Hewlett-Packard Company

TPC Benchmark™ C

Full Disclosure Report
for
HP ProLiant DL580 - PDC 32P
Using
Oracle9i Enterprise Edition Release 2 with Real Application Clusters and Partitioning Options and
Red Hat Linux Advanced Server

Second Edition
October 2002

Second Edition – October 2002

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All performance data contained in this report were obtained in a rigorously controlled environment. Results obtained in other operating environments may vary significantly. HP does not warrant or represent that a user can or will achieve similar performance expressed in transactions per minute (tpmC) or normalized price/performance ($/tpmC). No warranty of system performance or price/performance is expressed or implied in this report.

Printed in U.S.A., 2002

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Preface

The TPC Benchmark C was developed by the Transaction Processing Performance Council (TPC). The TPC was founded to define transaction processing benchmarks and to disseminate objective, verifiable performance data to the industry. This full disclosure report is based on the TPC Benchmark C Standard Specifications Version 5.0, released March 7, 2001.

TPC Benchmark C Overview

The TPC describes this benchmark in Clause 0.1 of the specifications as follows:

TPC Benchmark C is an On Line Transaction Processing (OLTP) workload. It is a mixture of read-only and update intensive transactions that simulate the activities found in complex OLTP application environments. It does so by exercising a breadth of system components associated with such environments, which are characterized by:

- The simultaneous execution of multiple transaction types that span a breadth of complexity
- On-line and deferred transaction execution modes
- Multiple on-line terminal sessions
- Moderate system and application execution time
- Significant disk input/output
- Transaction integrity (ACID properties)
- Non-uniform distribution of data access through primary and secondary keys
- Databases consisting of many tables with a wide variety of sizes, attributes, and relationships
- Contention of data access and update

The performance metric reported by TPC-C is a "business throughput" measuring the number of orders processed per minute. Multiple transactions are used to simulate the business activity of processing an order, and each transaction is subject to a response time constraint. The performance metric for this benchmark is expressed in transactions-per-minute-C (tpmC). To be compliant with the TPC-C standard, all references to tpmC results must include the tpmC rate, the associated price-per-tpmC, and the availability date of the priced configuration.

TPC-C uses terminology and metrics that are similar to other benchmarks, originated by the TPC or others. Such similarity in terminology does not in any way imply that TPC-C results are comparable to other benchmarks. The only benchmark results comparable to TPC-C are other TPC-C results conformant with the same revision.

Despite the fact that this benchmark offers a rich environment that emulates many OLTP applications, this benchmark does not reflect the entire range of OLTP requirements. In addition, the extent to which a customer can achieve the results reported by a vendor is highly dependent on how closely TPC-C approximates the customer application. The relative performance of systems derived from this benchmark does not necessarily hold for other workloads or environments. Extrapolations to other environments are not recommended.

Benchmark 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-C should not be used as a substitute for a specific customer application benchmark when critical capacity planning and/or product evaluation decisions are contemplated.

Abstract

Overview

This report documents the methodology and results of the TPC Benchmark C test conducted on the HP ProLiant DL580 - PDC 32P. The operating system used for the benchmark was Linux Advanced Server. The DBMS used was Oracle 9i Enterprise Edition Release 2 with Real Application Clusters and Partitioning Options.

TPC Benchmark C Metrics

The standard TPC Benchmark C metrics, tpmC (transactions per minute), price per tpmC (three year capital cost per measured tpmC), and the availability date are reported as:

138362.03 tpmC
$17.38 per tpmC
Available as March 5, 2003.

Standard and Executive Summary Statements

The following pages contain an executive summary of results for this benchmark.

Auditor

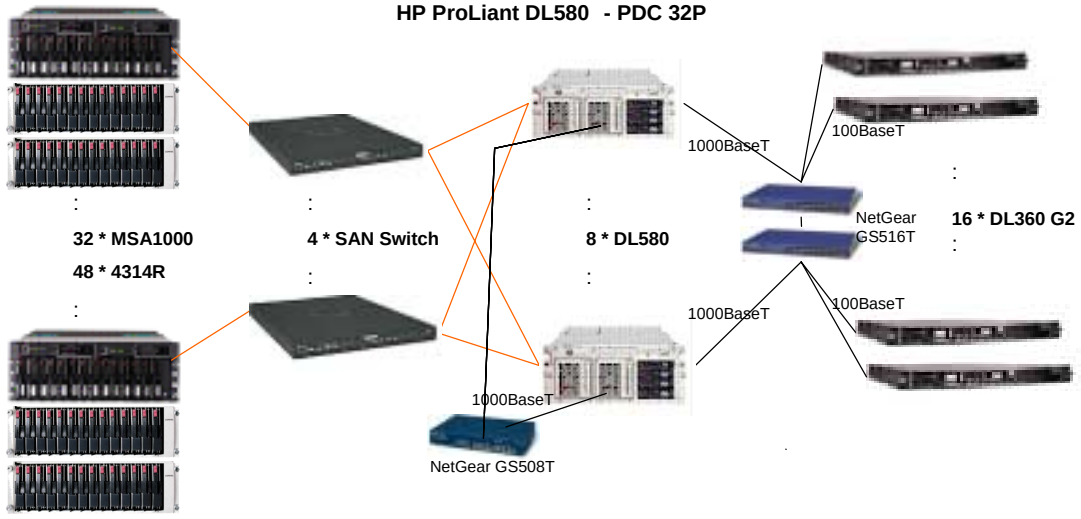
The benchmark configuration, environment and methodology were audited by Lorna Livingtree of Performance Metrics Inc. to verify compliance with the relevant TPC specifications.

	HP ProLiant DL580 - PDC 32P C/S	TPC-C Rev. 5.0 Report Date: October 2, 2002

Total System Cost	TPC-C Throughput	Price Performance	Availability Date
$2,404,503	**138,362.03 tpmC**	**$17.38**	**March 5, 2003*** Hardware available now

Processors	Database Manager	Operating System	Other Software	Number of Users
32 PIII Xeon 900/ MHz/2MB-Servers 16 PIII 1400 MHz/ 133/256K - Clients	Oracle 9i Enterprise Edi. Rel. 2 with Real Application Clusters and Partitioning Options	Red Hat Linux Advanced Server	BEA Tuxedo 8.0	**115200**

HP ProLiant DL580 - PDC 32P



System Components	Server Quantity	Server Description	Clients Quantity	Clients Description
Processor	32	Pentium III Xeon 900MHz/2MB	32	Pentium III 1400 MHz/133/ 256K
Memory	32	4 GB	64	1 GB
Disk Controllers	32	FCA 2214 - Fibre Channel HBA		
	32	Modular SAN Array 1000		
	48	StorageWorks Enclosure Model 4314R		
	4	StorageWorks SAN Switch 2/16 EL		
Disk Drives	976	18.2-GB 15K	16	18.2-GB 10K
	16	18.2-GB 10K		
Total Storage		18054 GB		
Tape Drives	1	12/24-Gigabyte DAT		

	HP ProLiant DL580 - PDC 32P with 16 ProLiant DL360R				TPC-C Rev. 5.0		
					Report Date:		2-Oct-02
Description	**Part Number**	**Third Party Brand**	**Pricing**	**Unit Price**	**Qty**	**Extended Price**	**3 yr. Maint. Price**
Server Hardware							
ProLiant DL580R X900 2MB 1024	155618-003		1	16,129	8	129,032	
PIII X900-2MB Processor Option Kit for ML570/DL580	222627-B21		1	6,199	16	99,184	
4G SDRAM (4x1GB)	189083-B21		1	3,999	32	127,968	
NC7770 PCI-X Gigabit Server Adapter	244948-B21		1	227	16	3,632	
Modular SAN Array 1000	201723-B21		1	9,995	32	319,840	
StorageWorks Enclosure Model 4314R - Rack-mountable	190209-001		1	2,955	48	141,840	
StorageWorks SAN Switch 2/16 EL	283056-B21		1	14,775	4	59,100	
5m LC-LC cable kit	221692-B22		1	82	64	5,248	
2GB Small Form Pluggable Adapter Kit	221470-B21		1	369	64	23,616	
FCA 2214 - Fibre Channel HBA	281541-B21		1	1,590	32	50,880	
V570 Color Monitor - 15 inch CRT - Opal	228113-001		1	169	8	1,352	
12/24-Gigabyte DAT Drive (Internal)	295513-B22		1	682	1	682	
R1500	242704-001		1	880	4	3,520	
18.2-GB Pluggable 1" Universal WideUltra3 15K HDD	188122-B22		1	447	976	436,272	
18.2-GB Pluggable 1" Universal WideUltra3 15K HDD (10% spares)	188122-B22		1	447	98		43,806
18.2GB Pluggable Ultra3 SCSI 10K 1" Universal HDD	142673-B22		1	319	16	5,104	
HP Rack Model 9142 (42U - Opal) - Flat Pallet	120663-B21		1	1,352	8	10,816	
HP Rack Sidewall Kit	120670-B21		1	212	1	212	
HP Rack Coupling Kit	120669-B21		1	85	7	595	
HP Enhanced Keyboard	122660-006		1	44	8	352	
HP Mouse	170299-B21		1	23	8	184	
FM-M1724-36YR 24x7 4HR 500 Srs Svr/EC	401782-002		1	1,795	8		14,360
FM-FC724-36 3YR 24X7 4HR RA4x/MSA1x/SA	402164-002		1	1,950	32		62,400
FM-4E724-36 3YR 24X7 4HR EMPTY DISK ENCL	171242-002		1	157	48		7,536
FM-FS724-36 3YR 24x7 4HR, FC/SAN SWITCH 16P	161308-002		1	4,538	4		18,152
NetGear GS508T 10/100/1000 Copper Gigabit Switch	GS508TNA	NetGear	5	719	3	2,157	
					Subtotal	**1,421,586**	**146,254**
Server Software							
Oracle9i DB Ent. Edi. Rel. 2, per processor for 3 years	Run time	Oracle	3	20,000	32	640,000	
Real Application Clusters, per processor for 3 Years	Run time	Oracle	3	10,000	32	320,000	
Partitioning, per processor for 3Years	Run time	Oracle	3	5,000	32	160,000	
Oracle Database Server Support Package for 3 years	Run time	Oracle	3	48,000	1		48,000
Red Hat Linux Advanced Server 2.1 (Basic)	RHF0090US	Red Hat	2	800	8	6,400	
Red Hat Two additional year maintenance and support	RHF0090US	Red Hat	2	800	16		12,800
					Subtotal	**1,126,400**	**60,800**
Client Hardware							
ProLiant DL360R02 P1.40/133-256K 128MB	233271-001		1	2,229	16	35,664	
1G Reg 133MHz SDRAM DIMM	128280-B21		1	880	64	56,320	
1.40GHz PIII Processor Option Kit (DL360 G2)	233273-B21		1	804	16	12,864	
NC3134 64 PCI Dual 10/100 All option kit	138603-B21		1	285	16	4,560	
V570 Color Monitor - 15 inch CRT - Opal	228113-001		1	169	1	169	
HP Enhanced Keyboard	122660-006		1	44	1	44	
HP Mouse	170299-B21		1	23	1	23	
18.2GB Pluggable Ultra3 SCSI 10K 1" Universal HDD	142673-B22		1	319	16	5,104	
FM-L0724-363YR 24x7 4HR 300 SERIES SVR	162657-002		1	1,450	16		23,200
					Subtotal	**114,748**	**23,200**
Client Software							
BEA Tuxedo 8.0 Teir 1		BEA	4	3,000	16	48,000	30,240
Red Hat Linux Personal (unlimited copies)	RHF099US	Red Hat	2	60	1	60	
Red Hat Linux Personal 8 systems x 3 years m& s Bundle	MCT0172US	Red Hat	2	4,800	2		9,600
					Subtotal	**48,060**	**39,840**
User Connectivity							
NetGear GS516T 10/100/1000 Copper Gigabit Switch	GS516TNA	NetGear	5	1,400	4	5,598	
					Subtotal	**5,598**	**0**
Oracle Mandatory E-Business Discount (License and Support)		Oracle	3			**($292,000)**	**($367)**
Large Purchase and Cash discount (See Note 1)	17.0%		1			**($261,177)**	**($28,807)**
					Total	**$2,163,216**	**$241,287**

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark pricing specifications. If you find that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

Three-Year Cost of Ownership: $2,404,503

tpmC Rating: 138,362.03

$ / tpmC: $17.38

Pricing: 1=HP Direct 2= Red Hat 3=Oracle (contact MaryBeth Pierantoni @ 650-506-2118, See Appendix G of FDR) 4=BEA 5=CDW

Note 1 = Discount based on HP Direct guidence and large cash purchase level.

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

Numerical Quantities Summary

MQTH, Computed Maximum Qualified Throughput 138,362.03 tpmC

Response Times (in seconds)	Average	90%	Maximum
New-Order	0.893	1.992	85.290
Payment	0.574	1.146	84.770
Order-Status	0.643	1.339	45.256
Delivery (interactive portion)	0.260	0.349	81.913
Delivery (deferred portion)	0.419	0.793	82.654
Stock-Level	0.581	0.831	81.376
Menu	0.102	0.102	0.328

Transaction Mix, in percent of total transaction

New-Order	44.916%
Payment	43.019%
Order-Status	4.020%
Delivery	4.025%
Stock-Level	4.020%

Emulation Delay (in seconds)	Resp.Time	Menu
New-Order	0.10	0.10
Payment	0.10	0.10
Order-Status	0.10	0.10
Delivery (interactive)	0.10	0.10
Stock-Level	0.10	0.10

Keying/Think Times (in seconds)	Min.	Average	Max.
New-Order	18.005/0.000	18.008/13.406	18.022/134.006
Payment	3.010/0.000	3.018/12.016	3.032/120.045
Order-Status	2.010/0.000	2.018/10.015	2.031/100.077
Delivery (interactive)	2.010/0.000	2.018/5.025	2.031/50.179
Stock-Level	2.010/0.000	2.018/5.014	2.030/50.096

Test Duration

Ramp-up time	102 minutes
Measurement interval	120 minutes
Transactions (all types) completed during measurement interval	38,453,521
Ramp down time	56 minutes

Checkpointing

Number of checkpoints	4
Checkpoint interval	30 minutes

General Items

Application Code and Definition Statements

The application program (as defined in clause 2.1.7) must be disclosed. This includes, but is not limited to, the code implementing the five transactions and the terminal input output functions.

Appendix A contains all source code implemented in this benchmark.

Test Sponsor

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

This benchmark was sponsored by Hewlett Packard Company. The benchmark was developed and engineered by Hewlett Packard Company and Oracle Corporation. Testing took place at HP Database Performance Engineering Laboratory in Houston, Texas.

Parameter Settings

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

- *Database options*
- *Recover/commit options*
- *Consistency locking options*
- *Operating system and application configuration parameters*

This requirement can be satisfied by providing a full list of all parameters.

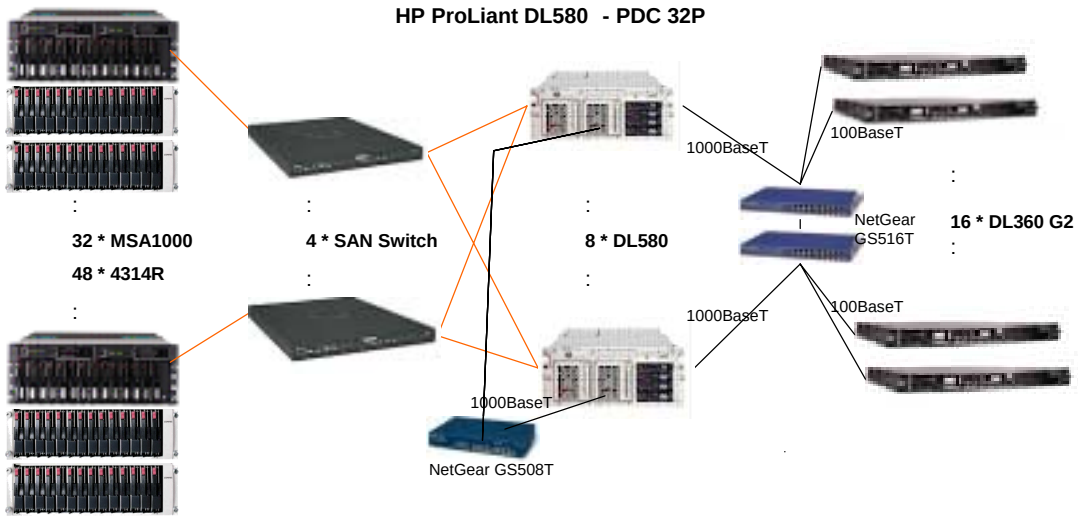
Appendix C contains the tunable parameters for the database, the operating system, and the transaction monitor.

Configuration Items

Diagrams of both measured and priced configurations must be provided, accompanied by a description of the differences.

The configuration diagram for both the tested and priced system are the same and included on the following page

Figure 1. Benchmarked and Priced Configuration



Clause 1 Related Items

Table Definitions

Listing must be provided for all table definition statements and all other statements used to set up the database.
Appendix B contains the code used to define and load the database tables.

Physical Organization of Database

The physical organization of tables and indices within the database must be disclosed.
976 disks used in the benchmark have a capacity of 18.2GB 15K rpm.
16 disks used in the benchmark have a capacity of 18.2 GB 10K rpm (for OS)

Modular SAN Array 1000	SAN Switch # (HBA #)	Unformatted Capacity	Contents
1	1	254GB	Database log for Node 1
2	1	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 ware & rollback segs, control file
3	1	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 dist, 1/15 temp
4	1	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 system, 1/15 temp
5	1	254GB	Database log for Node 2
6	1	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 ware & rollback segs, cluster manager
7	1	655GB	1/24 stock, cust, ordl, nord, ihist & cust2, 1/8 dist, 1/15 temp
8	1	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 system, 1/15 temp
9	2	254GB	Database log for Node 3
10	2	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 ware & rollback segs, 1/2 icust-1 and istock
11	2	655GB	1/24 stock, cust, ordl, nord, ihist & cust2, 1/8 dist, 1/15 temp
12	2	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 system, 1/15 temp
13	2	254GB	Database log for Node 4
14	2	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 ware & rollback segs 1/2 icust-1 and istock
15	2	655GB	1/24 stock, cust, ordl, nord, ihist & cust2, 1/8 dist, 1/15 temp
16	2	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 system, 1/15 temp
17	3	254GB	Database log for Node 5
18	3	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 ware & rollback segs, statspack
19	3	655GB	1/24 stock, cust, ordl, nord, ihist & cust2, 1/8 dist, 1/15 temp
20	3	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 system, 1/15 temp
21	3	254GB	Database log for Node 6
22	3	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 ware & rollback segs, item table & index
23	3	655GB	1/24 stock, cust, ordl, nord, ihist & cust2, 1/8 dist, 1/15 temp
24	3	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 system, 1/15 temp
25	4	254GB	Database log for Node 7
26	4	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 ware & rollback segs, extra cust file for 5% space
27	4	655GB	1/24 stock, cust, ordl, nord, ihist & cust2, 1/8 dist, 1/15 temp
28	4	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 system, 1/15 temp
29	4	254GB	Database log for Node 8
30	4	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 ware & rollback segs, 1/2 extra stock 5% space
31	4	655GB	1/24 stock, cust, ordl, nord, ihist & cust2, 1/8 dist, 1/15 temp
32	4	655GB	1/24 stock, cust, ordl, nord, hist & icust2, 1/8 system, 1/2 extra stock 5% growth space

Priced Configuration:

The priced configuration has additional 12/24-Gigabyte DAT drive. All other hardware and software remained the same between the benchmarked and priced configurations.

Insert and Delete Operations

It must be ascertained that insert and/or delete operations to any of the tables can occur concurrently with the TPC-C transaction mix. Furthermore, any restrictions in the SUT database implementation that precludes inserts beyond the limits defined in Clause 1.4.11 must be disclosed. This includes the maximum number of rows that can be inserted and the minimum key value for these new rows.

All insert and delete functions were verified to be fully operational during the entire benchmark.

Partitioning

While there are a few restrictions placed upon horizontal or vertical partitioning of tables and rows in the TPC-C benchmark, any such partitioning must be disclosed.

Horizontal partitioning based on warehouse id was used on the neworder (nord), orders (ordr), orderline (ordl) and history (hist) tables.

Replication, Duplication or Additions

Replication of tables, if used, must be disclosed. Additional and/or duplicated attributes in any table must be disclosed along with a statement on the impact on performance.

No replications, duplications or additional attributes were used in this benchmark.

Clause 2 Related Items

Random Number Generation

The method of verification for the random number generation must be described.

Random numbers were generated using the drand48() and lrand48() UNIX calls. These functions generate pseudo random numbers using the linear congruential algorithm and 48-bit integer arithmetic. The random number generators are initially seeded using the srand48() call.

Input/Output Screen Layout

The actual layout of the terminal input/output screens must be disclosed.

All screen layouts followed the specifications exactly.

Priced Terminal Feature Verification

The method used to verify that the emulated terminals provide all the features described in Clause 2.2.2.4 must be explained. Although not specifically priced, the type and model of the terminals used for the demonstration in 8.1.3.3 must be disclosed and commercially available (including supporting software and maintenance).

The terminal attributes were verified by the auditor manually exercising each specification on a representative ProLiant DL360R.

Presentation Manager or Intelligent Terminal

Any usage of presentation managers or intelligent terminals must be explained.

Application code running on the client machines implemented the TPC-C user interface. No presentation manager software or intelligent terminal features were used. The source code for the forms applications is listed in Appendix A.

Transaction Statistics

Table 2.1 lists the numerical quantities that Clauses 8.1.3.5 to 8.1.3.11 require.

Table 2. 1 Transaction Statistics

Statistic		Value
New Order	Home warehouse order lines	99.00%
	Remote warehouse order lines	1.00%
	Rolled back transactions	1.00%
	Average items per order	10.00
Payment	Home warehouse	84.99%
	Remote warehouse	15.01%
	Accessed by last name	59.99%
Order Status	Accessed by last name	60.02%
Delivery	Skipped transactions	None
Transaction Mix	New Order	44.916%
	Payment	43.019%
	Order status	4.020%
	Delivery	4.025%
	Stock level	4.020%

Queuing Mechanism

The queuing mechanism used to defer the execution of the Delivery transaction must be disclosed.

BEA Tuxedo on each client system served as the queuing mechanism to the database. Each delivery request was submitted to BEA Tuxedo asynchronously with control being returned to the client process immediately and the deferred delivery part completing asynchronously.

Clause 3 Related Items

Transaction System Properties (ACID)

The results of the ACID tests must be disclosed along with a description of how the ACID requirements were met. This includes disclosing which case was followed for the execution of Isolation Test 7.

All ACID property tests were successful. The executions are described below.

Atomicity

The system under test must guarantee that the database 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.

Completed Transactions

A row was randomly selected from the warehouse, district and customer tables, and the balances noted. A payment transaction was started with the same warehouse, district and customer identifiers and a known amount. The payment transaction was committed and the rows were verified to contain correctly updated balances.

Aborted Transactions

A row was randomly selected from the warehouse, district and customer tables, and the balances noted. A payment transaction was started with the same warehouse, district and customer identifiers and a known amount. The payment transaction was rolled back and the rows were verified to contain the original balances.

Consistency

Consistency is the property of the application that requires any execution of a database transaction to take the database from one consistent state to another, assuming that the database is initially in a consistent state.

Consistency conditions one through four were tested using a shell script to issue queries to the database. The results of the queries verified that the database was consistent for all four tests.

A run was executed under full load over two hours with checkpoints.

The shell script was executed again. The result of the same queries verified that the database remained consistent after the run.

Isolation

Sufficient conditions must be enabled at either the system or application level to ensure the required isolation defined above (clause 3.4.1) is obtained.

Isolation tests one through nine were executed using shell scripts to issue queries to the database. Each included timestamps to demonstrate the concurrency of operations. Isolation was tested in both a single node environment and in the multiple node environment. The results of the queries were captured to files. The captured files were verified by the auditor to demonstrate the required isolation had been met.

Durability

The tested system must guarantee durability: the ability to preserve the effects of committed transaction and insure database consistency after recovery from any one of the failures listed in Clause 3.5.3.

Durable Media Failure

Durability from media failure was demonstrated on a database scaled for 2800 warehouses. The standard driving mechanism was used to generate the transaction load of 28000 users. The fully scaled database under full load would also have passed the following test.

Loss of Data

To demonstrate recovery from a permanent failure of durable medium containing TPC-C tables, the following steps were executed:

1. A partition on a disk was backed up.
2. The total number of New Orders was determined by the sum of D_NEXT_O_ID of all rows in the DISTRICT table giving the beginning count. Consistency check 3 was verified before run.
3. The RTE was started with 28000 users and against two nodes.
4. The test was allowed to run for a minimum of 10 minutes.
5. The backed up partition was overwritten with garbage information.
6. ORACLE9i recorded errors about corrupt data on the partition. The database and the RTE were then shut down.
7. The database partition which was backed up in Step 1 was restored.
8. The database was then started. The database was recovered using the recover command from SQLPLUS.
9. The database was opened and ORACLE 9i performed instance recovery.
10. Consistency conditions were executed and verified.
11. Step 2 was repeated and the difference between the first and second counts was noted.
12. An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.
13. The counts in step 10 and 11 were compared and the results verified that all committed transactions had been successfully recovered.
14. Samples were taken from the RTE files and used to query the database to demonstrate successful transactions had corresponding rows in the ORDER table.
15.

Loss of Log

To demonstrate recovery from a permanent failure of durable medium containing TPC-C tables, the following steps were executed:

1. The total number of New Orders was determined by the sum of D_NEXT_O_ID of all rows in the DISTRICT table giving the beginning count. Consistency check 3 was verified before run.
2. The RTE was started with 28000 users and against two nodes.
3. The test was allowed to run for a minimum of 10 minutes.
4. A log disk containing log information for node 2 was removed.
5. The system continued running because the logs are mirrored.
6. The database and the RTE were then shut down.
7. The database was then started. Consistency conditions were executed and verified.
8. Step 1 was repeated and the difference between the first and second counts was noted.
9. An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.
10. The counts in step 7 and 8 were compared and the results verified that all committed transactions had been successfully recovered.
11. Samples were taken from the RTE files and used to query the database to demonstrate successful transactions had corresponding rows in the ORDER table.

Instantaneous Interruption, Loss of Memory (8 Nodes)

Because loss of power erases the contents of memory, the instantaneous interruption and the loss of memory tests were combined into a single test. This test was executed on a fully scaled database of 11520 warehouses under a full load of 115200 users. The following steps were executed:

1. The total number of New Orders was determined by the sum of D_NEXT_O_ID of all rows in the DISTRICT table giving the beginning count.
2. The RTE was started with 115200 users.
3. The test was allowed to run for a minimum of 10 minutes.
4. A checkpoint was issued.
5. Upon completion of the checkpoint a system crash and loss of memory were induced by turning all six of the computers in the cluster off. No battery backup or Uninterruptible Power Supply (UPS) were used to preserve the contents of memory.
6. The RTE was shutdown.
7. Power was restored and one of the systems restarted.
8. ORACLE 9i was restarted and performed an automatic recovery.
9. Consistency conditions were executed and verified.
10. Step 1 was repeated and the difference between the first and second counts was noted.
11. An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.
12. The counts in step 9 and 10 were compared and the results verified that all committed transactions had been successfully recovered.
13. Samples were taken from the RTE files and used to query the database to demonstrate successful transactions had corresponding rows in the ORDER table.

Instantaneous Interruption, Loss of Memory (1 Node)

Because loss of power erases the contents of memory, the instantaneous interruption and the loss of memory tests were combined into a single test. This test was executed on a fully scaled database of 11520 warehouses under a full load of 115200 users. The following steps were executed:

1. The total number of New Orders was determined by the sum of D_NEXT_O_ID of all rows in the DISTRICT table giving the beginning count.
2. The RTE was started with 115200 users.
3. The test was allowed to run for a minimum of 10 minutes.
4. A checkpoint was issued.
5. Upon completion of the checkpoint a system crash and loss of memory on a single node was induced by turning one of the nodes of the cluster off. No battery backup or Uninterruptible Power Supply (UPS) were used to preserve the contents of memory.
6. The RTE was shutdown.
7. The database was shutdown on remaining seven nodes.
8. Power was restored and restarted the system which was powered off.
9. ORACLE 9i was restarted and performed an automatic recovery.
10. Consistency conditions were executed and verified.
11. Step 1 was repeated and the difference between the first and second counts was noted.
12. An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.
13. The counts in step 10 and 11 were compared and the results verified that all committed transactions had been successfully recovered.

14. Samples were taken from the RTE files and used to query the database to demonstrate successful transactions had corresponding rows in the ORDER table.

Loss of Cluster interconnect

To demonstrate recovery from a permanent failure of an inter-node connection, the following steps were executed on a fully scaled database of 11520 warehouses under a full load of 115200 users.

1. The D_NEXT_O_ID fields for all rows in the District table were summed to determine a starting count of Orders in the database prior to the test.
2. The RTE was started with 115200 users.
3. After 10 minutes into the measurement period, the cluster interconnect switch was powered off.
4. The system detected the interconnect loss. The test was aborted on the RTEs.
5. All Oracle instances were shutdown.
6. ORACLE 9i was restarted and performed an automatic recovery.
7. Consistency conditions were executed and verified.
8. Step 1 was repeated and the difference between the first and second counts was noted.
9. An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.
10. The counts in step 8 and 9 were compared and the results verified that all committed transactions had been successfully recovered.
11. Samples were taken from the RTE files and used to query the database to demonstrate successful transactions had corresponding rows in the ORDER table.

Clause 4 Related Items

Initial Cardinality of Tables

The cardinality (e.g. number of rows) of each table, as it existed at the start of the benchmark run, must be disclosed. If the database was over-scaled and inactive rows of the WAREHOUSE table were deleted, the cardinality of the WAREHOUSE table as initially configured and the number of rows deleted must be disclosed.

Table 4.1 Number of Rows for Server

Table	Occurrences
Warehouse	11520
District	115200
Customer	345600000
History	345600000
Order	345600000
New Order	10368000
Order Line	3456103850
Stock	1152000000
Item	100000
Deleted Warehouse	0

Database Layout

The distribution of tables and logs across all media must be explicitly depicted for tested and priced systems.
The benchmarked configuration used four 16 port SAN switch 2/16. Each switch was connected to the eight nodes of the cluster and eight Modular SAN Array 1000. Total of 32 Modular SAN Arrays in the cluster. Each Modular SAN Array 1000 contained 12 disk drives. Eight Modular SAN Arrays had two RAID 1 partitions and were used for database log. Array accelerator was disabled for the log volumes. 24 of the Modular SAN Array had two additional StorageWorks Enclosure 4314R connected to it. Each of the StorageWorks Enclosure 4314R contained 12 disk drives. Each of these 24 Modular SAN Array had one RAID 0 volume (database) and one RAID 1 Volume (database backup). Array accelerator was set to 100% write cache for data volumes. All the disk drives were 18.2GB 15K rpm.

In addition, each of the system had two internal disk drives (RAID 1) for operating system.

Section 1.2 of this report details the distribution of database tables and logs across all disks. The code that creates the database and tables are included in Appendix B.

Type of Database

A statement must be provided that describes:

1. *The data model implemented by DBMS used (e.g. relational, network, hierarchical).*
2. *The database interface (e.g. embedded, call level) and access language (e.g. SQL, DL/1, COBOL read/write used to implement the TPC-C transaction. If more than one interface/access language is used to implement TPC-C, each*

interface/access language must be described and a list of which interface/access language is used with which transaction type must be disclosed.

Oracle 9i Enterprise Edition Release 2 with Real Application Clusters and Partitioning Options is a relational DBMS.

Anonymous block PL/SQL and stored procedures were accessed through the ORACLE Call Interface. Application code is included in Appendix A.

Database Mapping

The mapping of database partitions/replications must be explicitly described.
The database was not replicated. The database tables Orders, New_Order, Order_Line, and History were partitioned horizontally by Warehouse ID. Each of these tables had 8 partitions.

60 Day Space

Details of the 60 day space computations along with proof that the database is configured to sustain 8 hours of growth for the dynamic tables (Order, Order-Line, and History) must be disclosed.
Table 1

SEGMENT	BLOCKS	REQUIRED	STATIC	DYNAMIC	OVERSIZE
CUSTCLUSTER	91,110,400	91,098,005	91,098,005	-	12,395
DISTCLUSTER	138,240	120,965	120,965	-	17,275
HIST	9,216,000	7,319,806	-	6,139,904	1,896,194
ICUST1	8,345,600	2,123,520	2,123,520	-	6,222,080
ICUST2	6,137,856	4,729,805	4,729,805	-	1,408,051
IDIST	8,345,600	107,520	107,520	-	8,238,080
IITEM	15,360	499	499	-	14,861
INORD	2,457,600	1,268,736	1,268,736	-	1,188,864
IORDL	98,365,440	78,169,084	-	65,568,768	20,196,356
IORDR1	3,686,400	2,571,878	2,571,878	-	1,114,522
IORDR2	5,529,600	3,862,118	3,862,118	-	1,667,482
ISTOK	8,345,600	6,101,760	6,101,760	-	2,243,840
ITEMCLUSTER	15,360	3,413	3,413	-	11,947
IWARE	8,345,600	107,520	107,520	-	8,238,080
ORDR	6,144,000	4,878,243	-	4,091,904	1,265,757
STOKCLUSTER	121,651,200	121,464,005	121,464,005	-	187,195
SYSTEM	196,608	196,608	196,608	-	-
WARECLUSTER	13,824	13,613	13,613	-	211

STATIC	Dynamic	Oversize	Daily Growth	Daily Spread	Space 60
233,769,965	75,800,576	53,923,190	14,566,557	32,073,354	3,032,164,636

Block size	4,096	Log/NO_txn (KB)	12.5116
60 Day (blocks)	3,032,164,636	tpmC	138,362.03
60 Day (GB)	11,567	8hr Log (GB)	792.45
Data Disks	1,008	raid-1	1,584.90
Capacity (GB)	16.96		
Total (GB)	17,095.68	Log disks	112
		Capacity (GB)	16.96
		Total (GB)	1,899.52

Clause 5 Related Items

Throughput

Measured tpmC must be reported

Measured tpmC	138362.03 tpmC
Price per tpmC	$17.38 per tpmC

Response Times

Ninetieth percentile, maximum and average response times must be reported for all transaction types as well as for the menu response time.

Table 5.1: Response Times

Type	Average	Maximum	90th %
New-Order	0.893	85.290	1.992
Payment	0.574	84.770	1.146
Order-Status	0.643	45.256	1.339
Interactive Delivery	0.260	81.913	0.349
Deferred Delivery	0.419	82.654	0.793
Stock-Level	0.581	81.376	0.831
Menu	0.102	0.328	0.102

Keying and Think Times

The minimum, the average, and the maximum keying and think times must be reported for each transaction type.

Table 5.2: Keying Times

Type	Minimum	Average	Maximum
New-Order	18.005	18.008	18.022
Payment	3.010	3.018	3.032
Order-Status	2.010	2.018	2.031
Interactive Delivery	2.010	2.018	2.031
Stock-Level	2.010	2.018	2.030

Table 5.3: Think Times

Type	Minimum	Average	Maximum
New-Order	0.000	13.406	134.006
Payment	0.000	12.016	120.045
Order-Status	0.000	10.015	100.077
Interactive Delivery	0.000	5.025	50.179
Stock-Level	0.000	5.014	50.096

Response Time Frequency Distribution Curves and Other Graphs

Response Time frequency distribution curves (see Clause 5.6.1) must be reported for each transaction type.

The performance curve for response times versus throughput (see Clause 5.6.2) must be reported for the New-Order transaction.

Think Time frequency distribution curves (see Clause 5.6.3) must be reported for each transaction type.

Keying Time frequency distribution curves (see Clause 5.6.4) must be reported for each transaction type.

A graph of throughput versus elapsed time (see Clause 5.6.5) must be reported for the New-Order transaction.

