struct-
>update_num_file,
                  (g_struct->c_l_opt->intStreamNum * -1));
          }
      }

#endif
}

/*throughput update */
void throughput_wait(struct global_struct *g_struct)
{
#ifndef SQLWINT
  int             semid;          /* semaphore for controlling
UFs*/
  key_t           semkey;         /* key to generate semid */
#else
  HANDLE          hSem;
  int             j;
```

```
  int             SemTimeout = 600000;    /* Des time out
period of 1 minute */
#endif

#ifdef SQLWINT
      hSem = open_semaphore(g_struct,
THROUGHPUT_SEM);
      for (j = 0; j < g_struct->c_l_opt->intStreamNum; j++)
      {
            if (verbose)
              fprintf(stderr,"About to wait again ...\n");
            if (WaitForSingleObject(hSem, INFINITE) ==
WAIT_FAILED)
            {
                fprintf(stderr,
                    "WaitForSingleObject (hSem) failed on
stream %d, error: %d, quitting\n",
                    j, GetLastError());
                exit(-1);
            }
            if (verbose)
                fprintf(stderr,"Streams to wait for  %d\n",j);
      }
      fprintf(stderr,"finished waiting on stream semaphore!
Ready to run updates!\n");
      /* close the semaphore handle */
      if (! CloseHandle(hSem)) {
        fprintf(stderr, "Close Sem failed - Last Error: %d\n",
GetLastError());
          /* no exit here */
      }
#else
      semid = open_semaphore(g_struct);
      /* call the sem_op routine to decrement the semaphore
by */
      /* however many streams .... by calling this function
with*/
     /* a negative number, this stream is forced to wait until
*/
      /* the semaphore gets back to 0 */
      if (sem_op(semid, 0, (g_struct->c_l_opt-
>intStreamNum * -1)) != 0)
      {                                          /*jenSEM*/
            fprintf(stderr,
                "Failure to wait on throughput semaphone for
%d streams\n",
                 g_struct->c_l_opt->intStreamNum);
            exit(1);
      }                                          /*jenSEM*/
      fprintf(stderr,"finished waiting on stream semaphore!
Ready to run updates!\n");
      semctl(semid, 0,IPC_RMID,0);  /* we've finished
waiting, now */
                        /* remove the semaphore */
#endif
}

void runpower_wait(struct global_struct *g_struct, int
sem_num)
{
   char semfile[150];
#ifdef SQLWINT
   HANDLE hSem;

   if (sem_num == 1)
      strcpy (semfile, g_struct->sem_file);
   else
      strcpy (semfile, g_struct->sem_file2);
#else   /* AIX */
   int             semid;          /* semaphore for controlling
UFs*/
   key_t           semkey;         /* key to generate semid
*/

   strcpy (semfile, g_struct->update_num_file);

#endif

  if (g_struct->c_l_opt->update == 1)
    fprintf(stderr,"querystream waiting for update stream
(UF1) to signal semaphore based on %s\n", semfile);
  else
    fprintf(stderr,"updatestream (UF2) waiting on
querystream semaphore to signal semaphore based on %s\n",
semfile);

#ifdef SQLWINT

   hSem = open_semaphore(g_struct, sem_num);
   if (verbose)
     fprintf(stderr,"Runpower queries about to wait ...\n");
   if (WaitForSingleObject(hSem, INFINITE) ==
WAIT_FAILED)
   {
     fprintf(stderr,
      "WaitForSingleObject (hSem) failed on stream 0, error:
%d, quitting\n",
       GetLastError());
       exit(-1);
   }
   if (! CloseHandle(hSem))
   {
         fprintf(stderr, "Close Sem failed - Last Error: %d\n",
GetLastError());
          /* no exit here */
   }

#else

   semid = open_semaphore(g_struct);

  /* call the sem_op routine to decrement the semaphore by
*/
   /* however many streams .... by calling this function
with*/
   /* a negative number, this stream is forced to wait until */
   /* the semaphore gets back to 0 */
   /* aix semaphores start at 0, not 1, so sem_num -1 is used
*/
   if (sem_op(semid, sem_num - 1, -1) != 0)
   {                                          /*jenSEM*/
      fprintf(stderr,
           "Failure to wait on runpower semaphone for %d
streams\n",
            g_struct->c_l_opt->intStreamNum);
      exit(1);
   }                                          /*jenSEM*/
#endif
   if (g_struct->c_l_opt->update == 1)
    fprintf(stderr,"querystream finished waiting on
updatestream semaphore\n");
   else
    fprintf(stderr,"updatestream finished waiting on
querystream semaphore\n");
}

void release_semaphore(struct global_struct *g_struct, int
sem_num)
```

```
{
#ifndef SQLWINT
  int              semid;            /* semaphore for controlling
UFs*/
  key_t            semkey;           /* key to generate semid */
#else
  HANDLE           hSem;
  int              SemTimeout = 600000;    /* Des time out
period of 1 minute */
#endif

#ifdef SQLWINT
      hSem = open_semaphore(g_struct, sem_num); /* query
*/
      if (! ReleaseSemaphore(hSem,
                        1,
                        (LPLONG)(NULL)))
      {
         fprintf(stderr, "ReleaseSemaphore failed, Sem#: %d
LastError: %d, quit \n",
               sem_num, GetLastError());
          exit(-1);
      }
#else
      semid = open_semaphore(g_struct); /* query */
      /* aix semaphores start at 0, not 1, so sem_num -1 is
used */
      if (sem_op(semid, sem_num - 1, 1) != 0)
/*jenSEM*/
       {                                        /*jenSEM*/
            fprintf(stderr,
                  "Failed to increment semaphore %d for
throughput stream %d\n",
                  sem_num, g_struct->c_l_opt->intStreamNum);
            fprintf(stderr,
                  "file for generation of semaphore is: %s\n",
                  g_struct->update_num_file);
            exit(1);
       }

#endif
      if (g_struct->c_l_opt->intStreamNum == 0)
      {  /* RUNPOWER */
        if (sem_num == 1)
        {
          fprintf(stderr, "UF1 completed.\n");
        }
        else
        {
          fprintf(stderr, "query stream completed.\n");
        }
      }
}

#ifdef SQLWINT /* Compile only in NT */
HANDLE open_semaphore(struct global_struct *g_struct, int
num)
{
      HANDLE  hSem;
      LPCTSTR semfile;

      if (num == 1)
            semfile = (LPCTSTR)g_struct->sem_file;
      else
            semfile = (LPCTSTR)g_struct->sem_file2;

      while ((hSem =
OpenSemaphore(SEMAPHORE_ALL_ACCESS |
                              SEMAPHORE_MODIFY_STATE
|
                              SYNCHRONIZE,
                              TRUE,
                              semfile))
                  == (HANDLE)(NULL))
      {
        /*
        ** if cannot open the semaphore, wait for 0.1 second
        */
        fprintf(stderr,"Retry Open semaphore %s\n",semfile);

        Sleep(1000);
      }
      return hSem;
}

#else  /* Compile only in non-NT (i.e. AIX) */
int open_semaphore(struct global_struct *g_struct)
{
      int              semid;            /* semaphore for
controlling UFs*/
      key_t            semkey;           /* key to generate
semid */
      int num;

      if (g_struct->c_l_opt->intStreamNum == 0)
            num = 2;
      else
            num = 1;

      semkey = ftok(g_struct->update_num_file,'J');
      while ((semid = semget(semkey,num,0)) < 0)
      {
            if (errno == ENOENT)
            {
                  sleep(2);
                  fprintf(stderr,"cleanUp: looping for access to
semaphore stream %d  ",
                        g_struct->c_l_opt->intStreamNum);
                  fprintf(stderr,"semkey=%ld semid = %d
file=%s\n",semkey,semid,
                        g_struct->update_num_file);
            }
            else
            {
                  fprintf(stderr,"query stream %d semget failed
errno = %d\n",
                        g_struct->c_l_opt->intStreamNum,errno);
                  exit(1);
            }
      }
      return semid;
}
#endif
```

tpcdUF.sqc

```
/***********************************************
*****************************
*
*  TPCDUF.SQC
*
*  Revision History:
*
*  05 dec 98 aph Created tpcdUF.sqc containing runUF1_fn()
and runUF2_fn()
*               so that it can be bound separately with a different
isolation level.
```

```
* 15 may 99 bbe Added cast (short) for type conversion
between a long and a short.
* 16 jun 99 jen Added in proper connect reset code for UF
functions (mistakenly
*             removed
* 17 jun 99 jen SEMA Changes semaphore file for update
functions to look for tpcd.setup
*             not for the orders.***  update data file  (AIX
only )
* 21 jul 99 bbe Commented out conditions in SQL statments
that searched on fields
*             other than app_id.
*
************************************************
*****************************/

#define UF1DEBUG
#define UF2DEBUG

#ifndef SQLPTX
#define exit(rc) exit(rc)
#else
#define exit(rc) _exit(rc)
#endif /* SLQPTX */

#include "tpcdbatch.h"
/** EXEC SQL INCLUDE SQLCA; **/

#include "sqlca.h"
extern struct sqlca sqlca;

/************************************************
************************/
/* Function Prototypes                                  */
/************************************************
************************/
extern int SleepSome( int amount );
extern long error_check(void);                       /*
@d28763 tjg */
extern void dumpCa(struct sqlca*);       /*kmw*/
extern int sem_op (int semid, int semnum, int value);
extern char *get_time_stamp(int form, Timer_struct
*timer_pointer);      /* TIME_ACC jen */

/************************************************
******************/
/* Declare the SQL host variables.                      */
/************************************************
******************/
EXEC SQL BEGIN DECLARE SECTION;
  char UF_dbname[9] = "\0";
  char UF_userid[9] = "\0";
  char UF_passwd[9] = "\0";
  sqlint32 UF_chunk = 0;
  short month = 0;
EXEC SQL END DECLARE SECTION;