Figure 5.1: Response Times Frequency Distribution for New Order Transactions

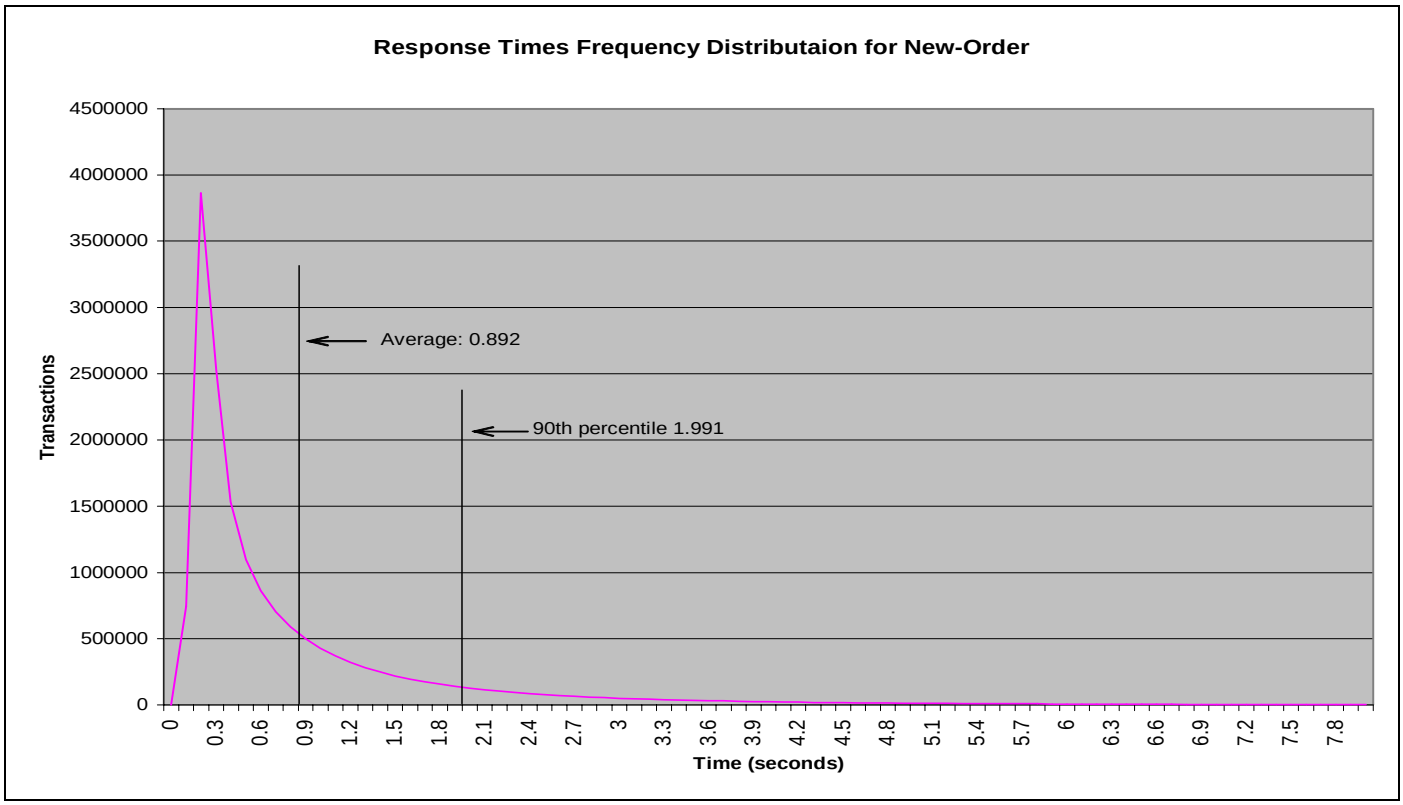


Figure 5.2: Response Times Frequency Distribution for Payment Transactions

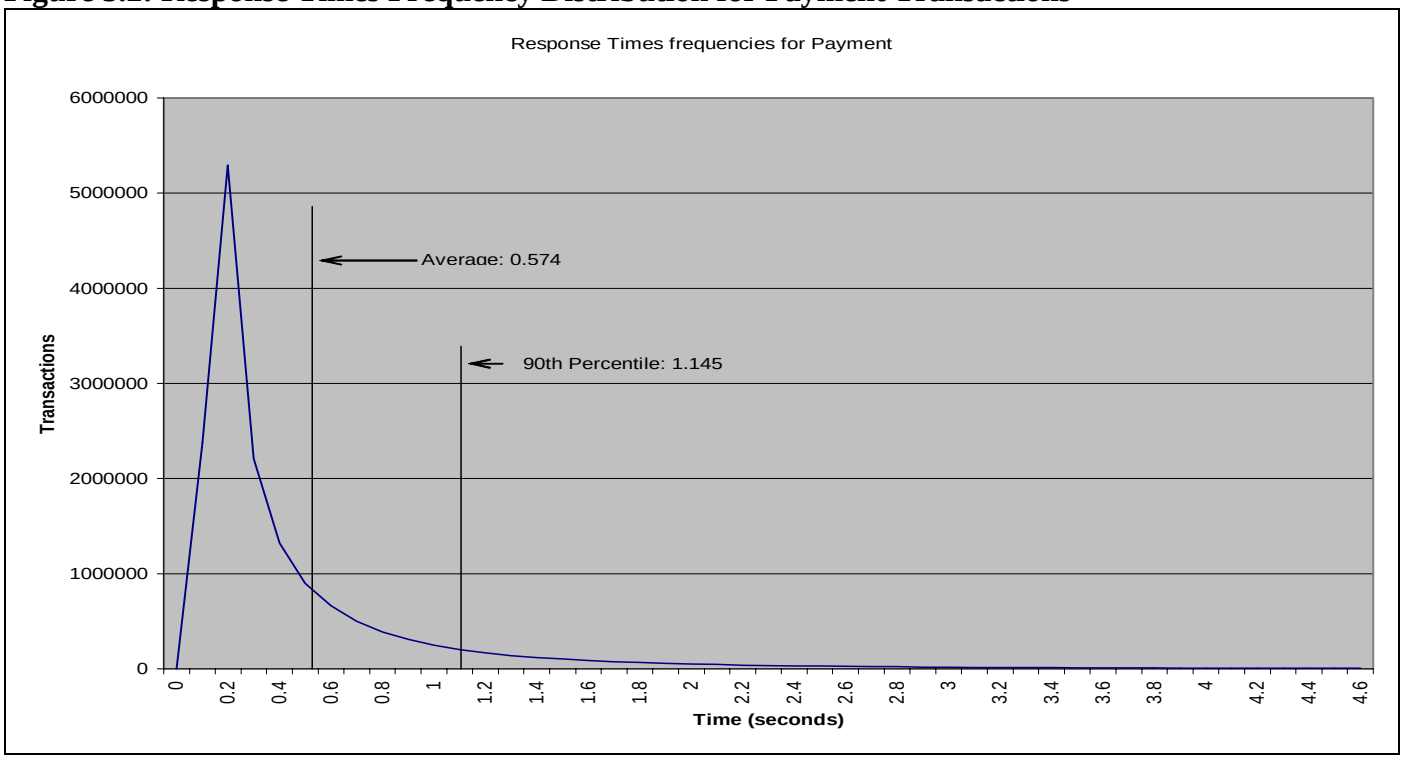


Figure 5.3: Response Times Frequency Distribution for Order Status Transactions

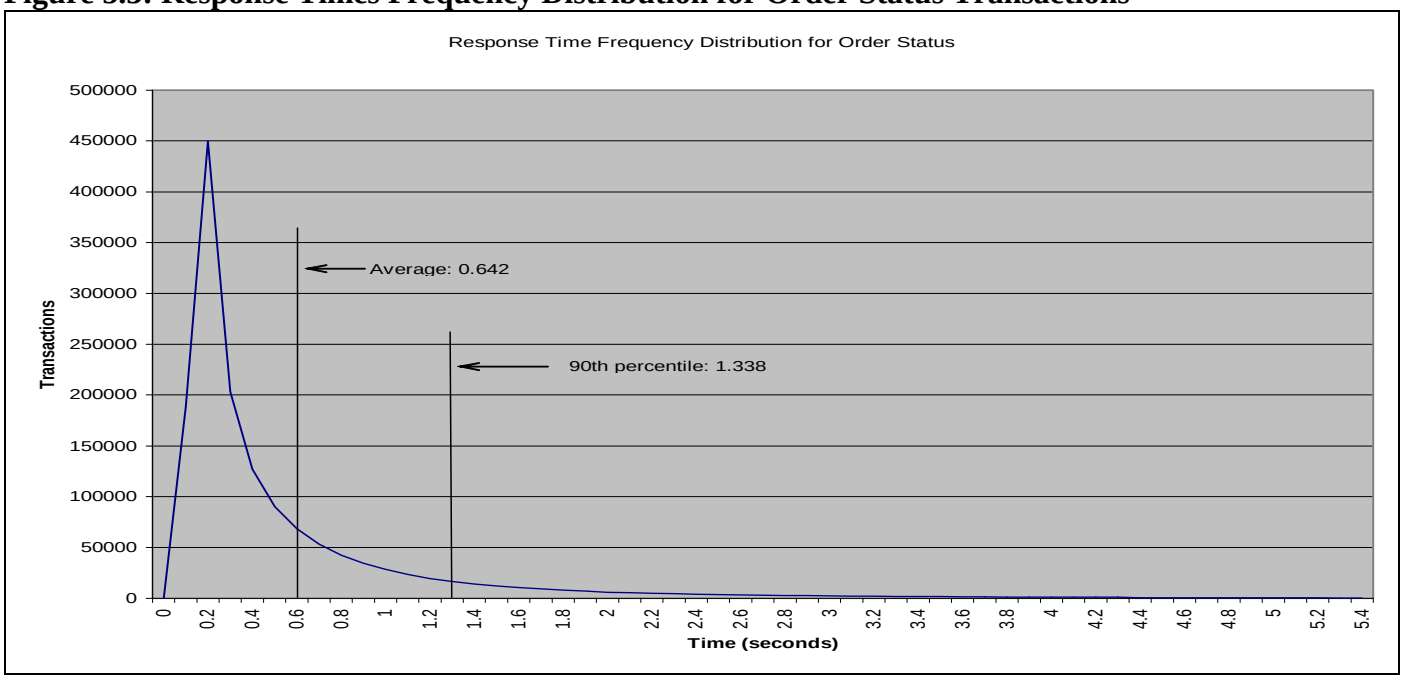


Figure 5.4: Response Times Frequency Distribution for Delivery Transactions

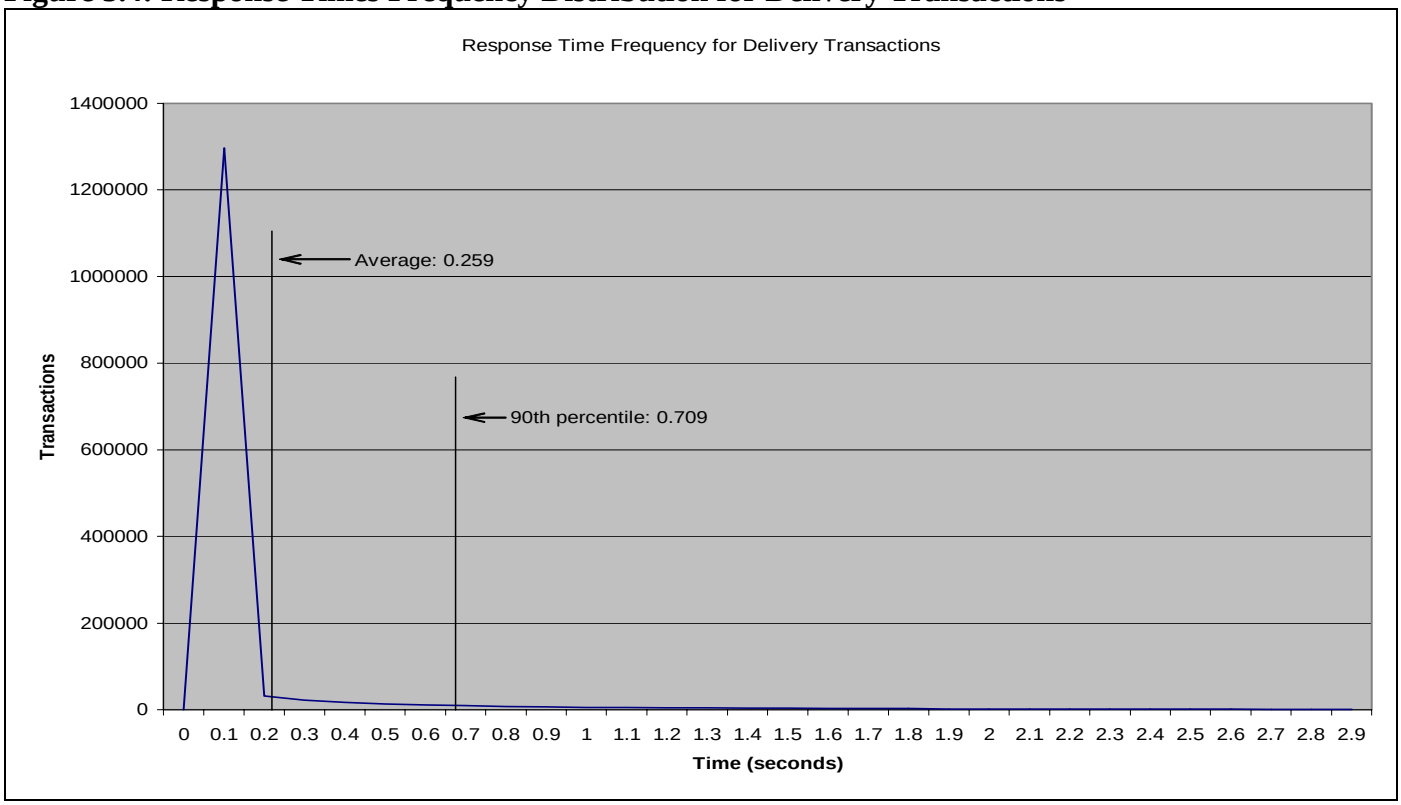


Figure 5.5: Response Times Frequency Distribution for Stock Level Transactions

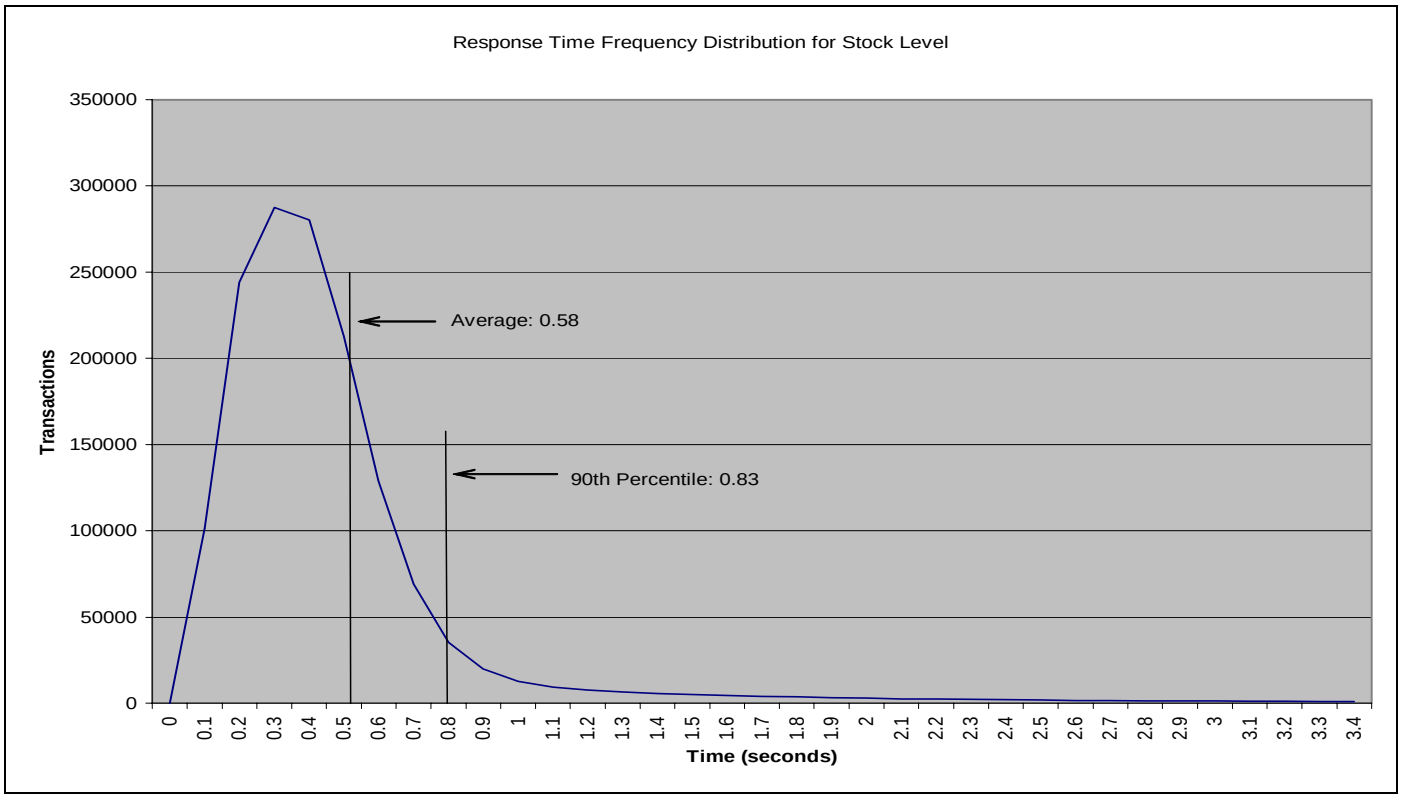


Figure 5.6: Response Time versus Throughput

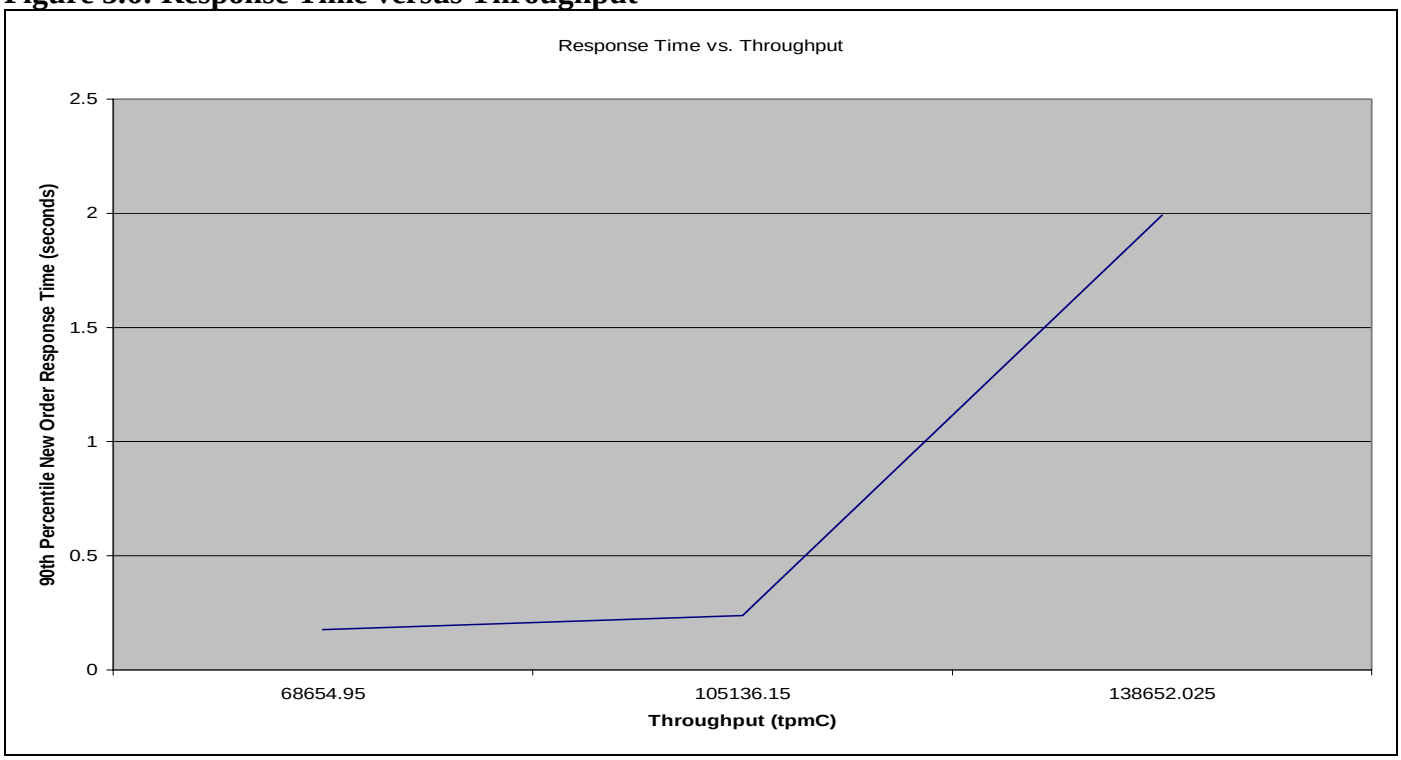


Figure 5.7: Think Times distribution for New Order Transactions

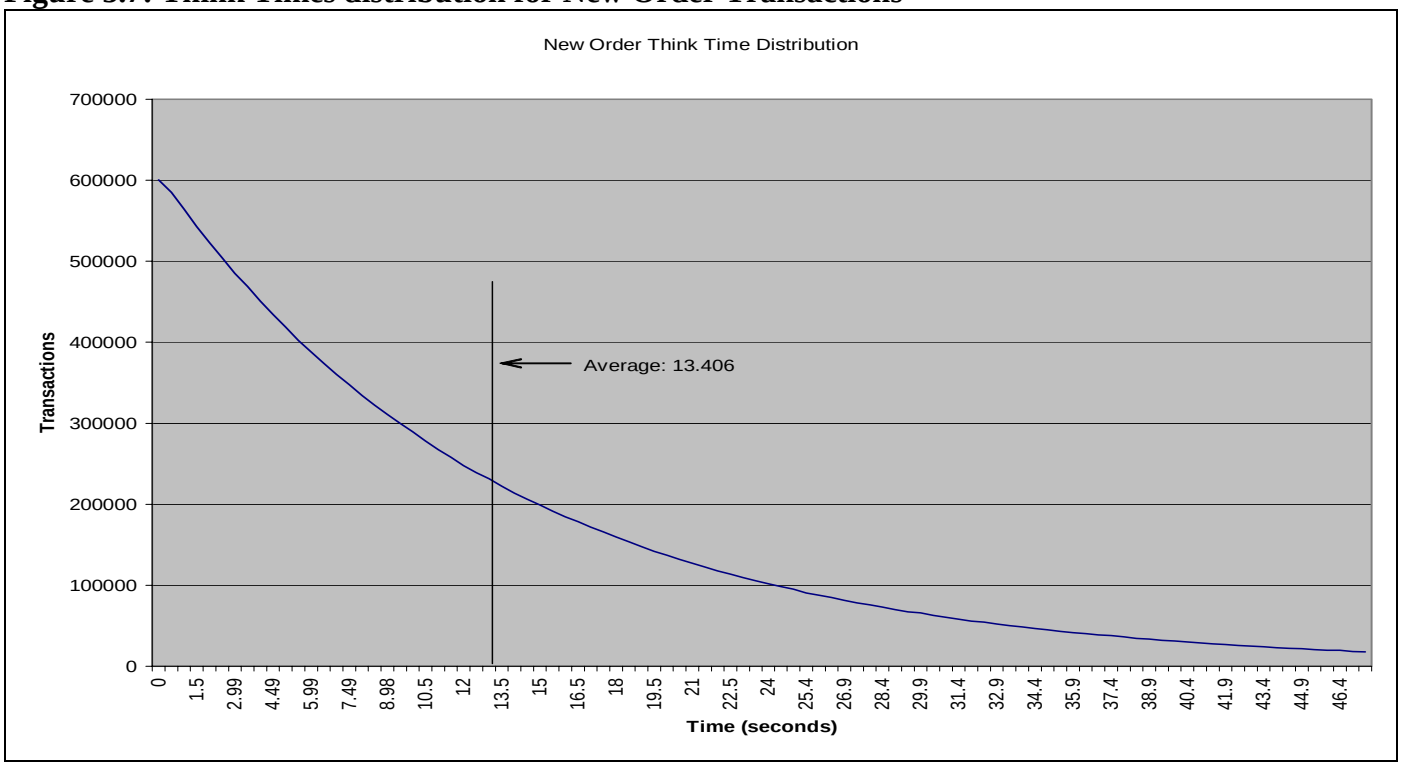
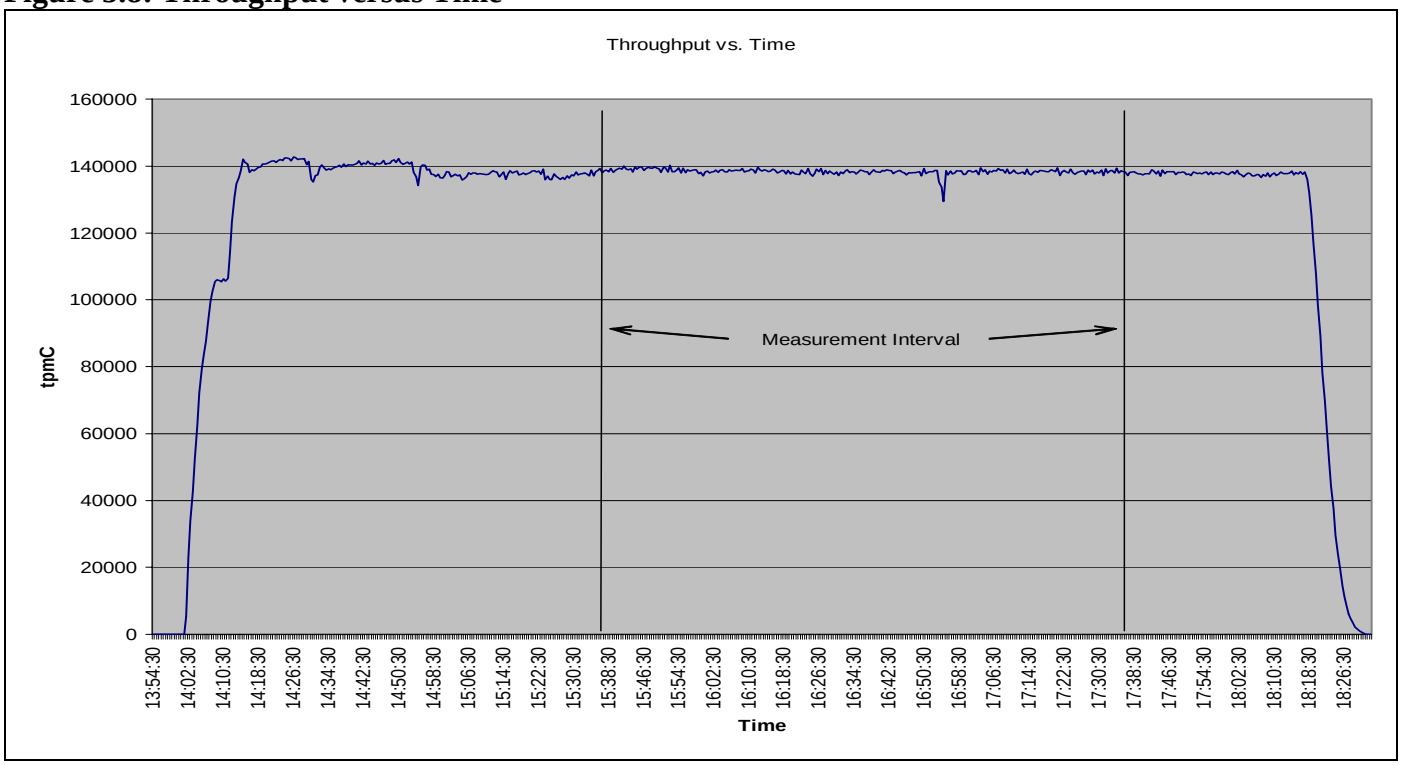


Figure 5.8: Throughput versus Time



Steady State Determination

The method used to determine that the SUT had reached a steady state prior to commencing the measurement interval must be disclosed.

Steady state was determined using real time monitor utilities from both the operating system and the RTE. Steady state was further confirmed by the throughput data collected during the run and graphed in Figure 5.8.

Work Performed During Steady State

A description of how the work normally performed during a sustained test (for example checkpointing, writing redo/undo log records, etc.) actually occurred during the measurement interval must be reported.

For each of the TPC Benchmark C transaction types, the following steps are executed. Each emulated user starts an Internet browser and asks to attach to the application on the desired client. The application formats the menus, input forms and data output using HTML (HyperText Markup Language). The HTML strings are transmitted over TCP/IP back to the client, where they can be
displayed by any Web Browser software. The application on the client is run under the control of the Apache Web Server.

Transactions are submitted by the RTE in accordance with the rules of the TPC-C benchmark. The emulated user chooses a transaction from the menu. The RTE records the time it takes from selecting the menu item to receiving the requested form. Data is generated for input to the form, then the user waits the specified keying time. The submit is sent and the RTE records the time it takes for the transaction to be processed and all the output data to be returned. The user then waits for the randomly generated think time before starting the process over again. All timings taken by the RTE generate a start and end timestamp. Keying and think times are calculated as the difference between end-time of a timing to the start of the next.

The database records transactions in the database tables and the transaction log. Writes to the database may stay in Oracle's in-memory data cache for a while before being written to disk. Checkpoints are initiated once the log files were filled and allowed to roll over.

Measurement Period Duration

A statement of the duration of the measurement interval for the reported Maximum Qualified Throughput (tpmC) must be included.

The reported measured interval was exactly 120 minutes long.

Regulation of Transaction Mix

The method of regulation of the transaction mix (e.g., card decks or weighted random distribution) must be described. If weighted distribution is used and the RTE adjusts the weights associated with each transaction type, the maximum adjustments to the weight from the initial value must be disclosed.

The RTE was given a weighted random distribution, which could not be adjusted during the run.

Transaction Statistics

The percentage of the total mix for each transaction type must be disclosed. The percentage of New-Order transactions rolled back as a result of invalid item number must be disclosed. The average number of order-lines entered per New-Order transaction must be disclosed. The percentage of remote order lines per New-Order transaction must be disclosed. The percentage of remote Payment transactions must be disclosed. The percentage of customer selections by customer last name in the Payment and Order-Status transactions must be disclosed. The percentage of Delivery transactions skipped due to there being fewer than necessary orders in the New-Order table must be disclosed.

Table 5.4: Transaction Statistics

Statistic		Value
New Order	Home warehouse order lines	99.00%
	Remote warehouse order lines	1.00%
	Rolled back transactions	1.00%
	Average items per order	10.00
Payment	Home warehouse	84.99%
	Remote warehouse	15.01%
	Accessed by last name	59.99%
Order Status	Accessed by last name	60.02%
Delivery	Skipped transactions	0
Transaction Mix	New Order	44.92%
	Payment	43.02%
	Order status	4.02%
	Delivery	4.03%
	Stock level	4.02%

Checkpoint Count and Location

The number of checkpoints in the Measurement Interval, the time in seconds from the start of the Measurement Interval to the first checkpoint, and the Checkpoint Interval must be disclosed.

A checkpoint is the process of writing all modified data pages to disk. The TPC-C benchmark on HP ProLiant DL580 - PDC 32P was set up to checkpoint within every 30 minutes. One checkpoint occurred during the warm-up period and 4 checkpoints occurred during the measurement period.

Checkpoint Duration

The start time and duration in seconds of at least the four longest checkpoints during the measurement Interval must be disclosed.

Node	Start Time	End Time	Duration
1	16:01:31	16:28:10	0:26:39
2	16:02:08	16:28:44	0:26:36
3	16:02:52	16:29:49	0:26:57
4	16:02:01	16:28:37	0:26:36
5	16:01:50	16:28:21	0:26:31
6	16:02:03	16:28:37	0:26:34
7	16:02:23	16:28:57	0:26:34
8	16:02:04	16:28:36	0:26:32
1	16:31:06	16:57:26	0:26:20
2	16:31:38	16:57:52	0:26:14
3	16:31:47	16:57:32	0:25:45
4	16:31:33	16:57:50	0:26:17
5	16:31:15	16:57:28	0:26:13
6	16:31:34	16:57:55	0:26:21
7	16:31:53	16:58:11	0:26:18
8	16:31:31	16:57:46	0:26:15
1	17:00:19	17:26:41	0:26:22
2	17:00:46	17:27:13	0:26:27
3	17:01:29	17:27:32	0:26:03
4	17:00:47	17:27:17	0:26:30
5	17:00:23	17:26:51	0:26:28
6	17:00:49	17:27:24	0:26:35
7	17:01:07	17:27:40	0:26:33
8	17:00:42	17:27:14	0:26:32
1	17:29:38	17:56:05	0:26:27
2	17:30:09	17:56:33	0:26:24
3	17:30:30	17:57:24	0:26:54
4	17:30:13	17:56:43	0:26:30
5	17:29:47	17:56:10	0:26:23
6	17:30:20	17:56:44	0:26:24
7	17:30:34	17:56:59	0:26:25
8	17:30:11	17:56:34	0:26:23

Clause 6 Related Items

RTE Descriptions

If the RTE is commercially available, then its inputs must be specified. Otherwise, a description must be supplied of what inputs (e.g., scripts) to the RTE had been used.

PRTE Software was used to simulate terminal users, generate random data and record response times. This package ran on systems that are distinct from the system under test. PRTE command file used is included in Appendix A.

Emulated Components

It must be demonstrated that the functionality and performance of the components being emulated in the Driver System are equivalent to the priced system. The results of the test described in Clause 6.6.3.4 must be disclosed.

Due to the large number of PCs and associated hardware that would be required to run these tests, Remote Terminal Emulator was used to emulate the connected PCs and LAN. As configured for this test, the driver software emulates the traffic that would be observed from the users ' PCs connected by Ethernet to the front-end clients using HTTP (HyperText Transfer Protocol)over TCP/IP.

The driver system consisted of 8 ProLiant servers.

Functional Diagrams

A complete functional diagram of both the benchmark configuration and the configuration of the proposed (target) system must be disclosed. A detailed list of all hardware and software functionality being performed on the Driver System and its interface to the SUT must be disclosed.

The diagram in Section 1 shows the tested and priced benchmark configurations.

Networks

The network configuration of both the tested services and proposed (target) services which are being represented and a thorough explanation of exactly which parts of the proposed configuration are being replaced with the Driver System must be disclosed.

The bandwidth of the networks used in the tested/priced configuration must be disclosed.

Section 1 of this report contains detailed diagrams of both the benchmark configuration and the priced configuration. In the tested configuration, eight server systems and 16 client systems were connected into two cascaded 16 port 1GB Ethernet switches.
In the tested configuration there were eight driver systems (RTE), each of them connected to two clients systems using 1000/100 Ethernet switch.

Operator Intervention

If the configuration requires operator intervention (see Clause 6.6.6), the mechanism and the frequency of this intervention must be disclosed.

This configuration does not require any operator intervention to sustain eight hours of the reported throughput.

Clause 7 Related Items

System Pricing

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

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

The details of the hardware and software are reported in the front of this report as part of the executive summary. All third party quotations are included at the end of this report as Appendix D.

Availability, Throughput, and Price Performance

The committed delivery date for general availability (availability date) of products used in the price calculation must be reported. When the priced system includes products with different availability dates, the reported availability date for the priced system must be the date at which all components are committed to be available.

A statement of the measured tpmC as well as the respective calculations for the 3-year pricing, price/performance (price/tpmC), and the availability date must be included.

- **Maximum Qualified Throughput** **138,362.03 tpmC**
- **Price per tpmC** **$17.38 per tpmC**
- **Available** **March 5, 2003**

All hardware components are available now.

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

This system is being priced for the United States of America.

Usage Pricing

For any usage pricing, the sponsor must disclose:

- *Usage level at which the component was priced.*
- *A statement of the company policy allowing such pricing.*

The component pricing based on usage is shown below:

- Oracle 9i Enterprise Edition Release 2 with Real Application Clusters and Partitioning Options
- 8 Red Hat Linux Advanced Server
- 16 Red Hat Linux Personal
- 16 BEA Tuxedo CTS 8.0

Clause 9 Related Items

Auditor's Report

The auditor's name, address, phone number, and a copy of the auditor's attestation letter indicating compliance must be included in the Full Disclosure Report.

This implementation of the TPC Benchmark C was audited by Lorna Livingtree of Performance Metrics Inc.

Lorna Livingtree
Performance Metrics Inc.
2229 Benita Dr. Suite 101
Rancho Cordova, CA 95670
916-635-2822

Availability of the Full Disclosure Report

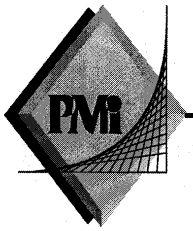
The Full Disclosure Report must be readily available to the public at a reasonable charge, similar to the charges for similar documents by the test sponsor. The report must be made available when results are made public. In order to use the phrase "TPC Benchmark™ C", the Full Disclosure Report must have been submitted to the TPC Administrator as well as written permission obtained to distribute same.

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

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

or

Hewlett Packard Company
Database Performance Engineering
P.O. Box 692000
Houston, TX 77269-2000



PERFORMANCE METRICS INC.
TPC Certified Auditors

September 5, 2002

Mr. Raghunath Othayoth and
Mr. Bryon Georgson
Database Performance Engineers
Compaq Computer Corporation
20555 SH 249
Houston, TX 77070

I have verified on-site and by remote the TPC Benchmark™ C client/server for an 8 node cluster with the following configuration on each node:

Platform: HP ProLiant DL580 - O2000 32P
Database Manager: Oracle9i
Operating System: Red Hat Linux Advanced Server version 2.1
Transaction Monitor: BEA Tuxedo 8.0

Servers: 8 ProLiant DL580's with:				
CPU's	Memory	Disks (total)	90% Response	TpmC
4 Pentium III Xeon@900Mhz	Main: 16 GB Cache: 2 MB	976 @18GB(15K) 16 @ 18GB (10K)	1.99 sec	138,362.03
16 Clients: DL360R each with:				
2 Pentium III Xeon @ 1.4 Ghz	Main: 4 GB Cache: 512 K	1 @ 18 GB	Na	Na

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

- The transactions were correctly implemented.
- The database files were properly sized and populated.

137 Yankton St, Suite 101, Folsom, CA 95630
(916) 985-113 fax: (916) 985-1185 email: Lorna@PerfMetrics.com

- The database was properly scaled with 11,520 warehouses. All warehouses were active during the performance run.
- The ACID properties were successfully demonstrated. Both a single node and a full system failures were demonstrated.
- Input data was generated according to the specified percentages.
- Eight hours of mirrored log space was present on the tested system.
- Eight hours of growth space for the dynamic tables was present on the tested system.
- The data for the 60 day space calculation was verified.
- The controller cache was disabled on the log disk controllers.
- The steady state portion of the test was 120 minutes.
- One checkpoint was taken before the measured interval.
- Four checkpoints were taken during the measured interval.
- The system pricing was checked for major components and maintenance.
- Third party quotes were verified for compliance.

Auditor Notes:
None.

Sincerely,

Lorna Livingtree
Auditor

137 Yankton St, Suite 101, Folsom, CA 95630
(916) 985-113 fax: (916) 985-1185 email: Lorna@PerfMetrics.com

Appendix A: Source Code

```
**************************

BS-7dc9.c
**************************

#include <stdio.h>
#include <xa.h>
#include <atmi.h>

#if defined(__cplusplus)
extern "C" {
#endif
extern int _tmrunserver _((int));
extern void dy_transaction _((TPSVCINFO *));
extern void no_transaction _((TPSVCINFO *));
extern void os_transaction _((TPSVCINFO *));
extern void pt_transaction _((TPSVCINFO *));
extern void sl_transaction _((TPSVCINFO *));
#if defined(__cplusplus)
}
#endif

static struct tmdsptchtbl_t _tmdsptchtbl[] = {
         { (char*)"dy_transaction", (char*)"dy_transaction", (void
(*) _((TPSVCINFO *))) dy_transaction, 0, 0 },
         { (char*)"no_transaction", (char*)"no_transaction", (void
(*) _((TPSVCINFO *))) no_transaction, 1, 0 },
         { (char*)"os_transaction", (char*)"os_transaction", (void
(*) _((TPSVCINFO *))) os_transaction, 2, 0 },
         { (char*)"pt_transaction", (char*)"pt_transaction", (void
(*) _((TPSVCINFO *))) pt_transaction, 3, 0 },
         { (char*)"sl_transaction", (char*)"sl_transaction", (void
(*) _((TPSVCINFO *))) sl_transaction, 4, 0 },
         { NULL, NULL, NULL, 0, 0 }
};

#ifndef _TMDLLIMPORT
#define _TMDLLIMPORT
#endif

#if defined(__cplusplus)
extern "C" {
#endif
_TMDLLIMPORT extern struct xa_switch_t tmnull_switch;
#if defined(__cplusplus)
}
#endif

typedef void (*tmp_void_cast)();
typedef void (*tmp_voidvoid_cast)(void);
typedef int (*tmp_intchar_cast)(int, char **);
typedef int (*tmp_int_cast)(int);
static struct tmsvrargs_t tmsvrargs = {
         NULL,
         &_tmdsptchtbl[0],
         0,
         (tmp_intchar_cast)tpsvrinit,
         (tmp_voidvoid_cast)tpsvrdone,
         (tmp_int_cast)_tmrunserver,   /* PRIVATE  */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         (tmp_intchar_cast)tpsvrthrinit,
         (tmp_voidvoid_cast)tpsvrthrdone
};

struct tmsvrargs_t *
#ifdef _TMPROTOTYPES
_tmgetsvrargs(void)
#else
_tmgetsvrargs()
#endif
{
         tmsvrargs.reserved1 = NULL;
         tmsvrargs.reserved2 = NULL;
         tmsvrargs.xa_switch = &tmnull_switch;
         return(&tmsvrargs);
}

int
#ifdef _TMPROTOTYPES
main(int argc, char **argv)
#else
main(argc,argv)
int argc;
char **argv;
#endif
{
#ifdef TMMAINEXIT
#include "mainexit.h"
#endif

         return( _tmstartserver( argc, argv, _tmgetsvrargs()));
}


**************************
BS-deli.c
**************************

#include <stdio.h>
#include <xa.h>
#include <atmi.h>

#if defined(__cplusplus)
extern "C" {
#endif
extern int _tmrunserver _((int));
extern void dy_transaction _((TPSVCINFO *));
#if defined(__cplusplus)
}
#endif

static struct tmdsptchtbl_t _tmdsptchtbl[] = {
         { (char*)"dy_transaction", (char*)"dy_transaction", (void
(*) _((TPSVCINFO *))) dy_transaction, 0, 0 },
         { NULL, NULL, NULL, 0, 0 }
};

#ifndef _TMDLLIMPORT
#define _TMDLLIMPORT
#endif

#if defined(__cplusplus)
extern "C" {
#endif
_TMDLLIMPORT extern struct xa_switch_t tmnull_switch;
#if defined(__cplusplus)
}
#endif

typedef void (*tmp_void_cast)();
typedef void (*tmp_voidvoid_cast)(void);
typedef int (*tmp_intchar_cast)(int, char **);
typedef int (*tmp_int_cast)(int);
static struct tmsvrargs_t tmsvrargs = {
         NULL,
         &_tmdsptchtbl[0],
         0,
         (tmp_intchar_cast)tpsvrinit,
         (tmp_voidvoid_cast)tpsvrdone,
         (tmp_int_cast)_tmrunserver,   /* PRIVATE  */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         (tmp_intchar_cast)tpsvrthrinit,
         (tmp_voidvoid_cast)tpsvrthrdone
};

struct tmsvrargs_t *
#ifdef _TMPROTOTYPES
_tmgetsvrargs(void)
#else
_tmgetsvrargs()
#endif
{
         tmsvrargs.reserved1 = NULL;
         tmsvrargs.reserved2 = NULL;
         tmsvrargs.xa_switch = &tmnull_switch;
         return(&tmsvrargs);
}

int
#ifdef _TMPROTOTYPES
main(int argc, char **argv)
#else
main(argc,argv)
int argc;
char **argv;
#endif
{
#ifdef TMMAINEXIT
#include "mainexit.h"
#endif

         return( _tmstartserver( argc, argv, _tmgetsvrargs()));
}


**************************
BS-newo.c
**************************

#include <stdio.h>
#include <xa.h>
#include <atmi.h>
```

```
#if defined(__cplusplus)
extern "C" {
#endif
extern int _tmrunserver _((int));
extern void no_transaction _((TPSVCINFO *));
#if defined(__cplusplus)
}
#endif

static struct tmdsptchtbl_t _tmdsptchtbl[] = {
        { (char*)"no_transaction", (char*)"no_transaction", (void
(*) _((TPSVCINFO *))) no_transaction, 0, 0 },
        { NULL, NULL, NULL, 0, 0 }
};

#ifndef _TMDLLIMPORT
#define _TMDLLIMPORT
#endif

#if defined(__cplusplus)
extern "C" {
#endif
_TMDLLIMPORT extern struct xa_switch_t tmnull_switch;
#if defined(__cplusplus)
}
#endif

typedef void (*tmp_void_cast)();
typedef void (*tmp_voidvoid_cast)(void);
typedef int (*tmp_intchar_cast)(int, char **);
typedef int (*tmp_int_cast)(int);
static struct tmsvrargs_t tmsvrargs = {
         NULL,
         &_tmdsptchtbl[0],
         0,
         (tmp_intchar_cast)tpsvrinit,
         (tmp_voidvoid_cast)tpsvrdone,
         (tmp_int_cast)_tmrunserver,   /* PRIVATE  */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         (tmp_intchar_cast)tpsvrthrinit,
         (tmp_voidvoid_cast)tpsvrthrdone
};

struct tmsvrargs_t *
#ifdef _TMPROTOTYPES
_tmgetsvrargs(void)
#else
_tmgetsvrargs()
#endif
{
         tmsvrargs.reserved1 = NULL;
         tmsvrargs.reserved2 = NULL;
         tmsvrargs.xa_switch = &tmnull_switch;
         return(&tmsvrargs);
}

int
#ifdef _TMPROTOTYPES
main(int argc, char **argv)
#else
main(argc,argv)
int argc;
char **argv;
#endif
{
#ifdef TMMAINEXIT
#include "mainexit.h"
#endif

         return( _tmstartserver( argc, argv, _tmgetsvrargs()));
}



**************************
BS-ordo.c
**************************

#include <stdio.h>
#include <xa.h>
#include <atmi.h>

#if defined(__cplusplus)
extern "C" {
#endif
extern int _tmrunserver _((int));
extern void os_transaction _((TPSVCINFO *));
#if defined(__cplusplus)
}
#endif

static struct tmdsptchtbl_t _tmdsptchtbl[] = {
        { (char*)"os_transaction", (char*)"os_transaction", (void
(*) _((TPSVCINFO *))) os_transaction, 0, 0 },
        { NULL, NULL, NULL, 0, 0 }
};

#ifndef _TMDLLIMPORT
#define _TMDLLIMPORT
#endif

#if defined(__cplusplus)
extern "C" {
#endif
_TMDLLIMPORT extern struct xa_switch_t tmnull_switch;
#if defined(__cplusplus)
}
#endif

typedef void (*tmp_void_cast)();
typedef void (*tmp_voidvoid_cast)(void);
typedef int (*tmp_intchar_cast)(int, char **);
typedef int (*tmp_int_cast)(int);
static struct tmsvrargs_t tmsvrargs = {
         NULL,
         &_tmdsptchtbl[0],
         0,
         (tmp_intchar_cast)tpsvrinit,
         (tmp_voidvoid_cast)tpsvrdone,
         (tmp_int_cast)_tmrunserver,   /* PRIVATE  */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         NULL,                         /* RESERVED */
         (tmp_intchar_cast)tpsvrthrinit,
         (tmp_voidvoid_cast)tpsvrthrdone
};

struct tmsvrargs_t *
#ifdef _TMPROTOTYPES
_tmgetsvrargs(void)
#else
_tmgetsvrargs()
#endif
{
         tmsvrargs.reserved1 = NULL;

         tmsvrargs.reserved2 = NULL;
         tmsvrargs.xa_switch = &tmnull_switch;
         return(&tmsvrargs);
}

int
#ifdef _TMPROTOTYPES
main(int argc, char **argv)
#else
main(argc,argv)
int argc;
char **argv;
#endif
{
#ifdef TMMAINEXIT
#include "mainexit.h"
#endif

         return( _tmstartserver( argc, argv, _tmgetsvrargs()));
}



**************************
BS-payo.c
**************************

#include <stdio.h>
#include <xa.h>
#include <atmi.h>

#if defined(__cplusplus)
extern "C" {
#endif
extern int _tmrunserver _((int));
extern void pt_transaction _((TPSVCINFO *));
#if defined(__cplusplus)
}
#endif

static struct tmdsptchtbl_t _tmdsptchtbl[] = {
        { (char*)"pt_transaction", (char*)"pt_transaction", (void
(*) _((TPSVCINFO *))) pt_transaction, 0, 0 },
        { NULL, NULL, NULL, 0, 0 }
};

#ifndef _TMDLLIMPORT
#define _TMDLLIMPORT
#endif

#if defined(__cplusplus)
extern "C" {
#endif
_TMDLLIMPORT extern struct xa_switch_t tmnull_switch;
#if defined(__cplusplus)
}
#endif

typedef void (*tmp_void_cast)();
typedef void (*tmp_voidvoid_cast)(void);
typedef int (*tmp_intchar_cast)(int, char **);
typedef int (*tmp_int_cast)(int);
```

```
static struct tmsvrargs_t tmsvrargs = {
          NULL,
          &_tmdsptchtbl[0],
          0,
          (tmp_intchar_cast)tpsvrinit,
          (tmp_voidvoid_cast)tpsvrdone,
          (tmp_int_cast)_tmrunserver,   /* PRIVATE  */
          NULL,                         /* RESERVED */
          NULL,                         /* RESERVED */
          NULL,                         /* RESERVED */
          NULL,                         /* RESERVED */
          (tmp_intchar_cast)tpsvrthrinit,
          (tmp_voidvoid_cast)tpsvrthrdone
};

struct tmsvrargs_t *
#ifdef _TMPROTOTYPES
_tmgetsvrargs(void)
#else
_tmgetsvrargs()
#endif
{
          tmsvrargs.reserved1 = NULL;
          tmsvrargs.reserved2 = NULL;
          tmsvrargs.xa_switch = &tmnull_switch;
          return(&tmsvrargs);
}

int
#ifdef _TMPROTOTYPES
main(int argc, char **argv)
#else
main(argc,argv)
int argc;
char **argv;
#endif
{
#ifdef TMMAINEXIT
#include "mainexit.h"
#endif

          return( _tmstartserver( argc, argv, _tmgetsvrargs()));
}



**************************
BS-stoo.c
**************************

#include <stdio.h>
#include <xa.h>
#include <atmi.h>

#if defined(__cplusplus)
extern "C" {
#endif
extern int _tmrunserver _((int));
extern void sl_transaction _((TPSVCINFO *));
#if defined(__cplusplus)
}
#endif

static struct tmdsptchtbl_t _tmdsptchtbl[] = {
          { (char*)"sl_transaction", (char*)"sl_transaction", (void
(*) _((TPSVCINFO *))) sl_transaction, 0, 0 },
          { NULL, NULL, NULL, 0, 0 }
};

#ifndef _TMDLLIMPORT
#define _TMDLLIMPORT
#endif

#if defined(__cplusplus)
extern "C" {
#endif
_TMDLLIMPORT extern struct xa_switch_t tmnull_switch;
#if defined(__cplusplus)
}
#endif

typedef void (*tmp_void_cast)();
typedef void (*tmp_voidvoid_cast)(void);
typedef int (*tmp_intchar_cast)(int, char **);
typedef int (*tmp_int_cast)(int);
static struct tmsvrargs_t tmsvrargs = {
          NULL,
          &_tmdsptchtbl[0],
          0,
          (tmp_intchar_cast)tpsvrinit,
          (tmp_voidvoid_cast)tpsvrdone,
          (tmp_int_cast)_tmrunserver,   /* PRIVATE  */
          NULL,                         /* RESERVED */
          NULL,                         /* RESERVED */
          NULL,                         /* RESERVED */
          NULL,                         /* RESERVED */
          (tmp_intchar_cast)tpsvrthrinit,
          (tmp_voidvoid_cast)tpsvrthrdone
};

struct tmsvrargs_t *
#ifdef _TMPROTOTYPES
_tmgetsvrargs(void)
#else
_tmgetsvrargs()
#endif
{
          tmsvrargs.reserved1 = NULL;
          tmsvrargs.reserved2 = NULL;
          tmsvrargs.xa_switch = &tmnull_switch;
          return(&tmsvrargs);
}

int
#ifdef _TMPROTOTYPES
main(int argc, char **argv)
#else
main(argc,argv)
int argc;
char **argv;
#endif
{
#ifdef TMMAINEXIT
#include "mainexit.h"
#endif

          return( _tmstartserver( argc, argv, _tmgetsvrargs()));
}



**************************
BS-tpcc.c
**************************

#include <stdio.h>
#include <xa.h>
#include <atmi.h>

#if defined(__cplusplus)
extern "C" {
#endif
extern int _tmrunserver _((int));
extern void no_transaction _((TPSVCINFO *));
extern void os_transaction _((TPSVCINFO *));
extern void pt_transaction _((TPSVCINFO *));
extern void sl_transaction _((TPSVCINFO *));
#if defined(__cplusplus)
}
#endif

static struct tmdsptchtbl_t _tmdsptchtbl[] = {
          { (char*)"no_transaction", (char*)"no_transaction", (void
(*) _((TPSVCINFO *))) no_transaction, 0, 0 },
          { (char*)"os_transaction", (char*)"os_transaction", (void
(*) _((TPSVCINFO *))) os_transaction, 1, 0 },
          { (char*)"pt_transaction", (char*)"pt_transaction", (void
(*) _((TPSVCINFO *))) pt_transaction, 2, 0 },
          { (char*)"sl_transaction", (char*)"sl_transaction", (void
(*) _((TPSVCINFO *))) sl_transaction, 3, 0 },
          { NULL, NULL, NULL, 0, 0 }
};

#ifndef _TMDLLIMPORT
#define _TMDLLIMPORT
#endif

#if defined(__cplusplus)
extern "C" {
#endif
_TMDLLIMPORT extern struct xa_switch_t tmnull_switch;
#if defined(__cplusplus)
}
#endif

typedef void (*tmp_void_cast)();
typedef void (*tmp_voidvoid_cast)(void);
typedef int (*tmp_intchar_cast)(int, char **);
typedef int (*tmp_int_cast)(int);
static struct tmsvrargs_t tmsvrargs = {
          NULL,
          &_tmdsptchtbl[0],
          0,
          (tmp_intchar_cast)tpsvrinit,
          (tmp_voidvoid_cast)tpsvrdone,
          (tmp_int_cast)_tmrunserver,   /* PRIVATE  */
          NULL,                         /* RESERVED */
          NULL,                         /* RESERVED */
          NULL,                         /* RESERVED */
          NULL,                         /* RESERVED */
          (tmp_intchar_cast)tpsvrthrinit,
          (tmp_voidvoid_cast)tpsvrthrdone
};

struct tmsvrargs_t *
#ifdef _TMPROTOTYPES
_tmgetsvrargs(void)
#else
_tmgetsvrargs()
#endif
{
          tmsvrargs.reserved1 = NULL;
```

```
          tmsvrargs.reserved2 = NULL;
          tmsvrargs.xa_switch = &tmnull_switch;
          return(&tmsvrargs);
}

int
#ifdef _TMPROTOTYPES
main(int argc, char **argv)
#else
main(argc,argv)
int argc;
char **argv;
#endif
{
#ifdef TMMAINEXIT
#include "mainexit.h"
#endif

          return( _tmstartserver( argc, argv, _tmgetsvrargs()));
}



**************************
delirpt.c
**************************

/*        FILE:               DELIRPT.C
 *                                    Microsoft TPC-C Kit Ver.
3.00.000
 *
 *                                    Copyright Microsoft, 1996
 *
 *        PURPOSE:  Delivery report processing application
 *        Author:             Philip Durr
 *                                    philipdu@Microsoft.com
 */

#include <stdio.h>
#include <stdlib.h>
#include <time.h>

#define LOGFILE_READ_EOF      0
                                                  //check log file
flag return current state
#define LOGFILE_CLEAR_EOF     1
                                                  //clear end of
log file flag
#define LOGFILE_SET_EOF                2
                                                        //set
flag end of log file reached

#define INTERVAL                       .01
                                                  //90th
percentile calculation bucket interval

#define ERR_SUCCESS
          1000                                    //success no
error
#define ERR_READING_LOGFILE                               1001
                                    //io errors occured reading
delivery log file
#define ERR_INSUFFICIENT_MEMORY                           1002
                                    //insuficient memory to
process 90th percentile report
#define ERR_CANNOT_OPEN_RESULTS_FILE    1005
                    //Cannot open delivery results file delilog.

#define TRUE        1
#define FALSE       0

typedef int         BOOL;

typedef struct _DelTime
{
          struct tm dtime;
          int                 wMilliseconds;
} DelTime;

typedef struct _RPTLINE
{
          DelTime   start;

          //delilog report line start time
          DelTime   end;

          //delilog report line end time
          int                           response;

          //delilog report line time delivery took in milliseconds
          int                           w_id;

                    //delilog report line warehouse id for delivery
          int                           o_carrier_id;

          //delilog report line carier id for delivery
          int                           items[10];

                    //delilog report line delivery line items
          int       day;
} RPTLINE, *PRPTLINE;
```

```
//error message structure used in ErrorMessage API
typedef struct _SERRORMSG
{
          int                 iError;
          //error id of message
          char      szMsg[80];
          //message to sent to browser
} SERRORMSG;

int                                       versionMS = 3;
                                                  //delirpt version
int                                       versionMM = 0;
int                                       versionLS = 2;
int                                       iReport;
                                                  //delirpt report
to process
int                                       iStartTime;
                                                        //begin
times to accept for report
int                                       iEndTime;
                                                  //end times to
accept for report
int                                       StartDay;
int                                       OverMidnight=0;

FILE                            *fpLog;
                                                  //log file stream

//Local function prototypes
int                 main(int argc, char *argv[]);
static int          Init(void);
static void         Restore(void);
static int          DoReport(void);
int                           AverageResponse(void);
int                           SkippedDelivery(void);
int                           Percentile90th(void);
int                 CheckTimes(PRPTLINE pRptLine);
static int          OpenLogFile(void);
static void         CloseLogFile(void);
static void         ResetLogFile(void);
static BOOL         LogEOF(int iOperation);
static BOOL         ReadReportLine(char *szBuffer, PRPTLINE
pRptLine);
static BOOL         ParseReportLine(char *szLine, PRPTLINE
pRptLine);
static BOOL         ParseDate(char *szDate, DelTime
          *pTime);
static BOOL         ParseTime(char *szTime, DelTime *pTime);
static void         ErrorMessage(int iError);
static BOOL         GetParameters(int argc, char *argv[]);
static void         PrintParameters(void);
static void         cls(void);
static BOOL         IsNumeric(char *ptr);


/* FUNCTION: int main(int argc, char *argv[])
 *
 * PURPOSE:         This function is the beginning execution point
for the delivery executable.
 *
 * ARGUMENTS:       int                argc      number of command
line arguments passed to delivery
 *                                    char      *argv[]   array
of command line argument pointers
 *
 * RETURNS:                   None
 *
 * COMMENTS:        None
 *
 */

int main(int argc, char *argv[])
{
          int       iError;

          if ( GetParameters(argc, argv) )
          {
                    PrintParameters();
                    return -1;
          }

          if ( (iError=Init()) != ERR_SUCCESS )
          {
                    ErrorMessage(iError);
                    Restore();
                    return -1;
          }

          if ( (iError = DoReport()) != ERR_SUCCESS )
                    ErrorMessage(iError);

          Restore();

          return 0;
}

/* FUNCTION: static int Init(void)
 *
 * PURPOSE:         This function initializes the delirtp
application.
```

```
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  None
 *
 * COMMENTS:        None
 *
 */

static int Init(void)
{
          int iError;

          if ( (iError = OpenLogFile()) )
                    return iError;
          return TRUE;
}

/* FUNCTION: static void Restore(void)
 *
 * PURPOSE:         This function cleans up the delirpt application
before termination.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  None
 *
 * COMMENTS:        None
 *
 */

static void Restore(void)
{
          CloseLogFile();
          return;
}

/* FUNCTION: static int DoReport(void)
 *
 * PURPOSE:                  This function dispatches the
requested report.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  ERR_SUCCESS if successfull or error
code if an error occurs.
 *
 * COMMENTS:        None
 *
 */

static int DoReport(void)
{
          int iRc;

          switch(iReport)
          {
                    case 1:
                              iRc = AverageResponse();
                              break;
                    case 2:
                              iRc = Percentile90th();
                              break;
                    case 3:
                              iRc = SkippedDelivery();
                              break;
                    case 4:
                              if ( (iRc = AverageResponse()) !=
ERR_SUCCESS )
                                        break;
                              if ( (iRc = Percentile90th()) !=
ERR_SUCCESS )
                                        break;
                              if ( (iRc = SkippedDelivery()) !=
ERR_SUCCESS )
                                        break;
                              break;
          }
          return iRc;
}

/* FUNCTION: int AverageResponse(void)
 *
 * PURPOSE:                  This function processes the
AverageResponse report.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  ERR_SUCCESS if successfull or error
code if an error occurs.
 *
 * COMMENTS:        None
 *
 */

int AverageResponse(void)
{
          RPTLINE reportLine;
          unsigned long       iTotalResponse;
          unsigned long       iLines;
          double    fAverage;
          char      szDelivery[128];

          ResetLogFile();

          iTotalResponse = 0;
          iLines = 0;
          printf("\n\n******** Average Response Time Report
*******\n");
          while ( !LogEOF(LOGFILE_READ_EOF) )
          {
                    if ( ReadReportLine(szDelivery, &reportLine) )
                              return ERR_READING_LOGFILE;
                    if ( szDelivery[0] == '*' )
                              continue;
                    if ( !LogEOF(LOGFILE_READ_EOF) )
                    {
                              if ( CheckTimes(&reportLine) )
                                        continue;
                              iLines++;
                              iTotalResponse +=
reportLine.response;

                              if ( iLines % 10 == 0 )
                                        printf("Reading Report
Line:\t%d\r", iLines);
                    }
          }
          printf("                                                \r");
          if ( iLines == 0 )
          {
                    printf("No deliveries found.\n");
          }
          else
          {
                    fAverage = (iTotalResponse / iLines)/1000.0;
                    printf("Total Deliveries:       %u\n", iLines);
                    printf("Total Response Times:  %10.3f (sec)\n",
(iTotalResponse/1000.0));
                    printf("Average Response Time: %10.3f (sec)\n",
fAverage);
          }

          return ERR_SUCCESS;
}

/* FUNCTION: int Percentile90th(void)

 *
 * PURPOSE:                  This function processes the 90th
percentile report.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  ERR_SUCCESS if successfull or error
code if an error occurs.
 *
 * COMMENTS:        This function requires enough space to allocate
needed
 *                                   buckets which will be 2 *
max response time in
 *                                   deci-seconds.
 *
 */

int Percentile90th(void)
{
          RPTLINE reportLine;
          int                 iBucketSize;
          int                 i;
          long                iMaxSeconds;
          int                 iTotalBuckets;
          double    iTotal;
          double    i90thPercent;
          short     *psBuckets;
          char      szDelivery[128];

          printf("\n\n******** 90th Percentile *******\n");
          printf("Calculating Max Response Seconds...\n");

          ResetLogFile();

          iMaxSeconds = -1;
          while ( !LogEOF(LOGFILE_READ_EOF) )
          {
                    if ( ReadReportLine(szDelivery, &reportLine) )
                              return ERR_READING_LOGFILE;
                    if ( szDelivery[0] == '*' )
                              continue;
                    if ( !LogEOF(LOGFILE_READ_EOF) )
                    {
                              if ( iMaxSeconds <
reportLine.response )
                                        iMaxSeconds =
reportLine.response;
                    }
          }

          iTotalBuckets = iMaxSeconds + 1;

          printf("Allocating Buckets...\n");
```

```
          iBucketSize = iTotalBuckets * sizeof(short);

          if ( !(psBuckets = (short *)malloc(iBucketSize)) )
                    return ERR_INSUFFICIENT_MEMORY;

/*
          ZeroMemory(psBuckets, iBucketSize);
*/

          iTotal = 0;

          ResetLogFile();
          printf("Calculating Distribution...\n");

          while ( !LogEOF(LOGFILE_READ_EOF) )
          {
                    if ( ReadReportLine(szDelivery, &reportLine) )
                              return ERR_READING_LOGFILE;
                    if ( szDelivery[0] == '*' )
                              continue;
                    if ( !LogEOF(LOGFILE_READ_EOF) )
                    {
                              if ( CheckTimes(&reportLine) )
                                        continue;
                              psBuckets[reportLine.response]++;
                              iTotal++;
                    }
          }

          i90thPercent = iTotal * .9;

          for(i=0, iTotal = 0.0; iTotal < i90thPercent; iTotal +=
(double)psBuckets[i] )
                    i++;

          printf("90th Percentile = %d.%d\n", i/1000, (i % 1000));

          free(psBuckets);

          return ERR_SUCCESS;
}

/* FUNCTION: int SkippedDelivery(void)
 *
 * PURPOSE:                  This function processes the Skipped
Deliveries report.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  ERR_SUCCESS if successfull or error
code if an error occurs.
 *
 * COMMENTS:        None
 *
 */

int SkippedDelivery(void)
{
          RPTLINE reportLine;
          char      szDelivery[128];
          int                 i;
          int                 items[10];

          ResetLogFile();

          printf("\n\n******** Skipped Delivery Report *******\n");
          memset(items, 0, sizeof(items));
          printf("Reading Delivery Log File...");

          while ( !LogEOF(LOGFILE_READ_EOF) )
          {
                    if ( ReadReportLine(szDelivery, &reportLine) )
                              return ERR_READING_LOGFILE;
                    if ( szDelivery[0] == '*' )
                              continue;
                    if ( !LogEOF(LOGFILE_READ_EOF) )
                    {
                              if ( CheckTimes(&reportLine) )
                                        continue;
                              for(i=0; i<10; i++)
                              {
                                        if ( !reportLine.items[i] )
                                                  items[i]++;
                              }
                    }
          }
          printf("\n");
          printf("Skipped delivery table.\n");
          printf("  1    2    3    4    5    6    7    8    9   10
\n");
          printf("---- ---- ---- ---- ---- ---- ---- ---- ---- ----
\n");
          for(i=0; i<10; i++)
                    printf("%4.4d ", items[i]);
          printf("\n");

          return ERR_SUCCESS;
}

/* FUNCTION: BOOL CheckTimes(PRPTLINE pRptLine)
 *
 * PURPOSE:         This function checks to see of the delilog
record falls withing the
 *                           begin and end time from the command
line.
 *
 * ARGUMENTS:       PRPTLINE  pRptLine  delilog processed report
line.
 *
 * RETURNS:                  BOOL      FALSE     if report line is
not within the
 *                           requested start and end times.
 *                                                                TRUE
          if the report line is within the
 *                           requested start and end times.
 *
 * COMMENTS:        If startTime and endTime are both 0 then the
user requested
 *                                     the default behavior which
is all records in delilog are
 *                                     valid.
 */

BOOL CheckTimes(PRPTLINE pRptLine)
{
          int       iRptEndTime;
          int       iRptStartTime;

          iRptStartTime = (pRptLine->start.dtime.tm_hour * 3600000)
+ (pRptLine->start.dtime.tm_min * 60000) + (pRptLine-
>start.dtime.tm_sec * 1000) + pRptLine->start.wMilliseconds;
          iRptEndTime = (pRptLine->end.dtime.tm_hour * 3600000) +
(pRptLine->end.dtime.tm_min * 60000) + (pRptLine->end.dtime.tm_sec
* 1000) + pRptLine->end.wMilliseconds;

          if ( iStartTime == 0 && iEndTime == 0 )
                    return FALSE;

          if ( !OverMidnight ) {
                    if ( iStartTime <= iRptStartTime && iEndTime >=
iRptEndTime )
                              return FALSE;
          }
          else {
                    if ( pRptLine->day == StartDay ) {
                              if ( iStartTime <= iRptStartTime )
                                        return FALSE;
                    }
                    else {
                              if ( iEndTime >= iRptEndTime )
                                        return FALSE;
                    }
          }

          return TRUE;
}

/* FUNCTION: int OpenLogFile(void)
 *
 * PURPOSE:         This function opens the delivery log file for
use.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  int
          ERR_CANNOT_OPEN_RESULTS_FILE  Cannot create results log
file.
 *                                                    ERR_SUCCESS
                                                              Log
file successfully opened
 *
 *
 * COMMENTS:        None
 *
 */

static int OpenLogFile(void)
{
          fpLog = fopen("delilog", "rb");

          if ( !fpLog )
                    return ERR_CANNOT_OPEN_RESULTS_FILE;

          return ERR_SUCCESS;
}

/* FUNCTION: int CloseLogFile(void)
 *
 * PURPOSE:         This function closes the delivery log file.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  None
 *
 * COMMENTS:        None
 *
 */

static void CloseLogFile(void)
{
```

```
          if ( fpLog )
                    fclose(fpLog);

          return;
}


/* FUNCTION: static void ResetLogFile(void)
 *
 * PURPOSE:         This function prepares the delilog. file for
reading
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                   None
 *
 * COMMENTS:        None
 *
 */

static void ResetLogFile(void)
{
          fseek(fpLog, 0L, SEEK_SET);
          LogEOF(LOGFILE_CLEAR_EOF);

          return;
}

/* FUNCTION: static BOOL LogEOF(int iOperation)
 *
 * PURPOSE:         This function tracks and reports the end of
file condition
 *                            on the delilog file.
 *
 * ARGUMENTS:       int iOperation      requested operation this
can be:
 *
                            LOGFILE_READ_EOF    check log file
flag return current state
 *
                            LOGFILE_CLEAR_EOF   clear end of log
file flag
 *
                            LOGFILE_SET_EOF               set
flag end of log file reached
 *
 *
 * RETURNS:                   None
 *
 * COMMENTS:        None
 *
 */

static BOOL LogEOF(int iOperation)
{
          static BOOL bEOF;

          switch(iOperation)
          {
                    case LOGFILE_READ_EOF:
                              return bEOF;
                              break;
                    case LOGFILE_CLEAR_EOF:
                              bEOF = FALSE;
                              break;
                    case LOGFILE_SET_EOF:
                              bEOF = TRUE;
                              break;
          }
          return FALSE;
}

/* FUNCTION: static BOOL ReadReportLine(char *szBuffer, PRPTLINE
pRptLine)
 *
 * PURPOSE:         This function reads a text line from the
delilog file.
 *                            on the delilog file.
 *
 * ARGUMENTS:       char                *szBuffer buffer to placed
read delilog file line into.
 *                                      PRPTLINE  pRptLine
          returned structure containing parsed delilog
 *
                                        report line.
 *
 * RETURNS:                   FALSE     if successfull or TRUE if
an error occurs.
 *
 * COMMENTS:        None
 *
 */

static BOOL ReadReportLine(char *szBuffer, PRPTLINE pRptLine)
{
          int i = 0;
          int ch;
          int iEof;

          while( i < 128 )
          {
                    ch = fgetc(fpLog);
                    if ( iEof = feof(fpLog) )
                              break;
                    if ( ch == '\r' )
                    {
                              if ( i )
                                        break;
                              continue;
                    }
                    if ( ch == '\n' )
                    {
                              continue;
                    }
                    szBuffer[i++] = ch;

          }

          //delivery item format is to long cannot be a valid
delivery item
          if ( i >= 128 )
                    return TRUE;

          szBuffer[i] = 0;
          if ( iEof )
          {
                    LogEOF(LOGFILE_SET_EOF);
                    if ( i == 0 )
                              return FALSE;
          }
          if ( szBuffer[0] == '*' )
          {
                    //error line ignore
                    return FALSE;
          }
          return ParseReportLine(szBuffer, pRptLine);
}

/* FUNCTION: static BOOL ParseReportLine(char *szLine, PRPTLINE
pRptLine)
 *
 * PURPOSE:         This function reads a text line from the
delilog file.
 *                            on the delilog file.
 *
 * ARGUMENTS:       char                *szLine             buffer
containing the delilog file line to be parsed.
 *                                      PRPTLINE  pRptLine
          returned structure containing parsed delilog

 *
                                        report line values.
 *
 * RETURNS:                   FALSE     if successfull or TRUE if
an error occurs.
 *
 * COMMENTS:        None
 *
 */

static BOOL ParseReportLine(char *szLine, PRPTLINE pRptLine)
{
          int i;

          if ( ParseDate(szLine, (DelTime *) &pRptLine->start) )
                    return TRUE;

          pRptLine->end.dtime.tm_year = pRptLine-
>start.dtime.tm_year;
          pRptLine->end.dtime.tm_mon = pRptLine-
>start.dtime.tm_mon;
          pRptLine->end.dtime.tm_mday = pRptLine-
>start.dtime.tm_mday;

          pRptLine->day=(pRptLine->start.dtime.tm_mon*100) +
pRptLine->start.dtime.tm_mday;
          if (StartDay == 0) {
                    StartDay=pRptLine->day;
                    printf("Setting Start Day to %d\n", StartDay);
          }

          if ( !(szLine = strchr(szLine, ',')) )
                    return TRUE;
          szLine++;

          if ( ParseTime(szLine, (DelTime *) &pRptLine->start) )
                    return TRUE;

          if ( !(szLine = strchr(szLine, ',')) )
                    return TRUE;
          szLine++;

          if ( ParseTime(szLine, (DelTime *) &pRptLine->end) )
                    return TRUE;

          if ( !(szLine = strchr(szLine, ',')) )
                    return TRUE;
          szLine++;

          if ( !IsNumeric(szLine) )
                    return TRUE;
          pRptLine->response = atoi(szLine);
```

```
        if ( !(szLine = strchr(szLine, ',')) )
                return TRUE;
        szLine++;

        if ( !IsNumeric(szLine) )
                return TRUE;
        pRptLine->w_id = atoi(szLine);

        if ( !(szLine = strchr(szLine, ',')) )
                return TRUE;
        szLine++;

        if ( !IsNumeric(szLine) )
                return TRUE;
        pRptLine->o_carrier_id = atoi(szLine);

        if ( !(szLine = strchr(szLine, ',')) )
                return TRUE;
        szLine++;

        for(i=0; i<10; i++)
        {
                if ( !IsNumeric(szLine) )
                        return TRUE;
                pRptLine->items[i] = atoi(szLine);

                if ( i<9 && !(szLine = strchr(szLine, ',')) )
                        return TRUE;
                szLine++;
        }

        return FALSE;
}

/* FUNCTION: static BOOL ParseDate(char *szDate, DelTime *pTime)
 *
 * PURPOSE:         This function validates and extracts a date
string in the format
 *                          yy/mm/dd into an DelTime structure.
 *
 * ARGUMENTS:       char                        *szDate
        buffer containing the date to be parsed.
 *                                              DelTime *pTime
        system time structure where date will be placed.
 *
 * RETURNS:                 FALSE if successfull or TRUE if an
error occurs.
 *
 * COMMENTS:        None
 *
 */

static BOOL ParseDate(char *szDate, DelTime *pTime)
{
        if ( !isdigit(*szDate) || !isdigit(*(szDate+1)) ||
!isdigit(*(szDate+2)) || !isdigit(*(szDate+3)) || *(szDate+4) !=
'/' ||
             !isdigit(*(szDate+5)) || !isdigit(*(szDate+6))
|| *(szDate+7) != '/' ||
             !isdigit(*(szDate+8)) || !isdigit(*(szDate+9))
)
             return TRUE;

        pTime->dtime.tm_year = atoi(szDate);

        pTime->dtime.tm_mon= atoi(szDate+5);

        pTime->dtime.tm_mday = atoi(szDate+8);

        if ( pTime->dtime.tm_mon > 12 || pTime->dtime.tm_mon < 0
|| pTime->dtime.tm_mday > 31 || pTime->dtime.tm_mday < 0 )
                return TRUE;

        return FALSE;
}

/* FUNCTION: static BOOL ParseTime(char *szTime, DelTime *pTime)
 *
 * PURPOSE:         This function validates and extracts a time
string in the format
 *                          hh:mm:ss:mmm into an DelTime
structure.
 *
 * ARGUMENTS:       char                        *szTime
        buffer containing the time to be parsed.
 *                                      DelTime *pTime
        system time structure where date will be placed.
 *
 * RETURNS:                 FALSE if successfull or TRUE if an
error occurs.
 *
 * COMMENTS:        None
 *
 */

static BOOL ParseTime(char *szTime, DelTime *pTime)
{
        if ( !isdigit(*szTime) || !isdigit(*(szTime+1)) ||
*(szTime+2) != ':' ||
             !isdigit(*(szTime+3)) || !isdigit(*(szTime+4))
|| *(szTime+5) != ':' ||
             !isdigit(*(szTime+6)) || !isdigit(*(szTime+7))
|| *(szTime+8) != ':' ||
             !isdigit(*(szTime+9)) ||
!isdigit(*(szTime+10)) || !isdigit(*(szTime+11)) )
              return TRUE;

        pTime->dtime.tm_hour = atoi(szTime);
        pTime->dtime.tm_min = atoi(szTime+3);
        pTime->dtime.tm_sec = atoi(szTime+6);
        pTime->wMilliseconds = atoi(szTime+9);

        if ( pTime->dtime.tm_hour > 23 || pTime->dtime.tm_hour <
0 ||
             pTime->dtime.tm_min > 59 || pTime->dtime.tm_min
< 0 ||
             pTime->dtime.tm_sec > 59 || pTime->dtime.tm_sec
< 0 ||
             pTime->wMilliseconds < 0 )
             return TRUE;

        if ( pTime->wMilliseconds > 999 )
        {
             pTime->dtime.tm_sec += (pTime-
>wMilliseconds/1000);