/************************************************
*********************/
/* Declare the global variables.                        */
/************************************************
******************/
extern char env_tpcd_tmp_dir[150];
extern FILE *instream, *outstream;  /* File pointers */
extern char sourcefile[256];   /* Used for semaphores and
table functions?*/
extern struct {                      /* jen LONG */
            short len;
            char data[32700];
          } stmt_str;               /* jen LONG */

/************************************************
******************/
/* UF1 child                                            */
/* (i is the application number.)                       */
/************************************************
******************/
void runUF1_fn ( int updatePair, int i, char *dbname, char
*userid, char *passwd )
{
  int rc = 0;
  int split_updates = 2;      /* no. of ways update records are
split */
  int concurrent_inserts = 2;  /* jenCI no of concurrent
updates to be */
                       /* jenCI run at once*/
  int loop_updates = 1;       /* jenCI no of updates to be run
in one  */
                       /* jenCI "concurrent" invocation.
should*/
                       /* jenCI be split_updates /
concurrent_inserts*/
  int startChunk = 0;         /* jenCI number of first chunk to
insert for */
                       /* jenCI this child */
  int stopChunk = 0;          /* jenCI number of last chunk to
insert for */
                       /* jenCI this child */
  long insertedLineitem = 0;  /*kmw*/
  long insertedOrders = 0;    /*kmw*/
  long saveInsertedOrders = 0; /*kbs*/

  long sqlcode;
  int maxwait;

#ifndef SQLWINT
  int              su_semid;
  key_t              su_semkey;
#else
  HANDLE             su_hSem;
  char              UF1_semfile[256];
#endif

  char myoutstreamfile[256];
  FILE *myoutstream;

  strcpy(UF_dbname, dbname);
  strcpy(UF_userid, userid);
  strcpy(UF_passwd, passwd);

  /* Get ready to start logging diagnostic output */
  sprintf (myoutstreamfile, UF1OUTSTREAMPATTERN,
env_tpcd_tmp_dir, PATH_DELIM,
        updatePair, i);
  if ( (myoutstream = fopen (myoutstreamfile,
WRITEMODE)) == NULL)
  {
    fprintf (stderr, "\nThe output file '%s' for update pair %d
set %d could not be opened. runUF1_fn\n",
          myoutstreamfile,updatePair,i);
    rc=-1;
    goto UF1_exit;
  }
  outstream=myoutstream;    /* initialize outstream for
error_check dxxxxhar*/

  fprintf( myoutstream,"\nUF1 for update pair %d set %d
starting at %*.*s\n",
        updatePair, i,
```

```
        T_STAMP_1LEN,T_STAMP_1LEN,  /*
TIME_ACC jen*/
        get_time_stamp(T_STAMP_FORM_1,(Timer_struct
*)NULL));    /* TIME_ACC jen*/


  if (getenv ("TPCD_SPLIT_UPDATES") != NULL)
    split_updates = atoi (getenv
("TPCD_SPLIT_UPDATES"));
  if (getenv ("TPCD_CONCURRENT_INSERTS") !=
NULL)                  /*jenCI*/
    concurrent_inserts = atoi (getenv
("TPCD_CONCURRENT_INSERTS'));  /*jenCI*/
  loop_updates = split_updates / concurrent_inserts;
/*jenCI*/

  /* determine the starting and stopping point of the chunks
that this  jenCI*/
  /* invocation will apply. i is starting chunk number with
range 0     jenCI*/
  /* through (concurrent_inserts -1)
jenCI*/
  startChunk = i * loop_updates;
/*jenCI*/
  stopChunk = startChunk + (loop_updates - 1);
/*jenCI*/

  /* Establish a connection to the database */
  if (!strcmp(userid,"\0"))  /** No authentication provided
**/
    EXEC SQL CONNECT TO :UF_dbname;
  else
    EXEC SQL CONNECT TO :UF_dbname
USER :UF_userid USING :UF_passwd;
  error_check();
  if (sqlca.sqlcode < 0)
  {
    rc=-1;
    goto UF1_exit;
  }

  /* Start processing each chunk in my range */
#ifdef UF1DEBUG
  fprintf (myoutstream,"Before loop_a startChunk = %d,
stopChunk = %d\n", startChunk, stopChunk);
  fflush(myoutstream);
#endif
  for ( UF_chunk = startChunk; UF_chunk <= stopChunk;
UF_chunk++ )           /*jenCI*/
  {                                                    /*jenCI*/
    /* wlc  062797 */
    sqlcode = SQL_RC_E911;
    month = (short)UF_chunk;  /* Cast 'short' added bbe */
    maxwait = 1;
    rc = 0;

#ifdef UF1DEBUG
  fprintf (myoutstream, "Before While_a Chunk= %d
\n",UF_chunk);
  fflush(myoutstream);
#endif
    /* Loop to handle any deadlocks */
    while (sqlcode == SQL_RC_E911 && maxwait <=
MAXWAIT && rc==0)
    {
            sqlcode = 0;
#ifdef UF1DEBUG
  fprintf (myoutstream, "in loop before orders exec sql\n");
  fflush(myoutstream);
#endif
            EXEC SQL INSERT INTO TPCD.ORDERS
             SELECT
O_ORDERKEY,O_CUSTKEY,O_ORDERSTATUS,O_TO
TALPRICE,

O_ORDERDATE,O_ORDERPRIORITY,O_CLERK,O_SHI
PPRIORITY,O_COMMENT
             FROM TPCDTEMP.ORDERS_NEW
             WHERE APP_ID = :UF_chunk;
            /*AND 12*(YEAR(O_ORDERDATE)-
1992)+MONTH(O_ORDERDATE)-01 = :month;*/

        if (sqlca.sqlcode < 0)
          sqlcode = error_check();

        if (sqlcode == SQL_RC_E911)
        {       /* we've hit a deadlock */
          fprintf (myoutstream,
              "\nDeadlock detected inserting from
tpcdtemp.orders_new for chunk %d for pair
%d..Retrying...\n",UF_chunk,updatePair);
          SleepSome(UF_DEADLOCK_SLEEP);
          maxwait++;                    /* jen DEADLOCK
*/
        }
        else if (sqlcode < 0)
        {
          fprintf(myoutstream,
              "Insert into orders pair %d chunk %d failed
sqlcode=%d\n",
              updatePair,UF_chunk,sqlcode);
          dumpCa(&sqlca);
          rc = -1;
        }
        else
        {
          /* Everything worked with ORDERS, proceed with
LINEITEM */
          saveInsertedOrders = sqlca.sqlerrd[2];

          sqlcode = 0;
#ifdef UF1DEBUG
          fprintf (myoutstream, "in lineitem for update pair
number %d set %d chunk %d\n",
              updatePair, i,UF_chunk);
          fflush(myoutstream);
#endif

          EXEC SQL INSERT INTO TPCD.LINEITEM
            SELECT
L_ORDERKEY,L_PARTKEY,L_SUPPKEY,L_LINENUM
BER,L_QUANTITY,
            L_EXTENDEDPRICE,L_DISCOUNT,L_TAX,

L_RETURNFLAG,L_LINESTATUS,L_SHIPDATE,L_CO
MMITDATE,L_RECEIPTDATE,

L_SHIPINSTRUCT,L_SHIPMODE,L_COMMENT
           FROM TPCDTEMP.LINEITEM_NEW WHERE
APP_ID = :UF_chunk;
            /*(AND L_ORDERKEY IN
              (SELECT O_ORDERKEY FROM
TPCD.ORDERS
              WHERE 12*(YEAR(O_ORDERDATE)-
1992)+MONTH(O_ORDERDATE)-01 = :month);*/

          if (sqlca.sqlcode < 0)
            sqlcode = error_check();

          if (sqlcode == SQL_RC_E911)
```

```
        {       /* we've hit a deadlock */
          fprintf (myoutstream,
                "\nA deadlock has been detected inserting
from tpcdtemp.lineitem%d_%d...Retrying...\n",
                updatePair, UF_chunk);
          SleepSome(UF_DEADLOCK_SLEEP);
          maxwait++;                    /* jen DEADLOCK
*/
        }
        else if (sqlcode < 0)
        {
          fprintf(myoutstream,
              "Insert into lineitem pair %d chunk %d failed
sqlcode=%d\n",
                updatePair,UF_chunk,sqlcode);
          dumpCa(&sqlca);
          rc = -1;
        }
        else
        {
#ifdef UF1DEBUG
          fprintf (myoutstream, "lineitem insert succeeded\n");
          fflush(myoutstream);
#endif
          /* accumulate the number of row inserted */
          /* Order count ONLY updated if both orders and
lineitem */
          /* go through */
          insertedOrders += saveInsertedOrders;         /*
kbs */
          insertedLineitem += sqlca.sqlerrd[2];
          rc=0;
          EXEC SQL COMMIT WORK;
          error_check();

#ifdef UF1DEBUG
          /* report the number of row inserted */
          fprintf(myoutstream, "    interim %ld rows for
chunk %d into TPCD.ORDERS at %*.*s\n",

insertedOrders,UF_chunk,T_STAMP_1LEN,T_STAMP_1L
EN,  /* TIME_ACC jen*/

get_time_stamp(T_STAMP_FORM_1,(Timer_struct
*)NULL));  /* TIME_ACC jen*/
          /* report the number of row deleted *s inserted */
          fprintf(myoutstream,
                "    interim %ld rows for chunk %d into
TPCD.LINEITEM at %*.*s\n",
                insertedLineitem,UF_chunk,
                T_STAMP_1LEN,T_STAMP_1LEN,  /*
TIME_ACC jen*/
                get_time_stamp(T_STAMP_FORM_1,
                        (Timer_struct *)NULL));  /*
TIME_ACC jen*/

          fprintf( myoutstream,
                "    inserts for update pair %d chunk %d
complete at %*.*s\n\n",
                updatePair, UF_chunk,
                T_STAMP_1LEN,T_STAMP_1LEN,  /*
TIME_ACC jen*/
                get_time_stamp(T_STAMP_FORM_1,
                        (Timer_struct *)NULL));  /*
TIME_ACC jen*/