             pTime->wMilliseconds = pTime->wMilliseconds  %
1000;
        }

        return FALSE;
}

/* FUNCTION: void ErrorMessage(int iError)
 *
 * PURPOSE:         This function displays an error message in the
delivery executable's console window.
 *
 * ARGUMENTS:       int                 iError    error id to be
displayed
 *
 * RETURNS:                 None
 *
 * COMMENTS:        None
 *
 */

static void ErrorMessage(int iError)
{
        int i;

        static SERRORMSG errorMsgs[] =
        {
             {       ERR_SUCCESS,
                                                 "Success, no
error."
                                                 },
             {       ERR_CANNOT_OPEN_RESULTS_FILE,
             "Cannot open delivery results file delilog."
                                                 },
             {       ERR_READING_LOGFILE,
                                 "Reading delivery log file,
Delivery item format incorrect."        },
             {       ERR_INSUFFICIENT_MEMORY,
             "insufficient memory to process 90th
percentile report."         },
             {       0,

        ""

                                                 }
        };

        for(i=0; errorMsgs[i].szMsg[0]; i++)
        {
             if ( iError == errorMsgs[i].iError )
             {
                       printf("\nError(%d): %s\n", iError,
errorMsgs[i].szMsg);
                       return;
             }
        }
        printf("Error(%d): %s", errorMsgs[0].szMsg);
        return;
}

/* FUNCTION: BOOL GetParameters(int argc, char *argv[])
 *
 * PURPOSE:         This function parses the command line passed in
to the delivery executable, initializing
 *                          and filling in global variable
parameters.
 *
 * ARGUMENTS:       int                 argc      number of command
line arguments passed to delivery
 *                                      char      *argv[]   array
of command line argument pointers
 *
 * RETURNS:                 BOOL      FALSE     parameter read
successfull
```

```
 *                                                              TRUE
          user has requested parameter information screen be
displayed.
 *
 * COMMENTS:        None
 *
 */

static BOOL GetParameters(int argc, char *argv[])
{
          int                           i;
          DelTime   startTime;
          DelTime   endTime;

          iStartTime = 0;
          iEndTime = 0;
          iReport = 4;

          for(i=0; i<argc; i++)
          {
                    if ( argv[i][0] == '-' || argv[i][0] == '/' )
                    {
                              switch(argv[i][1])
                              {
                                        case 'S':
                                        case 's':
                                                  if (
ParseTime(argv[i]+2, &startTime) )
                                                            return
TRUE;
                                                  iStartTime =
(startTime.dtime.tm_hour * 3600000) + (startTime.dtime.tm_min *
60000) + (startTime.dtime.tm_sec * 1000) + startTime.wMilliseconds;
                                                  break;
                                        case 'E':
                                        case 'e':
                                                  if (
ParseTime(argv[i]+2, &endTime) )
                                                            return
TRUE;
                                                  iEndTime =
(endTime.dtime.tm_hour * 3600000) + (endTime.dtime.tm_min * 60000)
+ (endTime.dtime.tm_sec * 1000) + endTime.wMilliseconds;
                                                  if (iStartTime >
iEndTime)

          OverMidnight=1;
                                                  break;
                                        case 'R':
                                        case 'r':
                                                  iReport =
atoi(argv[i]+2);
                                                  if ( iReport > 4
|| iReport < 1 )
                                                            iReport
= 4;
                                                  break;
                                        case '?':
                                                  return TRUE;
                              }
                    }
          }
          return FALSE;
}

/* FUNCTION: void PrintParameters(void)
 *
 * PURPOSE:         This function displays the supported command
line flags.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  None
 *
 * COMMENTS:        None
 *
 */

static void PrintParameters(void)
{
          printf("DELIRPT:\n\n");
          printf("Parameter
Default\n");
          printf("-----------------------------------------------
---------------------\n");
          printf("-S Start Time HH:MM:SS:MMM
All    \n");
          printf("-E End Time HH:MM:SS:MMM
All    \n");
          printf("-R 1)Average Response, 2)90th 3) Skipped 4) All
All    \n");
          printf("-? This help screen\n\n");
          printf("Note:  Command line switches are NOT case
sensitive.\n");

          return;
}


/* FUNCTION: void cls(void)
 *
 * PURPOSE:         This function clears the console window
 *
 * ARGUMENTS:       None
 *
 * RETURNS:                  None
 *
 * COMMENTS:        None
 *
 */

static void cls(void)
{
          system("clear");

          return;
}

/* FUNCTION: BOOL IsNumeric(char *ptr)
 *
 * PURPOSE:         This function determines if a string is
numeric. It fails if any characters other
 *                           than numeric and null terminator are
present.
 *
 * ARGUMENTS:       char                          *ptr      pointer
to string to check.
 *
 * RETURNS:                  BOOL      FALSE     if string is not
all numeric
 *                                                               TRUE
          if string contains only numeric characters i.e. '0' - '9'
 *
 * COMMENTS:        A comma is counted as a valid delimiter.
 *
 */

static BOOL IsNumeric(char *ptr)
{
          if ( *ptr == 0 )
                    return FALSE;

          while( *ptr && isdigit(*ptr) )
                    ptr++;
          if ( !*ptr || *ptr == ',' )
                    return TRUE;
          else
                    return FALSE;
}


**************************
logfile_mod.c
**************************

/*+*************************************************************
**********

 *
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*********************************************************************
*********/


/*+
 * Abstract: This file contains the Digital created front end
functions
 *                  for the tpcc benchmark.
 *
 * Author: W Carr
 * Creation Date: October 1997
 *
 *
 * Modification history:
 *
 *
 *      08/01/2002      Andrew Bond, HP
 *                      - Conversion to run under Linux and Apache
 *
*/


#include <stdio.h>
#include <stdarg.h>
#include <time.h>
#include <sys/time.h>
#include <errno.h>
#include <unistd.h>


#include "apr_thread_mutex.h"


#include <oci.h>
#include <ocidfn.h>
#include <ociapr.h>


#include <tpccerr.h>
#include <tpccstruct.h>
#include <oracle_db8.h>
#include <tpccapi.h>


#include <tpcc.h>


static FILE         *LogFile;
static char                   t1[1];
static apr_thread_mutex_t *   ErrCriticalSection;
static apr_thread_mutex_t *   LogCriticalSection;



/* FUNCTION: void TPCCOpenLog( void )
 *
 * PURPOSE:         This function opens the log file.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:         None
 *
 * COMMENTS:        None
 *
 */
BOOL
TPCCOpenLog( apr_pool_t *pool )
{
  char                        szFile[FILENAMESIZE];

  apr_thread_mutex_create(&LogCriticalSection, 0, pool);

  strcpy( szFile, szTpccLogPath );
  strcat( szFile, "tpcclog" );

  if (LogFile = fopen( szFile, "a")) {
    apr_thread_mutex_create(&ErrCriticalSection, 0, pool);
    return TRUE;
  }
  else
  {
    return FALSE;
  }
}



/* FUNCTION: void TPCCCloseLog( void )
 *
 * PURPOSE:         This function closes the log file.
 *
 * ARGUMENTS:       None
 *
 * RETURNS:         None
 *
 * COMMENTS:        None
 *
 */
BOOL
TPCCCloseLog( void )
```

```
{
  fclose( LogFile );

  return TRUE;
}

/* FUNCTION: void TPCCLog( char *szType, char *szStr )
 *
 * PURPOSE:         This function reports the date, time, operation
and
 *                  string to the log file.
 *
 * ARGUMENTS:       char    *szType     String containing the
operation type
 *                                      i.e. Query or Response.
 *                  char      *szStr    String associated with the
operation.
 *
 * RETURNS:         None
 *
 * COMMENTS:        None
 *
 */
void
TPCCLog( char *fmt, ... )
{
  va_list           marker;
  char                      szArg[4096];
  struct timezone       tz;
  struct timeval        tv;
  struct tm             systemTime;
  struct tm             *pst;
  int                   len, ret;

  va_start( marker, fmt );
  vsprintf( szArg, fmt, marker );
  va_end( marker );

  pst=&systemTime;
  ret=gettimeofday(&tv, &tz);

  apr_thread_mutex_lock( LogCriticalSection );

  pst=localtime(&tv.tv_sec);

  len = fprintf( stderr,
                    "[%ld] %2.2d/%2.2d/%2.2d
%2.2d:%2.2d:%2.2d\t%s\r\n",
                    getpid(),
                    1900+pst->tm_year, pst->tm_mon+1, pst-
>tm_mday,
                    pst->tm_hour, pst->tm_min, pst->tm_sec,
                    szArg );
  apr_thread_mutex_unlock( LogCriticalSection );
}

void
TPCCErrInternal( char *szTmp, int len )
{
  int                       dwWriteLen;
  FILE                      *ErrFile;
  char                      szFile[FILENAMESIZE];

  apr_thread_mutex_lock( ErrCriticalSection );

  strcpy( szFile, szTpccLogPath );
  strcat( szFile, "tpccerr" );

  ErrFile = fopen( szFile, "a");

  if (ErrFile) {
    len = fprintf( ErrFile, "%s\n", szTmp);
    fclose( ErrFile );
  }

  apr_thread_mutex_unlock( ErrCriticalSection );
}


void
TPCCErr( char *fmt, ...)
{
  va_list           marker;
  char                      szTmp[4096];
  char                      szArg[4096];
  struct timezone   tz;
  struct timeval    tv;
  struct tm                 systemTime;
  struct tm                 *pst;
  int                       len, ret;

  va_start( marker, fmt );
  vsprintf( szArg, fmt, marker );
  va_end( marker );

  pst=&systemTime;
  ret=gettimeofday(&tv, &tz);
  pst=localtime(&tv.tv_sec);

  len = sprintf( szTmp,
                    "%2.2d/%2.2d/%2.2d %2.2d:%2.2d:%2.2d\t%s\r\n",
                    1900+pst->tm_year, pst->tm_mon+1, pst-
>tm_mday,
                    pst->tm_hour, pst->tm_min, pst->tm_sec,
```

```
                    szArg );


  TPCCErrInternal( szTmp, len );
}



void
TPCCTransactionErr( pConnData pConn, char *fmt, ...)
{
  va_list           marker;
  char                      szTmp[4096];
  char                      szArg[4096];
  struct timezone       tz;
  struct timeval        tv;
  struct tm             systemTime;
  struct tm             *pst;
  int                   len, ret;


  va_start( marker, fmt );
  vsprintf( szArg, fmt, marker );
  va_end( marker );


  pst=&systemTime;
  ret=gettimeofday(&tv, &tz);
  pst=localtime(&tv.tv_sec);
  len = sprintf( szTmp,
                    "%2.2d/%2.2d/%2.2d
%2.2d:%2.2d:%2.2d\tTransaction error. w_id: %d, ld_id: %d, pCC: %x,
status: %d, dbstatus: %d, %s\r\n",
                    1900+pst->tm_year, pst->tm_mon+1, pst-
>tm_mday,
                    pst->tm_hour, pst->tm_min, pst->tm_sec,
                    pConn->w_id, pConn->ld_id, pConn->pCC,
                    pConn->status, pConn->dbstatus,
                    szArg );


  TPCCErrInternal( szTmp, len );
}


**************************
logfile_tux.c
**************************

/*+*****************************************************************
**********
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*****************************************************************
*********/


/*+
 * Abstract: This file contains the Digital created front end
functions
 *                  for the tpcc benchmark.
 *
 * Author: W Carr
 * Creation Date: October 1997
 *
 *
 * Modification history:
 *
 *
 *      08/01/2002      Andrew Bond, HP
 *                      - Conversion to run under Linux and Apache
 *
*/


#include <stdio.h>
#include <stdarg.h>
#include <time.h>
#include <sys/time.h>


#include <tpccstruct.h>


static FILE         *LogFile;
```

```
void
TPCCErr( char *fmt, ...)
{
  va_list           marker;
  char                        szTmp[4096];
  char                        szArg[4096];
  struct timezone   tz;
  struct timeval    tv;
  struct tm                   systemTime;
  struct tm                   *pst;
  int                         len, ret;

  va_start( marker, fmt );
  vsprintf( szArg, fmt, marker );
  va_end( marker );

  pst=&systemTime;
  ret=gettimeofday(&tv, &tz);
  pst=localtime(&tv.tv_sec);

  len = userlog( "%2.2d/%2.2d/%2.2d %2.2d:%2.2d:%2.2d\t%s\r\n",
                     1900+pst->tm_year, pst->tm_mon+1, pst-
>tm_mday,
                     pst->tm_hour, pst->tm_min, pst->tm_sec,
                     szArg );

  if (len < 0)
          printf("TPCCErr: Error writing to Tuxedo userlog\n");

}


**************************
mod_tpcc.c
**************************

/*+*************************************************************
**********

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*
 *
*
 *
*

**********************************************************************
*********/


/*+
 * Abstract: This file contains the Digital created front end
functions
 *                  for the tpcc benchmark.
 *
 * Author: A Bradley & W Carr
 * Creation Date: May 1997
 *
 *
 * Modification history:
 *
 *
 *      08/01/2002      Andrew Bond, HP
 *                      - Conversion to run under Linux and Apache
 *                            - Additions by Joe Orton to support
Apache 2.0
*/
#include "httpd.h"
#include "http_config.h"
#include "http_protocol.h"
#include "ap_config.h"
#include "ap_mpm.h"
#include "apr_thread_mutex.h"

#include <stdio.h>
#include <stdarg.h>
#include <malloc.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>

#include <oci.h>
#include <ocidfn.h>
#include <ociapr.h>
```

```
#define MOD_TPCC_C

#include <tpccerr.h>

#include <tpccstruct.h>

#include <oracle_db8.h>

#include <tpccapi.h>


#include <tpcc.h>

#include <mod_tpcc.h>


#ifdef FFE_DEBUG

# include <crtdbg.h>

static int tmpDbgFlag;

static _HFILE hMemFile;

#endif


int tpcc_handler(request_rec *req);

static int tpcc_post_config(apr_pool_t *p, apr_pool_t *plog,
apr_pool_t *ptemp, server_rec *s);

static void tpcc_child_init(apr_pool_t *p, server_rec *s);

static apr_status_t tpcc_child_exit(void *data);


#define FORMMAXSIZE 4096


#define MYFILE  "/etc/httpd/logs/tpcc.log"

#define BOGUS "Bogus File!"

#define GOOD "Good File!"


int     LogFD;

int       myerrno;

int       max_threads;


static void tpcc_register_hooks(apr_pool_t *p)

{

  fprintf(stderr, "register()");


    ap_hook_handler(tpcc_handler, NULL, NULL, APR_HOOK_MIDDLE);

    ap_hook_post_config(tpcc_post_config, NULL, NULL,
APR_HOOK_MIDDLE);

/*

    ap_hook_child_init(tpcc_child_init, NULL, NULL,
APR_HOOK_MIDDLE);

*/

}


/* Dispatch list for API hooks */

module AP_MODULE_DECLARE_DATA tpcc_module = {

    STANDARD20_MODULE_STUFF,

    NULL,                  /* create per-dir    config structures
*/

    NULL,                  /* merge  per-dir    config structures
*/

    NULL,                  /* create per-server config structures
*/

    NULL,                  /* merge  per-server config structures
*/

    NULL,                  /* table of config file commands
*/

    tpcc_register_hooks  /* register hooks                      */

};


#define MAX(a,b) ((a)>(b)?(a):(b))


#define PUT_STRING(szString, iLen, pStart, pStruct) \

pStruct.szStr=szString; pStruct.iIndex=pStart;
pStruct.iFieldSize=iLen;


#define CONVERT_SPECIAL(pout,pin,iwid)\

{\

  char *out = pout;\

  char *in = pin;\

  int wid = iwid;\

  while( wid && '\0' != *in )\

  {\

    if( '>' == *in )\

    {*out++='&'; *out++='g'; *out++='t'; *out++=';';}\

    else if( '<' == *in )\

    {*out++='&'; *out++='l'; *out++='t'; *out++=';';}\

    else if( '&' == *in )\

    {*out++='&'; *out++='a'; *out++='m'; *out++='p'; *out++=';';}\

    else if( '\"' == *in )\

    {*out++='&'; *out++='q'; *out++='u'; *out++='o'; *out++='t';
*out++=';';}\

    else\

    {*out++=*in;}\

    in++;\

    wid--;\

  }\

  while( wid-- ) *out++ = ' ';\

}


/* define indexes for the building of the forms */

/* defines for new order */

#define NO_WDID 0

#define NO_WID NO_WDID + 1

#define NO_DID NO_WID + 1

#define NO_DATE NO_DID + 1

#define NO_CID NO_DATE + 1

#define NO_LAST NO_CID + 1

#define NO_CREDIT NO_LAST + 1

#define NO_DISC NO_CREDIT + 1

#define NO_OID NO_DISC + 1

#define NO_LINES NO_OID + 1

#define NO_W_TAX NO_LINES + 1

#define NO_D_TAX NO_W_TAX + 1

#define NO_S_WID NO_D_TAX + 1
```

```
#define NO_IID NO_S_WID + 1
#define NO_INAME NO_IID + 1
#define NO_QTY NO_INAME + 1
#define NO_STOCK NO_QTY + 1
#define NO_BG NO_STOCK + 1
#define NO_PRICE NO_BG + 1
#define NO_AMT NO_PRICE + 1
#define NO_STAT NO_AMT + (14*8) + 1
#define NO_TOTAL NO_STAT + 1

/* defines for payment input form */
#define PT_WDID_INPUT 0
#define PT_WID_INPUT PT_WDID_INPUT + 1

/* defines for payment output form */
#define PT_WDID 0
#define PT_LONG_DATE PT_WDID + 1
#define PT_WID PT_LONG_DATE + 1
#define PT_DID PT_WID + 1
#define PT_W_ST_1 PT_DID + 1
#define PT_D_ST_1 PT_W_ST_1 + 1
#define PT_W_ST_2 PT_D_ST_1 + 1
#define PT_D_ST_2 PT_W_ST_2 + 1
#define PT_W_CITY PT_D_ST_2 + 1
#define PT_W_ST PT_W_CITY + 1
#define PT_W_ZIP PT_W_ST + 1
#define PT_D_CITY PT_W_ZIP + 1
#define PT_D_ST PT_D_CITY + 1
#define PT_D_ZIP PT_D_ST + 1
#define PT_CID PT_D_ZIP + 1
#define PT_C_WID PT_CID + 1
#define PT_C_DID PT_C_WID + 1
#define PT_FIRST PT_C_DID + 1
#define PT_MIDDLE PT_FIRST + 1
#define PT_LAST PT_MIDDLE + 1
#define PT_SM_DATE PT_LAST + 1
#define PT_C_STR_1 PT_SM_DATE + 1
#define PT_CREDIT PT_C_STR_1 + 1
#define PT_D_STR_2 PT_CREDIT + 1
#define PT_DISC PT_D_STR_2 + 1
#define PT_C_CITY PT_DISC + 1
#define PT_C_ST PT_C_CITY + 1
#define PT_C_ZIP PT_C_ST + 1
#define PT_C_PHONE PT_C_ZIP + 1
#define PT_AMT PT_C_PHONE + 1
#define PT_BAL PT_AMT + 1
#define PT_LIM PT_BAL + 1
#define PT_CUST_DATA PT_LIM + 1

/* defines for order status */
#define OS_WDID 0
#define OS_WID OS_WDID + 1
#define OS_DID OS_WID + 1
#define OS_CID OS_DID + 1
#define OS_FIRST OS_CID + 1
#define OS_MIDDLE OS_FIRST + 1
#define OS_LAST OS_MIDDLE + 1
#define OS_BAL OS_LAST + 1
#define OS_OID OS_BAL + 1
#define OS_DATE OS_OID + 1
#define OS_CAR_ID OS_DATE + 1
#define OS_S_WID OS_CAR_ID + 1
#define OS_IID OS_S_WID + 1
#define OS_QTY OS_IID + 1
#define OS_AMT OS_QTY + 1
#define OS_SM_DATE OS_AMT + 1
/* defines for delivery form */
#define D_WDID 0
#define D_WID D_WDID + 1
#define D_CAR D_WID + 1
#define D_QUEUE1 D_CAR + 1
#define D_DELTA1 D_QUEUE1 + 1
#define D_WID1 D_DELTA1 + 1
#define D_CAR1 D_WID1 + 1
#define D_OID10 D_CAR1 + 1
#define D_OID11 D_OID10 + 1
#define D_OID12 D_OID11 + 1
#define D_OID13 D_OID12 + 1
#define D_OID14 D_OID13 + 1
#define D_OID15 D_OID14 + 1
#define D_OID16 D_OID15 + 1
#define D_OID17 D_OID16 + 1
#define D_OID18 D_OID17 + 1
#define D_OID19 D_OID18 + 1
#define D_QUEUE2 D_OID19 + 1
#define D_DELTA2 D_QUEUE2 + 1
#define D_WID2 D_DELTA2 + 1
#define D_CAR2 D_WID2 + 1
#define D_OID20 D_CAR2 + 1
#define D_OID21 D_OID20 + 1
#define D_OID22 D_OID21 + 1
#define D_OID23 D_OID22 + 1
#define D_OID24 D_OID23 + 1
#define D_OID25 D_OID24 + 1
#define D_OID26 D_OID25 + 1
#define D_OID27 D_OID26 + 1
#define D_OID28 D_OID27 + 1
#define D_OID29 D_OID28 + 1

/* defines for stock level form */
```

```
#define SL_WDID 0
#define SL_WID SL_WDID + 1
#define SL_DID SL_WID + 1
#define SL_TH SL_DID + 1
#define SL_LOW SL_TH + 1


#define WDID(w_id,d_id) (w_id*10+(d_id-1))


#define PANIC_FORM_SIZE 4096


#define NUMBER_POOL_FORM_TYPES 5
#define DELIVERY_FORM 0
#define NEW_ORDER_FORM 1
#define ORDER_STATUS_FORM 2
#define PAYMENT_FORM 3
#define STOCK_LEVEL_FORM 4


#define NUMBER_POOL_RESPONSE_TYPES 5
#define DELIVERY_RESPONSE 0
#define NEW_ORDER_RESPONSE 1
#define ORDER_STATUS_RESPONSE 2
#define PAYMENT_RESPONSE 3
#define STOCK_LEVEL_RESPONSE 4


#ifdef FFE_DEBUG
# define FFE_ASSERT(arg) _ASSERT(arg)
#else
# define FFE_ASSERT(arg)
#endif


#define RESERVE_FORM(type,szForm)\
  {\
    apr_thread_mutex_lock( gpForms->critSec[type] );\
    FFE_ASSERT( gpForms->iNextFreeForm[type] <= gpForms-
>iMaxIndex[type] );\
    szForm = gpForms->index[gpForms->iFirstFormIndex[type] +\
                                gpForms->iNextFreeForm[type]++];\
    apr_thread_mutex_unlock( gpForms->critSec[type] );\
  }
#define UNRESERVE_FORM(type,szForm)\
  {\
    apr_thread_mutex_lock( gpForms->critSec[type] );\
    FFE_ASSERT( gpForms->iNextFreeForm[type] > 0 );\
    gpForms->index[gpForms->iFirstFormIndex[type] +\
                     --gpForms->iNextFreeForm[type]] = szForm;\
    apr_thread_mutex_unlock( gpForms->critSec[type] );\
  }


#define RESERVE_RESPONSE(type,szResponse)\
  {\
    apr_thread_mutex_lock( gpResponses->critSec[type] );\
    FFE_ASSERT(gpResponses->iNextFreeResponse[type]<=gpResponses-
>iMaxIndex[type]);\
    szResponse = gpResponses->index[gpResponses-
>iFirstResponseIndex[type] +\
                                    gpResponses-
>iNextFreeResponse[type]++];\
    apr_thread_mutex_unlock( gpResponses->critSec[type] );\
  }
#define UNRESERVE_RESPONSE(type,szResponse)\
  {\
    apr_thread_mutex_lock( gpResponses->critSec[type] );\
    FFE_ASSERT(gpResponses->iNextFreeResponse[type] > 0 );\
    gpResponses->index[gpResponses->iFirstResponseIndex[type] +\
                       --gpResponses->iNextFreeResponse[type]] =
szResponse;\
    apr_thread_mutex_unlock( gpResponses->critSec[type] );\
  }


#define RESERVE_PANIC_FORM(szForm)\
  {\
    apr_thread_mutex_lock( gpPanicForms->critSec );\
    FFE_ASSERT( gpPanicForms->iNextFree <= gpPanicForms->iMaxIndex
);\
    szForm = gpPanicForms->index[gpPanicForms->iNextFree++];\
    apr_thread_mutex_unlock( gpPanicForms->critSec );\
  }


#define UNRESERVE_PANIC_FORM(szForm)\
  {\
    apr_thread_mutex_lock( gpPanicForms->critSec );\
    FFE_ASSERT( gpPanicForms->iNextFree > 0 );\
    gpPanicForms->index[--gpPanicForms->iNextFree] = szForm;\
    apr_thread_mutex_unlock( gpPanicForms->critSec );\
  }


#if 0
CMD                 0
FORM ID             3
LOGIN WAREHOUSE     4
LOGIN DISTRICT      5
DELI QUEUE TIME     6
CARRIER ID          7
DISTRICT  8
CUSTOMER  9
NEWORDER FIELDS A-X,a-u
CUST LAST NAME      Y
CUST WAREHOUSE      Z
CUST DISTRICT       v
AMOUNT PAID         w
THRESHOLD x
#endif


#define MENU_BAR \
```

```
"<HR>"\
"<INPUT TYPE=submit NAME=0 VALUE=NewOrder>"\
"<INPUT TYPE=submit NAME=0 VALUE=Payment>"\
"<INPUT TYPE=submit NAME=0 VALUE=Delivery>"\
"<INPUT TYPE=submit NAME=0 VALUE=OrderStatus>"\
"<INPUT TYPE=submit NAME=0 VALUE=StockLevel>"\
"<INPUT TYPE=submit NAME=0 VALUE=Exit>"

static char         szFormTemplate[] =
"<BODY><FORM ACTION=%s METHOD=GET>";

static char         szWelcomeFormTemplate[] =
"<BODY><FORM ACTION=/%s METHOD=GET>"
"<INPUT TYPE=hidden NAME=3 VALUE=W00>"
"Please Identify your Warehouse and District for this session.<BR>"
"Warehouse ID <INPUT NAME=4 SIZE=5><BR>"
"District ID <INPUT NAME=5 SIZE=2><BR>"
"<HR>"
"<INPUT TYPE=submit NAME=0 VALUE=Submit>"
"</FORM></BODY>";

static char
szWelcomeForm[sizeof(szWelcomeFormTemplate)+FILENAMESIZE];
static int  iWelcomeFormLen;

static char         szMainMenuFormTemplate[] =
"<BODY><FORM ACTION=%s METHOD=GET>"
"<INPUT TYPE=hidden NAME=3 VALUE=M%06d>"
"%55.55s<BR>"
"Select Desired Transaction.<BR>"
MENU_BAR
"</FORM></BODY>";

static char szDeliveryFormTemp2i[] =
"<INPUT TYPE=hidden NAME=3 VALUE=D######>"
"<INPUT TYPE=hidden NAME=6 VALUE=0>"
"<PRE>                                  Delivery<BR>"
"Warehouse: #####<BR><BR>"
"Carrier Number: <INPUT NAME=7 SIZE=1><BR><BR>"
"Execution Status:<BR></PRE>"
"<HR><INPUT TYPE=submit NAME=0 VALUE=Process>"
"<INPUT TYPE=submit NAME=0 VALUE=Menu>"
"</FORM></BODY>";

static char szDeliveryFormTemp2p[] =
"<INPUT TYPE=hidden NAME=3 VALUE=d######>"
"<PRE>                                  Delivery<BR>"
"Warehouse: #####<BR><BR>"
"Carrier Number: ##<BR><BR>"
"Execution Status: Delivery has been queued.<BR>"
"</PRE>"
MENU_BAR
"</FORM></BODY>";

static char szNewOrderFormTemp2i[] =
"<INPUT TYPE=hidden NAME=3 VALUE=N######>"
"<PRE>                                  New Order<BR>"
"Warehouse: #####"
"  District: <INPUT NAME=8 SIZE=2>
Date:<BR>"
"Customer:  <INPUT NAME=9 SIZE=4>   "
"Name:                    Credit:      %Disc:<BR>"
"Order Number:           Number of Lines:           "
"W_tax:         D_tax:<BR><BR>"
" Supp_W  Item_Id  Item Name                Qty  Stock  B/G  "
"Price    Amount<BR>"
" <INPUT NAME=A SIZE=5>  <INPUT NAME=B SIZE=6>"
"                            <INPUT NAME=C SIZE=1><BR>"
" <INPUT NAME=D SIZE=5>  <INPUT NAME=E SIZE=6>"
"                            <INPUT NAME=F SIZE=1><BR>"
" <INPUT NAME=G SIZE=5>  <INPUT NAME=H SIZE=6>"
"                            <INPUT NAME=I SIZE=1><BR>"
" <INPUT NAME=J SIZE=5>  <INPUT NAME=K SIZE=6>"
"                            <INPUT NAME=L SIZE=1><BR>"
" <INPUT NAME=M SIZE=5>  <INPUT NAME=N SIZE=6>"
"                            <INPUT NAME=O SIZE=1><BR>"
" <INPUT NAME=P SIZE=5>  <INPUT NAME=Q SIZE=6>"
"                            <INPUT NAME=R SIZE=1><BR>"
" <INPUT NAME=S SIZE=5>  <INPUT NAME=T SIZE=6>"
"                            <INPUT NAME=U SIZE=1><BR>"
" <INPUT NAME=V SIZE=5>  <INPUT NAME=W SIZE=6>"
"                            <INPUT NAME=X SIZE=1><BR>"
" <INPUT NAME=a SIZE=5>  <INPUT NAME=b SIZE=6>"
"                            <INPUT NAME=c SIZE=1><BR>"
" <INPUT NAME=d SIZE=5>  <INPUT NAME=e SIZE=6>"
"                            <INPUT NAME=f SIZE=1><BR>"
" <INPUT NAME=g SIZE=5>  <INPUT NAME=h SIZE=6>"
"                            <INPUT NAME=i SIZE=1><BR>"
" <INPUT NAME=j SIZE=5>  <INPUT NAME=k SIZE=6>"
"                            <INPUT NAME=l SIZE=1><BR>"
" <INPUT NAME=m SIZE=5>  <INPUT NAME=n SIZE=6>"
"                            <INPUT NAME=o SIZE=1><BR>"
" <INPUT NAME=p SIZE=5>  <INPUT NAME=q SIZE=6>"
"                            <INPUT NAME=r SIZE=1><BR>"
" <INPUT NAME=s SIZE=5>  <INPUT NAME=t SIZE=6>"
"                            <INPUT NAME=u SIZE=1><BR>"
"Execution Status:
Total:<BR><HR>"
"<INPUT TYPE=submit NAME=0 VALUE=Process>"
"<INPUT TYPE=submit NAME=0 VALUE=Menu>"
"</FORM></BODY>";
```

```
static char szNewOrderFormTemp2p[] =
"<INPUT TYPE=hidden NAME=3 VALUE=n######>"
"<PRE>                                New Order<BR>"
"Warehouse: #####"
"  District: ##                        Date: ###################
<BR>"
"Customer:  ####   Name: ################   Credit: ##   "
"%Disc: #####            <BR>"
"Order Number: ########  Number of Lines: ##        "
"W_tax: #####   D_tax: #####  <BR><BR>"
" Supp_W  Item_Id  Item Name                 Qty  Stock  B/G  "
"Price    Amount<BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"  #####   ######   ########################  ##    ###    #   "
"$######  $#######  <BR>"
"Execution Status: ########################                   "
"Total:  $########  <BR>"
"</PRE>"
MENU_BAR
"</FORM></BODY>";


static char szOrderStatusFormTemp2i[] =
"<INPUT TYPE=hidden NAME=3 VALUE=O######>"
"<PRE>                                     Order-Status<BR>"
"Warehouse: #####  District: <INPUT NAME=8 SIZE=1><BR>"
"Customer: <INPUT NAME=9 SIZE=4>   Name:                       "
"<INPUT NAME=Y SIZE=23><BR>"
"Cust-Balance:<BR><BR>"
"Order-Number:              Entry-Date:
Carrier-Number:<BR>"
"Supply-W     Item-Id    Qty     Amount      Delivery-
Date<BR></PRE><HR>"
"<INPUT TYPE=submit NAME=0 VALUE=Process>"
"<INPUT TYPE=submit NAME=0 VALUE=Menu>"
"</FORM></BODY>";


static char szOrderStatusFormTemp2p[] =
"<INPUT TYPE=hidden NAME=3 VALUE=o######>"
"<PRE>                                     Order-Status<BR>"
"Warehouse: #####  District: ##<BR>"
"Customer: ####   Name: ################ ## ################<BR>"
"Cust-Balance: $#########<BR><BR>"
"Order-Number: ########   Entry-Date: ###################
Carrier-Number: ##"
"<BR>"
"Supply-W     Item-Id    Qty     Amount      Delivery-Date<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"  #####       ######     ##     $#########     ##########<BR>"
"</PRE>"
MENU_BAR
"</FORM></BODY>";


static char szPaymentFormTemp2i[] =
"<INPUT TYPE=hidden NAME=3 VALUE=P######>"
"<PRE>                                       Payment<BR>"
"Date:  <BR><BR>"
"Warehouse: #####                         District: <INPUT NAME=8
SIZE=2><BR>"
"<BR><BR><BR><BR>"
"Customer: <INPUT NAME=9 SIZE=4>"
"Cust-Warehouse: <INPUT NAME=Z SIZE=5>  "
"Cust-District: <INPUT NAME=v SIZE=1><BR>"
```

```
"Name:                        <INPUT NAME=Y SIZE=16>
"
"Since:<BR>"
"                                                Credit:<BR>"
"                                                Disc:<BR>"
"                                                Phone:<BR><BR>"
"Amount Paid:          $<INPUT NAME=w SIZE=7>      New Cust
Balance:<BR>"
"Credit Limit:<BR><BR>Cust-Data: <BR><BR><BR><BR></PRE><HR>"
"<INPUT TYPE=submit NAME=0 VALUE=Process>"
"<INPUT TYPE=submit NAME=0 VALUE=Menu>"
"</FORM></BODY>";


static char szPaymentFormTemp2p[] =
"<INPUT TYPE=hidden NAME=3 VALUE=p######>"
"<PRE>                                  Payment<BR>"
"Date: ################### <BR><BR>"
"Warehouse: #####                          District: ##<BR>"
"####################                      ####################<BR>"
"####################                      ####################<BR>"
"#################### ## ##########       #################### ##
##########"
"<BR><BR>"
"Customer: ####  Cust-Warehouse: ###### Cust-District: ##<BR>"
"Name:   ################ ## ################     Since:
##########<BR>"
"        ####################                    Credit: ##<BR>"
"        ####################                    %Disc:
#####<BR>"
"        #################### ## ##########       Phone:
##################"
"<BR><BR>"
"Amount Paid:          $#######      New Cust Balance:
$##############<BR>"
"Credit Limit:   $##############<BR><BR>"
"Cust-Data: ##################################################<BR>"
"           ##################################################<BR>"
"           ##################################################<BR>"
"           ##################################################<BR>"
"</PRE>"
MENU_BAR
"</FORM></BODY>";


static char szStockLevelFormTemp2i[] =
"<INPUT TYPE=hidden NAME=3 VALUE=S######>"
"<PRE>                                 Stock-Level<BR>"
"Warehouse: #####  District: ##<BR><BR>"
"Stock Level Threshold: <INPUT NAME=x SIZE=2><BR><BR>"
"low stock:    <BR><HR>"
"<INPUT TYPE=submit NAME=0 VALUE=Process>"
"<INPUT TYPE=submit NAME=0 VALUE=Menu>"
"</FORM></BODY>";


static char szStockLevelFormTemp2p[] =
"<INPUT TYPE=hidden NAME=3 VALUE=s######>"
"<PRE>                                 Stock-Level<BR>"
"Warehouse: #####  District: ##<BR><BR>"
"Stock Level Threshold: ##<BR><BR>"
"low stock: ###"
"</PRE>"
MENU_BAR
"</FORM></BODY>";


static char szErrorFormTemplate[] =
"<BODY><FORM ACTION=%s METHOD=GET>"
"<INPUT TYPE=hidden NAME=3 VALUE=e%06d>"
"Error: %d (%s): %s"
MENU_BAR
"</FORM></BODY>";


static char szResponseHeaderTemplate[] =
"####\n";


static char  szResponseHeader[sizeof(szResponseHeaderTemplate)];
FORM_INDEXES responseHeaderIndexes[1] = { 0 };
int            responseHeaderLen = 0;



#define MATCHES_BEGIN(p) ('B'==p[0])
#define MATCHES_CHECKPOINT(p) \
(0==strncmp(p,"Checkpoint",strlen("Checkpoint")))
#define MATCHES_CHECKPOINT_STARTUP(p) \
(0==strncmp(p,"CheckpointStartup",strlen("CheckpointStartup")))
#define MATCHES_CLEAR(p) ('C'==p[0]&&'l'==p[1])
#define MATCHES_DELIVERY(p) ('D'==p[0])
#define MATCHES_EXIT(p) ('E'==p[0])
#define MATCHES_MENU(p) ('M'==p[0])
#define MATCHES_NEWORDER(p) ('N'==p[0])
#define MATCHES_ORDERSTATUS(p) ('O'==p[0])
#define MATCHES_PAYMENT(p) ('P'==p[0]&&'a'==p[1])
#define MATCHES_PROCESS(p) ('P'==p[0]&&'r'==p[1])
#define MATCHES_STOCKLEVEL(p) ('S'==p[0]&&'t'==p[1])
#define MATCHES_SUBMIT(p) ('S'==p[0]&&'u'==p[1])
#ifdef FFE_DEBUG
# define MATCHES_MEMORYCHECK(p) ('!'==p[0]&&'M'==p[1])
#endif

/* function prototypes */
void BeginCmd( request_rec *req );
void CheckpointCmd( request_rec *req, int w_id, int ld_id );
void CheckpointStartupCmd( request_rec *req, int w_id, int ld_id );
void ClearCmd( request_rec *req );
void ExitCmd( request_rec *req );
void MenuCmd( request_rec *req, int w_id, int ld_id );
```

```
void SubmitCmd( request_rec *req, int *w_id, int *ld_id );
void MemoryCheckCmd( request_rec *req, int w_id, int ld_id );


BOOL GetKeyValuePtr( char *szIPtr, char *szKey, char **pszOPtr );
BOOL GetCharKeyValuePtr( char *szIPtr, char cKey, char **pszOPtr );
BOOL GetKeyValueString( char *szIPtr, char *szKey,
                            char *szValue, int iSize );
BOOL GetWDID(char *ptr, int *lw_id, int *ld_id, char **optr);


void Log( char *szType, char *szStr );
void MakePanicPool( int dwResponseSize, apr_pool_t *p );
void MakeTemplatePool( int dwFormSize, int dwResponseSize,
apr_pool_t *p);
void MakeTransactionPool( int dwTransactionPoolSize, apr_pool_t
*p);
void DeletePanicPool( void );
void DeleteTemplatePool( void );
void DeleteTransactionPool( void );


int ProcessDeliveryQuery( request_rec *req,
                              char *the_request,
                              int w_id, int ld_id );
int ProcessNewOrderQuery( request_rec *req,
                              char *the_request,
                              int w_id, int ld_id );
int ProcessOrderStatusQuery( request_rec *req,
                                 char *the_request,
                                 int w_id, int ld_id );
int ProcessPaymentQuery( request_rec *req,
                             char *the_request,
                             int w_id, int ld_id );
int ProcessStockLevelQuery( request_rec *req,
                                char *the_request,
                                int w_id, int ld_id );


int ProcessQueryString(request_rec *req);


void PutNumeric( int iInt, int iFieldSize, char *pChar );
void SendErrorResponse( request_rec *req, int iError,
                            int iErrorType, char *szMsg, int
w_id, int ld_id,
                            pConnData pConn );
void SendMainMenuForm( request_rec *req,
                         int w_id, int ld_id, char *szStatus );
void SendResponse(request_rec *req, char *szStr, int iStrLen);
void SendWelcomeForm(request_rec *req);
#ifdef FFE_DEBUG
unsigned __stdcall CheckMemory(void *param);
#endif


/* typedefs */
typedef struct
{
  char *szStr;
  int iIndex;
  int iFieldSize;
  int iNewIndex;
  int iNewFieldSize;
} PutStrStruct, *pPutStrStruct;


typedef struct
{
  apr_thread_mutex_t * critSec;
#ifdef FFE_DEBUG
  int     iMaxIndex;
#endif
  int     iNextFree;
  char    *index[1];
  char    forms[PANIC_FORM_SIZE];
} PanicStruct, *pPanicStruct;


typedef struct
{
  apr_thread_mutex_t * critSec[NUMBER_POOL_FORM_TYPES];
#ifdef FFE_DEBUG
  int     iMaxIndex[NUMBER_POOL_FORM_TYPES];
#endif
  int     iNextFreeForm[NUMBER_POOL_FORM_TYPES];
  int     iFirstFormIndex[NUMBER_POOL_FORM_TYPES];
  char    *index[1];
  char    forms[1];
} FormStruct, *pFormStruct;


typedef struct
{
  apr_thread_mutex_t * critSec[NUMBER_POOL_RESPONSE_TYPES];
#ifdef FFE_DEBUG
  int     iMaxIndex[NUMBER_POOL_RESPONSE_TYPES];
#endif
  int     iNextFreeResponse[NUMBER_POOL_RESPONSE_TYPES];
  int     iFirstResponseIndex[NUMBER_POOL_RESPONSE_TYPES];
  char    *index[1];
  char    responses[1];
} ResponseStruct, *pResponseStruct;


/* global variables */
static int                    iInitStatus         = FALSE;


static apr_thread_mutex_t *   startupspinlock;
static BOOL             startupFlag     = FALSE;


static pPanicStruct gpPanicForms        = NULL;
```

```
static int giPanic                      = 0;

static pFormStruct gpForms              = 0;

static int giFormLen[NUMBER_POOL_FORM_TYPES] = { 0 };

static pResponseStruct gpResponses      = 0;

static int giResponseLen[NUMBER_POOL_RESPONSE_TYPES] = { 0 };



/* FUNCTION: BOOL APIENTRY DllMain(HANDLE hModule, int
ul_reason_for_call,

 *                                         LPVOID lpReserved)

 *

 * PURPOSE:         This is the main entry point to an ISAPI dll.
All dll

 *                  global initializations should be done in this
routine.

 *

 * ARGUMENTS:       HANDLE    hModule                       dll
module handle

 *                  int       ul_reason_for_call  reason for call

 *                  LPVOID    lpReserved
          reserved for future use

 *

 * RETURNS:         BOOL      Always TRUE                   Errors
in intiialization

 *                                                          are
presented at the first

 *                                                          screen
to the user.

 * COMMENTS:        None

 *

 */


static int tpcc_post_config(apr_pool_t *p, apr_pool_t *plog,
apr_pool_t *ptemp, server_rec *s)

{

  if (iInitStatus == FALSE) {

    apr_thread_mutex_create( &startupspinlock, 0, p);


    LogFD=open(MYFILE, O_CREAT|O_RDWR);

    myerrno=errno;

    MyLogFile=fdopen(LogFD, "a+");

    if (LogFD == -1)

    {

          printf("Bad file open, errno=%d\n", myerrno);

    }


    iInitStatus=TRUE;


    TPCCOpenLog(s->process->pool);


    ap_mpm_query(AP_MPMQ_MAX_THREADS, &max_threads);


#if (DEBUG == 1)

        fprintf(MyLogFile, "tpcc_post_config, pid=%d\n", getpid());

        fprintf(MyLogFile, "s->path: %s\n", s->path);

        fprintf(MyLogFile, "s->port: %d\n", s->port);

        fprintf(MyLogFile, "s->server_hostname: %s\n", s-
>server_hostname);

        fprintf(MyLogFile, "s->error_fname: %s\n", s->error_fname);

        fprintf(MyLogFile, "Max threads = %d\n", max_threads);

        fflush(MyLogFile);

#endif


  }


  return OK;

}


static void tpcc_child_init(apr_pool_t *p, server_rec *s)

{


#if (DEBUG == 1)

        fprintf(MyLogFile, "In tpcc_child_init\n");

        fflush(MyLogFile);

#endif


}


static apr_status_t tpcc_child_exit(void *data)

{

#if (DEBUG == 1)

        fprintf(MyLogFile, "In tpcc_child_exit\n");

        fflush(MyLogFile);

#endif


    TPCCShutdown( );


    DeleteTransactionPool( );

    DeleteTemplatePool( );

    DeletePanicPool( );


    TPCCCloseLog( );

}



/* FUNCTION: int tpcc_handler(request_rec *req)

 *

 * PURPOSE:         This function is the main entry point for the
TPCC DLL.

 *                  The internet service calls this function
passing in the

 *                  http string.

 *

 * ARGUMENTS:       request_rec         *req      structure ptr
containing the

 *
         internet service information.