#endif
        }
      } /* process lineitem INSERTs */
    } /* while loop for deadlocks */
  } /* while processing chunks */

  /* report the number of row deleted */
  fprintf(myoutstream, "%ld rows inserted into
TPCD.ORDERS at %*.*s\n",
        insertedOrders,T_STAMP_1LEN,T_STAMP_1LEN,
/* TIME_ACC jen*/
        get_time_stamp(T_STAMP_FORM_1,(Timer_struct
*)NULL));  /* TIME_ACC jen*/
  fprintf(myoutstream, "%ld rows inserted into
TPCD.LINEITEM at %*.*s\n",

insertedLineitem,T_STAMP_1LEN,T_STAMP_1LEN,  /*
TIME_ACC jen*/
        get_time_stamp(T_STAMP_FORM_1,(Timer_struct
*)NULL));  /* TIME_ACC jen*/

  if (sqlcode < 0)
  {
    if (sqlcode == SQL_RC_E911)
    {
      fprintf (myoutstream,"# of deadlocks exceeds %i\n",
MAXWAIT);
    }
    rc=-1;
    EXEC SQL ROLLBACK WORK;
    error_check();              /* @d22275 tjg */

    goto UF1_exit;
  }

/* UF1_conn_reset:  */
  EXEC SQL CONNECT RESET;
  error_check();              /* @d22275 tjg */

UF1_exit:
  fclose (myoutstream);
  /* exiting, increment the semaphore */

  /* we used the first flat file to generate the semaphore key
*/

#ifndef SQLWINT
  /*    we will use the tpcd.setup file to generate the
semaphore key   begin SEMA */
  if (getenv("TPCD_AUDIT_DIR") != NULL)
  {
    /* this is assuming that you will be running this from 0th
node */
    sprintf(sourcefile, "%s%ctools%ctpcd.setup",
          getenv("TPCD_AUDIT_DIR"),
PATH_DELIM,PATH_DELIM);
  }
  else
  {
    fprintf (stderr, "Can't open UF1 semaphore file
TPCD_AUDIT_DIR is not defined.\n");
    exit (-1);
  }
  /* end SEMA */

  su_semkey = ftok (sourcefile, 'J');
  while ( (su_semid = semget (su_semkey, 1, 0)) < 0)
  {
    if (errno == ENOENT) {
      sleep(2);
    }
    else {
      fprintf(stderr,"update set %d: semget failed errno =
%d\n",
```

```
            i, errno);
        exit(1);
    }
  }
  if (sem_op (su_semid, 0, 1) != 0)                    /*jen
SEM*/
  {
    fprintf(stderr,"Failure to increment semaphore UF1 set
%d\n",i);
    fprintf(stderr,"  semaphore sourcefile = %s  su_semid =
su_semid\n",sourcefile);
    exit(1);
  }                                                    /*jenSEM*/

#else  /* SQLWINT */
  sprintf (UF1_semfile, "%s.%s.UF1.semfile",
        getenv("TPCD_DBNAME"), getenv("USER"));
  fprintf(stderr,"UF1 semfile = %s\n",UF1_semfile);
  while ((su_hSem =
OpenSemaphore(SEMAPHORE_ALL_ACCESS |
                        SEMAPHORE_MODIFY_STATE |
                        SYNCHRONIZE,
                        TRUE,
                        UF1_semfile))
       == (HANDLE)(NULL))
  {
    /*
    ** if cannot open the semaphore, wait for 0.1 second
    */
    fprintf(stderr,"Retry Open semaphore %s\n",
UF1_semfile);

    sleep(1);
  }

  if (! ReleaseSemaphore(su_hSem,
                  1,
                  (LPLONG)(NULL)))
  {
    fprintf(stderr, "ReleaseSemaphore failed, LastError: %d,
quit\n",
          GetLastError());
    exit(-1);
  }
#endif /* SQLWINT */
  exit(rc);                /* child exiting after finishing up */
}


/************************************************
******************/
/* UF2 child                                    */
/************************************************
******************/
void runUF2_fn ( int updatePair, int thisConcurrentDelete,
int numChunks, char *dbname, char *userid, char *passwd )
{
  int rc = 0;
  long sqlcode;
  int maxwait;
  int startChunk = thisConcurrentDelete*numChunks; /*
where do we start? */
  long deletedLineitems = 0; /*kmw*/
  long deletedOrders = 0;    /*kmw*/
  long savedDeletedLineitems = 0; /*kbs*/

#ifndef SQLWINT
  int             su_semid; /* semaphore for controlling split
updates*/
  key_t           su_semkey; /* key to generate semid */
#else
  HANDLE          su_hSem;
  char            UF2_semfile[256];
#endif

  char myoutstreamfile[256];
  FILE *myoutstream, *src_fh=NULL;

  strcpy(UF_dbname, dbname);
  strcpy(UF_userid, userid);
  strcpy(UF_passwd, passwd);

  /* Generate the unique filename for this concurrent delete
process */
  sprintf (myoutstreamfile, UF2OUTSTREAMPATTERN,
env_tpcd_tmp_dir, PATH_DELIM,
        updatePair, thisConcurrentDelete);
  if ( (myoutstream = fopen (myoutstreamfile,
WRITEMODE)) == NULL)
  {
    fprintf (stderr,
          "\nThe output file '%s' for update pair %d set %d
could not be opened runUF2_fn.\n",
          myoutstreamfile,updatePair,thisConcurrentDelete);
    rc=-1;
    goto UF2_exit;
  }

  outstream=myoutstream;    /* initialize outstream for
error_check dxxxxhar*/

#ifdef UF2DEBUG
  fprintf (myoutstream, "RunUF2 Called %d   %d   %d\n",
                updatePair, thisConcurrentDelete,
numChunks );
  fflush(myoutstream);
#endif
  fprintf( myoutstream,
        "\nUF2 for update pair %d set %d starting at
%*.*s\n",
        updatePair, thisConcurrentDelete,
T_STAMP_1LEN,T_STAMP_1LEN,  /* TIME_ACC jen*/
        get_time_stamp(T_STAMP_FORM_1,(Timer_struct
*)NULL));  /* TIME_ACC jen*/

#ifdef UF2DEBUG
  fprintf (myoutstream, "before connect\n");
  fflush(myoutstream);
#endif

  if (!strcmp(userid,"\0"))  /** No authentication provided
**/
    EXEC SQL CONNECT TO :UF_dbname;
  else
    EXEC SQL CONNECT TO :UF_dbname
USER :UF_userid USING :UF_passwd;
  error_check();

#ifdef UF2DEBUG
  fprintf (myoutstream, "after connect  startchunk= %d,
EndChunk = %d\n",
                    startChunk, startChunk+numChunks);
  fflush(myoutstream);
#endif

  /* Start processing each chunk in my range */
  for ( UF_chunk = startChunk; UF_chunk <
startChunk+numChunks; UF_chunk++ )
  {
```

```
    /* Set things up for the loop which will retry if there is a
deadlock */
     sqlcode = SQL_RC_E911;
     month = (short)UF_chunk;
     maxwait = 1;
     rc = 0;

#ifdef UF2DEBUG
   fprintf (myoutstream, "Chunk = %d\n", UF_chunk);
   fflush(myoutstream);
#endif
     while (sqlcode == SQL_RC_E911 && maxwait <=
MAXWAIT && rc == 0)
     {

#ifdef UF2DEBUG
   fprintf (myoutstream, "in loop before orders exec sql\n");
   fflush(myoutstream);
#endif
       sqlcode = 0;

       EXEC SQL DELETE FROM TPCD.LINEITEM
             WHERE L_ORDERKEY IN
              (SELECT O_ORDERKEY FROM
TPCDTEMP.ORDERS_DEL
               WHERE APP_ID = :UF_chunk);
               /*AND O_ORDERKEY IN
                (SELECT O_ORDERKEY FROM
TPCD.ORDERS
                 WHERE 12*(YEAR(O_ORDERDATE)-
1992)+MONTH(O_ORDERDATE)-01 = :month));*/
       if (sqlca.sqlcode < 0)
          sqlcode = error_check();

       if (sqlcode == SQL_RC_E911)
       {       /* we've hit a deadlock */
          fprintf (myoutstream,
            "\nA deadlock detected while deleting from
LINEITEM: update pair %d set %d chunk %d.  Retrying.\n",
             updatePair, thisConcurrentDelete, UF_chunk);
          dumpCa(&sqlca);
          SleepSome(UF_DEADLOCK_SLEEP);
          maxwait++;      /* jen DEADLOCK */
       }
       else if (sqlcode < 0)
       {
          fprintf (myoutstream,"\n%s\n", stmt_str.data);
          fprintf (myoutstream,"\nsqlcode %d occurred deleting
from TPCD.LINEITEM\n", sqlca.sqlcode);
          dumpCa(&sqlca);
          fprintf (myoutstream,
                "for update pair number %d set %d chunk
%d..Exiting\n",
                updatePair, thisConcurrentDelete,UF_chunk);
          rc=-1;
       }
       else
       {
          /* accumulate the number of row deleted */
          savedDeletedLineitems = sqlca.sqlerrd[2];   /*kbs*/

#ifdef UF2DEBUG
         fprintf (myoutstream, "in loop for update pair number
%d set %d chunk %d\n",
                updatePair, thisConcurrentDelete,UF_chunk);
          fflush(myoutstream);
#endif