 *
```

```
 * RETURNS:         int       HSE_STATUS_SUCCESS  connection can be
dropped if
 *                                                              error
 *                           HSE_STATUS_SUCCESS_AND_KEEP_CONN
keep connect valid
 *                                                              comment
sent
 *

 * COMMENTS:        None

 *

 */


int tpcc_handler(request_rec *req)

{

  int                       status;

  int                       dbstatus;


  /*  TPCCLog("now in handler"); */


  if ( ! startupFlag ) {

    apr_thread_mutex_lock( startupspinlock );

    if ( ! startupFlag ) {


#if (DEBUG == 1)

       fprintf(MyLogFile, "tpcc_handler: Startup Section\n");

#endif


         if ( ERR_SUCCESS != ( iInitStatus = ReadRegistrySettings(
)))

         MakePanicPool( 50, req->pool );  /* make room for error
messages */

         else {

           dbstatus = TPCCStartup( );

           if( ERR_DB_SUCCESS != dbstatus ) {

             iInitStatus = dbstatus;

           }

         }


         {

           apr_pool_t *ppool = req->server->process->pool;


           strcpy(szModName, req->uri);


           MakeTemplatePool(max_threads, max_threads, ppool);

           MakePanicPool(max_threads, ppool);

           MakeTransactionPool(max_threads, ppool);

         }


     startupFlag = TRUE;

    }

    apr_thread_mutex_unlock( startupspinlock );

  }
```

```
#if (DEBUG == 1)

       fprintf(MyLogFile, "tpcc_handler: iInitStatus=%d\n",
iInitStatus);

#endif

  if( ERR_SUCCESS != iInitStatus )

  {

    SendErrorResponse(req, iInitStatus, ERR_TYPE_WEBDLL, NULL, -1,
-1, NULL);

    return TRUE;

  }



#if (DEBUG == 1)

       fprintf(MyLogFile, "req->the_request: %s\n", req-
>the_request);

       fprintf(MyLogFile, "req->unparsed_uri: %s\n", req-
>unparsed_uri);

       fprintf(MyLogFile, "req->uri: %s\n", req->uri);

       fprintf(MyLogFile, "req->filename: %s\n", req->filename);

       fprintf(MyLogFile, "req->args: %s\n", req->args);

       fflush(MyLogFile);

#endif

  /* process http query */

  status = ProcessQueryString(req);


  /* finish up with status returned by Processing functions */

  return OK;

}


/* FUNCTION: void SendErrorResponse( request_rec *req, int iError,

 *                                         int iErrorType, char
*szMsg,

 *                                         int w_id, int ld_id )

 *

 * PURPOSE:         This function displays an error form in the
client browser.

 *

 * ARGUMENTS:       request_rec         *req      IIS context
structure pointer

 *                                                              unique
to this connection.

 *                  int       iError                      id of
error message

 *                  int       iErrorType                  error
type, ERR_TYPE_SQL,

 *
         ERR_TYPE_DBLIB, ERR_TYPE_WEBDLL

 *                  int       w_id                        Login
warehouse ID.

 *                  int       ld_id                       Login
district ID.

 *                  char      *szMsg
         optional error message string

 *                                                              used
with ERR_TYPE_SQL and

 *
         ERR_TYPE_DBLIB
```

```
 *
 * RETURNS:         None
 *
 * COMMENTS:        If the error type is ERR_TYPE_WEBDLL the szMsg
parameter
 *                  may be NULL because it is ignored. If the error
type is
 *                  ERR_TYPE_SQL or ERR_TYPE_DBLIB then the szMsg
parameter
 *                  contains the text of the error message, so the
szMsg
 *                  parameter cannot be NULL.
 *
 */


void
SendErrorResponse( request_rec *req, int iError, int iErrorType,
                       char *szMsg, int w_id, int ld_id, pConnData
pConn )
{
  int     ii;


  static char szNoMsg[] = "";
  char              *szErrorTypeMsg;
  char              *szErrorMsg;
  char              *szForm;
  int               iStrLen;


  if ( !szMsg  )
    szMsg = szNoMsg;


#if (DEBUG == 1)
        fprintf(MyLogFile, "Entering SendErrorResponse\n");
        fflush(MyLogFile);
#endif


  RESERVE_PANIC_FORM( szForm );


#if (DEBUG == 1)
        fprintf(MyLogFile, "After Reserve Form\n");
        fflush(MyLogFile);
#endif


  if( ERR_TYPE_WEBDLL == iErrorType )
  {
    ii = 0;
    while( '\0' != errorMsgs[ii].szMsg[0] && iError !=
errorMsgs[ii].iError )
      ii++;
#if (DEBUG == 1)
        fprintf(MyLogFile, "After while\n");
        fflush(MyLogFile);
#endif
    if ( '\0' == errorMsgs[ii].szMsg[0] )
      ii = 1;  /* ERR_NO_MESSAGE */
    szErrorTypeMsg = "TPCCWEB";
    szErrorMsg = errorMsgs[ii].szMsg;
  }
  else if( ERR_TYPE_DBLIB == iErrorType )
  {
    szErrorTypeMsg = "DBLIB";
    szErrorMsg = szMsg;
  }
#if (DEBUG == 1)
        fprintf(MyLogFile, "After Reserve Form\n");
        fflush(MyLogFile);
#endif


/*
  if( NULL != pConn )
    TPCCTransactionErr( pConn, "%s(%d): %s\r\n",
                               szErrorTypeMsg, iError, szErrorMsg );
  else
*/
    TPCCErr( "%s(%d): %s\r\n", szErrorTypeMsg, iError, szErrorMsg
);
#if (DEBUG == 1)
        fprintf(MyLogFile, "szErrorMsg=%s\n", szErrorMsg);
        fflush(MyLogFile);
#endif


  iStrLen = sprintf( szForm, szErrorFormTemplate, req->uri,
                        WDID(w_id,ld_id), iError, szErrorTypeMsg,
szErrorMsg );


#if (DEBUG == 1)
        fprintf(MyLogFile, "szForm=%s\n", szForm);
        fflush(MyLogFile);
#endif


#if (DEBUG == 1)
        fprintf(MyLogFile, "SendErrorResponse: Before
SendResponse\n");
        fflush(MyLogFile);
#endif
  SendResponse(req, szForm, iStrLen);


#if (DEBUG == 1)
        fprintf(MyLogFile, "SendErrorResponse: After
SendResponse\n");
        fflush(MyLogFile);
#endif
  UNRESERVE_PANIC_FORM( szForm );
}
```

```
/* FUNCTION: void HandlePanic(pPutStrStruct pStruct,
 *                                    char *szInput, int
iInputSize,
 *                                    char **szOutput, int
*iOutputSize )
 *
 * PURPOSE:   This routine handles the case where the output string
contains
 * at least one of the special characters double quote ("),
ampersand (&),
 * less than (<), or greater than (>).  What it does is scan the
strings
 * to be output checking for all special characters.  It then moves
the
 * input string template sections further along in the output
string
 * making enough room for the strings including their special
quoted
 * charaters, then fills the new template with the output strings.
 *
 * ARGUMENTS:
 *
 * RETURNS:         void

 *
 * COMMENTS:
 */


void
HandlePanic( pPutStrStruct pStruct,
               char *szInput, int iInputSize,
               char **szOutput, int *iOutputSize )
{
  pPutStrStruct pStructTmp1;
  pPutStrStruct pStructTmp2;
  char *pIChar;
  int iExtra;
  int iTotalExtra;
  char *szTmp;


  RESERVE_PANIC_FORM( szTmp );


  /* first, save what we've done so far */
  *szOutput = szTmp;
  memcpy( szTmp, szInput, pStruct->iIndex );


  /* save the original values for string moving */
  pStructTmp1 = pStruct;
  while( NULL != pStructTmp1->szStr ) {
    pStructTmp1->iNewIndex = pStructTmp1->iIndex;
    pStructTmp1->iNewFieldSize = pStructTmp1->iFieldSize;
    pStructTmp1++;
  }


  /* parse all remaining strings for special characters and fix
indicies */
  pStructTmp1 = pStruct;
  iTotalExtra = 0;
  while( NULL != pStructTmp1->szStr ) {
    pIChar = pStructTmp1->szStr;
    iExtra = 0;
    while( 0 != *pIChar )
    {
      if( '"' == *pIChar )
          iExtra += 5;
      else if( '&' == *pIChar )
          iExtra += 4;
      else if( '<' == *pIChar )
          iExtra += 3;
      else if( '>' == *pIChar )
          iExtra += 3;
      pIChar++;
    }


    /* reset field width for this string */
    pStructTmp1->iNewFieldSize += iExtra;


    /* move all following indicies */
    for( pStructTmp2 = pStructTmp1+1;
           NULL != pStructTmp2->szStr;
           pStructTmp2++ )
      pStructTmp2->iNewIndex += iExtra;


    pStructTmp1++;
    iTotalExtra += iExtra;
  }


  /* update new string length */
  *iOutputSize = iInputSize + iTotalExtra;


  /* move end of string to new output string */
  --pStructTmp1;
  memcpy( &szTmp[pStructTmp1->iNewIndex + pStructTmp1-
>iNewFieldSize],
            &szInput[pStructTmp1->iIndex + pStructTmp1-
>iFieldSize],
            iInputSize - pStructTmp1->iIndex + pStructTmp1-
>iFieldSize);


  /* move input string pieces to new locations in output string */
  pStructTmp2 = pStructTmp1--;
  while( pStruct != pStructTmp2 )
  {
    memcpy( &szTmp[pStructTmp1->iNewIndex + pStructTmp1-
>iNewFieldSize],
              &szInput[pStructTmp1->iIndex + pStructTmp1-
>iFieldSize],
```

```
              pStructTmp2->iIndex -
              ( pStructTmp1->iIndex + pStructTmp1->iFieldSize ));
    pStructTmp2 = pStructTmp1--;
  }

  /* Now put in the strings */
  pStructTmp1 = pStruct;
  while( NULL != pStructTmp1->szStr ) {
    CONVERT_SPECIAL( &szTmp[pStructTmp1->iNewIndex], pStructTmp1->szStr,
                          pStructTmp1->iNewFieldSize );
    pStructTmp1++;
  }
}

/* FUNCTION: void SendResponse(request_rec *req, char *szForm,
 *                                  int iStrLen)
 *
 * PURPOSE:
 *    This function takes the forms generated by each transaction routine
 *    and calls the server callback function to pass it on to the browser.
 *
 * ARGUMENTS:
 *    request_rec   *req                Server context structure.
 *    char                              *szForm             form to pass to browser.
 *    int                     iStrLen             length of form excluding null.
 *
 * RETURNS:
 *    None
 *
 * COMMENTS:
 */

void
SendResponse(request_rec *req, char *szForm, int iStrLen)
{
  int               lpbSize, numpad;
  char              szHeader1[10];
  char              headerpad[5];

  lpbSize = iStrLen;

#if (DEBUG == 1)
        fprintf(MyLogFile, "Entering SendResponse\n");
        fflush(MyLogFile);
#endif

  sprintf(szHeader1, "%d\0", lpbSize);
  apr_table_setn(req->headers_out, "Keep-Alive", "1");
/*
  apr_table_setn(req->headers_out, "Content-Length", szHeader1);
*/

  numpad=MAXPAD-(strlen(szHeader1));

#if (DEBUG == 1)
        fprintf(MyLogFile, "Header Pad = %s\n", szHeader1);
        fprintf(MyLogFile, "numpad = %d\n", numpad);
        fflush(MyLogFile);
#endif

  if (numpad > 0)
  {
    sprintf(headerpad, "%s\0", "P");
    while (--numpad > 0)
      strcat(headerpad, (char *)"P");
  }

  apr_table_set(req->headers_out, "PRTE PAD", headerpad);
#if (DEBUG == 1)
        fprintf(MyLogFile, "Header Pad = %s\n", headerpad);
        fflush(MyLogFile);
#endif

  req->content_type = "text/html";
/*
  apr_send_http_header(req);
*/

  ap_rputs(szForm, req);
}

/* FUNCTION: ParseTemplateString(char *szForm, int *pcurLen,
 *                                      char *formTemplate,
FORM_INDEXES *indexes)
 *
 * PURPOSE:         This function parses the query string to find the ## signs
 *                  that mark the positions for the values to be put, and
 *                  stores these locations and lengths in the indexes structure.
 *
 * ARGUMENTS: char  *szForm    the resultant form
 *              int *pcurLen the current length of szForm
 *              char          *formTemplate       the form's template
 *              FORM_INDEXES *indexes   ptr to the array of indexes for the
 *                                              tag values of the form
 *
```

```
 * RETURNS:         void
 *
 * COMMENTS:
 */


void
ParseTemplateString(char *szForm, int *pcurLen,
                        char *formTemplate, FORM_INDEXES *indexes)
{
  int   curIndex = 0;
  int     ii = 0;
  int     jj;
  int     curLen;


  curLen = *pcurLen;
  while ('\0' != formTemplate[ii])
  {
    if('#' != formTemplate[ii])
    {
      szForm[curLen] = formTemplate[ii];
      ii++;
      curLen++;
    }
    else
    {
      jj = 0;
      indexes[curIndex].iStartIndex = curLen;
      while('#' == formTemplate[ii])
      {
          jj++;
          szForm[curLen] = formTemplate[ii];
          curLen++;
          ii++;
      }
      indexes[curIndex].iLen = jj;
      curIndex++;
    }
  }
  szForm[curLen] = '\0';
  *pcurLen = curLen;
}


/* FUNCTION: void PutNumeric(int iInt, int iFieldSize, char *pChar
)
 *
 * PURPOSE:         This function converts an integer to a char
string.
 *
 * ARGUMENTS:       int       iInt                the integer to
convert to string
 *                  int       iFieldSize          max size of char
string to return.
 *                  char      *pChar              the string to put
the int into.
 *
 * RETURNS:         None
 *
 * COMMENTS:        If the Integer value exceeds the max field
size, then
 *                  the string will be filled with iFieldSize "*"
to signal
 *                  an error.
 */


void
PutNumeric( int iInt, int iFieldSize, char *pChar )
{
  int iSaveSize = iFieldSize;
  char *pSaveStart = pChar;
  char pAsterisk[] = "********************";
  BOOL bSignFlag = TRUE;


  pChar += (iFieldSize - 1);
  if(0 > iInt)
  {
    bSignFlag = FALSE;
    iInt = abs(iInt);
  }


  do
  {
    *pChar = ( iInt % 10 ) + '0';
    iInt /= 10;
    iFieldSize--;
    if( iFieldSize )
      pChar--;
  } while( iFieldSize );


  if( !bSignFlag )
  {
    if('0' == *pChar)
      *pChar = '-';
    else
    {
      memcpy( pSaveStart, pAsterisk, iSaveSize );
      return;
    }
  }


  if( 0 != iInt )
  {
    /* put in string of ** to signal error */
    memcpy( pSaveStart, pAsterisk, iSaveSize );
  }
```

```
}


/* FUNCTION: void SendDeliveryForm( request_rec *req,
 *                                          int w_id, int ld_id )
 *
 * PURPOSE:         This function puts the data into the input form
and then
 *                  returns the form to the browser.
 *
 * ARGUMENTS:       request_rec         *req      structure pointer
to passed in
 *
          internet service information.
 *                  int       w_id                          Login
warehouse ID.
 *                  int       ld_id                         Login
district ID.
 &
 * RETURNS:                   None
 *
 * COMMENTS:        None
 *
 */


void
SendDeliveryForm( request_rec *req, int w_id, int ld_id )
{
  char    *deliveryForm;


  RESERVE_FORM( DELIVERY_FORM, deliveryForm );


  PutNumeric(WDID(w_id,ld_id),
              deliveryFormIndexesI[D_WDID].iLen,

&deliveryForm[deliveryFormIndexesI[D_WDID].iStartIndex]);
  PutNumeric(w_id,
              deliveryFormIndexesI[D_WID].iLen,

&deliveryForm[deliveryFormIndexesI[D_WID].iStartIndex]);


  SendResponse(req, deliveryForm, giFormLen[DELIVERY_FORM]);


  UNRESERVE_FORM( DELIVERY_FORM, deliveryForm );
}


/* FUNCTION: void SendNewOrderForm( request_rec *req,
 *                                          int w_id, int ld_id )
 *
 * PURPOSE:         This function puts the data into the input form
and then
 *                  returns the form to the browser.
 *
 * ARGUMENTS:       request_rec         *req      pointer to the
structure that
 *                                                          is
passed in the internet
 *                  int                 w_id      warehouse id
 *                  int                 ld_id     login district id
 *
 * RETURNS:         None
 *
 * COMMENTS:        None
 *
 */


void
SendNewOrderForm( request_rec *req, int w_id, int ld_id )
{
  char    *newOrderForm;


  RESERVE_FORM( NEW_ORDER_FORM, newOrderForm );


  PutNumeric(WDID(w_id,ld_id),
              newOrderFormIndexes[NO_WDID].iLen,

&newOrderForm[newOrderFormIndexes[NO_WDID].iStartIndex]);
  PutNumeric(w_id,
              newOrderFormIndexes[NO_WID].iLen,

&newOrderForm[newOrderFormIndexes[NO_WID].iStartIndex]);


  SendResponse(req, newOrderForm, giFormLen[NEW_ORDER_FORM]);


  UNRESERVE_FORM( NEW_ORDER_FORM, newOrderForm );
}


/* FUNCTION: void SendPaymentForm(request_rec *req,
 *                                      int w_id, int ld_id,
DBContext *pdb)
 *
 * PURPOSE:         This function puts the data into the input form
and then
 *                  returns the form to the browser.
 *
 * ARGUMENTS:
 *                  request_rec         *req      pointer to
structure passed in
 *                                                          the
internet
 *                  int                         w_id
         warehouse id
 *                  int                         ld_id     login
district id
 *
 * RETURNS:         None
 *
 * COMMENTS:        None
 *
 */
```

```
void
SendPaymentForm( request_rec *req, int w_id, int ld_id )
{
  char    *paymentForm;

  RESERVE_FORM( PAYMENT_FORM, paymentForm );

  PutNumeric(WDID(w_id,ld_id),
              paymentFormIndexes[PT_WDID_INPUT].iLen,
&paymentForm[paymentFormIndexes[PT_WDID_INPUT].iStartIndex]);
  /* the date field is before wid for the response so use 2 here */
  PutNumeric(w_id,
              paymentFormIndexes[PT_WID_INPUT].iLen,
&paymentForm[paymentFormIndexes[PT_WID_INPUT].iStartIndex]);

  SendResponse(req, paymentForm, giFormLen[PAYMENT_FORM]);

  UNRESERVE_FORM( PAYMENT_FORM, paymentForm );
}

/* FUNCTION: void SendOrderStatusForm(request_rec *req,
 *                                          int w_id, int
ld_id, DBContext *pdb)
 *
 * PURPOSE:         This function fills in data and then sends the
order status
 *                  input form back to the browser.
 *
 * ARGUMENTS:       request_rec *req    ptr to structure passed in
the
 *
          internet.
 *                  int                 w_id      warehouse id
 *                  int                 ld_id     login district id
 *
 * RETURNS:         None
 *
 * COMMENTS:        None
 *
 */

void
SendOrderStatusForm( request_rec *req, int w_id, int ld_id )
{
  char    *orderStatusForm;

  RESERVE_FORM( ORDER_STATUS_FORM, orderStatusForm );

  PutNumeric(WDID(w_id,ld_id),
              orderStatusFormIndexes[OS_WDID].iLen,
&orderStatusForm[orderStatusFormIndexes[OS_WDID].iStartIndex]);
  PutNumeric(w_id,
              orderStatusFormIndexes[OS_WID].iLen,
&orderStatusForm[orderStatusFormIndexes[OS_WID].iStartIndex]);
  SendResponse(req, orderStatusForm, giFormLen[ORDER_STATUS_FORM]);

  UNRESERVE_FORM( ORDER_STATUS_FORM, orderStatusForm );
}

/* FUNCTION: void SendStockLevelForm(request_rec *req,
 *                                          int w_id, int
d_id, DBContext *pdb)
 *
 * PURPOSE:         This function puts the data into the input form
and then
 *                  returns the form to the browser.
 *
 * ARGUMENTS:       request_rec         *req      structure pointer
to passed
 *                                                          in
internet service information
 *                  int                 w_id
          warehouse id
 *                  int                 d_id
          district id
 *                  DBContext *pdb                pointer to
database context.
 *
 * RETURNS:         None
 *
 * COMMENTS:        None
 *
 */

void
SendStockLevelForm( request_rec *req, int w_id, int d_id )
{
  char    *stockLevelForm;

  RESERVE_FORM( STOCK_LEVEL_FORM, stockLevelForm );

  PutNumeric(WDID(w_id,d_id),
              stockLevelFormIndexes[SL_WDID].iLen,
&stockLevelForm[stockLevelFormIndexes[SL_WDID].iStartIndex]);
  PutNumeric(w_id,
              stockLevelFormIndexes[SL_WID].iLen,
&stockLevelForm[stockLevelFormIndexes[SL_WID].iStartIndex]);
  PutNumeric(d_id,
              stockLevelFormIndexes[SL_DID].iLen,
&stockLevelForm[stockLevelFormIndexes[SL_DID].iStartIndex]);
```

```
  SendResponse(req, stockLevelForm, giFormLen[STOCK_LEVEL_FORM]);


  UNRESERVE_FORM( STOCK_LEVEL_FORM, stockLevelForm );
}


/* FUNCTION: void SendMainMenuForm(request_rec *req,
 *                                      int w_id, int ld_id,
char *szStatus)
 *
 * PURPOSE:         This function sends the main menu form to the
browser.
 *
 * ARGUMENTS:       request_rec         *req      IIS context
structure pointer
 *                                                          unique
to this connection.
 *
 *                  int       w_id
         warehouse id
 *                  int       ld_id                       login
district id
 *                  char      *szStatus           String to report
previous
 *
         operation status.
 *
 * RETURNS:         None
 *
 * COMMENTS:
 */


void
SendMainMenuForm( request_rec *req,
                    int w_id, int ld_id, char *szStatus )
{
  char    *szForm;
  int     iStrLen;
  static char       *szNoStatus = "";
  char    *pszStatus;


  pszStatus = ( NULL == szStatus ) ? szNoStatus : szStatus;


#if (DEBUG == 1)
        fprintf(MyLogFile, "Before RESERVE_PANIC_FORM\n");
        fflush(MyLogFile);
#endif


  RESERVE_PANIC_FORM( szForm );


#if (DEBUG == 1)
        fprintf(MyLogFile, "Before SendMainMenuForm\n");
        fflush(MyLogFile);
#endif
  iStrLen = sprintf( szForm, szMainMenuFormTemplate,
                          req->uri, WDID(w_id,ld_id), pszStatus );


  SendResponse(req, szForm, iStrLen);


  UNRESERVE_PANIC_FORM( szForm );
}



/* FUNCTION: void SendWelcomeForm(request_rec *req)
 *
 * PURPOSE:         This function sends the welcome form to the
browser.
 *
 * ARGUMENTS:   None
 *
 * RETURNS:         None
 *
 * COMMENTS:        The welcome form is generated on
initialization.
 */


void
SendWelcomeForm(request_rec *req)
{
  char              *mod_name;


#if (DEBUG == 1)
        fprintf(MyLogFile, "SendWelcomeForm 1\n");
        fflush(MyLogFile);
#endif
    mod_name = strrchr( req->uri, '/' );
    if( NULL != mod_name )
      mod_name++;
    else
      {
        fprintf(MyLogFile, "SendWelcomeForm: Null mod_name\n");
        return;
      }


  iWelcomeFormLen = sprintf(szWelcomeForm, szWelcomeFormTemplate,
mod_name);


#if (DEBUG == 1)
        fprintf(MyLogFile, "SendWelcomeForm 2\n");
        fflush(MyLogFile);
#endif


  SendResponse( req, szWelcomeForm, iWelcomeFormLen );
}


/* FUNCTION: int ProcessQueryString(request_rec *req)
 *
```

```
 * PURPOSE:         This function extracts the relevent information
out
 *                  of the http command passed in from the browser.
 *
 * ARGUMENTS:       request_rec         *req      IIS context
structure pointer
 *                                                          unique
to this connection.
 *
 * RETURNS:         int                                     server
connection status code
 *
 * COMMENTS:        If this is the initial connection i.e. client
is at
 *                  welcome screen then there will not be a
terminal id or
 *                  current form id if this is the case then the
pTermid and
 *                  pFormid return values are undefined.
 */


int
ProcessQueryString(request_rec *req)
{
  static char *beginptr = "Begin";
  char *ptr;
  char *cmdptr;
  int cFormID;
  int w_id;
  int ld_id;
  int status;
  int retcode;


  w_id = 0;
  ld_id = 0;


#if (DEBUG == 1)
        fprintf(MyLogFile, "Starting QueryString 1\n");
        fprintf(MyLogFile, "&ptr=%x\n", &ptr);
        fflush(MyLogFile);
#endif
  if ( GetCharKeyValuePtr( req->args, '3', &ptr ))
  {
    cFormID = *ptr++;
    if( !GetWDID( ptr, &w_id, &ld_id, &ptr )) {
#if (DEBUG == 1)
        fprintf(MyLogFile, "Calling SendErrorResponse\n");
        fflush(MyLogFile);
#endif
      SendErrorResponse( req, ERR_W_ID_INVALID, ERR_TYPE_WEBDLL,
NULL,
                                w_id, ld_id, NULL );
      return TRUE;
    }
  }
  else
    cFormID = '\0';


  /* now figure out what command we have and execute it */
  if ( !GetCharKeyValuePtr( ptr, '0', &cmdptr ))
  {
    if(  req->args == NULL ) {
      cmdptr = beginptr;
    }
    else {
      SendErrorResponse( req, ERR_COMMAND_UNDEFINED,
ERR_TYPE_WEBDLL,
                                NULL, w_id, ld_id, NULL );
      return TRUE;
    }
  }


  if( '\0' == cFormID && !MATCHES_BEGIN( cmdptr )) {
    SendErrorResponse( req, ERR_INVALID_FORM_AND_CMD_NOT_BEGIN,
                            ERR_TYPE_WEBDLL, NULL, w_id, ld_id, NULL
);
    return TRUE;
  }


  status = TRUE;
  if( MATCHES_PROCESS( cmdptr ))
  {
#if (DEBUG == 1)
        fprintf(MyLogFile, "Matches Process\n");
        fflush(MyLogFile);
#endif


    if( 'N' == cFormID )
      retcode = ProcessNewOrderQuery( req, ptr, w_id, ld_id );
    else if( 'P' == cFormID )
      retcode = ProcessPaymentQuery( req, ptr, w_id, ld_id );
    else if( 'D' == cFormID )
      retcode = ProcessDeliveryQuery( req, ptr, w_id, ld_id );
    else if( 'O' == cFormID )
      retcode = ProcessOrderStatusQuery( req, ptr, w_id, ld_id );
    else if( 'S' == cFormID )
      retcode = ProcessStockLevelQuery( req, ptr, w_id, ld_id );
    else {
      SendErrorResponse( req, ERR_INVALID_FORM, ERR_TYPE_WEBDLL,
NULL,
                                w_id, ld_id, NULL );
      return TRUE;
    }


    if( ERR_DB_PENDING == retcode )
      status = TRUE;
```

```
    else if( ERR_DB_SUCCESS != retcode ) {
#if (DEBUG == 1)
        fprintf(MyLogFile, "Here We Are Again!!!\n");
        fflush(MyLogFile);
#endif
      if (!apr_table_get(req->headers_out, "PRTE PAD"))
      {
         SendErrorResponse( req, retcode, ERR_TYPE_WEBDLL, NULL,
w_id, ld_id, NULL );
      }
      return TRUE;
    }
  }
  else if( MATCHES_BEGIN( cmdptr ))
    BeginCmd( req );
  else if( MATCHES_NEWORDER( cmdptr ))
    SendNewOrderForm( req, w_id, ld_id );
  else if( MATCHES_PAYMENT( cmdptr ))
    SendPaymentForm( req, w_id, ld_id );
  else if( MATCHES_ORDERSTATUS( cmdptr ))
    SendOrderStatusForm( req, w_id, ld_id );
  else if( MATCHES_STOCKLEVEL( cmdptr ))
    SendStockLevelForm( req, w_id, ld_id );
  else if( MATCHES_DELIVERY( cmdptr ))
    SendDeliveryForm( req, w_id, ld_id );
  else if( MATCHES_SUBMIT( cmdptr ))
    SubmitCmd( req, &w_id, &ld_id );
  else if( MATCHES_MENU( cmdptr ))
    MenuCmd( req, w_id, ld_id );
  else if( MATCHES_EXIT( cmdptr ))
    ExitCmd( req );
  else if( MATCHES_CLEAR( cmdptr ))
    ClearCmd( req );
  else
    SendErrorResponse( req, ERR_COMMAND_UNDEFINED, ERR_TYPE_WEBDLL,
                           NULL, w_id, ld_id, NULL );


  return status;
}


/* FUNCTION: PutFloat2(double dVal, int iFieldSize, char *pChar )
 *
 * PURPOSE:         This function converts a double into a char
string
 *                  in the format of xx.xx
 *
 * ARGUMENTS: double          dVal                the value to
convert to char
 *              int iFieldSize          max size of char string
 *              char          pChar               string where to
put value
 *
 * RETURNS:         void
 *
 * COMMENTS:        If the double exceeds the max field size
entered,
 *                  the char string will be filled with iFieldSize
*'s
 *                  to signal an error
 */


void
PutFloat2( double dVal, int iFieldSize, char *pChar )
{
  int iInt;
  int iDecimal;
  BOOL bSignFlag = TRUE;
  int iSaveSize = iFieldSize;
  char *pSaveStart = pChar;
  char pAsterisk[] = "**********";
  double dtmp;



  pChar += (iFieldSize - 1);


  dtmp=(dVal*100.0);


  if(0 > dVal)
  {
    bSignFlag = FALSE;
    iInt = abs((int)( dtmp ));
  }
  else
  {
    iInt = (int)( dtmp );
  }
  iDecimal = 2;
  do
  {
    *pChar-- = ( iInt % 10 ) + '0';
    iInt /= 10;
    iFieldSize--;
  } while( --iDecimal );


  *pChar-- = '.';
  iFieldSize--;


  do
  {
    *pChar-- = ( iInt % 10 ) + '0';
    iInt /= 10;
    iFieldSize--;
  } while( iFieldSize && iInt != 0 );
```

```
  if( !iFieldSize && iInt != 0 )
  {
    /* put in string of ** to signal error */
    memcpy(pSaveStart, pAsterisk, iSaveSize);
    return;
  }
  if(!bSignFlag)
  {
    iFieldSize--;
    if( 0 >= iFieldSize )
    {
      /* put in string of  ** to signal error */
      memcpy(pSaveStart, pAsterisk, iSaveSize);
      return;
    }
    *pChar-- = '-';
  }

  /* Fill in the remaining spaces in the field with blanks. */
  while( iFieldSize-- )
    *pChar-- = ' ';
}
/* FUNCTION: void PutHTMLStrings( pPutStrStruct pStruct,
 *                                                 char *szInput,
int iInputSize,
 *                                                 char **szOutput,
int *iOutputSize )
 *
 * PURPOSE:  This routine takes a template output string and a data
structure
 *             containing strings, positions, and field widths of
strings to be
 *             compied into the template.  The routine scans all
input strings to
 *             determine if any contain special charaters that need
to be quoted
 *             in the output string.  If none exist, the template
is filled with
 *             the desired strings.  If at least one special
character exists in
 *             the output strings, a more expensive routine is
called to build a
 *             new output string template containing the quoted
strings.
 *
 * ARGUMENTS: pPutStrStruct   pStruct   pointer to structure
containing the
 *                                                 strings,
positions and field lengths.
 *              char                   *szInput  pointer to input
form
 *              int           iInputSize          length of the
input form
 *              char                   **szOutput          pointer
to the new input form
 *                                                 it may
or may not be different
 *                                                 than
the input form.
 *              int           iOutputSize         length of the new
input form.
 *
 * RETURNS:   none
 *
 * COMMENTS:        none
 */

void
PutHTMLStrings( pPutStrStruct pStruct,
                    char *szInput, int iInputSize,
                    char **szOutput, int *iOutputSize )
{
  char *pIChar;
  char *pOChar;
  int     iFieldSize;

  while( NULL != pStruct->szStr )
  {
    pIChar = pStruct->szStr;
    pOChar = szInput + pStruct->iIndex;
    iFieldSize = pStruct->iFieldSize;
    while( 0 != *pIChar && iFieldSize )
    {
      /* '>' is the highest ACSII value of the special characters.
*/
      /* If '>' is greater than the character is question, check
further. */
      if( '>' > *pIChar )
      {
          if( '"' == *pIChar || '&' == *pIChar ||
              '<' == *pIChar || '>' == *pIChar )
          {
            /* We have found at least one special character in the
desired */
            /* output string, go the the more expensive routine to
build */
            /* the desired output string. */
            HandlePanic( pStruct, szInput, iInputSize, szOutput,
iOutputSize );
            return;
          }
          else
            *pOChar = *pIChar;
      }
      else
          *pOChar = *pIChar;

      pIChar++;
      pOChar++;
      iFieldSize--;
    }
```

```
    /* Fill in the remaining spaces in the field with blanks. */
    while( iFieldSize-- )
      *pOChar++ = ' ';

    pStruct++;
  }

  /* The output string is the template and the length is unchanged
*/
  *szOutput = szInput;
  *iOutputSize = iInputSize;

  return;
}

/* FUNCTION: void TPCCDeliveryResponse( request_rec *req,
 *                                                int retcode,
 *                                                DeliveryData
*deliveryData )
 *
 * PURPOSE:         This function fills in the values and returns
the
 *                  response form to the browser.
 *
 * ARGUMENTS:       request_rec *req
 *                  int                            retcode  return
code from db
 *                  DeliveryData                   *deliveryData
pointer to the delivery
 *                                                             data
structure.
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */

void
TPCCDeliveryResponse( int retcode, pDeliveryData pDelivery,
                pDeliveryData
CompletedDeliveries[DELIVERY_RESPONSE_COUNT] )
{
  int ssCnt = 0;
  char *szOutput;
  int iOutputLen;
  PutStrStruct StrStruct[2];
  char *deliveryForm;
  request_rec *req;

  req = pDelivery->pCC;

  if ( ERR_DB_PENDING == retcode )
  {
    return;
  }
  else if ( ERR_DB_DEADLOCK_LIMIT == retcode )
  {

    SendErrorResponse( req, ERR_DELIVERY_NOT_PROCESSED,
                            ERR_TYPE_WEBDLL, NULL,
                            pDelivery->w_id, pDelivery->ld_id,
                            (pConnData)pDelivery );

    return;
  }
  else    if ( ERR_DB_SUCCESS != retcode )
  {
    SendErrorResponse( req, ERR_DB_DELIVERY_NOT_QUEUED,
                            ERR_TYPE_WEBDLL, NULL,
                            pDelivery->w_id, pDelivery->ld_id,
                            (pConnData)pDelivery );

    return;
  }

  RESERVE_RESPONSE( DELIVERY_RESPONSE, deliveryForm );

  PutNumeric(WDID(pDelivery->w_id,pDelivery->ld_id),
               deliveryFormIndexesP[D_WDID].iLen,
&deliveryForm[deliveryFormIndexesP[D_WDID].iStartIndex]);
  PutNumeric(pDelivery->w_id,
               deliveryFormIndexesP[D_WID].iLen,
&deliveryForm[deliveryFormIndexesP[D_WID].iStartIndex]);
  PutNumeric(pDelivery->o_carrier_id,
               deliveryFormIndexesP[D_CAR].iLen,
&deliveryForm[deliveryFormIndexesP[D_CAR].iStartIndex]);

  UNRESERVE_TRANSACTION_STRUCT( DELIVERY_TRANS, pDelivery );

  PUT_STRING(NULL, 0, 0, StrStruct[ssCnt]);
  PutHTMLStrings(StrStruct, deliveryForm,
giResponseLen[DELIVERY_RESPONSE],
                    &szOutput, &iOutputLen);

  SendResponse(req, szOutput, iOutputLen);

  UNRESERVE_RESPONSE( DELIVERY_RESPONSE, deliveryForm );

  if( szOutput != deliveryForm )
    UNRESERVE_PANIC_FORM( szOutput );
}
```

```
/* FUNCTION: void TPCCNewOrderResponse(request_rec *req,
 *                                          int retcode,
 *                                          NewOrderData
*newOrderData )
 *
 * PURPOSE:         This function fills in the values and returns
the
 *                  response form to the browser.
 *
 * ARGUMENTS:       request_rec         *req      pointer to the
structure
 *                                                        that
contains the internet
 *                                                        service
information.
 *                  int                 retcode   return status
from the db.
 *                  NewOrderData        *newOrderData       pointer
to structure containing
 *                                                        data
about the current txn.
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */


void
TPCCNewOrderResponse( int retcode, pNewOrderData pNewOrder )
{
  int     i;
  char  szDate[]   = "xx-xx-xxxx xx:xx:xx";
  char  szBlanks[] = "                          ";
  char  szDollar[] = "$";
  PutStrStruct StrStruct[133];
  int ssCnt = 0;
  int jj;
  int kk;
  int mm;
  char *newOrderForm;
  char *szOutput;
  int iOutputLen;
  BOOL bValid;
  char *execution_status;
  char szStatus[80];
  request_rec *req;


  req = pNewOrder->pCC;


  if ( ERR_DB_PENDING == retcode )
  {
    return;
  }
  else if ( ERR_DB_DEADLOCK_LIMIT == retcode )
  {
    SendErrorResponse( req, ERR_NEW_ORDER_NOT_PROCESSED,
                            ERR_TYPE_WEBDLL, NULL,
                            pNewOrder->w_id, pNewOrder->ld_id,
                            (pConnData)pNewOrder );
    return;
  }
  else if( ERR_DB_SUCCESS != retcode && ERR_DB_NOT_COMMITED !=
retcode )
  {
    sprintf( szStatus,
               "Item number is not valid, or DB error = %d",
               pNewOrder->dbstatus );
    SendErrorResponse( req, ERR_DB_ERROR,
                            ERR_TYPE_WEBDLL, NULL,
                            pNewOrder->w_id, pNewOrder->ld_id,
                            (pConnData)pNewOrder );
    return;
  }
  else if ( ERR_DB_SUCCESS == retcode )
  {
    bValid = TRUE;
    execution_status = "Transaction commited.";
  }
  else if ( ERR_DB_NOT_COMMITED == retcode )
  {

    bValid = FALSE;
    execution_status = "Item number is not valid.";
  }


  RESERVE_RESPONSE( NEW_ORDER_RESPONSE, newOrderForm );


  if(bValid)
  {
    PutNumeric(WDID(pNewOrder->w_id,pNewOrder->ld_id),
                newOrderResponseIndexes[NO_WDID].iLen,

&newOrderForm[newOrderResponseIndexes[NO_WDID].iStartIndex]);
    PutNumeric(pNewOrder->w_id,
                newOrderResponseIndexes[NO_WID].iLen,

&newOrderForm[newOrderResponseIndexes[NO_WID].iStartIndex]);
    PutNumeric(pNewOrder->d_id,
                newOrderResponseIndexes[NO_DID].iLen,

&newOrderForm[newOrderResponseIndexes[NO_DID].iStartIndex]);


    /* put the date in if valid */
    PutNumeric(pNewOrder->o_entry_d.day, 2, &szDate[0]);
    PutNumeric(pNewOrder->o_entry_d.month, 2, &szDate[3]);
    PutNumeric(pNewOrder->o_entry_d.year, 4, &szDate[6]);
    PutNumeric(pNewOrder->o_entry_d.hour, 2, &szDate[11]);
```

```
    PutNumeric(pNewOrder->o_entry_d.minute, 2, &szDate[14]);
    PutNumeric(pNewOrder->o_entry_d.second, 2, &szDate[17]);

memcpy(&newOrderForm[newOrderResponseIndexes[NO_DATE].iStartIndex],
            szDate, newOrderResponseIndexes[NO_DATE].iLen);
  }
  else
  {
    /* put in blanks for the date if not valid */

memcpy(&newOrderForm[newOrderResponseIndexes[NO_DATE].iStartIndex],
            szBlanks, newOrderResponseIndexes[NO_DATE].iLen);
  }
  /* put in value for the customer id. */
  PutNumeric(pNewOrder->c_id,
              newOrderResponseIndexes[NO_CID].iLen,

&newOrderForm[newOrderResponseIndexes[NO_CID].iStartIndex]);


  /* put in the values for the last name and  credit rating */
  PUT_STRING(pNewOrder->c_last,
              newOrderResponseIndexes[NO_LAST].iLen,
              newOrderResponseIndexes[NO_LAST].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pNewOrder->c_credit,
              newOrderResponseIndexes[NO_CREDIT].iLen,
              newOrderResponseIndexes[NO_CREDIT].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;


  if(bValid)
  {
    /* put in the values */
    PutFloat2(pNewOrder->c_discount,
               newOrderResponseIndexes[NO_DISC].iLen,

&newOrderForm[newOrderResponseIndexes[NO_DISC].iStartIndex]);
    PutNumeric(pNewOrder->o_id,
                newOrderResponseIndexes[NO_OID].iLen,

&newOrderForm[newOrderResponseIndexes[NO_OID].iStartIndex]);
    PutNumeric(pNewOrder->o_ol_cnt,
                newOrderResponseIndexes[NO_LINES].iLen,

&newOrderForm[newOrderResponseIndexes[NO_LINES].iStartIndex]);
    PutFloat2(pNewOrder->w_tax,
               newOrderResponseIndexes[NO_W_TAX].iLen,

&newOrderForm[newOrderResponseIndexes[NO_W_TAX].iStartIndex]);
    PutFloat2(pNewOrder->d_tax,
               newOrderResponseIndexes[NO_D_TAX].iLen,

&newOrderForm[newOrderResponseIndexes[NO_D_TAX].iStartIndex]);
```

```
    for(i=0; i<pNewOrder->o_ol_cnt; i++)
    {
      PutNumeric(pNewOrder->o_ol[i].ol_supply_w_id,
                    newOrderResponseIndexes[NO_S_WID+(i*8)].iLen,

&newOrderForm[newOrderResponseIndexes[NO_S_WID+(i*8)].iStartIndex])
;
      PutNumeric(pNewOrder->o_ol[i].ol_i_id,
                    newOrderResponseIndexes[NO_IID+(i*8)].iLen,

&newOrderForm[newOrderResponseIndexes[NO_IID+(i*8)].iStartIndex]);
      PUT_STRING(pNewOrder->o_ol[i].i_name,
                    newOrderResponseIndexes[NO_INAME+(i*8)].iLen,

newOrderResponseIndexes[NO_INAME+(i*8)].iStartIndex,
                    StrStruct[ssCnt]);
      ssCnt++;
      PutNumeric(pNewOrder->o_ol[i].ol_quantity,
                    newOrderResponseIndexes[NO_QTY+(i*8)].iLen,

&newOrderForm[newOrderResponseIndexes[NO_QTY+(i*8)].iStartIndex]);


      PutNumeric(pNewOrder->o_ol[i].s_quantity,
                    newOrderResponseIndexes[NO_STOCK+(i*8)].iLen,

&newOrderForm[newOrderResponseIndexes[NO_STOCK+(i*8)].iStartIndex])
;
      PUT_STRING(pNewOrder->o_ol[i].b_g,
                    newOrderResponseIndexes[NO_BG+(i*8)].iLen,

newOrderResponseIndexes[NO_BG+(i*8)].iStartIndex,
                    StrStruct[ssCnt]);
      ssCnt++;

memcpy(&newOrderForm[newOrderResponseIndexes[NO_PRICE+(i*8)].iStart
Index-1],
                szDollar, 1);
      PutFloat2(pNewOrder->o_ol[i].i_price,
                    newOrderResponseIndexes[NO_PRICE+(i*8)].iLen,

          &newOrderForm[newOrderResponseIndexes[NO_PRICE+(i*8)].iSt
artIndex]);

memcpy(&newOrderForm[newOrderResponseIndexes[NO_AMT+(i*8)].iStartIn
dex-1],
                szDollar, 1);
      PutFloat2(pNewOrder->o_ol[i].ol_amount,
                    newOrderResponseIndexes[NO_AMT+(i*8)].iLen,

          &newOrderForm[newOrderResponseIndexes[NO_AMT+(i*8)].iStar
tIndex]);


    }
    /* need to blank out the rest of the unused item rows */
    jj = NO_AMT + ((i-1)*8) + 1;
    for(kk=i; kk<15; kk++)
```

```
    {
      /* there are 8 items per row - 6 plain and 2 with $*/
      for(mm=0; mm<6; mm++)
      {
          memcpy(&newOrderForm[newOrderResponseIndexes[jj].iStartIn
dex],
                 szBlanks, newOrderResponseIndexes[jj].iLen);
          jj++;
      }
      /* blank out the '$' for the blank $values */
      for(mm=0; mm<2; mm++)
      {
          memcpy(&newOrderForm[newOrderResponseIndexes[jj].iStartIn
dex-1],
                 szBlanks, newOrderResponseIndexes[jj].iLen+1);
          jj++;
      }
    }
  }
  else
  {
    /* will need to blank out any fields not entered when not valid
*/
    /* space for discount */

memcpy(&newOrderForm[newOrderResponseIndexes[NO_DISC].iStartIndex],
            szBlanks, newOrderResponseIndexes[NO_DISC].iLen);
    /*the actual order number */
    PutNumeric(pNewOrder->o_id,
                newOrderResponseIndexes[NO_OID].iLen,

&newOrderForm[newOrderResponseIndexes[NO_OID].iStartIndex]);
    /* space for number of lines, w_tax, and d_tax */
    for(kk=0; kk<3; kk++)
    {

memcpy(&newOrderForm[newOrderResponseIndexes[NO_LINES+kk].iStartInd
ex],
              szBlanks,
newOrderResponseIndexes[NO_LINES+kk].iLen);
    }
    /* spaces for each of the fields in the row items */
    jj = NO_S_WID;
    for(kk=0; kk<15; kk++)
    {
      /* there are 8 items per row - 6 plain and 2 with $*/
      for(mm=0; mm<6; mm++)
      {
          memcpy(&newOrderForm[newOrderResponseIndexes[jj].iStartIn
dex],
                 szBlanks, newOrderResponseIndexes[jj].iLen);
          jj++;
      }
      /* blank out the '$' for the blank $values */
      for(mm=0; mm<2; mm++)
      {
          memcpy(&newOrderForm[newOrderResponseIndexes[jj].iStartIn
dex-1],
                 szBlanks, newOrderResponseIndexes[jj].iLen+1);
          jj++;
      }


    }
  }


  /* output the execution status */
  PUT_STRING(execution_status,
newOrderResponseIndexes[NO_STAT].iLen,
               newOrderResponseIndexes[NO_STAT].iStartIndex,
               StrStruct[ssCnt]);
  ssCnt++;


  if(bValid)
  {
    /* total */
    PutFloat2(pNewOrder->total_amount,
                newOrderResponseIndexes[NO_TOTAL].iLen,

&newOrderForm[newOrderResponseIndexes[NO_TOTAL].iStartIndex]);
  }
  else
  {
    /* put blanks for total */

memcpy(&newOrderForm[newOrderResponseIndexes[NO_TOTAL].iStartIndex]
,
            szBlanks, newOrderResponseIndexes[NO_TOTAL].iLen);
  }
  PUT_STRING(NULL, 0, 0, StrStruct[ssCnt]);
  PutHTMLStrings(StrStruct, newOrderForm,
giResponseLen[NEW_ORDER_RESPONSE],
                    &szOutput, &iOutputLen);


#ifdef FFE_DEBUG
  pNewOrder->iStage |= UNRESERVING;
#endif


  UNRESERVE_TRANSACTION_STRUCT( NEW_ORDER_TRANS, pNewOrder );


  SendResponse(req, szOutput, iOutputLen);


  UNRESERVE_RESPONSE( NEW_ORDER_RESPONSE, newOrderForm );


  if( szOutput != newOrderForm )
    UNRESERVE_PANIC_FORM( szOutput );
}


/* FUNCTION: void TPCCPaymentResponse(request_rec *req,
```

```
 *                                              int retcode,
 *                                              PaymentData
*paymentData)
 *
 * PURPOSE:         This function fills in the values and returns
the
 *                  response form to the browser.
 *
 * ARGUMENTS:       request_rec         *req      pointer to
structure that
 *
          contains internet service
 *
          information.
 *                  int                 retcode   return status
from the db call
 *                  PaymentData         *paymentData        pointer
to structure containing
 *                                                            the
data for this transaction.
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */


void
TPCCPaymentResponse( int retcode, pPaymentData pPayment )
{
  char    *ptr;
  char    szcdata[4][64];
  char    szW_Zip[26];
  char    szD_Zip[26];
  char    szC_Zip[26];
  char    szC_Phone[26];
  int     i;
  int     l;
  char    *szZipPic = "XXXXX-XXXX";
  char  szLongDate[] = "XX-XX-XXXX XX:XX:XX";
  char  szDate[]   = "xx-xx-xxxx";
  char  szBlanks[] = "
";
  PutStrStruct StrStruct[34];
  int ssCnt = 0;
  char *paymentForm;
  char *szOutput;
  int iOutputLen;
  request_rec *req;


  req = pPayment->pCC;


  if ( ERR_DB_PENDING == retcode )
  {
    return;
  }
  else if ( ERR_DB_DEADLOCK_LIMIT == retcode )
  {
    SendErrorResponse( req, ERR_PAYMENT_NOT_PROCESSED,
                            ERR_TYPE_WEBDLL, NULL,
                            pPayment->w_id, pPayment->ld_id,
                            (pConnData)pPayment );
    return;
  }