          /* delete the orders now */

          EXEC SQL DELETE FROM TPCD.ORDERS
          WHERE O_ORDERKEY IN
           (SELECT O_ORDERKEY FROM
TPCDTEMP.ORDERS_DEL WHERE APP_ID
= :UF_chunk);
            /*AND 12*(YEAR(O_ORDERDATE)-
1992)+MONTH(O_ORDERDATE)-01 = :month;*/

          if (sqlca.sqlcode < 0)
            sqlcode = error_check();

          if (sqlcode == SQL_RC_E911)
          {       /* we've hit a deadlock */
#ifdef UF2DEBUG
   fprintf (myoutstream, "orders deadlocked\n");
   fflush(myoutstream);
#endif
            fprintf (myoutstream,
            "\nA deadlock detected while deleting from
ORDERS: update pair %d set %d chunk %d.  Retrying.\n",
            updatePair, thisConcurrentDelete, UF_chunk);
            dumpCa(&sqlca);
            SleepSome(UF_DEADLOCK_SLEEP);
            maxwait++;      /* jen DEADLOCK */
          }
          else if (sqlcode < 0)
          {
#ifdef UF2DEBUG
   fprintf (myoutstream, "orders failed\n");
   fflush(myoutstream);
#endif
            fprintf (myoutstream,"\nAn error %d occurred
deleting from TPCD.ORDERS\n",sqlca.sqlcode);
            dumpCa(&sqlca);
           fprintf (myoutstream,"for update pair number %d
set %d chunk %d..Exiting\n",
                  updatePair, thisConcurrentDelete,UF_chunk);
            rc=-1;
          }
         else
          {
#ifdef UF2DEBUG
   fprintf (myoutstream, "orders succeeded\n");
   fflush(myoutstream);
#endif
            /* accumulate the number of row deleted */
           /* Order count ONLY updated if both ordersand
lineitem */
            /* go through */
           deletedLineitems += savedDeletedLineitems;   /*
kbs */
            deletedOrders += sqlca.sqlerrd[2];
            rc=0;
            EXEC SQL COMMIT WORK;
            error_check();
#ifdef UF2DEBUG
            /* report the number of rows deleted */
            fprintf(myoutstream, "    interim %ld rows for
chunk %d from TPCD.ORDERS at %*.*s\n",

deletedOrders,UF_chunk,T_STAMP_1LEN,T_STAMP_1LE
N,  /* TIME_ACC jen*/

get_time_stamp(T_STAMP_FORM_1,(Timer_struct
*)NULL));  /* TIME_ACC jen*/
            fprintf(myoutstream, "    interim %ld rows for
chunk %d from TPCD.LINEITEM at %*.*s\n",

deletedLineitems,UF_chunk,T_STAMP_1LEN,T_STAMP_1
LEN,  /* TIME_ACC jen*/
```

```
get_time_stamp(T_STAMP_FORM_1,(Timer_struct
*)NULL));  /* TIME_ACC jen*/
            fprintf( myoutstream,
                  "    deletes for update pair %d chunk %d
complete at %*.*s\n\n",
                  updatePair, UF_chunk,
                  T_STAMP_1LEN,T_STAMP_1LEN,  /*
TIME_ACC jen*/
                  get_time_stamp(T_STAMP_FORM_1,
                        (Timer_struct *)NULL));  /*
TIME_ACC jen*/
#endif
          }
        } /* process orders  deletes */
      } /* while trying to delete one chunk loop */
    } /* while there are more chunks */

#ifdef UF2DEBUG
    fprintf (myoutstream, "after loop\n");
    fflush(myoutstream);
#endif
    /* report the number of row deleted */
    fprintf(myoutstream, "%ld rows deleted from
TPCD.ORDERS at %*.*s\n",
          deletedOrders,T_STAMP_1LEN,T_STAMP_1LEN,
/* TIME_ACC jen*/
          get_time_stamp(T_STAMP_FORM_1,(Timer_struct
*)NULL));  /* TIME_ACC jen*/
    fprintf(myoutstream, "%ld rows deleted from
TPCD.LINEITEM at %*.*s\n",

deletedLineitems,T_STAMP_1LEN,T_STAMP_1LEN, /*
TIME_ACC jen*/
          get_time_stamp(T_STAMP_FORM_1,(Timer_struct
*)NULL));  /* TIME_ACC jen*/

    if (sqlca.sqlcode < 0)
    {
      fprintf (myoutstream,"# of deadlocks %d exceeds %i\n",
maxwait,MAXWAIT);
       rc=-1;
       EXEC SQL ROLLBACK WORK;
       error_check();                  /* @d22275 tjg */
    }

/* UF2_conn_reset:  */                  /*971101jen*/
    EXEC SQL CONNECT RESET;
    error_check();                  /* @d22275 tjg */


UF2_exit:
    fclose (myoutstream);

    /* exiting, increment the semaphore */
#ifndef SQLWINT
    /* we used the tpcd.setup file to generate the semaphore
key      begin SEMA */
    if (getenv("TPCD_AUDIT_DIR") != NULL)
    {
      sprintf(sourcefile, "%s%ctools%ctpcd.setup",
            getenv("TPCD_AUDIT_DIR"), PATH_DELIM,
PATH_DELIM);
    }
    else
    {
      fprintf (stderr, "Can't open UF2 semaphore file
TPCD_AUDIT_DIR is not defined.\n");
      exit (-1);
    }

    su_semkey = ftok (sourcefile, 'D');   /* use D for deletes */
    /* end SEMA */
    while ((su_semid = semget(su_semkey,1,0)) < 0)
    {
      if (errno == ENOENT)
        sleep(2);
      else {
        fprintf(stderr,"UF2 update stream %d: semget failed
errno = %d\n",
              updatePair, errno);
        exit(1);
      }
    }
    if (sem_op (su_semid, 0, 1) != 0 )     /*jenSEM*/
    {                                      /*jenSEM*/
      fprintf(stderr,"Failure to increment semaphone UF2 set
%d\n", thisConcurrentDelete);
      exit(1);
    }                                                  /*jenSEM*/

#else
    sprintf (UF2_semfile, "%s.%s.UF2.semfile",
          getenv("TPCD_DBNAME"), getenv("USER"));
    fprintf(stderr,"UF2 semfile = %s\n",UF2_semfile);
    while ((su_hSem =
OpenSemaphore(SEMAPHORE_ALL_ACCESS |
                        SEMAPHORE_MODIFY_STATE |
                        SYNCHRONIZE,
                        TRUE,
                        UF2_semfile))
          == (HANDLE)(NULL)) {
      /*
      ** if cannot open the semaphore, wait for 0.1 second
      */
      fprintf(stderr,"Retry Open semaphore %s\n",
UF2_semfile);

      SleepSome(1);
    }

    if (! ReleaseSemaphore(su_hSem,
                    1,
                    (LPLONG)(NULL)))
    {
      fprintf(stderr, "ReleaseSemaphore failed, LastError: %d,
quit\n",
            GetLastError());
      exit(-1);
    }
#endif

    exit(rc);                  /* child exiting after finishing up */
}
```

Appendix E: ACID Transaction Source Code

acid.h

```
/*************************************************
************************/
```

```
/*      File: acid.h                                    */
/*************************************************
************************/

#include <stdio.h>
#include <stdlib.h>
#include <time.h>

#ifdef SQLWINT
  #include <windows.h>
  #include <sys\timeb.h>
  #include <sys\stat.h>
  #include <stdlib.h>
  #include <io.h>
#else
  #include <unistd.h>
  #include <sys/time.h>
  #include <sys/timeb.h>
#endif

#include <string.h>
#include <math.h>

#define acidtime(tvsec,tvusec) tvsec*1000+tvusec/1000
#define TSLEN 20

#if 0 /* needed on NT, not on AIX */
typedef struct timeval {
       long    tv_sec;         /* seconds */
       long    tv_usec;        /* and microseconds */
};
#endif

struct update_struct {
   int     qnum;
};

struct acidQ_struct {
   int     tag;
   long    o_key;
   double  l_extendedprice;
};

struct acidT_struct {
   int     termination;
   int     tag;
   int     logging;
   long    o_key;
   long    l_key;
   long    delta;
   long    l_partkey;
   long    l_suppkey;
   double  l_quantity;
   double  l_tax;
   double  l_discount;
   double  l_extendedprice;
   double  o_totalprice;
};

/*
** in acid.sqc
*/

int updateQ (struct update_struct *us);

char del(void);

#ifdef SQLWINT
void sleep (int sec);
#endif
```

acid.sqc

```
/*************************************************
************************/
/*      File: acid.sqc                                  */
/*************************************************
************************/

/*   changes:
 *
 *  961109  jel    add EXEC SQL CLOSE for each cursor in
acidT
 *                 to avoid bug in db2pe v1r2
 *  980225  gav    port to NT
 *  981103  kal    added ast_acidQ  for isolation test 7
 *  981103  kal    changed ast query to be the same as that
used in
 *                 consistency tests.  Fixed so the long lEprice is
 *                 cast to a double.  Changed so uses 3 decimal
points of
 *                 precision.
 *
 */

#include "acid.h"

#if (defined(SQLPTX) || defined(SQLWINT) ||
defined(SQLSUN) || defined(Linux))
double nearest(double);
#endif /* SQLPTX */


#define DEADLOCK -911

/*
#define TRUNC2(d) ((floor((d)*100.0))/100.0)
*/
/*
#define TRUNC2(d) ((floor(nearest((d)*100.0)))*0.01)
*/
/*
#define TRUNC2(d)
((floor(nearest((d)*1000.0)/10.0)/100.0))
*/
#define TRUNC2(d)
((floor(nearest((d)*100000.0)/1000.0)/100.0))

void sqlerror(char * , struct sqlca *);

EXEC SQL INCLUDE SQLCA;
EXEC SQL BEGIN DECLARE SECTION;
char dbname[8];   /* = "tpcd"; */
EXEC SQL END DECLARE SECTION;

#ifdef SQLWINT

 /*
 ** redefine gettimeofday so I don't have to
 ** change too much aix-specific code
 */
/*#typedef struct timeval { unsigned tv_sec; unsigned
tv_usec; }; */
typedef struct timezone { int dummy; };
struct timeb timer;

 void gettimeofday( struct timeval *tv, struct timezone *tz)
 {
```

```
   ftime(&timer);
   tv->tv_sec = timer.time;
   tv->tv_usec = timer.millitm  * 1000;
   tz->dummy = 0;
 }
#endif