  else if ( ERR_DB_NOT_COMMITED == retcode )
  {
    SendErrorResponse( req, ERR_PAYMENT_INVALID_CUSTOMER,
                            ERR_TYPE_WEBDLL, NULL,
                            pPayment->w_id, pPayment->ld_id,
                            (pConnData)pPayment );
    return;
  }
  else if ( ERR_DB_SUCCESS != retcode )
  {
    SendErrorResponse( req, ERR_DB_ERROR,
                            ERR_TYPE_WEBDLL, NULL,
                            pPayment->w_id, pPayment->ld_id,
                            (pConnData)pPayment );
    return;
  }



  RESERVE_RESPONSE( PAYMENT_RESPONSE,  paymentForm );


  PutNumeric(WDID(pPayment->w_id,pPayment->ld_id),
              paymentResponseIndexes[PT_WDID].iLen,

&paymentForm[paymentResponseIndexes[PT_WDID].iStartIndex]);
  PutNumeric(pPayment->h_date.day, 2,
              &szLongDate[0]);
  PutNumeric(pPayment->h_date.month, 2,
              &szLongDate[3]);
  PutNumeric(pPayment->h_date.year, 4,
              &szLongDate[6]);
  PutNumeric(pPayment->h_date.hour, 2,
              &szLongDate[11]);
  PutNumeric(pPayment->h_date.minute, 2,
              &szLongDate[14]);
  PutNumeric(pPayment->h_date.second, 2,
              &szLongDate[17]);

memcpy(&paymentForm[paymentResponseIndexes[PT_LONG_DATE].iStartInde
x],
           szLongDate, paymentResponseIndexes[PT_LONG_DATE].iLen);


  PutNumeric(pPayment->w_id,
              paymentResponseIndexes[PT_WID].iLen,
```

```
&paymentForm[paymentResponseIndexes[PT_WID].iStartIndex]);
  PutNumeric(pPayment->d_id,
              paymentResponseIndexes[PT_DID].iLen,
&paymentForm[paymentResponseIndexes[PT_DID].iStartIndex]);

  PUT_STRING(pPayment->w_street_1,
              paymentResponseIndexes[PT_W_ST_1].iLen,
              paymentResponseIndexes[PT_W_ST_1].iStartIndex,
              StrStruct[ssCnt]);

  ssCnt++;
  PUT_STRING(pPayment->d_street_1,
              paymentResponseIndexes[PT_D_ST_1].iLen,
              paymentResponseIndexes[PT_D_ST_1].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pPayment->w_street_2,
              paymentResponseIndexes[PT_W_ST_2].iLen,
              paymentResponseIndexes[PT_W_ST_2].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pPayment->d_street_2,
              paymentResponseIndexes[PT_D_ST_2].iLen,
              paymentResponseIndexes[PT_D_ST_2].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pPayment->w_city,
              paymentResponseIndexes[PT_W_CITY].iLen,
              paymentResponseIndexes[PT_W_CITY].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pPayment->w_state,
              paymentResponseIndexes[PT_W_ST].iLen,
              paymentResponseIndexes[PT_W_ST].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  FormatString(szW_Zip, szZipPic, pPayment->w_zip);

memcpy(&paymentForm[paymentResponseIndexes[PT_W_ZIP].iStartIndex],
          szW_Zip, paymentResponseIndexes[PT_W_ZIP].iLen);
  PUT_STRING(pPayment->d_city,
              paymentResponseIndexes[PT_D_CITY].iLen,
              paymentResponseIndexes[PT_D_CITY].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pPayment->d_state,
              paymentResponseIndexes[PT_D_ST].iLen,
              paymentResponseIndexes[PT_D_ST].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  FormatString(szD_Zip, szZipPic, pPayment->d_zip);

memcpy(&paymentForm[paymentResponseIndexes[PT_D_ZIP].iStartIndex],
          szD_Zip, paymentResponseIndexes[PT_D_ZIP].iLen);
  PutNumeric(pPayment->c_id,
              paymentResponseIndexes[PT_CID].iLen,
&paymentForm[paymentResponseIndexes[PT_CID].iStartIndex]);
  PutNumeric(pPayment->c_w_id,
              paymentResponseIndexes[PT_C_WID].iLen,
&paymentForm[paymentResponseIndexes[PT_C_WID].iStartIndex]);
  PutNumeric(pPayment->c_d_id,
              paymentResponseIndexes[PT_C_DID].iLen,
&paymentForm[paymentResponseIndexes[PT_C_DID].iStartIndex]);

  PUT_STRING(pPayment->c_first,
              paymentResponseIndexes[PT_FIRST].iLen,
              paymentResponseIndexes[PT_FIRST].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pPayment->c_middle,
              paymentResponseIndexes[PT_MIDDLE].iLen,
              paymentResponseIndexes[PT_MIDDLE].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pPayment->c_last,
              paymentResponseIndexes[PT_LAST].iLen,
              paymentResponseIndexes[PT_LAST].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;

  PutNumeric(pPayment->c_since.day, 2, &szDate[0]);
  PutNumeric(pPayment->c_since.month, 2, &szDate[3]);
  PutNumeric(pPayment->c_since.year, 4, &szDate[6]);

memcpy(&paymentForm[paymentResponseIndexes[PT_SM_DATE].iStartIndex]
, szDate,
          paymentResponseIndexes[PT_SM_DATE].iLen);

  PUT_STRING(pPayment->c_street_1,
              paymentResponseIndexes[PT_C_STR_1].iLen,
              paymentResponseIndexes[PT_C_STR_1].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pPayment->c_credit,
              paymentResponseIndexes[PT_CREDIT].iLen,
              paymentResponseIndexes[PT_CREDIT].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;

  PUT_STRING(pPayment->d_street_2,
```

```
              paymentResponseIndexes[PT_D_STR_2].iLen,
              paymentResponseIndexes[PT_D_STR_2].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;

  PutFloat2(pPayment->c_discount,
            paymentResponseIndexes[PT_DISC].iLen,
&paymentForm[paymentResponseIndexes[PT_DISC].iStartIndex]);

  PUT_STRING(pPayment->c_city,
              paymentResponseIndexes[PT_C_CITY].iLen,
              paymentResponseIndexes[PT_C_CITY].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;

  PUT_STRING(pPayment->c_state,
              paymentResponseIndexes[PT_C_ST].iLen,
              paymentResponseIndexes[PT_C_ST].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;

  FormatString(szC_Zip, szZipPic, pPayment->c_zip);
memcpy(&paymentForm[paymentResponseIndexes[PT_C_ZIP].iStartIndex],
szC_Zip,
          paymentResponseIndexes[PT_C_ZIP].iLen);
  FormatString(szC_Phone, "XXXXXX-XXX-XXX-XXXX",
               pPayment->c_phone);
memcpy(&paymentForm[paymentResponseIndexes[PT_C_PHONE].iStartIndex]
,
          szC_Phone, paymentResponseIndexes[PT_C_PHONE].iLen);

  PutFloat2(pPayment->h_amount,
            paymentResponseIndexes[PT_AMT].iLen,
&paymentForm[paymentResponseIndexes[PT_AMT].iStartIndex]);
  PutFloat2(pPayment->c_balance,
            paymentResponseIndexes[PT_BAL].iLen,
&paymentForm[paymentResponseIndexes[PT_BAL].iStartIndex]);

  PutFloat2(pPayment->c_credit_lim,
            paymentResponseIndexes[PT_LIM].iLen,
&paymentForm[paymentResponseIndexes[PT_LIM].iStartIndex]);

  ptr = pPayment->c_credit;
  if ( *ptr == 'B' && *(ptr+1) == 'C' )
  {
    ptr = pPayment->c_data;
    l = strlen( ptr ) / 50;
    for(i=0; i<4; i++, ptr += 50)
    {
      if ( i <= l )
      {
          strncpy(szcdata[i], ptr, 50);
          szcdata[i][50] = '\0';
      }
      else
          szcdata[i][0] = 0;

      PUT_STRING(szcdata[i],
                  paymentResponseIndexes[PT_CUST_DATA+i].iLen,
paymentResponseIndexes[PT_CUST_DATA+i].iStartIndex,
                  StrStruct[ssCnt]);
      ssCnt++;
    }
  }
  else
  {
    for(i=0; i<4; i++)
    {
memcpy(&paymentForm[paymentResponseIndexes[PT_CUST_DATA+i].iStartIn
dex],
              szBlanks,
paymentResponseIndexes[PT_CUST_DATA+i].iLen);
    }
  }

  PUT_STRING(NULL, 0, 0, StrStruct[ssCnt]);

  PutHTMLStrings(StrStruct, paymentForm,
giResponseLen[PAYMENT_RESPONSE],
                  &szOutput, &iOutputLen);

#ifdef FFE_DEBUG
  pPayment->iStage |= UNRESERVING;
#endif

  UNRESERVE_TRANSACTION_STRUCT( PAYMENT_TRANS, pPayment );

  SendResponse(req, szOutput, iOutputLen);

  UNRESERVE_RESPONSE( PAYMENT_RESPONSE, paymentForm );

  if( szOutput != paymentForm )
    UNRESERVE_PANIC_FORM( szOutput );
}

/* FUNCTION: void TPCCOrderStatusResponse( int retcode,
 *
OrderStatusData *orderStatusData)
 *
```

```
 * PURPOSE:         This function fills in the values and returns
the
 *                  response form to the browser.
 *
 * ARGUMENTS:       request_rec         *req      pointer to
structure containing
 *
          internet service information.
 *                  int                 retcode return status from
db call
 *                  OrderStatusData *orderStatusData        pointer
to structure
 *
          of data for this txn.
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */


void
TPCCOrderStatusResponse( int retcode, pOrderStatusData pOrderStatus
)
{
  int     i;
  int     jj;
  int     kk;
  int     mm;
  char  szLongDate[] = "XX-XX-XXXX XX:XX:XX";
  char  szDate[]   = "XX-XX-XXXX";
  char  szBlanks[] = "                          ";
  char  szDollar[] = "$";
  PutStrStruct StrStruct[4];
  int   ssCnt = 0;
  char    *orderStatusForm;
  char    *szOutput;
  int     iOutputLen;
  request_rec *req;


  req = pOrderStatus->pCC;


  if ( ERR_DB_PENDING == retcode )
  {
    return;
  }
  else if ( ERR_DB_DEADLOCK_LIMIT == retcode )
  {
    SendErrorResponse( req, ERR_ORDER_STATUS_NOT_PROCESSED,
                           ERR_TYPE_WEBDLL, NULL,
                           pOrderStatus->w_id, pOrderStatus->ld_id,
                           (pConnData)pOrderStatus );
    return;
  }
  else if ( ERR_DB_NOT_COMMITED == retcode )
  {
    SendErrorResponse( req, ERR_NOSUCH_CUSTOMER,
                           ERR_TYPE_WEBDLL, NULL,
                           pOrderStatus->w_id, pOrderStatus->ld_id,
                           (pConnData)pOrderStatus );
    return;
  }
  else    if ( ERR_DB_SUCCESS != retcode )
  {
    SendErrorResponse( req, ERR_DB_ERROR,
                           ERR_TYPE_WEBDLL, NULL,
                           pOrderStatus->w_id, pOrderStatus->ld_id,
                           (pConnData)pOrderStatus );
  return;
  }


  RESERVE_RESPONSE( ORDER_STATUS_RESPONSE, orderStatusForm );


  PutNumeric(WDID(pOrderStatus->w_id,pOrderStatus->ld_id),
              orderStatusResponseIndexes[OS_WDID].iLen,

&orderStatusForm[orderStatusResponseIndexes[OS_WDID].iStartIndex]);
  PutNumeric(pOrderStatus->w_id,
              orderStatusResponseIndexes[OS_WID].iLen,

&orderStatusForm[orderStatusResponseIndexes[OS_WID].iStartIndex]);
  PutNumeric(pOrderStatus->d_id,
              orderStatusResponseIndexes[OS_DID].iLen,

&orderStatusForm[orderStatusResponseIndexes[OS_DID].iStartIndex]);
  PutNumeric(pOrderStatus->c_id,
              orderStatusResponseIndexes[OS_CID].iLen,

&orderStatusForm[orderStatusResponseIndexes[OS_CID].iStartIndex]);
  PUT_STRING(pOrderStatus->c_first,
              orderStatusResponseIndexes[OS_FIRST].iLen,
              orderStatusResponseIndexes[OS_FIRST].iStartIndex,
StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pOrderStatus->c_middle,
              orderStatusResponseIndexes[OS_MIDDLE].iLen,
              orderStatusResponseIndexes[OS_MIDDLE].iStartIndex,
              StrStruct[ssCnt]);
  ssCnt++;
  PUT_STRING(pOrderStatus->c_last,
              orderStatusResponseIndexes[OS_LAST].iLen,
              orderStatusResponseIndexes[OS_LAST].iStartIndex,
StrStruct[ssCnt]);
  ssCnt++;
  PutFloat2(pOrderStatus->c_balance,
             orderStatusResponseIndexes[OS_BAL].iLen,

&orderStatusForm[orderStatusResponseIndexes[OS_BAL].iStartIndex]);
  PutNumeric(pOrderStatus->o_id,
```

```
              orderStatusResponseIndexes[OS_OID].iLen,
&orderStatusForm[orderStatusResponseIndexes[OS_OID].iStartIndex]);

  PutNumeric(pOrderStatus->o_entry_d.day, 2, &szLongDate[0]);
  PutNumeric(pOrderStatus->o_entry_d.month, 2, &szLongDate[3]);
  PutNumeric(pOrderStatus->o_entry_d.year, 4, &szLongDate[6]);
  PutNumeric(pOrderStatus->o_entry_d.hour, 2, &szLongDate[11]);
  PutNumeric(pOrderStatus->o_entry_d.minute, 2, &szLongDate[14]);
  PutNumeric(pOrderStatus->o_entry_d.second, 2, &szLongDate[17]);

memcpy(&orderStatusForm[orderStatusResponseIndexes[OS_DATE].iStartI
ndex],
           szLongDate, orderStatusResponseIndexes[OS_DATE].iLen);
  PutNumeric(pOrderStatus->o_carrier_id,
              orderStatusResponseIndexes[OS_CAR_ID].iLen,
&orderStatusForm[orderStatusResponseIndexes[OS_CAR_ID].iStartIndex]
);

  for(i=0; i<pOrderStatus->o_ol_cnt; i++)
  {
    PutNumeric(pOrderStatus->s_ol[i].ol_supply_w_id,
                orderStatusResponseIndexes[OS_S_WID+(i*5)].iLen,
&orderStatusForm[orderStatusResponseIndexes[OS_S_WID+(i*5)].iStartI
ndex]);
    PutNumeric(pOrderStatus->s_ol[i].ol_i_id,
                orderStatusResponseIndexes[OS_IID+(i*5)].iLen,
&orderStatusForm[orderStatusResponseIndexes[OS_IID+(i*5)].iStartInd
ex]);
    PutNumeric(pOrderStatus->s_ol[i].ol_quantity,
                orderStatusResponseIndexes[OS_QTY+(i*5)].iLen,
&orderStatusForm[orderStatusResponseIndexes[OS_QTY+(i*5)].iStartInd
ex]);

memcpy(&orderStatusForm[orderStatusResponseIndexes[OS_AMT+(i*5)].iS
tartIndex-1],
               szDollar, 1);
    PutFloat2(pOrderStatus->s_ol[i].ol_amount,
                orderStatusResponseIndexes[OS_AMT+(i*5)].iLen,
&orderStatusForm[orderStatusResponseIndexes[OS_AMT+(i*5)].iStartInd
ex]);
    PutNumeric(pOrderStatus->s_ol[i].ol_delivery_d.day,
                2, &szDate[0]);
    PutNumeric(pOrderStatus->s_ol[i].ol_delivery_d.month,
                2, &szDate[3]);
    PutNumeric(pOrderStatus->s_ol[i].ol_delivery_d.year,
                4, &szDate[6]);

memcpy(&orderStatusForm[orderStatusResponseIndexes[OS_SM_DATE+(i*5)
].iStartIndex],
             szDate,
orderStatusResponseIndexes[OS_SM_DATE+(i*5)].iLen);
  }
  /* need to blank out the rest of the unused item rows */
  jj = OS_SM_DATE + ((i-1)*5) + 1;
  for(kk=i; kk<15; kk++)
  {
    /* there are 5 items per row - 4 plain and 1 with $*/
    for(mm=0; mm<3; mm++)
    {

memcpy(&orderStatusForm[orderStatusResponseIndexes[jj].iStartIndex]
,
                szBlanks, orderStatusResponseIndexes[jj].iLen);
      jj++;
    }
    /* blank out the '$' for the blank $values */

memcpy(&orderStatusForm[orderStatusResponseIndexes[jj].iStartIndex-
1],
              szBlanks, orderStatusResponseIndexes[jj].iLen+1);
    jj++;

memcpy(&orderStatusForm[orderStatusResponseIndexes[jj].iStartIndex]
,
              szBlanks, orderStatusResponseIndexes[jj].iLen);
    jj++;
  }

  PUT_STRING(NULL, 0, 0, StrStruct[ssCnt]);
  PutHTMLStrings(StrStruct, orderStatusForm,
                     giResponseLen[ORDER_STATUS_RESPONSE],
                     &szOutput, &iOutputLen);

#ifdef FFE_DEBUG
  pOrderStatus->iStage |= UNRESERVING;
#endif

  UNRESERVE_TRANSACTION_STRUCT( ORDER_STATUS_TRANS, pOrderStatus );

  SendResponse(req, szOutput, iOutputLen);

  UNRESERVE_RESPONSE( ORDER_STATUS_RESPONSE, orderStatusForm );

  if( szOutput != orderStatusForm )
    UNRESERVE_PANIC_FORM( szOutput );
}

/* FUNCTION: void TPCCStockLevelResponse(int retcode,
 *                                                StockLevelData
*stockLevelData)
 *
 * PURPOSE:         This function puts the response data for the
transaction
 *                  into the form and sends the form back to the
browser.
 *
 * ARGUMENTS:       request_rec         *req      pointer to
structure containing
```

```
 *
          internet service information.
 *                  int                 retcode return status from
db call
 *                  StockLevelData      *stockLevelData     pointer
to structure containing
 *                                                          data
for this transaction.
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */


void
TPCCStockLevelResponse( int retcode, StockLevelData *pStockLevel )
{
  char *stockLevelForm;
  request_rec *req;


  req = pStockLevel->pCC;


  if ( ERR_DB_PENDING == retcode )
  {
    return;
  }
  else if ( ERR_DB_DEADLOCK_LIMIT == retcode )
  {
    SendErrorResponse( req, ERR_STOCKLEVEL_NOT_PROCESSED,
                           ERR_TYPE_WEBDLL, NULL,
                           pStockLevel->w_id, pStockLevel->ld_id,
                           (pConnData)pStockLevel );
    return;
  }
  else if ( ERR_DB_SUCCESS != retcode )
  {
    SendErrorResponse( req, ERR_DB_ERROR,
                           ERR_TYPE_WEBDLL, NULL,
                           pStockLevel->w_id, pStockLevel->ld_id,
                           (pConnData)pStockLevel );
    return;
  }


  RESERVE_RESPONSE( STOCK_LEVEL_RESPONSE, stockLevelForm );


  PutNumeric(WDID(pStockLevel->w_id,pStockLevel->ld_id),
              stockLevelResponseIndexes[SL_WDID].iLen,

&stockLevelForm[stockLevelResponseIndexes[SL_WDID].iStartIndex]);
  PutNumeric(pStockLevel->w_id,
              stockLevelResponseIndexes[SL_WID].iLen,

&stockLevelForm[stockLevelResponseIndexes[SL_WID].iStartIndex]);
  PutNumeric(pStockLevel->ld_id,
              stockLevelResponseIndexes[SL_DID].iLen,

&stockLevelForm[stockLevelResponseIndexes[SL_DID].iStartIndex]);
  PutNumeric(pStockLevel->threshold,
              stockLevelResponseIndexes[SL_TH].iLen,

&stockLevelForm[stockLevelResponseIndexes[SL_TH].iStartIndex]);
  PutNumeric(pStockLevel->low_stock,
              stockLevelResponseIndexes[SL_LOW].iLen,

&stockLevelForm[stockLevelResponseIndexes[SL_LOW].iStartIndex]);


#ifdef FFE_DEBUG
  pStockLevel->iStage |= UNRESERVING;
#endif


  UNRESERVE_TRANSACTION_STRUCT( STOCK_LEVEL_TRANS, pStockLevel );


  SendResponse(req, stockLevelForm,
                giResponseLen[STOCK_LEVEL_RESPONSE]);


  UNRESERVE_RESPONSE( STOCK_LEVEL_RESPONSE, stockLevelForm );
}



/* FUNCTION: int ProcessDeliveryQuery( request_rec *req,
 *
 * PURPOSE:         This function parses the query string,
validates the data,
 *                  and sends the request to the db/transport and
returns
 *                  a response to the browser.
 *
 * ARGUMENTS:       request_rec         *req      ptr to the
structure
 *
          containing the internet server
 *
          information.
 *
 * RETURNS:         int                 status
 *
 * COMMENTS:        None
 *
 */


int
ProcessDeliveryQuery( request_rec *req, char *the_request,
                          int w_id, int ld_id )
{
  int                       retcode;
  char                      *ptr;
  char                      *deliveryVals[MAXDELIVERYVALS];
```

```
  pDeliveryData               pDelivery;
  pDeliveryData
          CompletedDeliveries[DELIVERY_RESPONSE_COUNT];


  RESERVE_TRANSACTION_STRUCT( DELIVERY_TRANS, pDelivery );


  pDelivery->w_id = w_id;
  pDelivery->ld_id = ld_id;
  pDelivery->pCC = req;


  PARSE_QUERY_STRING(the_request, MAXDELIVERYVALS,
                         deliveryStrs, deliveryVals);


  if ( !GetValuePtr(deliveryVals, QUEUETIME, &ptr) )
    return ERR_DELIVERY_MISSING_QUEUETIME_KEY;


  if ( !GetNumeric(ptr, &pDelivery->queue_time) )
    return ERR_DELIVERY_QUEUETIME_INVALID;


  if ( !GetValuePtr(deliveryVals, OCD, &ptr) )
    return ERR_DELIVERY_MISSING_OCD_KEY;


  if ( !GetNumeric(ptr, &pDelivery->o_carrier_id) )
    return ERR_DELIVERY_CARRIER_INVALID;


  if ( pDelivery->o_carrier_id > 10 || pDelivery->o_carrier_id < 1
)
    return ERR_DELIVERY_CARRIER_ID_RANGE;


#ifdef FFE_DEBUG
  pDelivery->iStage |= CALLING_LH;
#endif
  retcode = TPCCDelivery( pDelivery );


#ifdef FFE_DEBUG
  _ASSERT(VALID_DB_ERR(retcode));
  pDelivery->iStage |= CALLING_RESP;
#endif
  TPCCDeliveryResponse( retcode, pDelivery, CompletedDeliveries );


  return retcode;
}


/* FUNCTION: int ProcessNewOrderQuery( request_rec *req,
 *
 * PURPOSE:         This function parses the query string,
validates the data,
 *                  and sends the request to the db/transport and
returns
 *                  a response to the browser.
 *
 * ARGUMENTS:       request_rec         *req      ptr to structure
containing
 *                  internet server info
 *
 * RETURNS:         int                 status
 *
 * COMMENTS:        None
 *
 */


int
ProcessNewOrderQuery( request_rec *req, char *the_request,
                          int w_id, int ld_id )
{
  int                         retcode;
  NewOrderData                *pNewOrder;


  RESERVE_TRANSACTION_STRUCT( NEW_ORDER_TRANS, pNewOrder );


  pNewOrder->w_id = w_id;
  pNewOrder->ld_id = ld_id;
  pNewOrder->pCC = req;


  if ( ERR_SUCCESS != ( retcode = ParseNewOrderQuery( the_request,

pNewOrder )))
    return retcode;


#ifdef FFE_DEBUG
  pNewOrder->iStage |= CALLING_LH;
#endif
  retcode = TPCCNewOrder( pNewOrder );


  if (pNewOrder->status > 0)
  {
        retcode=pNewOrder->status;
  }


#ifdef FFE_DEBUG
  _ASSERT(VALID_DB_ERR(retcode));
  pNewOrder->iStage |= CALLING_RESP;
#endif
  TPCCNewOrderResponse( retcode, pNewOrder );


  return retcode;
}


/* FUNCTION: int ProcessOrderStatusQuery( request_rec *req,
 *
 * PURPOSE:         This function parses the query string,
validates the data,
 *                  and sends the request to the db/transport and
returns
```

```
 *                  a response to the browser.
 *
 * ARGUMENTS:       request_rec         *req      ptr to structure
that contains
 *                                                          the
internet server info.
 *
 * RETURNS:         int                 status
 *
 * COMMENTS:        None
 *
 */


int
ProcessOrderStatusQuery( request_rec *req, char *the_request,
                             int w_id, int ld_id )
{
  int                         retcode;
  OrderStatusData   *pOrderStatus;

  RESERVE_TRANSACTION_STRUCT( ORDER_STATUS_TRANS, pOrderStatus );

  pOrderStatus->w_id = w_id;
  pOrderStatus->ld_id = ld_id;
  pOrderStatus->pCC = req;

  if( ERR_SUCCESS != ( retcode = ParseOrderStatusQuery(
the_request,
          pOrderStatus )))
    return retcode;

#ifdef FFE_DEBUG
  pOrderStatus->iStage |= CALLING_LH;
#endif
  retcode = TPCCOrderStatus( pOrderStatus );

  if (pOrderStatus->status > 0)
        retcode=ERR_DB_ERROR;

#ifdef FFE_DEBUG
  _ASSERT(VALID_DB_ERR(retcode));
  pOrderStatus->iStage |= CALLING_RESP;
#endif
  TPCCOrderStatusResponse( retcode, pOrderStatus );

  return retcode;
}

/* FUNCTION: int ProcessPaymentQuery( request_rec *req,
 *
 * PURPOSE:         This function gets and validates the input data
from the
 *                  payment form filling in the required input
variables.
 *                  It then calls the SQLPayment transaction,
constructs the
 *                  output form and writes it back to client
browser.
 *
 * ARGUMENTS:       request_rec         *req      ptr to structure
that contains
 *                                                          the
internet server info.
 *
 * RETURNS:         int                 status
 *
 * COMMENTS:        None
 *
 */


int
ProcessPaymentQuery( request_rec *req, char *the_request,
                         int w_id, int ld_id )
{
  int                         retcode;
  PaymentData                 *pPayment;

  RESERVE_TRANSACTION_STRUCT( PAYMENT_TRANS, pPayment );

  pPayment->w_id = w_id;
  pPayment->ld_id = ld_id;
  pPayment->pCC = req;

  if( ERR_SUCCESS != ( retcode = ParsePaymentQuery( the_request,
pPayment )))
    return retcode;

#ifdef FFE_DEBUG
  pPayment->iStage |= CALLING_LH;
#endif
  retcode = TPCCPayment( pPayment );

  if (pPayment->status > 0)
          retcode=ERR_DB_ERROR;

#ifdef FFE_DEBUG
  _ASSERT(VALID_DB_ERR(retcode));
  pPayment->iStage |= CALLING_RESP;
#endif
  TPCCPaymentResponse( retcode, pPayment );

  return retcode;
}
```

```
/* FUNCTION: int ProcessStockLevelQuery( request_rec *req,
 *
 * PURPOSE:         This function gets and validates the input data
from the
 *                  Stock Level form filling in the required input
variables.
 *                  It then calls the SQLStockLevel transaction,
constructs
 *                  the output form and writes it back to client
browser.
 *
 * ARGUMENTS:       request_rec         *req      ptr to structure
that contains
 *                                                        the
internet server info.
 *                  int                 iSyncId             client
browser sync id
 *
 * RETURNS:         int                 status
 *
 * COMMENTS:        None
 *
 */


int
ProcessStockLevelQuery( request_rec *req, char *the_request,
                            int w_id, int ld_id )
{
  char          *ptr;
  int               retcode;
  char              *stockLevelVals[MAXSTOCKLEVELVALS];
  StockLevelData    *pStockLevel;


#if (DEBUG == 1)
        fprintf(MyLogFile, "Entering ProcessStockLevelQuery\n");
          fflush(MyLogFile);
#endif


  RESERVE_TRANSACTION_STRUCT( STOCK_LEVEL_TRANS, pStockLevel );


  pStockLevel->w_id = w_id;
  pStockLevel->ld_id = ld_id;
  pStockLevel->pCC = req;


  PARSE_QUERY_STRING(the_request, MAXSTOCKLEVELVALS,
                        stockLevelStrs, stockLevelVals);


  if ( !GetValuePtr(stockLevelVals, TT, &ptr))
    return ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY;


  if ( !GetNumeric(ptr, &pStockLevel->threshold) )
    return ERR_STOCKLEVEL_THRESHOLD_INVALID;


  if ( pStockLevel->threshold >= 100 || pStockLevel->threshold < 0
)
     return ERR_STOCKLEVEL_THRESHOLD_RANGE;


#ifdef FFE_DEBUG
  pStockLevel->iStage |= CALLING_LH;
#endif


  retcode = TPCCStockLevel( pStockLevel );


  if (pStockLevel->status > 0)
        retcode=ERR_DB_ERROR;


#ifdef FFE_DEBUG
  _ASSERT(VALID_DB_ERR(retcode));
  pStockLevel->iStage |= CALLING_RESP;
#endif
  TPCCStockLevelResponse( retcode, pStockLevel );


  return retcode;
}



/* FUNCTION: BOOL GetValuePtr(char *pProcessedQuery[], int iIndex,
 *                                      char **pValue)
 *
 * PURPOSE:         This function passes back a pointer to the char
ptr to the
 *                  value requested.
 *
 * ARGUMENTS:       char  *pProcessedQuery[]   char* array of query
string values
 *              int   iIndex    index into the ProcessedQuery array
 *                char *pValue          character ptr into to the
key's value
 *
 * RETURNS:         BOOL      FALSE     there is no valid ptr for
this value
 *                          TRUE        the ptr returned is valid
 *
 *
 * COMMENTS:        none.
 */


BOOL
GetValuePtr(char *pProcessedQuery[], int iIndex, char **pValue)
{
  *pValue = pProcessedQuery[iIndex];


  if(NULL == *pValue)return FALSE;


  return TRUE;
}
```

```
/* FUNCTION: void MakeDeliveryTemplates( char *deliveryForm,
 *                                                    char
*deliveryResponse )
 *
 * PURPOSE:         This function constructs the templates for the
 *                  Delivery input and response HTML forms.
 *
 * ARGUMENTS:       char *deliveryForm  pointer to the HTML input
form.
 *                  char *deliveryResponse        pointer to the
HTML response form.
 *
 * RETURNS:         None
 *
 * COMMENTS:        None
 */


void
MakeDeliveryTemplates( char *deliveryForm, char *deliveryResponse )
{
  int     curLen;


  /* first make the input form template */
  curLen = sprintf(deliveryForm, szFormTemplate, szModName);

  ParseTemplateString(deliveryForm, &curLen, szDeliveryFormTemp2i,
                          deliveryFormIndexesI);
  giFormLen[DELIVERY_FORM] = curLen;


  /* now make the process form template */
  curLen = sprintf(deliveryResponse, szFormTemplate, szModName);

  ParseTemplateString(deliveryResponse, &curLen,
szDeliveryFormTemp2p,
                          deliveryFormIndexesP);
  giResponseLen[DELIVERY_RESPONSE] = curLen;
}


/* FUNCTION: void MakeNewOrderTemplates(char *newOrderForm,
                                                      char
*newOrderResponse )
 *
 * PURPOSE:         This function constructs the templates for both
the input
 *                  and the response HTML forms for NewOrder
function.
 *
 * ARGUMENTS:       char      *newOrderForm       pointer to the
input HTML form.
 *                  char      *newOrderResponse pointer to the
response HTML form.
 *
 * RETURNS:         none
 *
 * COMMENTS:        none.
 */


void
MakeNewOrderTemplates( char *newOrderForm, char *newOrderResponse )
{
  int     curLen;


  /* first make the input template */
  curLen = sprintf(newOrderForm, szFormTemplate, szModName);
  ParseTemplateString(newOrderForm, &curLen, szNewOrderFormTemp2i,
                          newOrderFormIndexes);
  giFormLen[NEW_ORDER_FORM] = curLen;


  /* now make the process template */
  curLen = sprintf(newOrderResponse, szFormTemplate, szModName);
  ParseTemplateString(newOrderResponse, &curLen,
szNewOrderFormTemp2p,
                          newOrderResponseIndexes);
  giResponseLen[NEW_ORDER_RESPONSE] = curLen;
}


/* FUNCTION: void MakeOrderStatusTemplates(char *orderStatusForm,
 *                                       char
*orderStatusResponse)
 *
 * PURPOSE:         This function constructs the template HTML
forms
 *                  for Order Status.
 *
 * ARGUMENTS:       char *orderStatusForm              pointer to
the input HTML form
 *                  char *orderStatusResponse    pointer to the
response HTML form
 *
 * RETURNS:         none
 *
 * COMMENTS:   none
 */


void
MakeOrderStatusTemplates(char *orderStatusForm, char
*orderStatusResponse)
{
  int     curLen;


  /* first make the input form template */
  curLen = sprintf(orderStatusForm, szFormTemplate, szModName);
  ParseTemplateString(orderStatusForm, &curLen,
szOrderStatusFormTemp2i,
                          orderStatusFormIndexes);
  giFormLen[ORDER_STATUS_FORM] = curLen;


  /* now make the process template */
  curLen = sprintf(orderStatusResponse, szFormTemplate, szModName);
```

```
  ParseTemplateString(orderStatusResponse, &curLen,
szOrderStatusFormTemp2p,
                          orderStatusResponseIndexes);
  giResponseLen[ORDER_STATUS_RESPONSE] = curLen;
}


/* FUNCTION: void MakePaymentTemplates(char *paymentForm,
 *                                             char
*paymentResponse)
 *
 * PURPOSE:         This function constructs the templates for the
 *                  Payment input and response HTML forms.
 *
 * ARGUMENTS:       char      *paymentForm         pointer to the
input HTML form.
 *                  char      *paymentResponse pointer to the
response HTML form.
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */


void
MakePaymentTemplates(char *paymentForm, char *paymentResponse)
{
  int     curLen;


  /* first make the input form template */
  curLen = sprintf(paymentForm, szFormTemplate, szModName);
  ParseTemplateString(paymentForm, &curLen, szPaymentFormTemp2i,
                          paymentFormIndexes);
  giFormLen[PAYMENT_FORM] = curLen;


  /* now make the process form template */
  curLen = sprintf(paymentResponse, szFormTemplate, szModName);
  ParseTemplateString(paymentResponse, &curLen,
szPaymentFormTemp2p,
                          paymentResponseIndexes);
  giResponseLen[PAYMENT_RESPONSE] = curLen;
}


/* FUNCTION: void MakeStockLevelTemplates(char *stockLevelForm,
 *                                     char *stockLevelResponse)
 *
 * PURPOSE:         This function constructs the templates for the
 *                  input and response Stock Level HTML pages.
 *
 * ARGUMENTS:       char      *stockLevelForm           pointer to
the input HTML form
 *                  char      *stockLevelResponse   pointer to the
response HTML form
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */
void
MakeStockLevelTemplates(char *stockLevelForm, char
*stockLevelResponse)
{
  int     curLen;


  /* first make the input template */
  curLen = sprintf(stockLevelForm, szFormTemplate, szModName);
  ParseTemplateString(stockLevelForm, &curLen,
szStockLevelFormTemp2i,
                          stockLevelFormIndexes);
  giFormLen[STOCK_LEVEL_FORM] = curLen;


  /* now make the process template */
  curLen = sprintf(stockLevelResponse, szFormTemplate, szModName);
  ParseTemplateString(stockLevelResponse, &curLen,
szStockLevelFormTemp2p,
                          stockLevelResponseIndexes);
  giResponseLen[STOCK_LEVEL_RESPONSE] = curLen;
}


/* FUNCTION: void MakeResponseHeader(void)
 *
 * PURPOSE:         This function constructs the HTML response
header.
 *
 * ARGUMENTS:       char      *responseString           pointer to
the header string
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */
void
MakeResponseHeader(void)
{
  ParseTemplateString(szResponseHeader, &responseHeaderLen,
                          szResponseHeaderTemplate,
responseHeaderIndexes);
}


/* FUNCTION: void MakePanicPool( int dwResponseSize )
 *
 * PURPOSE:         This function builds the array of panic forms
to be used
 *                  by the threads as they need an oversize form,
or to report
 *                  an error.
 *
 * ARGUMENTS:       none
 *
```

```
 * RETURNS:         none
 *
 * COMMENTS:        none
 */


void
MakePanicPool( int dwResponseSize, apr_pool_t *p )
{
  int iMallocSize;
  char *pForm;
  int ii;


  /* set up area for forms (including errors) that are built on the
fly. */
  iMallocSize = (((char *)&gpPanicForms->index - (char
*)gpPanicForms) +
                      (((char *)gpPanicForms->forms - (char
*)gpPanicForms->index)
                       * dwResponseSize) +
                      (((char *)&gpPanicForms-
>forms[PANIC_FORM_SIZE] -
                        (char *)&gpPanicForms->forms[0]) *
dwResponseSize));


#if (DEBUG == 1)
        fprintf(MyLogFile, "gpPanicForms malloc=%d\n",
iMallocSize);
        fflush(MyLogFile);
#endif


  gpPanicForms = malloc( iMallocSize );
  apr_thread_mutex_create( &gpPanicForms->critSec, 0, p );
#ifdef FFE_DEBUG
  gpPanicForms->iMaxIndex = dwResponseSize - 1;
#endif
  gpPanicForms->iNextFree = 0;
  pForm =
    ((char *)&gpPanicForms->index[0] +
     (((char *)&gpPanicForms->forms[0] - (char *)&gpPanicForms-
>index[0]) *
      dwResponseSize));


  for( ii = 0; ii < dwResponseSize; ii++ )
  {
    gpPanicForms->index[ii] = pForm;
    pForm += PANIC_FORM_SIZE;
  }
}


/* FUNCTION: void DeletePanicPool( void )
 *
 * PURPOSE:         This function destroys the array of panic forms
to be used
 *                  by the threads as they need an oversize or
error form.
 *
 * ARGUMENTS:       none
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */
void
DeletePanicPool( void )
{
  free( gpPanicForms );
}


/* FUNCTION: void MakeTemplatePool( int dwFormSize, int
dwResponseSize )
 *
 * PURPOSE:         This function builds the array of forms to be
used
 *                  by the threads as they need a form.  The forms
are
 *                  reserved and released by each thread as needed.
 *
 * ARGUMENTS:       none
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */


void
MakeTemplatePool( int dwFormSize, int dwResponseSize, apr_pool_t
*p)
{
  char szDeliveryForm[sizeof(szFormTemplate)+FILENAMESIZE+
                        sizeof(szDeliveryFormTemp2i)];
  char szNewOrderForm[sizeof(szFormTemplate)+FILENAMESIZE+
                        sizeof(szNewOrderFormTemp2i)];
  char szOrderStatusForm[sizeof(szFormTemplate)+FILENAMESIZE+
                             sizeof(szOrderStatusFormTemp2i)];
  char szPaymentForm[sizeof(szFormTemplate)+FILENAMESIZE+
                       sizeof(szPaymentFormTemp2i)];
  char szStockLevelForm[sizeof(szFormTemplate)+FILENAMESIZE+
                          sizeof(szStockLevelFormTemp2i)];
  char szDeliveryResponse[sizeof(szFormTemplate)+FILENAMESIZE+
                             sizeof(szDeliveryFormTemp2p)];
  char szNewOrderResponse[sizeof(szFormTemplate)+FILENAMESIZE+
                             sizeof(szNewOrderFormTemp2p)];
  char szOrderStatusResponse[sizeof(szFormTemplate)+FILENAMESIZE+
                                sizeof(szOrderStatusFormTemp2p)];
  char szPaymentResponse[sizeof(szFormTemplate)+FILENAMESIZE+
                            sizeof(szPaymentFormTemp2p)];
  char szStockLevelResponse[sizeof(szFormTemplate)+FILENAMESIZE+
```

```
                                sizeof(szStockLevelFormTemp2p)];
  int     iFormLen[NUMBER_POOL_FORM_TYPES];
  int     iResponseLen[NUMBER_POOL_RESPONSE_TYPES];
  int iMallocSize;
  int iRowSize;
  int ii;
  int jj;
  char *pForm;
  char *pResponse;


  /* now build the forms that are static */
  MakeDeliveryTemplates( szDeliveryForm, szDeliveryResponse );
  MakeNewOrderTemplates( szNewOrderForm, szNewOrderResponse );
  MakeOrderStatusTemplates( szOrderStatusForm,
szOrderStatusResponse );
  MakePaymentTemplates( szPaymentForm, szPaymentResponse );
  MakeStockLevelTemplates( szStockLevelForm, szStockLevelResponse
);
  MakeResponseHeader( );


  /* calculate the size of one row of forms */
  iRowSize = 0;
  for( jj = 0; jj < NUMBER_POOL_FORM_TYPES; jj++ )
  {
    iFormLen[jj] = ( giFormLen[jj] + 8 ) & ( ~(int)7 );
    iRowSize += iFormLen[jj];
  }


  iMallocSize = (((char *)&gpForms->index - (char *)gpForms) +
                 (((char *)gpForms->forms - (char *)gpForms-
>index)
                  * dwFormSize * NUMBER_POOL_FORM_TYPES ) +
                 (((char *)&gpForms->forms[iRowSize *
dwFormSize] -
                   (char *)&gpForms->forms[0])));
#if (DEBUG == 1)
        fprintf(MyLogFile, "gpForms malloc=%d\n", iMallocSize);
        fflush(MyLogFile);
#endif
  gpForms = malloc( iMallocSize );


  for( jj = 0; jj < NUMBER_POOL_FORM_TYPES; jj++ )
  {
    apr_thread_mutex_create( &gpForms->critSec[jj], 0, p );
    gpForms->iNextFreeForm[jj] = 0;
    gpForms->iFirstFormIndex[jj] = jj * dwFormSize;
#ifdef FFE_DEBUG
    gpForms->iMaxIndex[jj] = dwFormSize - 1;
#endif
  }


  pForm = ((char *)&gpForms->index[0] +
            (((char *)&gpForms->forms[0] - (char *)&gpForms-
>index[0]) *
             NUMBER_POOL_FORM_TYPES * dwFormSize));
  for( ii = 0; ii < dwFormSize; ii++ )
  {
    for( jj = 0; jj < NUMBER_POOL_FORM_TYPES; jj++ )
    {
      gpForms->index[jj*dwFormSize+ii] = pForm;
      pForm += iFormLen[jj];
    }
  }


  /* load the first row with the templates */
  pForm = gpForms->index[0];


  memcpy( pForm, szDeliveryForm, iFormLen[DELIVERY_FORM] );
  pForm += iFormLen[DELIVERY_FORM];


  memcpy( pForm, szNewOrderForm, iFormLen[NEW_ORDER_FORM] );
  pForm += iFormLen[NEW_ORDER_FORM];


  memcpy( pForm, szOrderStatusForm, iFormLen[ORDER_STATUS_FORM] );
  pForm += iFormLen[ORDER_STATUS_FORM];


  memcpy( pForm, szPaymentForm, iFormLen[PAYMENT_FORM] );
  pForm += iFormLen[PAYMENT_FORM];


  memcpy( pForm, szStockLevelForm, iFormLen[STOCK_LEVEL_FORM] );
  pForm += iFormLen[STOCK_LEVEL_FORM];


  /* copy the first row to all the other rows */
  pForm = gpForms->index[0];
  for( ii = 1; ii < dwFormSize; ii++ )
  {
    memcpy( gpForms->index[ii], pForm, iRowSize );
  }


  /* calculate the size of one row of responses */
  iRowSize = 0;
  for( jj = 0; jj < NUMBER_POOL_RESPONSE_TYPES; jj++ )
  {
    iResponseLen[jj] = ( giResponseLen[jj] + 8 ) & ( ~(int)7 );
    iRowSize += iResponseLen[jj];
  }


  iMallocSize = (((char *)&gpResponses->index - (char
*)gpResponses) +
                 (((char *)gpResponses->responses - (char
*)gpResponses->index)
                  * dwResponseSize * NUMBER_POOL_RESPONSE_TYPES
) +
                 (((char *)&gpResponses->responses[iRowSize *
dwResponseSize] -
```

```
                    (char *)&gpResponses->responses[0])));
#if (DEBUG == 1)
        fprintf(MyLogFile, "gpResponses malloc=%d\n", iMallocSize);
        fflush(MyLogFile);
#endif
  gpResponses = malloc( iMallocSize );

  for( jj = 0; jj < NUMBER_POOL_RESPONSE_TYPES; jj++ )
  {
    apr_thread_mutex_create( &gpResponses->critSec[jj], 0, p );
#ifdef FFE_DEBUG
    gpResponses->iMaxIndex[jj] = dwResponseSize - 1;
#endif
    gpResponses->iNextFreeResponse[jj] = 0;
    gpResponses->iFirstResponseIndex[jj] = jj * dwResponseSize;
  }

  pResponse = ((char *)&gpResponses->index[0] +
             (((char *)&gpResponses->responses[0] -
               (char *)&gpResponses->index[0]) *
              NUMBER_POOL_RESPONSE_TYPES * dwResponseSize));
  for( ii = 0; ii < dwResponseSize; ii++ )
  {
    for( jj = 0; jj < NUMBER_POOL_RESPONSE_TYPES; jj++ )
    {
      gpResponses->index[jj*dwResponseSize+ii] = pResponse;
      pResponse += iResponseLen[jj];
    }
  }

  /* load the first row with the templates */
  pResponse = gpResponses->index[0];

  memcpy( pResponse, szDeliveryResponse,
iResponseLen[DELIVERY_RESPONSE] );
  pResponse += iResponseLen[DELIVERY_RESPONSE];

  memcpy( pResponse, szNewOrderResponse,
iResponseLen[NEW_ORDER_RESPONSE] );
  pResponse += iResponseLen[NEW_ORDER_RESPONSE];

  memcpy(pResponse, szOrderStatusResponse,
iResponseLen[ORDER_STATUS_RESPONSE]);
  pResponse += iResponseLen[ORDER_STATUS_RESPONSE];

  memcpy( pResponse, szPaymentResponse,
iResponseLen[PAYMENT_RESPONSE] );
  pResponse += iResponseLen[PAYMENT_RESPONSE];

  memcpy( pResponse, szStockLevelResponse,
iResponseLen[STOCK_LEVEL_RESPONSE] );
  pResponse += iResponseLen[STOCK_LEVEL_RESPONSE];

  /* copy the first row to all the other rows */
  pResponse = gpResponses->index[0];
  for( ii = 1; ii < dwResponseSize; ii++ )
  {
    memcpy( gpResponses->index[ii], pResponse, iRowSize );
  }
}

/* FUNCTION: void DeleteTemplatePool( void )
 *
 * PURPOSE:         This function destroys the array of forms to be
used
 *                  by the threads as they need a form.
 *
 * ARGUMENTS:       none
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */
void
DeleteTemplatePool( void )
{
  free( gpResponses );

  free( gpForms );

  free( gpPanicForms );
}

/* FUNCTION: void MakeTransactionPool( int dwTransactionPoolSize )
 *
 * PURPOSE:         This function builds the array of forms to be
used
 *                  by the threads as they need a form.  The forms
are
 *                  reserved and released by each thread as needed.
 *
 * ARGUMENTS:       none
 *
 * RETURNS:         none
 *
 * COMMENTS:        none
 */
void
MakeTransactionPool( int dwTransactionPoolSize , apr_pool_t *p)
{
  int iMaxSize;
  int iSize;
  char *data;
  int ii;
```

```
  /**** set up transaction data pool used during async operation
****/

  iMaxSize = 0;

  iMaxSize = MAX(iMaxSize,sizeof(DeliveryData));

  iMaxSize = MAX(iMaxSize,sizeof(NewOrderData));

  iMaxSize = MAX(iMaxSize,sizeof(OrderStatusData));

  iMaxSize = MAX(iMaxSize,sizeof(PaymentData));

  iMaxSize = MAX(iMaxSize,sizeof(StockLevelData));

  iMaxSize = MAX(iMaxSize,sizeof(LoginData));

#if 1

  iSize = (((char *)&gpTransactionPool->index - (char
*)gpTransactionPool) +

             (((char *)gpTransactionPool->data - (char
*)gpTransactionPool->index)

              * dwTransactionPoolSize ) +

             (sizeof( char ) * iMaxSize * dwTransactionPoolSize ));

#else

  iSize = (((char *)&gpTransactionPool->index - (char
*)gpTransactionPool) +

             (((char *)gpTransactionPool->data - (char
*)gpTransactionPool->index)

              * dwTransactionPoolSize ) +

             (sizeof( char ) * iMaxSize * dwTransactionPoolSize ));

#endif


#if (DEBUG == 1)

        fprintf(MyLogFile, "gpTransaction malloc=%d\n", iSize);

        fflush(MyLogFile);

#endif

  gpTransactionPool = malloc( iSize );


  apr_thread_mutex_create( &gpTransactionPool->critSec, 0, p );

#ifdef FFE_DEBUG

  gpTransactionPool->iMaxIndex = dwTransactionPoolSize - 1;

  gpTransactionPool->iTransactionSize = iMaxSize;

  gpTransactionPool->iHistoryId = 0;

#endif

  gpTransactionPool->iNextFree = 0;


  /* careful here, the data is not right after index[0] as the
structure */

  /* defines.  We have wedged 'NumUsers + total' indexes in
between. */

  data = ((char *)&gpTransactionPool->index[0] +

           (((char *)&gpTransactionPool->data[0] -

             (char *)&gpTransactionPool->index[0]) *

            dwTransactionPoolSize ));


  for( ii = 0; ii < dwTransactionPoolSize; ii++ ) {

    gpTransactionPool->index[ii] = data;

    data += iMaxSize;

  }

}
```

```
/* FUNCTION: void DeleteTransactionPool( void )

 *

 * PURPOSE:         This function destroys the array of transaction
data

 *                  structures used     by the threads as they
process a transaction.

 *

 * ARGUMENTS:       none

 *

 * RETURNS:         none

 *

 * COMMENTS:        none

 */

void

DeleteTransactionPool( void )

{

  free( gpTransactionPool );

}


/* FUNCTION: void BeginCmd( request_rec *req )

 *

 * PURPOSE:         This routine is executed in response to the
browser query

 *                  'CMD=Begin&Server=??????'.

 *

 * ARGUMENTS:       request_rec         *req      IIS context
structure pointer

 *                                                                unique
to this connection.

 *                                                                at
login.

 * RETURNS:         None

 *

 * COMMENTS:        Specification of a server machine is required.

 */


void

BeginCmd( request_rec *req )

{

  SendWelcomeForm(req);

}




/* FUNCTION: void ClearCmd(request_rec *req)

 *

 * PURPOSE:         This resets all terminals and resets the log
file.

 *

 * ARGUMENTS:       request_rec         *req      IIS context
structure pointer

 *                                                                unique
to this connection.

 *

 * RETURNS:                   None