/*---------------------------------------------------------------*/
/*       acidQ                                                   */
/*---------------------------------------------------------------*/
int acidQ (struct acidQ_struct *acid)
{
   time_t timeT;
   FILE *out;
   char out_fn[50];
   struct timeval tv;
   struct timezone tz;
   int mypid;
   int rc = 0;


   EXEC SQL BEGIN DECLARE SECTION;
   sqlint32    okey;
   sqlint32    lEprice;
   double  eprice;
   EXEC SQL END DECLARE SECTION;

   okey = acid->o_key;

   /* mypid = getpid(); */
   mypid = acid->tag;

   sprintf(out_fn,
"%s%cacidQ.out.%d",getenv("TPCD_TMP_DIR"),del(),myp
id);
   out=fopen(out_fn,"a");
   if (out == NULL)
   {
    fprintf(stderr, "ERROR input file %s could not be
appended to!!\n",out_fn);
    }

   gettimeofday(&tv, &tz);
   time(&timeT);
   fprintf(out,"\n---------- START of acidQ tag: %d ----------
\n\n",mypid);
   fprintf(out, "acidQ tag: %d, begin transaction time: (%us
%06uu) %s",
         mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
   fprintf(out, "okey: %d\n", okey);

   gettimeofday(&tv, &tz);
   time(&timeT);
   fprintf(out,"acidQ tag: %d, before read of LINEITEM:
(%us %06uu) %s",
         mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));

   /*
   ** use the same sql code as used in the consistsql.pl to
   ** run the consistency acid queries.  Note we assign an
long int
   ** to lEprice (we make it 10s of pennies by * 1000).  Then
divide
   ** by 1000.0 and cast it to a double (eprice) for printing
   */

   EXEC SQL
     SELECT

INTEGER(DECIMAL(SUM(DECIMAL(INTEGER(INTEG
ER(DECIMAL

(INTEGER(100*DECIMAL(L_EXTENDEDPRICE,20,3)),
20,3) *
        (1-L_DISCOUNT)) * (1+L_TAX)),20,3)/100.0),20,3)
* 1000)
       into :lEprice
     FROM
       TPCD.LINEITEM
     WHERE
       L_ORDERKEY = :okey;

   if (sqlca.sqlcode != 0) {
     rc = sqlca.sqlcode;
     fprintf(out,"acidQ **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
     sqlerror("acidQ: select sum(l_extendedprice)", &sqlca);
     goto Qerror;
   }
  eprice = (double)lEprice / 1000.0;  /* translate to double for
printout*/

   gettimeofday(&tv, &tz);
   time(&timeT);
   fprintf(out,"ACID tag: %d, after read of LINEITEM: (%us
%06uu) %s",
         mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
   fprintf(out, "okey: %d \t sum(l_extendedprice): %0.3f\n",
         okey, eprice);

   EXEC SQL COMMIT;
   if (sqlca.sqlcode != 0) {
     rc = sqlca.sqlcode;
     fprintf(out,"acidQ **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
     sqlerror("acidQ: COMMIT", &sqlca);
     goto Qerror;
   }
   acid->l_extendedprice = eprice;

   rc = 0;
   goto Qexit;

 Qerror:
   EXEC SQL rollback work;
   if (sqlca.sqlcode != 0) sqlerror("acidQ: ROLLBACK
FAILED", &sqlca);

 Qexit:
   fprintf(out,"\n---------- END of acidQ tag: %d ----------
\n\n",mypid);
   fflush(out);fclose(out);
   return(rc);
}

/*---------------------------------------------------------------*/
/*       ast_acidQ                                               */
/*---------------------------------------------------------------*/
int ast_acidQ (struct acidQ_struct *acid)
{
   time_t timeT;
   FILE *out;
   char out_fn[50];
   struct timeval tv;
   struct timezone tz;
   int mypid;
   int rc = 0;
```

```
  EXEC SQL BEGIN DECLARE SECTION;
  double    ast_lEprice;
  double    ast_eprice;
  EXEC SQL END DECLARE SECTION;


  /* mypid = getpid(); */
  mypid = acid->tag;

  sprintf(out_fn,
"%s%cast_acidQ.out.%d",getenv("TPCD_TMP_DIR"),del(),
mypid);
  out=fopen(out_fn,"a");
  gettimeofday(&tv, &tz);
  time(&timeT);
  fprintf(out,"\n---------- START of ast_acidQ tag: %d ------
--\n\n",mypid);
  fprintf(out, "ast_acidQ tag: %d, begin transaction time:
(%us %06uu) %s",
          mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));

  gettimeofday(&tv, &tz);
  time(&timeT);
  fprintf(out,"ast_acidQ tag: %d, before read of LINEITEM:
(%us %06uu) %s",
          mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));

  /*
  ** use the same query acidQ except do n't select for specfic
okey.
  ** this ensures that the ast will be used instead of the base
table
  ** Have to use ast_lEprice as double since this sum is so
big
  */
  EXEC SQL
    SELECT
     SUM ( L_EXTENDEDPRICE*(1-L_DISCOUNT)*(1 +
L_TAX))
      into :ast_lEprice
    FROM
     TPCD.LINEITEM;

  if (sqlca.sqlcode != 0) {
     rc = sqlca.sqlcode;
     fprintf(out,"ast_acidQ **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
     sqlerror("ast_acidQ: select sum(l_extendedprice)",
&sqlca);
     goto Qerror;
  }
  ast_eprice = ast_lEprice;  /* use ast_eprice  for printout to
be consistent*/

  gettimeofday(&tv, &tz);
  time(&timeT);
  fprintf(out,"AST_ACID tag: %d, after read of LINEITEM:
(%us %06uu) %s",
          mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
  fprintf(out, "sum(l_extendedprice): %0.3f\n",
          ast_eprice);

  EXEC SQL COMMIT;
  if (sqlca.sqlcode != 0) {
     rc = sqlca.sqlcode;
     fprintf(out,"ast_acidQ **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
     sqlerror("ast_acidQ: COMMIT", &sqlca);
     goto Qerror;
  }
  acid->l_extendedprice = ast_eprice;

  rc = 0;
  goto Qexit;

 Qerror:
  EXEC SQL rollback work;
  if (sqlca.sqlcode != 0) sqlerror("ast_acidQ: ROLLBACK
FAILED", &sqlca);

 Qexit:
  fprintf(out,"\n---------- END of ast_acidQ tag: %d --------
\n\n",mypid);
  fflush(out);fclose(out);
  return(rc);
}
/*-------------------------------------------------------------*/
/*       acidT                                                 */
/*-------------------------------------------------------------*/
int acidT (struct acidT_struct *acid)
{

  time_t timeT;
  FILE *out;
  char out_fn[50];
  struct timeval tv;
  struct timezone tz;
  int mypid;
  int rc = 0;

  EXEC SQL BEGIN DECLARE SECTION;
  sqlint32      o_key, l_key, delta;
  sqlint32      l_partkey, l_suppkey;
  double    l_quantity, l_tax, l_discount, l_extendedprice;
  double    o_totalprice;
  double    new_quantity, rprice, cost, new_extprice,
new_ototal, ototal;
  EXEC SQL END DECLARE SECTION;

  EXEC SQL DECLARE l_cursor CURSOR FOR
    SELECT l_partkey, l_suppkey, l_quantity,
    l_tax, l_discount,
    l_extendedprice
      FROM tpcd.lineitem
      WHERE l_orderkey = :o_key
      AND l_linenumber = :l_key
      FOR UPDATE OF l_extendedprice, l_quantity;

  EXEC SQL DECLARE o_cursor CURSOR FOR
    SELECT o_totalprice
      FROM tpcd.orders
      WHERE o_orderkey = :o_key
      FOR UPDATE OF o_totalprice;

  if (acid->termination < 0 || acid->termination > 3) acid-
>termination = 0;
  o_key = acid->o_key;
  l_key = acid->l_key;
  delta = acid->delta;

  if (acid->logging) {
    /* mypid = getpid(); */
    mypid = acid->tag;
    sprintf(out_fn,
"%s%cacidT.out.%d",getenv("TPCD_TMP_DIR"),del(),myp
id);
    out=fopen(out_fn,"a");
    gettimeofday(&tv, &tz);
    time(&timeT);
```

```
    fprintf(out,"\n---------- START of acidT tag: %d ----------
\n\n",mypid);
    fprintf(out, "acidT tag: %d, begin transaction time: (%us
%06uu) %s",
            mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    fprintf(out, "o_key: %d\tl_key: %d\tdelta:%d\n", o_key,
l_key, delta);
  }
#ifdef DEBUG
  printf("o_key: %d\tl_key: %d\tdelta: %d\n", o_key, l_key,
delta);
#endif

 retry_tran:

  if (acid->logging) {
    gettimeofday(&tv, &tz);
    time(&timeT);
    fprintf(out,"acidT tag: %d, before read of LINEITEM:
(%us %06uu) %s",
            mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
  }

  EXEC SQL OPEN l_cursor;
  if (sqlca.sqlcode != 0) {
    if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
    rc = sqlca.sqlcode;
    if (acid->logging) {
      fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } else {
      fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } /* endif */
    sqlerror("acidT: OPEN l_cursor", &sqlca);
    goto Terror;
  }

  EXEC SQL FETCH l_cursor INTO
    :l_partkey, :l_suppkey, :l_quantity, :l_tax,
    :l_discount, :l_extendedprice;
  if (sqlca.sqlcode != 0) {
    if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
    rc = sqlca.sqlcode;
    if (acid->logging) {
      fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } else {
      fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } /* endif */
    sqlerror("acidT: FETCH l_cursor", &sqlca);
    goto Terror;
  }