 *
```

```
 * COMMENTS:        This function resets the connection information
for the
 *                  dll.  Any "users" with current connections will
be given
 *                  an error message on their next transaction.
 */


void
ClearCmd(request_rec *req)
{
  if ( bLog )
  {
    TPCCCloseLog( );
    TPCCOpenLog( req->server->process->pool);
  }

  SendWelcomeForm(req);
}


/* FUNCTION: void ExitCmd(request_rec *req,
 *
 * PURPOSE:         This function deallocates the terminal
associated with
 *                  the browser and presents the login screen.
 *
 * ARGUMENTS:       request_rec         *req      IIS context
structure pointer
 *                                                          unique
to this connection.
 * RETURNS:         None
 *
 * COMMENTS:        None
 *
 */


void
ExitCmd( request_rec *req )
{
/*
  TPCCDisconnect( req );
*/

  SendWelcomeForm( req );
}


/* FUNCTION: void MenuCmd( request_rec *req,
 *
 * PURPOSE:         This function displays the main menu.
 *
 * ARGUMENTS:       request_rec         *req      IIS context
structure pointer
 *                                                          unique
to this connection.
 * RETURNS:         None
 *
 * COMMENTS:        None
 *
 */


void
MenuCmd( request_rec *req, int w_id, int ld_id )
{
  SendMainMenuForm(req, w_id, ld_id, NULL);
}



/* FUNCTION: void SubmitCmd( request_rec *req )
 *
 * PURPOSE:         This function assigns a unique terminal id to
the calling
 *                  browser.
 *
 * ARGUMENTS:       request_rec         *req      IIS context
structure pointer
 *                                                          unique
to this connection.
 * RETURNS:         None
 *
 * COMMENTS:        A terminal id can be allocated but still be
invalid if the
 *                  requested warehouse number is outside the range
specified
 *                  in the registry. This then will force the
client id
 *                  to be invalid and an error message sent to the
users browser.
 */


void
SubmitCmd( request_rec *req, int *w_id, int *ld_id )
{
  int     iStatus;
  LoginData login;
  char    *ptr;

  if ( !GetCharKeyValuePtr( req->args, '4', &ptr ) ||
       ( 0 == ( *w_id = atoi( ptr ))) ||
       ( *w_id < 0 ))
  {
    SendErrorResponse( req, ERR_W_ID_INVALID, ERR_TYPE_WEBDLL,
                          NULL, *w_id, -1, NULL );
    goto SubmitError;
  }

  if ( !GetCharKeyValuePtr( req->args, '5', &ptr ) ||
       ( 0 == ( *ld_id = atoi( ptr ))) ||
       ( *ld_id > 10 ) ||
       ( *ld_id < 0 ))
```

```
  {
    SendErrorResponse( req, ERR_D_ID_INVALID, ERR_TYPE_WEBDLL,
                           NULL, *w_id, *ld_id, NULL );
    goto SubmitError;
  }

  login.w_id = *w_id;
  login.ld_id = *ld_id;
  login.pCC = req;
  strcpy( login.szServer, gszServer );
  strcpy( login.szDatabase, gszDatabase );
  strcpy( login.szUser, gszUser );
  strcpy( login.szPassword, gszPassword );
  sprintf( login.szApplication, "TPCC" );
  iStatus = TPCCConnect( &login );
  if( ERR_DB_SUCCESS != iStatus )
  {
    SendErrorResponse( req, iStatus, ERR_TYPE_WEBDLL,
                           NULL, *w_id, *ld_id, NULL );
    goto SubmitError;
  }

  SendMainMenuForm(req, *w_id, *ld_id, NULL);
  return;

SubmitError:
  return;

}



/* FUNCTION: BOOL GetKeyValuePtr( char *szIPtr, char *szKey, char
**pszOPtr )
 *
 * PURPOSE:         This function searches the input string for the
key
 *                  specified.  If found, it returns a pointer to
the value.
 *
 * ARGUMENTS:       char    *szIPtr               pointer to string
to check.
 *                  char      *szKey              pointer to key to
find.
 *                  char      **pszOPtr pointer to value.
 *
 * RETURNS:         BOOL      FALSE               if key is not
found.
 *                            TRUE                if key is found.
 *
 * COMMENTS:        A side affect of this routine is that the
output string
 *                  pointer will either point at the start of the
value being
 *                  searched or at the *start* point where ptr
originated.
 */
BOOL
GetKeyValuePtr( char *szIPtr, char *szKey, char **pszOPtr )
{
  char *szPtr1, *szPtr2;

  *pszOPtr = szIPtr;
  while (*szIPtr)
  {
    szPtr1 = szIPtr;
    szPtr2 = szKey;

    while ( *szPtr1 && *szPtr2 && 0 == ( *szPtr1 - *szPtr2 ))
      szPtr1++, szPtr2++;

    if ( '=' == *szPtr1 && '\0' == *szPtr2 )
    {
      *pszOPtr = ++szPtr1;
      return TRUE;
    }

    szIPtr++;
  }

  return FALSE;
}


/* FUNCTION: BOOL GetKeyValueCharPtr( char *szIPtr, char cKey, char
**pszOPtr )
 *
 * PURPOSE:         This function searches the input string for the
single char key
 *                  specified.  If found, it returns a pointer to
the value.
 *
 * ARGUMENTS:       char    *szIPtr               pointer to string
to check.
 *                  char      cKey                pointer to key to
find.
 *                  char      **pszOPtr pointer to value.
 *
 * RETURNS:         BOOL      FALSE               if key is not
found.
 *                            TRUE                if key is found.
 *
 * COMMENTS:        A side affect of this routine is that the
output string
 *                  pointer will either point at the start of the
value being
 *                  searched or at the *start* point where ptr
originated.
 */
BOOL
GetCharKeyValuePtr( char *szIPtr, char cKey, char **pszOPtr )
{
```

```
  BOOL    bGotStart;

  *pszOPtr = szIPtr;
  bGotStart = FALSE;

  if (szIPtr == NULL)
    return FALSE;

  while( *szIPtr )
  {
    if( cKey == *szIPtr && '=' == *++szIPtr )
    {
      *pszOPtr = ++szIPtr;
      return TRUE;
    }
    while( *szIPtr )
    {
      if( '&' == *szIPtr )
      {
          szIPtr++;
          break;
      }
      szIPtr++;
    }
  }

  return FALSE;
}

/* FUNCTION: BOOL GetNumeric(char *ptr, int *iValue)
 *
 * PURPOSE:         This function converts the string value to
integer, and
 *                  determines if the string is terminated
properly.  If it
 *                  contains non-numeric characters or if any
characters
 *                  other than '&' or '\0' terminate the integer
portion
 *                  of the string, this function fails.
 *
 * ARGUMENTS:       char    *ptr        pointer to string to check.
 *
 * RETURNS:         BOOL      FALSE     if string is not all
numeric and properly
 *                                      terminated.
 *                           TRUE      if string contains only
numeric characters
 *                                      i.e. '0' - '9' and is
properly terminated.
 *
 * COMMENTS:        None
 *
 */

BOOL
GetNumeric(char *ptr, int *iValue)
{
  int c;              /* current char */
  int total;         /* current total */
  BOOL bGotSomething = FALSE;

  c = (int)(unsigned char)*ptr++;

  total = 0;

  while ((c >= '0') && (c <= '9'))
  {
    total = 10 * total + (c - '0');     /* accumulate digit */
    c = (int)(unsigned char)*ptr++;    /* get next char */
    bGotSomething = TRUE;
  }
  if(('\0' == c) || ('&' == c) && bGotSomething)
  {
    *iValue = total;
    return (TRUE);   /* return result */
  }
  else
  {
    *iValue = 0;
    return(FALSE);
  }
}

/* FUNCTION: BOOL GetWDID(char *ptr, int *lw_id, int *ld_id, char
**optr)
 *
 * PURPOSE:         This function converts the string value to a
pair of integers
 *                  where the ascii numeric field represents an
encoded warehouse
 *                  and district id.  The least significant digit
is one less than
 *                  the actual local district id, and the remaining
high order
 *                  digits are 10 times the actual local warehouse
id.
 *
 * ARGUMENTS:       char    *ptr        pointer to string to check.
 *
 * RETURNS:         BOOL      FALSE     if string is not all
numeric and properly
 *                                      terminated.
 *                           TRUE      if string contains only
numeric characters
 *                                      i.e. '0' - '9' and is
properly terminated.
 *
 * COMMENTS:        A side affect of this routine is that the
output string
```

```
 *                  pointer will either point at the end of the
values being
 *                  searched or at the *start* point where ptr
originated.
 *
 */
BOOL
GetWDID(char *ptr, int *lw_id, int *ld_id, char **optr)
{
  int c;              /* current char */
  int pc;       /* previous character */
  int total;         /* current total */
  BOOL bGotSomething = FALSE;

  *lw_id = 0;
  *ld_id = 0;
  total = 0;

  *optr = ptr;
  pc = (int)(unsigned char)*ptr++;
  if((pc < '0') || (pc > '9'))
    return FALSE;

  c = (int)(unsigned char)*ptr++;

  while ((c >= '0') && (c <= '9'))
  {
    total = 10 * total + (pc - '0');     /* accumulate digit */
    pc = c;
    c = (int)(unsigned char)*ptr++;    /* get next char */
    bGotSomething = TRUE;
  }
  if(('\0' == c) || ('&' == c) && bGotSomething)
  {
    *lw_id = total;
    *ld_id = (int) (pc - '0') + 1;
    *optr = ptr;
    return TRUE;   /* return result */
  }
  else
    return FALSE;
}

/* FUNCTION: BOOL GetKeyValueString(char *szIPtr, char *szKey,
 *                                          char *szValue, int
iSize)
 *
 * PURPOSE:         This function searches for the key specified
and returns
 *                  the string value associated with it.
 *
 * ARGUMENTS:       char      *szIPtr                       string
to search
 *                  char      *szKey                        key to
search for
 *                  char      *szValue            location to store
value
 *                  int       iSize                         size of
output array.
 *
 * RETURNS:         BOOL      FALSE                         key not
found
 *                            TRUE                          key
found, value stored
 *
 *
 * COMMENTS:        http keys are formatted either KEY=value& or
KEY=value\0.
 *                  This DLL formats TPC-C input fields in such a
manner that
 *                  the keys can be extracted in the above manner.
 */

BOOL
GetKeyValueString(char *szIPtr, char *szKey,
                    char *szValue, int iSize)
{
  char *ptr;

  if( !GetKeyValuePtr( szIPtr, szKey, &ptr ))
    return FALSE;

  /* force zero termination of output string */
  iSize--;

  while( '\0' != *ptr && '&' != *ptr && iSize)
  {
    *szValue++ = *ptr++;
    iSize--;
  }
  *szValue = 0;
  return TRUE;
}

/* FUNCTION: void CheckMemory(void *param)
 *
 * PURPOSE:         This function loops calling _CrtCheckMemory()
 *
 * ARGUMENTS:
 *                  void      *param                        not
used
 *
 * RETURNS:         nothing
 *
 * COMMENTS:
 */
```

```
#ifdef FFE_DEBUG


unsigned __stdcall

CheckMemory(void *param)

{

          while (TRUE)

          {

                    _ASSERTE(_CrtCheckMemory());

                    Sleep(1000);

          }


          return 0;

}


#endif




**************************
mod_tpcc.h
**************************

#ifndef MOD_TPCC_H

#define MOD_TPCC_H

/*+**************************************************************
**********

 *
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**************************************************************
*********/


/*+

 * Abstract: This is the header file for web_ui.c.  it contains the

 *        function prototypes for the routines that are called
outside web_ui.c

 *

 * Author: A Bradley

 * Creation Date: May 1997

 *

 *

 *

 * Modification history:

 *

 *

 *      08/01/2002      Andrew Bond, HP

 *                      - Conversion to run under Linux and Apache

 *

 */


/* function prototypes */

BOOL GetNumeric(char *ptr, int *iValue);

BOOL GetValuePtr(char *pProcessedQuery[], int iIndex, char
**pValue);


/* define indexes for parsing the query string */

/* for the payment, orderstatus and new order txns */

#define DID 0

#define CID DID+1

/* more for the order status txn */

#define CLT_O CID+1

#define MAXORDERSTATUSVALS CLT_O + 1

/* for the stocklevel txn */

#define TT  0

#define MAXSTOCKLEVELVALS TT + 1

/* for the delivery txn */

#define QUEUETIME 0

#define OCD 1

#define MAXDELIVERYVALS OCD + 1

/* more for the payment txn */

#define CWI   CID + 1

#define CDI   CWI + 1

#define CLT_P CDI + 1

#define HAM   CLT_P + 1

#define MAXPAYMENTVALS HAM + 1

/* more for the neworder txn */
```

```
#define SP00  CID + 1
#define IID00 SP00 + 1
#define QTY00 IID00 + 1
#define SP01  QTY00 + 1
#define IID01 SP01 + 1
#define QTY01 IID01 + 1
#define SP02  QTY01 + 1
#define IID02 SP02 + 1
#define QTY02 IID02 + 1
#define SP03  QTY02 + 1
#define IID03 SP03 + 1
#define QTY03 IID03 + 1
#define SP04  QTY03 + 1
#define IID04 SP04 + 1
#define QTY04 IID04 + 1
#define SP05  QTY04 + 1
#define IID05 SP05 + 1
#define QTY05 IID05 + 1
#define SP06  QTY05 +1
#define IID06 SP06 + 1
#define QTY06 IID06 + 1
#define SP07  QTY06 + 1
#define IID07 SP07 + 1
#define QTY07 IID07 + 1
#define SP08  QTY07 + 1
#define IID08 SP08 + 1
#define QTY08 IID08 + 1
#define SP09  QTY08 + 1
#define IID09 SP09 + 1
#define QTY09 IID09 + 1
#define SP10  QTY09 + 1
#define IID10 SP10 + 1
#define QTY10 IID10 + 1
#define SP11  QTY10 + 1
#define IID11 SP11 + 1
#define QTY11 IID11 + 1
#define SP12  QTY11 + 1

#define IID12 SP12 + 1
#define QTY12 IID12 + 1
#define SP13  QTY12 + 1
#define IID13 SP13 + 1
#define QTY13 IID13 + 1
#define SP14  QTY13 + 1
#define IID14 SP14 + 1
#define QTY14 IID14 + 1
#define MAXNEWORDERVALS QTY14 + 1

#if 0
#define PARSE_QUERY_STRING(pQueryString,varMax,charTable,valTable)\
         {\
            int ii;\
            char *ptr, *tmpPtr;\
            ptr = pQueryString;\
            for (ii=0; ii < varMax; ii++)\
            {\
              if ( !(tmpPtr=strstr(ptr, stringTable[ii])) )\
                valTable[ii] = NULL;\
              else\
              {\
                ptr = tmpPtr;\
                if ( !(ptr=strchr(ptr, '=')) )\
                    valTable[ii] = NULL;\
                else\
                    valTable[ii] = ++ptr;\
              }\
            }\
          }
#else
#define PARSE_QUERY_STRING(pQueryString,varMax,charTable,valTable)\
{\
  int ii;\
  char *ptr;\
  int iKey;\
  ptr = pQueryString;\
  for( ii=0; ii<varMax; ii++ ) {\
    iKey = charTable[ii];\
    valTable[ii] = NULL;\
    if( iKey == *ptr && '=' == *++ptr ) {\
      valTable[ii] = ++ptr;\
    }\
    while( *ptr ) {\
      if( '&' == *ptr ) {\
          ptr++;\
          break;\
      }\
      ptr++;\
    }\
  }\
}
#endif

typedef struct _FORMINDEXES
{
  int iStartIndex;    // index into the form char array for values
  int iLen;           // length of the current value field
} FORM_INDEXES;

GLOBAL(FORM_INDEXES deliveryFormIndexesI[4], { 0 });
GLOBAL(FORM_INDEXES deliveryFormIndexesP[33], { 0 });
GLOBAL(FORM_INDEXES newOrderFormIndexes[4], { 0 });
```

```
GLOBAL(FORM_INDEXES newOrderResponseIndexes[136], { 0 });

GLOBAL(FORM_INDEXES orderStatusFormIndexes[4], { 0 });

GLOBAL(FORM_INDEXES orderStatusResponseIndexes[88], { 0 });

GLOBAL(FORM_INDEXES paymentFormIndexes[4], { 0 });

GLOBAL(FORM_INDEXES paymentResponseIndexes[38], { 0 });

GLOBAL(FORM_INDEXES stockLevelFormIndexes[5], { 0 });

GLOBAL(FORM_INDEXES stockLevelResponseIndexes[7], { 0 });


#ifdef MOD_TPCC_C

char deliveryStrs[] = {'6', '7'};

char newOrderStrs[] = {

'8', '9',

'A', 'B', 'C',

'D', 'E', 'F',

'G', 'H', 'I',

'J', 'K', 'L',

'M', 'N', 'O',

'P', 'Q', 'R',

'S', 'T', 'U',

'V', 'W', 'X',

'a', 'b', 'c',

'd', 'e', 'f',

'g', 'h', 'i',

'j', 'k', 'l',

'm', 'n', 'o',

'p', 'q', 'r',

's', 't', 'u'};

char orderStatusStrs[] = {'8', '9', 'Y'};

char paymentStrs[] = {'8', '9', 'Z', 'v', 'Y', 'w'};

char stockLevelStrs[] = {'x'};

#else

extern char deliveryStrs[];

extern char newOrderStrs[];

extern char orderStatusStrs[];

extern char paymentStrs[];

extern char stockLevelStrs[];

#endif /* MOD_TPCC_C */

GLOBAL(char szModName[FILENAMESIZE], { 0 });

#endif /* MOD_TPCC_H */


**************************
mod_tpcc_template.c
**************************

/*
**  mod_tpcc.c -- Apache sample tpcc module
**  [Autogenerated via ``apxs -n tpcc -g'']
**
**  To play with this sample module, first compile it into a
**  DSO file and install it into Apache's libexec directory
**  by running:
**
**    $ apxs -c -i mod_tpcc.c
**
**  Then activate it in Apache's httpd.conf file, for instance
**  for the URL /tpcc, as follows:
**
**    #   httpd.conf
**    LoadModule tpcc_module libexec/mod_tpcc.so
**    <Location /tpcc>
**    SetHandler tpcc
**    </Location>
**
**  Then after restarting Apache via
**
**    $ apachectl restart
**
**  you immediately can request the URL /%NAME and watch for the
**  output of this module. This can be achieved for instance via:
**
**    $ lynx -mime_header http://localhost/tpcc
**
**  The output should be similar to the following one:
**
**    HTTP/1.1 200 OK
**    Date: Tue, 31 Mar 1998 14:42:22 GMT
**    Server: Apache/1.3.4 (Unix)
**    Connection: close
**    Content-Type: text/html
**
**    The sample page from mod_tpcc.c
*/

#include "httpd.h"
#include "http_config.h"
#include "http_protocol.h"
#include "ap_config.h"

/* The sample content handler */
static int tpcc_handler(request_rec *r)
{
    r->content_type = "text/html";
    ap_send_http_header(r);
    if (!r->header_only)
        ap_rputs("The sample page from mod_tpcc.c\n", r);
    return OK;
}

/* Dispatch list of content handlers */
static const handler_rec tpcc_handlers[] = {
    { "tpcc", tpcc_handler },
    { NULL, NULL }
};

/* Dispatch list for API hooks */
module MODULE_VAR_EXPORT tpcc_module = {
    STANDARD_MODULE_STUFF,
    NULL,                  /* module initializer
*/
    NULL,                  /* create per-dir    config structures
*/
    NULL,                  /* merge  per-dir    config structures
*/
    NULL,                  /* create per-server config structures
*/
    NULL,                  /* merge  per-server config structures
*/
    NULL,                  /* table of config file commands
*/
    tpcc_handlers,        /* [#8] MIME-typed-dispatched handlers */
    NULL,                  /* [#1] URI to filename translation
*/
    NULL,                  /* [#4] validate user id from request
*/
    NULL,                  /* [#5] check if the user is ok _here_
*/
    NULL,                  /* [#3] check access by host address
*/
    NULL,                  /* [#6] determine MIME type
*/
    NULL,                  /* [#7] pre-run fixups
*/
    NULL,                  /* [#9] log a transaction
*/
    NULL,                  /* [#2] header parser
*/
    NULL,                  /* child_init
*/
    NULL,                  /* child_exit
*/
    NULL                   /* [#0] post read-request
*/
#ifdef EAPI
   ,NULL,                  /* EAPI: add_module
*/
    NULL,                  /* EAPI: remove_module
*/
    NULL,                  /* EAPI: rewrite_command
*/
    NULL                   /* EAPI: new_connection
*/
#endif
};


**************************
oracle_db8.c
**************************

/*+ file: oracle_db8.c based on Oracle file tpccpl.c */
```

```
/*+=============================================================
=+
 |        Copyright (c) 1994  Oracle Corp, Redwood Shores, CA
|
 |                   OPEN SYSTEMS PERFORMANCE GROUP
|
 |                        All Rights Reserved
|

+=============================================================
+
 | DESCRIPTION
 |    TPC-C transactions in PL/SQL.

+=============================================================-
*/
/*+************************************************************
**********
 *
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**********************************************************************
*********/


#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <sys/timeb.h>
#include <asm/atomic.h>
#include <linux/spinlock.h>


#include <oci.h>
#include <ocidfn.h>
#include <ociapr.h>


#define ORACLE_DB_C


#include <tpccerr.h>
#include <tpccstruct.h>
#include <oracle_db8.h>
#include <tpccapi.h>
#include <tpcc.h>


#define DEADLOCKRETRIES 6


static int  bTpccExit;        /* exit delivery disconnect loop as
dll exiting. */
static    spinlock_t          ErrorLogCriticalSection;



char szErrorLogName[256];
char szOraLogName[256];
char szOraErrorLogName[256];


/* prototypes */
int ORAReadRegistrySettings(void);
void vgetdate (unsigned char *oradt) ;
void cvtdmy (unsigned char *oradt, char *outdate);
void cvtdmyhms (unsigned char *oradt, char *outdate);



FILE  *vopen(char *fnam, char *mode)
{
FILE *fd;


#ifdef  DEBUG
  TPCCErr("tkvuopen() fnam: %s,   mode: %s\n", fnam, mode);
#endif


    fd = fopen((char *)fnam,(char *)mode);
    if (!fd){
        TPCCErr(" fopen on %s failed %d\n",fnam,fd);
          /*        exit(-1);  */
    }
    return(fd);
}


int sqlfile(char *fnam, text *linebuf)
{
```

```
FILE *fd;
int nulpt = 0;

#ifdef  DEBUG
  TPCCErr("sqlfile() fnam: %s,  linebuf: %#x\n", fnam, linebuf);
#endif

    fd = vopen(fnam,"r");
    if(NULLP == fd)
    {
      return(ERR_DB_ERROR);
    }
    while (fgets((char *)linebuf+nulpt, SQL_BUF_SIZE,fd))
    {
        nulpt = strlen((char *)linebuf);
    }
    return(nulpt);
}

int getfile(char *filename, text *filebuf)
{
  text parsbuf[SQL_BUF_SIZE];

  strcpy(parsbuf, szTpccLogPath);
  strcat(parsbuf, filename);
  return(sqlfile(parsbuf, filebuf));

}



int TPCCStartupDB()
{
#ifdef DEBUG_TPCCSTARTUPDB
  _ASSERT(FALSE);
#endif

  spin_lock_init(&ErrorLogCriticalSection);

  return ERR_DB_SUCCESS;

}

int TPCCShutdownDB(void)
{

  bTpccExit = TRUE;

  /* Add Oracle specific code */

  return ERR_DB_SUCCESS;
}



int ocierror(char *fname, int lineno, OraContext *p, sword status)
{
  text errbuf[512];
  text tempbuf[512];
  sb4 errcode;
  OCIError *errhp;

  errhp = p->errhp;

  switch (status) {
  case OCI_SUCCESS:
    return RECOVERR;
    break;
  case OCI_SUCCESS_WITH_INFO:
    sprintf(errbuf, "Module %s Line %d\r\n", fname, lineno);
    strcat(errbuf, "Error - OCI_SUCCESS_WITH_INFO\r\n");
    break;
  case OCI_NEED_DATA:
    sprintf(errbuf, "Module %s Line %d\r\n", fname, lineno);
    strcat(errbuf, "Error - OCI_NEED_DATA\r\n");
    break;
  case OCI_NO_DATA:
    sprintf(errbuf, "Module %s Line %d\r\n", fname, lineno);
    sprintf(errbuf, "Error - OCI_NO_DATA\r\n");
    break;
  case OCI_ERROR:
    (void) OCIErrorGet (errhp, (ub4) 1,
                            (text *) NULL, &errcode, tempbuf,
                            (ub4) sizeof(errbuf),
OCI_HTYPE_ERROR);

    switch(errcode){
    case NOT_SERIALIZABLE:
    /* if error is NOT_SERIALIZABLE return without writing anything
*/
      return errcode;

    case DEADLOCK:
      TPCCErr("Warning Deadlock, being retried");
      return RECOVERR;

    case SNAPSHOT_TOO_OLD:
      /* SNAPSHOT_TOO_OLD is considered recoverable */
      TPCCErr("Error snapshot too old: %s", tempbuf);
      return RECOVERR;

    default:
    /* else write a message */
```

```
      /* All else are irrecoverable */
      TPCCErr("Module %s Line %d\r\nError - %s\r\n",
                fname, lineno, tempbuf);
      return errcode;
    }

/* vmm313    TPCCDisconnectDB(p); */
/* vmm313    exit(1); */
    break;
  case OCI_INVALID_HANDLE:
    sprintf(errbuf, "Module %s Line %d\r\n", fname, lineno);
    strcat(errbuf, "Error - OCI_INVALID_HANDLE\r\n");
    TPCCErr("%s", errbuf);
    TPCCDisconnectDB(p, NULL);
    return IRRECERR;
    /*      terminate(-1);  */
    /*      exit(-1);   */
    break;
  case OCI_STILL_EXECUTING:
    sprintf(errbuf, "Module %s Line %d\r\n", fname, lineno);
    strcat(errbuf, "Error - OCI_STILL_EXECUTE\r\n");
    break;
  case OCI_CONTINUE:
    sprintf(errbuf, "Module %s Line %d\r\n", fname, lineno);
    strcat(errbuf, "Error - OCI_CONTINUE\r\n");
    break;
  default:
    break;
  }
  TPCCErr("%s", errbuf);
  return RECOVERR;
}



/* FUNCTION: int TPCCConnectDB(CallersContext *pCC, int iTermId,
int iSyncId,
 *  OraContext **dbproc, char *server, char *database, char *user,
 *  char *password, char *app, int *spid, long *pack_size)
 *
 * PURPOSE:         This function opens the sql connection for use.
 *
 * ARGUMENTS:       CallersContext      *pCC      passed in
structure pointer from inetsrv.
 *                  int                           iTermId
         terminal id of browser
 *                  int                           iSyncId
         sync id of browser
 *                  OraContext                    **dbproc  pointer
to returned OraContext
 *                  char                          *server
         SQL server name
 *                  char                          *database SQL
server database
 *                  char                          *user
         user name
 *                  char                          *password user
password
 *                  char                          *app
         pointer to returned application array
 *                  int                           *spid
         pointer to returned spid
 *                  long                          *pack_size
         pointer to returned default pack size
 *
 * RETURNS:                    int       0         if successful
 *                                       1         if an error
occurs
 *
 * COMMENTS:        None
 *
 */



int TPCCConnectDB(OraContext **dbproc, pLoginData pLogin)
{

#define SERIAL_TXT "alter session set isolation_level =
serializable"
#ifdef SQL_TRACE
#define SQLTXT1 "alter session set sql_trace = true"
#endif

  /* Add Oracle specific code */

  text stmbuf[100];
  OraContext *p;
  char userstr[256];

  *dbproc = (OraContext *) malloc(sizeof(OraContext));

  p = *dbproc;

  /* initialize flags to not initialized */
  p->new_init = 0;
  p->pay_init = 0;
  p->ord_init = 0;
  p->sto_init = 0;
  p->del_init = 0;

  sprintf(userstr,"%s/%s@%s",
            pLogin->szUser,pLogin->szPassword,pLogin->szServer);

  OCIEnvCreate(&(p->tpcenv), OCI_DEFAULT | OCI_OBJECT, NULL, NULL,
NULL, NULL, (size_t) 0, NULL);

  OCIHandleAlloc((dvoid *)p->tpcenv, (dvoid **)&(p->tpcsrv),
OCI_HTYPE_SERVER,
                     0 , (dvoid **)0);
```

```
  OCIHandleAlloc((dvoid *)p->tpcenv, (dvoid **)&(p->errhp),
OCI_HTYPE_ERROR,
                     0 , (dvoid **)0);
  OCIHandleAlloc((dvoid *)p->tpcenv, (dvoid **)&(p->datecvterrhp),
OCI_HTYPE_ERROR,
                     0 , (dvoid **)0);
  OCIHandleAlloc((dvoid *)p->tpcenv, (dvoid **)&(p->tpcsvc),
OCI_HTYPE_SVCCTX,
                     0 , (dvoid **)0);
  if (RECOVERR != (OCIERROR(p, OCIServerAttach(p->tpcsrv, p->errhp,
                                                          (text *)0,
0, OCI_DEFAULT))))
    /*    return IRRECERR;  */
    return ERR_DB_ERROR;

  /*
OCIERROR(p, OCIServerAttach(p->tpcsrv, p->errhp,
                                                        userstr,
strlen(userstr),

OCI_DEFAULT));*/
    /*
    {
      return IRRECERR;
    }
    */
OCIAttrSet((dvoid *)p->tpcsvc, OCI_HTYPE_SVCCTX, (dvoid *)p-
>tpcsrv,
               (ub4)0, OCI_ATTR_SERVER, p->errhp);
OCIHandleAlloc((dvoid *)p->tpcenv, (dvoid **)&(p->tpcusr),
OCI_HTYPE_SESSION,
                     0 , (dvoid **)0);
OCIAttrSet((dvoid *)p->tpcusr, OCI_HTYPE_SESSION, (dvoid *)pLogin-
>szUser,
               (ub4)strlen(pLogin->szUser),OCI_ATTR_USERNAME, p-
>errhp);
OCIAttrSet((dvoid *)p->tpcusr, OCI_HTYPE_SESSION,
               (dvoid *)pLogin->szPassword,
               (ub4)strlen(pLogin->szPassword), OCI_ATTR_PASSWORD,
p->errhp);
  if (RECOVERR != (OCIERROR(p, OCISessionBegin(p->tpcsvc, p->errhp,
p->tpcusr,
                                            OCI_CRED_RDBMS,
OCI_DEFAULT))))
    return (ERR_DB_ERROR);

 OCIAttrSet(p->tpcsvc, OCI_HTYPE_SVCCTX, p->tpcusr, 0,
OCI_ATTR_SESSION,
               p->errhp);

  /* run all transaction in serializable mode */

OCIHandleAlloc(p->tpcenv, (dvoid **)&(p->curi), OCI_HTYPE_STMT, 0,
(dvoid**)0);
  sprintf ((char *) stmbuf, SERIAL_TXT);
OCIStmtPrepare(p->curi, p->errhp, stmbuf, strlen((char *)stmbuf),
                     OCI_NTV_SYNTAX, OCI_DEFAULT);
  if (RECOVERR != OCIERROR(p, OCIStmtExecute(p->tpcsvc, p->curi, p-
>errhp,
                                                          1, 0, 0, 0,
OCI_DEFAULT)))
    return (ERR_DB_ERROR);
OCIHandleFree(p->curi, OCI_HTYPE_STMT);



#ifdef SQL_TRACE
  /* Turn on the SQL_TRACE */
  OCIHandleAlloc(p->tpcenv, (dvoid **)&(p->curi), OCI_HTYPE_STMT,
0, &xmem);
  sprintf ((char *) stmbuf, TRACE_TXT);
  OCIStmtPrepare(p->curi, p->errhp, stmbuf, strlen((char *)stmbuf),
                     OCI_NTV_SYNTAX, OCI_DEFAULT);
  if (RECOVERR != OCIERROR(p, OCIStmtExecute(p->tpcsvc, p->curi, p-
>errhp,
                                                        1, 0, 0, 0,
OCI_DEFAULT)))