#ifdef DEBUG
  printf("l_quantity = %0.3f\n",l_quantity);
  printf("l_tax = %0.3f \n",l_tax);
  printf("l_discount = %0.3f \n",l_discount);
  printf("l_extendedprice = %0.3f \n", l_extendedprice);
#endif

  if (acid->logging) {
    gettimeofday(&tv, &tz);
    time(&timeT);
    fprintf(out,"acidT tag: %d, after read of LINEITEM:
(%us %06uu) %s",
            mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    fprintf(out, "l_partkey: %d  l_suppkey: %d  l_quantity:
%0.3f\nl_tax: %0.3f  l_discount: %0.3f  l_extendedprice:
%0.3f\n",
            l_partkey, l_suppkey, l_quantity, l_tax, l_discount,
l_extendedprice);
  }

  rprice = TRUNC2( l_extendedprice/l_quantity );
  cost = TRUNC2( rprice * delta );
  new_extprice = l_extendedprice + cost;
  new_quantity = l_quantity + delta;

#ifdef DEBUG
  printf("rprice = %0.3f\n", rprice );
  printf("cost = %0.3f\n", cost );
  printf("new_extprice = %0.3f\n", new_extprice );
  printf("new_quantity = %0.3f\n", new_quantity );
#endif

  EXEC SQL UPDATE tpcd.lineitem
    SET l_extendedprice = :new_extprice,
      l_quantity = :new_quantity
    WHERE CURRENT OF l_cursor;

  if (sqlca.sqlcode != 0) {
    if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
    rc = sqlca.sqlcode;
    if (acid->logging) {
      fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } else {
      fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } /* endif */
    sqlerror("acidT: UPDATE l_cursor", &sqlca);
    goto Terror;
  }

  if (acid->logging) {
    gettimeofday(&tv, &tz);
    time(&timeT);
    fprintf(out,"acidT tag: %d, after update of LINEITEM:
(%us %06uu) %s",
            mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    fprintf(out, "updated l_extendedprice: %0.3f\n",
new_extprice );
    fprintf(out, "updated l_quantity: %0.3f\n", new_quantity );
  }

/* if (acid->termination == 0) {
    EXEC SQL CLOSE L_CURSOR;
    EXEC SQL CLOSE O_CURSOR;
    EXEC SQL COMMIT;
    if (sqlca.sqlcode != 0) {
      if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
      rc = sqlca.sqlcode;
      if (acid->logging) {
        fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
      } else {
        fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
      }
      sqlerror("acidT: COMMIT", &sqlca);
      goto Terror;
    }
  } */

  if (acid->logging) {
    gettimeofday(&tv, &tz);
```

```
    time(&timeT);
    fprintf(out,"acidT tag: %d, before read of ORDER: (%us
%06uu) %s",
            mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
  }

  EXEC SQL OPEN o_cursor;
  if (sqlca.sqlcode != 0) {
    if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
    rc = sqlca.sqlcode;
    if (acid->logging) {
      fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } else {
      fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } /* endif */
    sqlerror("acidT: OPEN o_cursor", &sqlca);
    goto Terror;
  }

  EXEC SQL FETCH o_cursor INTO :o_totalprice;
  if (sqlca.sqlcode != 0) {
    if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
    rc = sqlca.sqlcode;
    if (acid->logging)
    {
      fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    }
    else
    {
      fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    }
    sqlerror("acidT: FETCH o_cursor", &sqlca);
    goto Terror;
  }

#ifdef DEBUG
  printf("o_totalprice = %0.3f\n",o_totalprice);
#endif

  if (acid->logging) {
    gettimeofday(&tv, &tz);
    time(&timeT);
    fprintf(out,"acidT tag: %d, after read of ORDER: (%us
%06uu) %s",
            mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    fprintf(out, "o_totalprice: %0.3f\n", o_totalprice);
  }

#ifdef DEBUG
  {
   double zeroone= l_extendedprice * (1.0- l_discount);
   double zeroonetimes= (l_extendedprice * (1.0-
l_discount))*100.0;
   double firstone = TRUNC2(l_extendedprice * (1.0-
l_discount));
   double notone= TRUNC2 ( l_extendedprice * (1.0-
l_discount)) * (1.0+l_tax);
   double secondone= TRUNC2( TRUNC2( l_extendedprice
* (1.0-l_discount) ) * (1.0+l_tax) );
   printf("firstone=   %f\n", firstone);
   printf("zeroone=   %f\n", zeroone);
   printf("zeroonetimes=   %f\n", zeroonetimes);
   printf("notone=   %f\n", notone);
   printf("secondone=   %f\n", secondone);
  }
#endif

  ototal = o_totalprice -
           TRUNC2( TRUNC2( l_extendedprice * (1-
l_discount) ) * (1+l_tax) );
  new_ototal = TRUNC2( new_extprice * (1.0-l_discount));
  new_ototal = TRUNC2( new_ototal * (1.0+l_tax) );
  new_ototal = ototal + new_ototal;

#ifdef DEBUG
  printf("o_totalprince= %f\n",o_totalprice);
  printf("ototal= %0.3f\n",ototal);
  printf("ototal= %f\n",ototal);
  printf("new_ototal= %0.3f\n",new_ototal);
#endif

  EXEC SQL UPDATE tpcd.orders
    SET o_totalprice = :new_ototal
    WHERE CURRENT OF o_cursor;
  if (sqlca.sqlcode != 0) {
    if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
    rc = sqlca.sqlcode;
    if (acid->logging) {
      fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } else {
      fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } /* endif */
    sqlerror("acidT: UPDATE o_cursor", &sqlca);
    goto Terror;
  }

  if (acid->logging) {
    gettimeofday(&tv, &tz);
    time(&timeT);
    fprintf(out,"acidT tag: %d, after update of ORDER: (%us
%06uu) %s",
            mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    fprintf(out, "updated o_totalprice: %0.3f\n", new_ototal);
  }

/*
** why is this code in here? we don't want to
** commit until the history table has been updated as well
  if (acid->termination == 0) {
    EXEC SQL CLOSE L_CURSOR;
    EXEC SQL CLOSE O_CURSOR;
    EXEC SQL COMMIT;
    if (sqlca.sqlcode != 0) {
      if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
      rc = sqlca.sqlcode;
      if (acid->logging) {
        fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
      } else {
        fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
      }
      sqlerror("acidT: COMMIT", &sqlca);
      goto Terror;
    }
  }
*/

  if (acid->logging) {
    gettimeofday(&tv, &tz);
    time(&timeT);
    fprintf(out,"acidT tag: %d, before insert into HISTORY:
(%us %06uu) %s",
            mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
  }
```

```
  EXEC SQL INSERT INTO tpcd.history values
    (:l_partkey, :l_suppkey, :o_key, :l_key, :delta,
CURRENT TIMESTAMP);
  if (sqlca.sqlcode != 0) {
    if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
    rc = sqlca.sqlcode;
    if (acid->logging) {
      fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } else {
      fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
    } /* endif */
    sqlerror("acidT: INSERT INTO history", &sqlca);
    goto Terror;
  }

  if (acid->logging) {
    gettimeofday(&tv, &tz);
    time(&timeT);
    fprintf(out,"acidT tag: %d, after insert into HISTORY:
(%us %06uu) %s",
            mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
  }

  /* sleep for 1 second for 80% of the transactions */
#ifdef SQLWINT
  if ( ((rand() % (100)) + 1) < 80 ) sleep(1);
#else
  if ( ((random() % (100)) + 1) < 80 ) sleep(1);
#endif

  switch (acid->termination) {
   case 1:
    {
      if (acid->logging)
      {
        gettimeofday(&tv, &tz);
        time(&timeT);
        fprintf(out,"acidT tag: %d, wait before COMMIT:
(%us %06uu) %s",
                mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
      }
    }
    sleep(60);
   case 0:
    if (acid->logging) {
      gettimeofday(&tv, &tz);
      time(&timeT);
      fprintf(out,"acidT tag: %d, immediately before
COMMIT: (%us %06uu) %s",
              mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    }
    EXEC SQL CLOSE L_CURSOR;
    EXEC SQL CLOSE O_CURSOR;
    EXEC SQL COMMIT;
    if (sqlca.sqlcode != 0) {
      if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
      rc = sqlca.sqlcode;
      if (acid->logging) {
        fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
      } else {
        fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
      } /* endif */
      sqlerror("acidT: COMMIT", &sqlca);
      goto Terror;
    }
    if (acid->logging) {
      gettimeofday(&tv, &tz);
      time(&timeT);
      fprintf(out,"acidT tag: %d, after COMMIT: (%us
%06uu) %s",
              mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    }
    break;
   case 3:
    if (acid->logging) {
      gettimeofday(&tv, &tz);
      time(&timeT);
      fprintf(out,"acidT tag: %d, wait before ROLLBACK:
(%us %06uu) %s",
              mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    }
    sleep(60);
   case 2:
    if (acid->logging) {
      gettimeofday(&tv, &tz);
      time(&timeT);
      fprintf(out,"acidT tag: %d, immediately before
ROLLBACK: (%us %06uu) %s",
              mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    }
    EXEC SQL CLOSE L_CURSOR;
    EXEC SQL CLOSE O_CURSOR;
    EXEC SQL rollback work;
    if (sqlca.sqlcode != 0) {
      if(sqlca.sqlcode == DEADLOCK) goto retry_tran;
      rc = sqlca.sqlcode;
      if (acid->logging) {
        fprintf(out,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
      } else {
        fprintf(stderr,"acidT **ERROR** sqlcode =
%d\n",sqlca.sqlcode);
      } /* endif */
      sqlerror("acidT: ROLLBACK", &sqlca);
      goto Terror;
    }
    if (acid->logging) {
      gettimeofday(&tv, &tz);
      time(&timeT);
      fprintf(out,"acidT tag: %d, after ROLLBACK: (%us
%06uu) %s",
              mypid, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    }
      break;
  }

  acid->l_partkey = l_partkey;
  acid->l_suppkey = l_suppkey;
  acid->l_quantity = l_quantity;
  acid->l_tax = l_tax;
  acid->l_discount = l_discount;
  acid->l_extendedprice = l_extendedprice;
  acid->o_totalprice = o_totalprice;

  rc = 0;
  goto Texit;

 Terror:
    EXEC SQL CLOSE L_CURSOR;
    EXEC SQL CLOSE O_CURSOR;
  EXEC SQL rollback work;
  if (sqlca.sqlcode != 0) sqlerror("acidT: ROLLBACK
FAILED", &sqlca);

 Texit:
```

```
  if (acid->logging) {
    fprintf(out,"\n---------- END of acidT tag: %d ----------
\n\n",mypid);
    fflush(out);fclose(out);
  }
  return(rc);
}

/*---------------------------------------------------------------*/
/*      updateQ                                                  */
/*---------------------------------------------------------------*/
int updateQ (struct update_struct *us)
{
  FILE *out;
  time_t timeT;
  struct timeval tv;
  struct timezone tz;
  int qnum;
  int rc = 0;
  int i;
  int secs2sleep;
  char buff[256];
  struct acidtype {int logging;} a, *acid;

  EXEC SQL BEGIN DECLARE SECTION;
  double    acctbal;
  double    discount;
  double    price;
  sqlint32      availqty;
  sqlint32      size;
  EXEC SQL END DECLARE SECTION;

  qnum = us->qnum;

  acid = &a;
  acid->logging= 1;

  sprintf(buff,
"%s%cupdate.out",getenv("TPCD_TMP_DIR"),del());
  out=fopen(buff,"a");

  gettimeofday(&tv, &tz);
  time(&timeT);
  fprintf(out,"\n---------- START of update ----------\n\n");
  fprintf(out, "update query number: %d, begin transaction
time: (%us %06uu) %s",
        qnum, tv.tv_sec, tv.tv_usec, ctime(&timeT));

  sqlca.sqlcode = 0;
  discount = 0.25;
  price = 5000.50;
  acctbal = 1000.00;
  availqty = 10;
  size = 5;

  for (i=1; i <= 2; i++) {
    gettimeofday(&tv, &tz);
    time(&timeT);
    fprintf(out,"update query number: %d, pass %d,
immediately before UPDATE: (%us %06uu) %s",
          qnum, i, tv.tv_sec, tv.tv_usec, ctime(&timeT));

    switch (qnum)
    {
     case 1:
     {
       EXEC SQL
         UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
         WHERE L_ORDERKEY IN (326,512,928,995);
       if (sqlca.sqlcode != 0) {
         rc = sqlca.sqlcode;
         if (acid->logging)
         {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
         }
         else
         {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
         }
         sqlerror("update query number 1", &sqlca);
         goto Uerror;
       }
       discount = discount * (-1);
       secs2sleep = 300;
       break;
     }
     case 2:
     {
       EXEC SQL
         UPDATE TPCD.SUPPLIER set S_ACCTBAL =
S_ACCTBAL + :acctbal
         WHERE S_NAME in
('Supplier#000000647','Supplier#000000070','Supplier#0000
00802');
       if (sqlca.sqlcode != 0) {
         rc = sqlca.sqlcode;
         if (acid->logging)
         {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
         }
         else
         {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
         }
         sqlerror("update query number 2", &sqlca);
         goto Uerror;
       }
       acctbal = acctbal * (-1);
       secs2sleep = 90;
       break;
     }
     case 3:
     {
       EXEC SQL
         UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
         WHERE L_ORDERKEY IN (260930, 402497,
457859, 509889, 58117,
                   538311, 588421, 416167, 97830,
90276);
       if (sqlca.sqlcode != 0) {
         rc = sqlca.sqlcode;
         if (acid->logging)
         {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
         }
         else
         {
```

```
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
          }
          sqlerror("update query number 3", &sqlca);
          goto Uerror;
        }
        discount = discount * (-1);
        secs2sleep = 300;
        break;
      }
      case 4:
      {
        if ( i ==1 ) {
          EXEC SQL
            UPDATE TPCD.ORDERS set O_ORDERDATE =
O_ORDERDATE - 6 MONTHS
            WHERE O_ORDERKEY =  67461;
          /* WHERE O_ORDERKEY IN
(22400,28515,34338,46596,67461,92644,98307);*/
        } else {
          EXEC SQL
            UPDATE TPCD.ORDERS set O_ORDERDATE =
O_ORDERDATE + 6 MONTHS
            WHERE O_ORDERKEY =  67461;
        }
        if (sqlca.sqlcode != 0) {
          rc = sqlca.sqlcode;
          if (acid->logging)
          {
            fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
          }
          else
          {
            fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
          }
          sqlerror("update query number 4", &sqlca);
          goto Uerror;
        }
        secs2sleep = 300;
        break;
      }
      case 5:
      {
        EXEC SQL
          UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
          WHERE L_ORDERKEY IN
(70976,566279,152897,84226,232483);
        if (sqlca.sqlcode != 0) {
          rc = sqlca.sqlcode;
          if (acid->logging)
          {
            fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
          }
          else
          {
            fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
          }
          sqlerror("update query number 5", &sqlca);
          goto Uerror;
        }
        discount = discount * (-1);
        secs2sleep = 300;
        break;
      }
      case 6:
      {
        EXEC SQL
          UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
          WHERE L_ORDERKEY in
(33,131,161,195,229,230,231,323,353,356);
        if (sqlca.sqlcode != 0) {
          rc = sqlca.sqlcode;
          if (acid->logging)
          {
            fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
          }
          else
          {
            fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
          }
          sqlerror("update query number 6", &sqlca);
          goto Uerror;
        }
        discount = discount * (-1);
        secs2sleep = 300;
        break;
      }
      case 7:
      {
        EXEC SQL
          UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
          WHERE L_ORDERKEY IN
(562917,410659,16550,398401,157634,429920,45411);
        if (sqlca.sqlcode != 0) {
          rc = sqlca.sqlcode;
          if (acid->logging)
          {
            fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
          }
          else
          {
            fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
          }
          sqlerror("update query number 7", &sqlca);
          goto Uerror;
        }
        discount = discount * (-1);
        secs2sleep = 300;
        break;
      }
      case 8:
      {
        EXEC SQL
          UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
          WHERE L_ORDERKEY IN
(129569,343591,270242,254983,98500,28963);
        if (sqlca.sqlcode != 0) {
          rc = sqlca.sqlcode;
          if (acid->logging)
```

```
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 8", &sqlca);
        goto Uerror;
      }
      discount = discount * (-1);
      secs2sleep = 300;
      break;
    }
    case 9:
    {
      EXEC SQL
        UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
        WHERE L_ORDERKEY IN
(113509,232997,246691,379233,448162,32134);
      if (sqlca.sqlcode != 0) {
        rc = sqlca.sqlcode;
        if (acid->logging)
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 9", &sqlca);
        goto Uerror;
      }
      discount = discount * (-1);
      secs2sleep = 300;
      break;
    }
    case 10:
    {
      EXEC SQL
        UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
        WHERE L_ORDERKEY IN
(516487,245411,265799,253025,6914,562020);
      if (sqlca.sqlcode != 0) {
        rc = sqlca.sqlcode;
        if (acid->logging)
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 10", &sqlca);
        goto Uerror;
      }
      discount = discount * (-1);
      secs2sleep = 300;
      break;
    }
    case 11:
    {
      EXEC SQL
        UPDATE TPCD.PARTSUPP set PS_AVAILQTY =
PS_AVAILQTY + :availqty
        WHERE PS_PARTKEY IN
(12098,5134,13334,17052,3452,12552,1084,5797);
      if (sqlca.sqlcode != 0) {
        rc = sqlca.sqlcode;
        if (acid->logging)
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 11", &sqlca);
        goto Uerror;
      }
      availqty = availqty * (-1);
      secs2sleep = 180;
      break;
    }
    case 12:
    {
      if ( i ==1 ) {
        EXEC SQL
          UPDATE TPCD.LINEITEM set
L_RECEIPTDATE = L_RECEIPTDATE - 3 YEARS
          WHERE L_ORDERKEY IN
(33,70,195,355,677,837,960,962,1028);
      } else {
        EXEC SQL
          UPDATE TPCD.LINEITEM set
L_RECEIPTDATE = L_RECEIPTDATE + 3 YEARS
          WHERE L_ORDERKEY IN
(33,70,195,355,677,837,960,962,1028);
      }
      if (sqlca.sqlcode != 0) {
        rc = sqlca.sqlcode;
        if (acid->logging)
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                  qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 12", &sqlca);
        goto Uerror;
      }
      secs2sleep = 300;
      break;
    }
    case 13:
    {
      EXEC SQL
```

```
        UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
        WHERE L_ORDERKEY IN
(263,9476,32355,34854,53445,56901);
      if (sqlca.sqlcode != 0) {
        rc = sqlca.sqlcode;
        if (acid->logging)
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 13", &sqlca);
        goto Uerror;
      }
      discount = discount * (-1);
      secs2sleep = 90;
      break;
    }
    case 14:
    {
      EXEC SQL
        UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
        WHERE L_ORDERKEY IN
(32,225,326,448,449,483,512);
      if (sqlca.sqlcode != 0) {
        rc = sqlca.sqlcode;
        if (acid->logging)
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 14", &sqlca);
        goto Uerror;
      }
      discount = discount * (-1);
      secs2sleep = 180;
      break;
    }
    case 15:
    {
      EXEC SQL
        UPDATE TPCD.LINEITEM set L_DISCOUNT =
L_DISCOUNT + :discount
        WHERE L_ORDERKEY IN (1,4,7,35,135,131300);
      if (sqlca.sqlcode != 0) {
        rc = sqlca.sqlcode;
        if (acid->logging)
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 15", &sqlca);
        goto Uerror;
      }
      discount = discount * (-1);
      secs2sleep = 180;
      break;
    }
    case 16:
    {
      EXEC SQL
        UPDATE TPCD.PART set P_SIZE = P_SIZE + :size
        WHERE P_PARTKEY IN (4,7,15,1313);
      if (sqlca.sqlcode != 0) {
        rc = sqlca.sqlcode;
        if (acid->logging)
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 16", &sqlca);
        goto Uerror;
      }
      size = size * (-1);
      secs2sleep = 180;
      break;
    }
    case 17:
    {
      EXEC SQL
        UPDATE TPCD.LINEITEM set
L_EXTENDEDPRICE = L_EXTENDEDPRICE + :price
        WHERE L_ORDERKEY IN
(4065,110372,165061,265702,87138);
      if (sqlca.sqlcode != 0) {
        rc = sqlca.sqlcode;
        if (acid->logging)
        {
          fprintf(out,"update query number: %d, pass %d,
**ERROR** sqlcode = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        else
        {
          fprintf(stderr,"update query number: %d, pass %d,
**ERROR** sqlcode  = %d\n",
                qnum, i, sqlca.sqlcode);
        }
        sqlerror("update query number 17", &sqlca);
        goto Uerror;
      }
      price = price * (-1);
      secs2sleep = 90;
      break;
    }
    default:
    {
      fprintf(out,"ERROR: Invalid query number specified
%d\n", qnum);
      rc = 1;
```

```
        goto Uexit;
      }
    }

    gettimeofday(&tv, &tz);
    time(&timeT);

    if (acid->logging)
      fprintf(out,"update query number: %d, pass %d, after
UPDATE: (%us %06uu) %s",
            qnum, i, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    else
      fprintf(stderr,"update query number: %d, pass %d, after
UPDATE: (%us %06uu) %s",
            qnum, i, tv.tv_sec, tv.tv_usec, ctime(&timeT));

    if ( i == 2 ) {
      gettimeofday(&tv, &tz);
      time(&timeT);
      fprintf(out,"update query number: %d, pass %d,
sleeping for %d seconds: (%us %06uu) %s",
            qnum, i, secs2sleep, tv.tv_sec, tv.tv_usec,
ctime(&timeT));
      fflush(out);
      system("touch /tmp/tpcd/update.sync.sleep");
      sleep(secs2sleep);
    }

    gettimeofday(&tv, &tz);
    time(&timeT);
    fprintf(out,"update query number: %d, pass %d,
immediately before COMMIT: (%us %06uu) %s",
          qnum, i, tv.tv_sec, tv.tv_usec, ctime(&timeT));

    EXEC SQL COMMIT;
    if (sqlca.sqlcode != 0) {
      rc = sqlca.sqlcode;
      fprintf(out,"update pass %d, **ERROR** sqlcode =
%d\n", i, sqlca.sqlcode);
      sqlerror("update: COMMIT", &sqlca);
      goto Uerror;
    }
    gettimeofday(&tv, &tz);
    time(&timeT);
    if (acid->logging)
      fprintf(out,"update query number: %d, pass %d, after
COMMIT: (%us %06uu) %s",
            qnum, i, tv.tv_sec, tv.tv_usec, ctime(&timeT));
    else
      fprintf(stderr,"update query number: %d, pass %d, after
COMMIT: (%us %06uu) %s",
            qnum, i, tv.tv_sec, tv.tv_usec, ctime(&timeT));
  }

  rc = 0;
  goto Uexit;

 Uerror:
  EXEC SQL rollback work;
  if (sqlca.sqlcode != 0) sqlerror("update: ROLLBACK
FAILED", &sqlca);
  system("touch /tmp/tpcd/update.sync.sleep");

 Uexit:
  fprintf(out,"\n---------- END of update ----------\n\n");
  fflush(out);fclose(out);
  return(rc);
}

/*-------------------------------------------------------------------*/
/*      connect_to_TM                                                */
/*-------------------------------------------------------------------*/
void connect_to_TM( void )
{
  char *dbname_ptr;
  if ((dbname_ptr = getenv("TPCD_QUAL_DBNAME")) !=
NULL) {
    fprintf(stderr,"********** %s
**********\n",dbname_ptr);
    strcpy (dbname, dbname_ptr);
  }

  EXEC SQL CONNECT TO :dbname IN SHARE MODE;
  if (sqlca.sqlcode < 0) {
    fprintf(stderr, "CONNECT TO %s failed SQLCODE =
%d\n", dbname, sqlca.sqlcode);
    exit(-1);
  }
  return;
}

/*-------------------------------------------------------------------*/
/*      disconnect_from_TM                                           */
/*-------------------------------------------------------------------*/
void disconnect_from_TM ( void )
{
  EXEC SQL CONNECT RESET;
  if (sqlca.sqlcode < 0) {
    fprintf(stderr, "DISCONNECT failed SQLCODE =
%d\n", sqlca.sqlcode);
    exit(-1);
  }
  return;
}

/*-------------------------------------------------------------------*/
/*      sqlerror                                                     */
/*-------------------------------------------------------------------*/
void sqlerror(char *msg, struct sqlca *psqlca)
{
  FILE *err_fp;


  char  err_fn[256];


  int j,k;

  sprintf(err_fn,
"%s%cacid.sqlerrors",getenv("TPCD_TMP_DIR"),del());
  err_fp=fopen(err_fn,"a");
  fprintf(err_fp,"acid: sqlcode: %4d %s\n", psqlca->sqlcode,
msg);
  fprintf(stderr,"acid: sqlcode: %4d %s\n", psqlca->sqlcode,
msg);
  fflush(stderr);
  if (psqlca->sqlerrmc[0] != ' ' || psqlca->sqlerrmc[1] != ' ') {
    fprintf(err_fp,"acid: slerrmc:  ");
    for(j = 0; j < 5; j++)
    {
      for(k = 0; k < 14; k++) fprintf(err_fp,"%x ", psqlca-
>sqlerrmc[j*10+k]);
      fprintf(err_fp,"    ");
      for(k = 0; k < 14; k++) fprintf(err_fp,"%c",  psqlca-
>sqlerrmc[j*10+k]);
      fprintf(err_fp,"\n");
      if (j < 4) fprintf(err_fp,"          ");
    }
  }
```

```
   fprintf(err_fp,"acid: sqlerrp:  ");
   for(j = 0; j < 8; j++)    fprintf(err_fp,"%c", psqlca->sqlerrp[j]);
   fprintf(err_fp,"\n");

   fprintf(err_fp,"acid: sqlerrd: ");
   for(j = 0; j < 6; j++)    fprintf(err_fp," %d", psqlca->sqlerrd[j]);
   fprintf(err_fp,"\n");

   if (psqlca->sqlwarn[0] != ' ') {
      fprintf(err_fp,"acid: sqlwarn: ");
      for(j = 0; j < 8; j++)    fprintf(err_fp,"%c ", psqlca->sqlwarn[j]);
      fprintf(err_fp,"\n");
   }

   fprintf(err_fp,"\n");
   fflush(err_fp);fclose(err_fp);
}

#ifdef SQLWINT
void sleep(int sec)
{
  Sleep(sec * 1000);
}
#endif


char del(void)
{
#ifdef SQLWINT
  return '\\';
#else
  return '/';
#endif
}

#if defined(SQLPTX) || defined(SQLWINT) || defined(SQLSUN) || defined(Linux)
/* added fot PTX as this one is not there in libm */
double nearest(double x)
{
        double y, z;

        y = x;
        if (x < 0)
                y = -x;
        z = y - (int)y;
        if (z == 0.5) {
                if ((int)floor(y) % 2) {
                        return((x < 0) ? -ceil(y) : ceil(y));
                } else {
                        return((x < 0) ? -floor(y) : floor(y));
                }
        } else  if (z < 0.5)
                        return((x < 0) ? -floor(y) : floor(y));
                else
                        return((x < 0) ? -ceil(y) : ceil(y));
}
#endif /* SQLPTX */
```

nt_compile.bat

```
db2start
db2 connect to %1
db2 prep acid.sqc bindfile package isolation rr
db2 connect reset
db2 terminate

REM cl -c -Zi -DTPCD_V2 -DWIN32 -DSQLWINT -D_X86_=1 -W3 -J mainacid.c acid.c
cl -c -Zi -DTPCD_V2 -DSQLWINT -W3 -J mainacid.c acid.c


REM !!!! The compilation of the mainacid program absolutely requires
REM !!!! including the COMMODE.OBJ file.
REM !!!! This is used to avoid NT file buffering    -gav
REM Attempting to link with COMMODE.OBJ ...
link -debug -out:mainacid.exe commode.obj mainacid.obj acid.obj -align:0x1000 "user32.lib" "kernel32.lib"  db2api.lib -subsystem:console
```

Appendix F: Price Quotations

From: jinyun@cn.ibm.com
To: pengzhen@langchao.com
Cc: wangshh@langchao.com ; liudp@langchao.com ; choys@cn.ibm.com ; pchek@cn.ibm.com ; yanweif@cn.ibm.com ; feizw@cn.ibm.com ; cxmwang@cn.ibm.com
Sent: Wednesday, April 14, 2004 7:40 PM
Subject: DB2 reference pricing in China

Dear Mr. Peng:

The table shown below lists the reference pricing in China for DB2 Universal Database Enterprise Server Edition product that has been used in TPC-H Benchmark test.

All prices shown are in Ren-Min-Bi (RMB).

DB2 Enterprise Server Edition (ESE)	Part #	Qty	Reference Price per Unit	TotalQuantity Reference Price
SW License & 1 year Maintenance	D518GLL	4	373,315.70	1,493,262.80
SW Maintenance Renewal – 1 year	E00BILL	4	74,663.14	298,652.56
SW Maintenance Renewal – 1 year	E00BILL	4	74,663.14	298,652.56
			Sub-total reference price for DB2 ESE:	**2,090,567.92**

DB2 Database Partition Feature (DPF)	Part #	Qty	Reference Price per Unit	TotalQuantity Reference Price
SW License & 1 year Maintenance	D518JLL	4	112,135.59	448,542.34
SW Maintenance Renewal – 1 year	E00BJLL	4	22,427.12	89,708.46
SW Maintenance Renewal – 1 year	E00BJLL	4	22,427.12	89,708.46
			Sub-total reference price for DB2 DPF:	**627,959.26**
			TOTAL REFERENCE PRICE:	**2,718,527.18**

This reference pricing may change without notice.

If I can be of any further assistance, please feel free to contact me.

Regards,

Joan King
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