    return(ERR_DB_ERROR);
  OCIHandleFree((dvoid *)p->curi, OCI_HTYPE_STMT);
#endif /* End SQL_TRACE */

  /****  logon = 1;***/

  if (tkvcninit (&(p->bindvars.info.newOrder), p)) {
    TPCCDisconnectDB (p, NULL);
    return ERR_DB_ERROR;
  }
  else
    p->new_init = 1;

  if (tkvcpinit (&(p->bindvars.info.payment), p)) {
    TPCCDisconnectDB (p, NULL);
    return ERR_DB_ERROR;
  }
  else
    p->pay_init = 1;

  if (tkvcoinit (&(p->bindvars.info.orderStatus), p)) {
    TPCCDisconnectDB (p, NULL);
    return ERR_DB_ERROR;
  }
  else
    p->ord_init = 1;

  if (tkvcsinit (&(p->bindvars.info.stockLevel), p)) {
    TPCCDisconnectDB (p, NULL);
    return ERR_DB_ERROR;
  }
  else
    p->sto_init = 1;
```

```
  if (tkvcdinit (&(p->bindvars.info.delivery), p)) {
    TPCCDisconnectDB (p, NULL);
    return ERR_DB_ERROR;
  }
  else
    p->del_init = 1;

  return ERR_DB_SUCCESS;
}



/* FUNCTION: int TPCCDisconnectDB(OraContext *dbproc)
 *
 * PURPOSE:         This function closes the sql connection.
 *
 * ARGUMENTS:
 *                  OraContext          *dbproc   pointer to
OraContext
 *
 * RETURNS:         int       ERR_DB_SUCCESS      if successfull
 *                            error value         if an error
occurs
 *
 * COMMENTS:        None
 *
 */



int TPCCDisconnectDB(OraContext *dbproc, CallersContext *pCC){


  /* Add Oracle specific code */



   if (1 == dbproc->new_init) {
      tkvcndone(&(dbproc->nctx));
      dbproc->new_init = 0;
   }


   if (1 == dbproc->pay_init) {
      tkvcpdone(&(dbproc->pctx));
      dbproc->pay_init = 0;
   }
   if (1 == dbproc->ord_init) {
      tkvcodone(&(dbproc->octx));
      dbproc->ord_init = 0;
   }
   if (1 == dbproc->sto_init) {
      tkvcsdone(&(dbproc->sctx));
      dbproc->sto_init = 0;
   }
   if (1 == dbproc->del_init) {
      tkvcddone(&(dbproc->dctx));
      dbproc->del_init = 0;
   }


   OCIHandleFree((dvoid *)dbproc->tpcusr, OCI_HTYPE_SESSION);
   OCIHandleFree((dvoid *)dbproc->tpcsvc, OCI_HTYPE_SVCCTX);
   OCIHandleFree((dvoid *)dbproc->errhp, OCI_HTYPE_ERROR);
   OCIHandleFree((dvoid *)dbproc->datecvterrhp, OCI_HTYPE_ERROR);
   OCIHandleFree((dvoid *)dbproc->tpcsrv, OCI_HTYPE_SERVER);
   OCIHandleFree((dvoid *)dbproc->tpcenv, OCI_HTYPE_ENV);


#ifdef BATCH_DEL
   if (lfp) {
      fclose (lfp);
      lfp = NULL;
   }
#endif /* BATCH_DEL */



  return ERR_DB_SUCCESS;
}


/* FUNCTION: TPCCStockLevelDB(CallersContext      *pCC, int
iTermId, int iSyncId, OraContext *dbproc,  int deadlock_retry,
StockLevelData *pStockLevel)
 *
 * PURPOSE:         This function handles the stock level
transaction.
 *
 * ARGUMENTS:       CallersContext      *pCC
 *          passed in structure pointer from inetsrv.
 *                  int                 iTermId
 *          terminal id of browser
 *                  int                 iSyncId
 *          sync id of browser
 *                  OraContext          *dbproc
 *          connection db process id
 *                  StockLevelData      *pStockLevel
 *          stock level input / output data structure
 *                  int                 deadlock_retry
 *          retry count if deadlocked
 *
 * RETURNS:         int       ERR_DB_SUCCCESS     if successfull
 *                            error value         if deadlocked
 *
 * COMMENTS:        None
 *
 */


int TPCCStockLevelDB(OraContext *dbproc, pStockLevelData
pStockLevel)
{



  int tries,status;
```

```
  StockLevelData *pbindvars;


  pbindvars = &dbproc->bindvars.info.stockLevel;


  memcpy(pbindvars, pStockLevel, sizeof(StockLevelData));



  for ( tries = 0,status = RECOVERR;
          tries < DEADLOCKRETRIES && status == RECOVERR;  tries++)
{


    status = tkvcs(dbproc);

  }


  pStockLevel->low_stock = dbproc-
>bindvars.info.stockLevel.low_stock;

  if (status == RECOVERR) return ERR_DB_DEADLOCK_LIMIT;

  else return (status);


}


/* FUNCTION: int TPCCNewOrderDB(CallersContext *pCC, int iTermId,
int iSyncId, int iTermId, int iSyncId, OraContext *dbproc, int
deadlock_retry, NewOrderData  *pNewOrder)

 *

 * PURPOSE:         This function handles the new order
transaction.

 *

 * ARGUMENTS:       CallersContext      *pCC
          passed in structure pointer from inetsrv.

 *                  int                 iTermId
          terminal id of browser

 *                  int                 iSyncId
          sync id of browser

 *                  OraContext          *dbproc
          connection db process id

 *                  NewOrderData        *pNewOrder
          pointer to new order structure for input/output data

 *                  int                 deadlock_retry
          retry count if deadlocked

 *

 * RETURNS:         int       ERR_DB_SUCCESS
          transaction committed

 *                            ERR_DB_NOT_COMMITTED    item number
is not valid

 *                            ERR_DB_DEADLOCK_LIMIT
          deadlock max retry reached

 *                            ERR_DB_ERROR

 *

 *

 * COMMENTS:        None

 *

 */


#pragma message ("FIXME: return code is overloaded.  How to report
invalid item number?")

int TPCCNewOrderDB( OraContext *dbproc, pNewOrderData  pNewOrder)

{


  int tries,status;

  int ii;

  int jj;

  int datebufsize;

  OCIError *datecvterrhp = dbproc->datecvterrhp;

  unsigned char localcr_date[7];


  NewOrderData *pbindvars = &(dbproc->bindvars.info.newOrder);

  newctx *nctx = &(dbproc->nctx);

  newtemp *ntemp = &(dbproc->tempvars.new);


/*  vgetdate(&ntemp->cr_date); */

  vgetdate(localcr_date);

  cvtdmyhms(localcr_date,ntemp->entry_date);

  OCIDateFromText(datecvterrhp,ntemp->entry_date,strlen(ntemp-
>entry_date),"DD-MM-YYYY HH24:MI:SS",21,(text *) 0,0,&ntemp-
>cr_date);


  ntemp->n_retry = 0;


  memcpy(pbindvars, pNewOrder, sizeof(NewOrderData));

  for(jj= 0; jj<MAX_OL; jj++)

    {

      ntemp->nol_i_id[jj] = pbindvars->o_ol[jj].ol_i_id;

      ntemp->nol_supply_w_id[jj] = pbindvars-
>o_ol[jj].ol_supply_w_id;

      ntemp->nol_quantity[jj] = pbindvars->o_ol[jj].ol_quantity;

    }


  for ( tries = 0,status = RECOVERR;

          tries < DEADLOCKRETRIES && status == RECOVERR; tries++)

    {

      status = tkvcn(&dbproc->bindvars.info.newOrder, dbproc);

    }


  memcpy(pNewOrder, pbindvars, sizeof(NewOrderData));


  /* convert and/or copy data to our structure format */

  pNewOrder->c_discount = ntemp->c_discount*100.0;

  pNewOrder->w_tax = (float)ntemp->w_tax*100.0;

  pNewOrder->d_tax = (float)ntemp->d_tax*100.0;



  for (ii = 0; ii < pNewOrder->o_ol_cnt; ii++)

    {

      pNewOrder->o_ol[ii].ol_i_id = ntemp->nol_i_id[ii];

      pNewOrder->o_ol[ii].ol_supply_w_id = ntemp-
>nol_supply_w_id[ii];

      pNewOrder->o_ol[ii].ol_quantity = ntemp->nol_quantity[ii];

      strncpy(pNewOrder->o_ol[ii].i_name, ntemp->i_name[ii], 24);

      pNewOrder->o_ol[ii].s_quantity = ntemp->s_quantity[ii];
```

```
      pNewOrder->o_ol[ii].i_price = ntemp->i_price[ii]/100.0;
      pNewOrder->o_ol[ii].ol_amount = ntemp->nol_amount[ii]/100.0;
      pNewOrder->o_ol[ii].b_g[0]=ntemp->brand_generic[ii];
    }


  /* datebufsize = the size of entry_date in newtemp struct */
 datebufsize=21;
 /* datebufsize=sizeof(ntemp->entry_date); */
/*  OCIDateToText(datecvterrhp, &ntemp->cr_date,(text *) "DD-MM-
YYYY HH:MM:SS", 19, (text *) 0, 0, &datebufsize, &ntemp-
>entry_date); */
  /* cvtdmyhms(ntemp->cr_date, ntemp->entry_date);  */
  pNewOrder->o_entry_d.day = atoi(&(ntemp->entry_date[0]));
  pNewOrder->o_entry_d.month = atoi(&(ntemp->entry_date[3]));
  pNewOrder->o_entry_d.year = atoi(&(ntemp->entry_date[6]));
  pNewOrder->o_entry_d.hour = atoi(&(ntemp->entry_date[11]));
  pNewOrder->o_entry_d.minute = atoi(&(ntemp->entry_date[14]));
  pNewOrder->o_entry_d.second = atoi(&(ntemp->entry_date[17]));

  if (status == RECOVERR) return ERR_DB_DEADLOCK_LIMIT;
  else return (status);

}

/* FUNCTION: int TPCCPaymentDB(CallersContext *pCC, int iTermId,
int iSyncId, OraContext *dbproc, int deadlock_retry, PaymentData
*pPayment)
 *
 * PURPOSE:         This function handles the payment transaction.
 *
 * ARGUMENTS:       CallersContext      *pCC
         passed in structure pointer from inetsrv.
 *                  int                 iTermId
         terminal id of browser
 *                  int                 iSyncId
         sync id of browser
 *                  OraContext          *dbproc
         connection db process id
 *                  PaymentData         *pPayment           pointer
to payment input/output data structure
 *                  int                 deadlock_retry
         deadlock retry count
 *
 * RETURNS:         int       ERR_DB_SUCCESS                success
 *                            ERR_DB_DEADLOCK_LIMIT         max
deadlocked reached
 *                            ERR_DB_NOT_COMMITED invalid data
entry
 *
 * COMMENTS:        None
 *
 */

int TPCCPaymentDB(OraContext *dbproc, pPaymentData pPayment)
{
  int tries;
  int status;
  int datebufsize;
  float ftmp;
  OCIError *datecvterrhp = dbproc->datecvterrhp;

  PaymentData *pbindvars = &(dbproc->bindvars.info.payment);
  payctx *pctx = &(dbproc->pctx);
  paytemp *ptemp = &(dbproc->tempvars.pay);

  ptemp->p_retry = 0;

  memcpy(pbindvars, pPayment, sizeof(PaymentData));

  /* the db is stored in pennies - convert input to cents. */
  ftmp=pbindvars->h_amount*100;
  ptemp->h_amount = (int)(ftmp);

  for ( tries = 0,status = RECOVERR;
          tries < DEADLOCKRETRIES && status == RECOVERR; tries++) {

    if ((pbindvars->c_id) == 0) {
      (pbindvars->byname) = TRUE;
    }
    else {
      (pbindvars->byname) = FALSE;
    }

    status = tkvcp(&dbproc->bindvars.info.payment, dbproc);

  }

  memcpy(pPayment, pbindvars, sizeof(PaymentData));
  /* datebufsize = the size of c_since_str in paytemp struct */
 datebufsize=11;
  /* convert date format */
  /* OCIDateToText(datecvterr, &ptemp->customer_sdate,(text *) 0,
10, (text *) 0, 0, &datebufsize, &ptemp->c_since_str); */
  OCIDateToText(datecvterrhp, &ptemp->customer_sdate,(text *) "DD-
MM-YYYY", 10, (text *) 0, 0, &datebufsize, &ptemp->c_since_str);
  /* cvtdmy(ptemp->customer_sdate, ptemp->c_since_str); */
  /* datebufsize = the size of h_date string in paytemp struct */
 datebufsize=DATE_SIZ;
/*   OCIDateToText(datecvterrhp, &ptemp->cr_date,(text *) "DD-MM-
YYYY.HH24:MI:SS", 21, (text *) 0, 0, &datebufsize, &ptemp->h_date);
*/
  pPayment->c_credit_lim = ptemp->c_credit_lim/100.0;
  pPayment->c_discount = ptemp->c_discount*100.0;
  pPayment->c_balance = pPayment->c_balance/100.0;
  pPayment->h_amount = ptemp->h_amount/100.0;

  pPayment->c_since.day = atoi(&(ptemp->c_since_str[0]));
```

```
  pPayment->c_since.month = atoi(&(ptemp->c_since_str[3]));
  pPayment->c_since.year = atoi(&(ptemp->c_since_str[6]));
  pPayment->h_date.day = atoi(&(ptemp->h_date[0]));
  pPayment->h_date.month = atoi(&(ptemp->h_date[3]));
  pPayment->h_date.year = atoi(&(ptemp->h_date[6]));
  pPayment->h_date.hour = atoi(&(ptemp->h_date[11]));
  pPayment->h_date.minute = atoi(&(ptemp->h_date[14]));
  pPayment->h_date.second = atoi(&(ptemp->h_date[17]));

  if (status == RECOVERR) return ERR_DB_DEADLOCK_LIMIT;
  else return (status);

}



/* FUNCTION: int TPCCOrderStatusDB(CallersContext *pCC, int
iTermId, int iSyncId, OraContext *dbproc, int deadlock_retry,
OrderStatusData *pOrderStatus)
 *
 * PURPOSE:         This function processes the Order Status
transaction.
 *
 * ARGUMENTS:       CallersContext      *pCC
         passed in structure pointer from inetsrv.
 *                  int                 iTermId
         terminal id of browser
 *                  int                 iSyncId
         sync id of browser
 *                  OraContext          *dbproc
         connection db process id
 *                  OrderStatusData     *pOrderStatus
         pointer to Order Status data input/output structure
 *                  int                 deadlock_retry
         deadlock retry count
 *
 * RETURNS:         int       ERR_DB_DEADLOCK_LIMIT
         max deadlock reached
 *                            ERR_DB_NOT_COMMITED           No
orders found for customer
 *                            ERR_DB_SUCCESS
         Transaction successfull
 *
 * COMMENTS:        None
 *
 */


int TPCCOrderStatusDB(OraContext *dbproc, pOrderStatusData
pOrderStatus)
{


  int tries,status;
  int ii;
  OrderStatusData *pbindvars = &(dbproc-
>bindvars.info.orderStatus);
  ordtemp *otemp = &(dbproc->tempvars.ord);
  OCIError *datecvterrhp = dbproc->datecvterrhp;


  memcpy(pbindvars, pOrderStatus, sizeof(OrderStatusData));


  for ( tries = 0,status = RECOVERR;
      tries < DEADLOCKRETRIES && status == RECOVERR; tries++) {


    if ((pbindvars->c_id) == 0) {
      (pbindvars->byname) = TRUE;
    }
    else {
      (pbindvars->byname) = FALSE;
    }


    status = tkvco(&dbproc->bindvars.info.orderStatus, dbproc);


  }


  if (status == ERR_DB_ERROR) return status;


  memcpy(pOrderStatus,pbindvars, sizeof(OrderStatusData));


  for (ii=0; ii < pOrderStatus->o_ol_cnt; ii++)
    {
      pOrderStatus->s_ol[ii].ol_supply_w_id = otemp-
>loc_ol_supply_w_id[ii];
      pOrderStatus->s_ol[ii].ol_i_id = otemp->loc_ol_i_id[ii];
      pOrderStatus->s_ol[ii].ol_quantity = otemp-
>loc_ol_quantity[ii];
      pOrderStatus->s_ol[ii].ol_amount = otemp-
>loc_ol_amount[ii]/100.0;
      pOrderStatus->s_ol[ii].ol_delivery_d.day =
          atoi(&(otemp->ol_delivery_date_str[ii][0]));
      pOrderStatus->s_ol[ii].ol_delivery_d.month =
          atoi(&(otemp->ol_delivery_date_str[ii][3]));
      pOrderStatus->s_ol[ii].ol_delivery_d.year =
          atoi(&(otemp->ol_delivery_date_str[ii][6]));
    };



  pOrderStatus->c_balance = pOrderStatus->c_balance/100.0;
  pOrderStatus->o_entry_d.day = atoi(&(otemp->entry_date_str[0]));
  pOrderStatus->o_entry_d.month = atoi(&(otemp-
>entry_date_str[3]));
  pOrderStatus->o_entry_d.year = atoi(&(otemp->entry_date_str[6]));
  pOrderStatus->o_entry_d.hour = atoi(&(otemp-
>entry_date_str[11]));
  pOrderStatus->o_entry_d.minute = atoi(&(otemp-
>entry_date_str[14]));
  pOrderStatus->o_entry_d.second = atoi(&(otemp-
>entry_date_str[17]));


  if (status == RECOVERR) return ERR_DB_DEADLOCK_LIMIT;
  else return (status);


}
```

```
/* FUNCTION: int TPCCDeliveryDB( CallersContext *pCC, int
iConnectionID,
   * int iSyncID, DBContext *pdbContext,
   * int deadlock_retry, pDeliveryData pDelivery )
   *
   * PURPOSE:       This function writes the delivery information
to the
   *            delivery pipe. The information is sent as a long.
   *
   * ARGUMENTS:     CallersContext      *pCC
passed in structure
   *                                                pointer from
inetsrv.
   *                int                 iTermId
terminal id of browser
   *                int                 iSyncId
sync id of browser
   *                OraContext          *dbproc
connection db process id
   *                int                 deadlock_retry
deadlock retry count
   *                DeliveryData        *pDelivery
pointer to Delivery data
   *                                                input/output
structure
   *
   * RETURNS:       int       ERR_DB_SUCCESS                success
   *                          ERR_DB_DEADLOCK_LIMIT         max
deadlocked reached
   *                          ERR_DB_NOT_COMMITED other error
   *
   * COMMENTS:      The pipe is initially created with 16K buffer
size this
   *            should allow for up to 4096 deliveries
   *                to be queued before an overflow condition would
occur.
   *                The only reason that an overflow would occur is
if the delivery
   *                application stopped listening while deliveries
were being
   *            posted.
   *
   */


int TPCCDeliveryDB( OraContext *dbproc, pDeliveryData pDeliveryData
)
{



  int retries = 0;
  int status;
  DeliveryData *pbindvars;


  pbindvars = &dbproc->bindvars.info.delivery;
  memcpy(pbindvars, pDeliveryData, sizeof(DeliveryData));

  for (retries = 0, status = RECOVERR;
       retries < DEADLOCKRETRIES &&status == RECOVERR; retries++){


    status = tkvcd(pDeliveryData, dbproc);
  }


  if(status == RECOVERR) return ERR_DB_DEADLOCK_LIMIT;
  else return (status);



}


int TPCCGetLastDBErrorDB(OraContext *dbproc)
{



  /* Add Oracle specific code */


  return ERR_DB_SUCCESS;


}



/* FUNCTION: int TPCCCheckpointDB(CallersContext *pCC, int iTermId,
int iSyncId, OraContext *dbproc, int deadlock_retry, Checkpoint
*pCheckpoint
 *
 * PURPOSE:         This function does a checkpoinnt transaction.
 *
 * ARGUMENTS:       CallersContext      *pCC                passed
in structure pointer
 *                                                          from
inetsrv.
 *                  int                 iTermId
         terminal id of browser
 *                  int                 iSyncId             sync id
of browser
 *                  OraContext          *dbproc
         connection db process id
 *                  Checkpoint          *Checkpoint         pointer
to Checkpoint data
 *                  int                 deadlock_retry
         deadlock retry count
 *
 * RETURNS:         int       ERR_DB_DEADLOCK_LIMIT         max
deadlock reached
 *                            ERR_DB_NOT_COMMITED No orders found
for customer
 *                            ERR_DB_SUCCESS
         Transaction successfull
 *
 * COMMENTS:        None
 *
 */
```

```
#define CHECKPOINT_TXT "alter system switch logfile"


int TPCCCheckpointDB (OraContext *dbproc, pCheckpointData
pCheckpoint ) {


  text stmbuf[100];


  OCIHandleAlloc(dbproc->tpcenv, (dvoid **)&(dbproc->curi),
OCI_HTYPE_STMT,

                     0, (dvoid**)0);

  sprintf ((char *) stmbuf, CHECKPOINT_TXT);

  OCIERROR(dbproc, OCIStmtPrepare(dbproc->curi, dbproc->errhp,
stmbuf,

                                        strlen((char *)stmbuf),

                                        OCI_NTV_SYNTAX,
OCI_DEFAULT));

  if (RECOVERR != OCIERROR(dbproc,

                                OCIStmtExecute(dbproc->tpcsvc,
dbproc->curi,

                                                    dbproc->errhp,
1, 0, 0, 0,

                                                    OCI_DEFAULT)))

    return (ERR_DB_ERROR);

  OCIHandleFree(dbproc->curi, OCI_HTYPE_STMT);


  return ERR_DB_SUCCESS;


}



**************************
oracle_db8.h
**************************

/*+ file: oracle_db8.h based on Oracle file tpccpl.h */

/*+=================================================================
=+

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|

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|


+=================================================================
+

 | DESCRIPTION

 |    header file for the TPC-C transactions.


+=================================================================-
*/

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*********-*/

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*********-*/


/*

 *

 *

 * Modification history:

 *

 *

 *      08/01/2002      Andrew Bond, HP

 *                        Conversion to run under Linux and Apache

 *

*/


#ifndef ORACLE_DB_H

#define ORACLE_DB_H




#ifndef DISCARD

# define DISCARD (void)

#endif


#ifndef sword

# define sword int

#endif
```

```
#define VER7            2


#define NA              -1      /* ANSI SQL NULL */

#define NLT             1       /* length for string null
terminator */

#define DEADLOCK        60      /* ORA-00060: deadlock */

#define NO_DATA_FOUND   1403    /* ORA-01403: no data found */

#define NOT_SERIALIZABLE  8177  /* ORA-08177: transaction not
serializable */

#define SNAPSHOT_TOO_OLD  1555  /* ORA-01555: snapshot too old */



#define RECOVERR -10

#define IRRECERR -20

#define NO_COMMIT -30

#define NOERR 111


#define DEADLOCKWAIT 10



#if (defined(__osf__) && defined(__alpha))

#define HDA_SIZ 512

#else

#define HDA_SIZ 256

#endif



#define MSG_SIZ 512

#define DATE_SIZ 20  /* DD-MM-YYYY.HH:MI:SS  plus null terminator
*/

#define NITEMS 15

#define NDISTS 10

#define ROWIDLEN 20

#define OCIROWLEN 20

#define DEL_DATE_LEN 7

#define SQL_BUF_SIZE 8192


#ifndef NULLP

# define NULLP (void *)NULL

#endif /* NULLP */


#define ADR(object) ((ub1 *)&(object))

#define SIZ(object) ((sword)sizeof(object))


typedef char date[24+NLT];

typedef char varchar2;



struct _delctx {

   sb2 cons_ind[NDISTS];

   sb2 w_id_ind[NDISTS];

   sb2 d_id_ind[NDISTS];

   sb2 c_id_ind[NDISTS];

   sb2 del_o_id_ind[NDISTS];

   sb2 del_date_ind[NDISTS];

   sb2 carrier_id_ind[NDISTS];

   sb2 amt_ind[NDISTS];

   sb2 no_rowid_ind[NDISTS];

   sb2 o_rowid_ind[NDISTS];

#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)

   sb2 inum_ind;

#endif


   OCIBind *olamt_bp;


   ub2 cons_len[NDISTS];

   ub2 w_id_len[NDISTS];

   ub2 d_id_len[NDISTS];

   ub4 c_id_len[NDISTS];

   ub4 del_o_id_len[NDISTS];

   ub2 del_date_len[NDISTS];

   ub2 carrier_id_len[NDISTS];

   ub2 amt_len[NDISTS];

   ub2 no_rowid_len[NDISTS];

   ub2 no_rowid_ptr_len[NDISTS];

   ub2 o_rowid_len[NDISTS];

   ub2 o_rowid_ptr_len[NDISTS];

#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)

   ub2 inum_len;

#endif


   ub2 cons_rcode[NDISTS];

   ub2 w_id_rcode[NDISTS];

   ub2 d_id_rcode[NDISTS];

   ub2 c_id_rcode[NDISTS];

   ub2 del_o_id_rcode[NDISTS];

   ub2 del_date_rcode[NDISTS];

   ub2 carrier_id_rcode[NDISTS];

   ub2 amt_rcode[NDISTS];

   ub2 no_rowid_rcode[NDISTS];

   ub2 o_rowid_rcode[NDISTS];

#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)

   ub2 inum_rcode;

#endif


   int cons[NDISTS];

   int w_id[NDISTS];

   int d_id[NDISTS];

   int c_id[NDISTS];

   int del_o_id[NDISTS];

   int carrier_id[NDISTS];

   /* float amt[NDISTS]; Changed to int */
```

```
   int amt[NDISTS];
   ub4 del_o_id_rcnt;
   OCIRowid *no_rowid_ptr[NDISTS];
   OCIRowid *o_rowid_ptr[NDISTS];
   OCIDate del_date[NDISTS];
#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)
   char inum[10];
#endif
   OCIStmt *curd0;
   OCIStmt *curd1;
   OCIStmt *curd2;
   OCIStmt *curd3;
   OCIStmt *curd4;
   OCIStmt *curd5;
   OCIStmt *curd6;
   OCIStmt *curdtest;

   OCIBind *w_id_bp;
   OCIBind *w_id_bp3;
   OCIBind *w_id_bp4;
   OCIBind *w_id_bp5;
   OCIBind *w_id_bp6;
   OCIBind *d_id_bp;
   OCIBind *d_id_bp3;
   OCIBind *d_id_bp4;
   OCIBind *d_id_bp6;
   OCIBind *o_id_bp;
   OCIBind *cr_date_bp;
   OCIBind *c_id_bp;
   OCIBind *c_id_bp3;
   OCIBind *no_rowid_bp;
   OCIBind *carrier_id_bp;
   OCIBind *o_rowid_bp;
   OCIBind *del_o_id_bp;
   OCIBind *del_o_id_bp3;
   OCIBind *amt_bp;
   OCIBind *bstr1_bp[10];
   OCIBind *bstr2_bp[10];
   OCIDefine *inum_dp;
   OCIDefine *d_id_dp;
   OCIDefine *del_o_id_dp;
   OCIDefine *no_rowid_dp;
   OCIDefine *c_id_dp;
   OCIDefine *o_rowid_dp;
   OCIDefine *cons_dp;
   OCIDefine *amt_dp;

   int norow;
};
typedef struct _delctx delctx;
```

```
struct _amtctx {
  int ol_amt[NDISTS][NITEMS];
  sb2 ol_amt_ind[NDISTS][NITEMS];
  ub4 ol_amt_len[NDISTS][NITEMS];
  ub2 ol_amt_rcode[NDISTS][NITEMS];
  int ol_cnt[NDISTS];
};
typedef struct _amtctx amtctx;



struct _newctx {
  sb2 nol_i_id_ind[NITEMS];
  sb2 nol_supply_w_id_ind[NITEMS];
  sb2 nol_quantity_ind[NITEMS];
  sb2 nol_amount_ind[NITEMS];
  sb2 i_name_ind[NITEMS];
  sb2 s_quantity_ind[NITEMS];
  sb2 i_price_ind[NITEMS];
  sb2 ol_w_id_ind[NITEMS];
  sb2 ol_d_id_ind[NITEMS];
  sb2 ol_o_id_ind[NITEMS];
  sb2 ol_number_ind[NITEMS];
  sb2 cons_ind[NITEMS];
  sb2 s_rowid_ind[NITEMS];
  sb2 s_remote_ind[NITEMS];
  sb2 s_quant_ind[NITEMS];
  sb2 i_data_ind[NITEMS];
  sb2 s_data_ind[NITEMS];
  sb2 s_dist_info_ind[NITEMS];
  sb2 ol_dist_info_ind[NITEMS];
  sb2 null_date_ind[NITEMS];
  sb2 s_bg_ind[NITEMS];

  ub2 nol_i_id_len[NITEMS];
  ub2 nol_supply_w_id_len[NITEMS];
  ub2 nol_quantity_len[NITEMS];
  ub2 nol_amount_len[NITEMS];
  ub2 i_name_len[NITEMS];
  ub2 s_quantity_len[NITEMS];
  ub2 i_price_len[NITEMS];
  ub2 ol_w_id_len[NITEMS];
  ub2 ol_d_id_len[NITEMS];
  ub2 ol_o_id_len[NITEMS];
  ub2 ol_number_len[NITEMS];
  ub2 cons_len[NITEMS];
  ub2 s_rowid_len[NITEMS];
  ub2 s_remote_len[NITEMS];
```

```
  ub2 s_quant_len[NITEMS];
  ub2 i_data_len[NITEMS];
  ub2 s_data_len[NITEMS];
  ub2 s_dist_info_len[NITEMS];
  ub2 ol_dist_info_len[NITEMS];
  ub2 null_date_len[NITEMS];
  sb2 s_bg_len[NITEMS];

  ub2 nol_i_id_rcode[NITEMS];
  ub2 nol_supply_w_id_rcode[NITEMS];
  ub2 nol_quantity_rcode[NITEMS];
  ub2 nol_amount_rcode[NITEMS];
  ub2 i_name_rcode[NITEMS];
  ub2 s_quantity_rcode[NITEMS];
  ub2 i_price_rcode[NITEMS];
  ub2 ol_w_id_rcode[NITEMS];
  ub2 ol_d_id_rcode[NITEMS];
  ub2 ol_o_id_rcode[NITEMS];
  ub2 ol_number_rcode[NITEMS];
  ub2 cons_rcode[NITEMS];
  ub2 s_rowid_rcode[NITEMS];
  ub2 s_remote_rcode[NITEMS];
  ub2 s_quant_rcode[NITEMS];
  ub2 i_data_rcode[NITEMS];
  ub2 s_data_rcode[NITEMS];
  ub2 s_dist_info_rcode[NITEMS];
  ub2 ol_dist_info_rcode[NITEMS];
  ub2 null_date_rcode[NITEMS];
  sb2 s_bg_rcode[NITEMS];

  int ol_w_id[NITEMS];
  int ol_d_id[NITEMS];
  int ol_o_id[NITEMS];
  int ol_number[NITEMS];
  int cons[NITEMS];

  OCIRowid  *s_rowid_ptr[NITEMS];

  int s_remote[NITEMS];
  char i_data[NITEMS][51];
  char s_data[NITEMS][51];
  char s_dist_info[NITEMS][25];

/* changed to OCIDate  unsigned char null_date[NITEMS][7]; */
  OCIDate null_date[NITEMS]; /* base date for null date entry */
/* not needed for Oracle 8.1.5   OCIStmt *curn; */
  OCIStmt *curn1;
  OCIStmt *curn2;
  OCIStmt *curn3[10];
  OCIStmt *curn4;

  OCIBind *i_price_bp;
  OCIBind *i_name_bp;
  OCIBind *s_bg_bp;
  OCIBind *s_data_bp;
  OCIBind *i_data_bp;
  ub4 nol_i_count;
  ub4 nol_s_count;
  ub4 nol_q_count;
  ub4 nol_item_count;

  ub4 nol_name_count;
  ub4 nol_qty_count;
  ub4 nol_bg_count;
  ub4 nol_am_count;
  ub4 s_remote_count;
  ub4 s_data_count;
  ub4 i_data_count;
  OCIBind *ol_i_id_bp4;
  OCIBind *ol_supply_w_id_bp4;
  OCIBind *ol_quantity_bp4;
  OCIBind *w_id_bp;
  OCIBind *d_id_bp;
  OCIBind *c_id_bp;
  OCIBind *o_all_local_bp;
  OCIBind *o_all_cnt_bp;
  OCIBind *w_tax_bp;
  OCIBind *d_tax_bp;
  OCIBind *o_id_bp;
  OCIBind *c_discount_bp;
  OCIBind *c_credit_bp;
  OCIBind *c_last_bp;
  OCIBind *retries_bp;
  OCIBind *cr_date_bp;
  OCIBind *ol_i_id_bp;
  OCIBind *ol_supply_w_id_bp;
  OCIBind *s_quantity_bp;
  OCIBind *s_rowid_bp;
  OCIBind *ol_quantity_bp;
  OCIBind *s_remote_bp;
  OCIBind *id_bp[10][15];
  OCIBind *sd_bp[10][15];
  OCIDefine *Dcons[10];
  OCIDefine *Ds_rowid[10];
  OCIDefine *Di_price[10];
  OCIDefine *Di_data[10];
  OCIDefine *Ds_dist_info[10];
  OCIDefine *Ds_data[10];
  OCIDefine *Ds_quantity[10];
  OCIDefine *Di_name[10];
  OCIBind *ol_o_id_bp;
  OCIBind *ol_d_id_bp;
```

```
OCIBind *ol_w_id_bp;
OCIBind *ol_number_bp;
OCIBind *ol_amount_bp;
OCIBind *ol_dist_info_bp;
OCIBind *null_date_bp;
sb2 w_id_ind;
ub2 w_id_len;
ub2 w_id_rc;

sb2 d_id_ind;

ub2 d_id_len;
ub2 d_id_rc;

sb2 c_id_ind;
ub2 c_id_len;
ub2 c_id_rc;

sb2 o_all_local_ind;
ub2 o_all_local_len;
ub2 o_all_local_rc;

sb2 o_ol_cnt_ind;
ub2 o_ol_cnt_len;
ub2 o_ol_cnt_rc;

sb2 w_tax_ind;
ub2 w_tax_len;
ub2 w_tax_rc;

sb2 d_tax_ind;
ub2 d_tax_len;
ub2 d_tax_rc;

sb2 o_id_ind;
ub2 o_id_len;
ub2 o_id_rc;

sb2 c_discount_ind;
ub2 c_discount_len;
ub2 c_discount_rc;

sb2 c_credit_ind;
ub2 c_credit_len;
ub2 c_credit_rc;

sb2 c_last_ind;
ub2 c_last_len;
ub2 c_last_rc;

sb2 retries_ind;
  ub2 retries_len;
  ub2 retries_rc;

  sb2 cr_date_ind;
  ub2 cr_date_len;
  ub2 cr_date_rc;



  int cs;
  int norow;

/* context holders */
int i_name_ctx;
int i_data_ctx;
int i_price_ctx;
int s_data_ctx;
int s_dist_info_ctx;
int s_quantity_ctx;

};
typedef struct _newctx newctx;

struct _ordctx {
   sb2 c_rowid_ind[100];
   sb2 ol_supply_w_id_ind[NITEMS];
   sb2 ol_i_id_ind[NITEMS];
   sb2 ol_quantity_ind[NITEMS];
   sb2 ol_amount_ind[NITEMS];
   sb2 ol_delivery_d_ind[NITEMS];
   sb2 ol_w_id_ind;
   sb2 ol_d_id_ind;
   sb2 ol_o_id_ind;
   sb2 c_id_ind;
   sb2 c_first_ind;
   sb2 c_middle_ind;
   sb2 c_balance_ind;
   sb2 c_last_ind;
   sb2 o_id_ind;
   sb2 o_entry_d_ind;
   sb2 o_carrier_id_ind;
   sb2 o_ol_cnt_ind;

   ub4 c_rowid_len[100];
   ub2 ol_supply_w_id_len[NITEMS];
   ub2 ol_i_id_len[NITEMS];
   ub2 ol_quantity_len[NITEMS];
   ub2 ol_amount_len[NITEMS];
   ub2 ol_delivery_d_len[NITEMS];
   ub2 ol_w_id_len;
   ub2 ol_d_id_len;
```

```
ub2 ol_o_id_len;

ub2 c_rowid_rcode[100];
ub2 ol_supply_w_id_rcode[NITEMS];
ub2 ol_i_id_rcode[NITEMS];
ub2 ol_quantity_rcode[NITEMS];
ub2 ol_amount_rcode[NITEMS];
ub2 ol_delivery_d_rcode[NITEMS];
ub2 ol_w_id_rcode;
ub2 ol_d_id_rcode;
ub2 ol_o_id_rcode;

ub4 ol_supply_w_id_csize;
ub4 ol_i_id_csize;
ub4 ol_quantity_csize;
ub4 ol_amount_csize;
ub4 ol_delivery_d_csize;
ub4 ol_w_id_csize;
ub4 ol_d_id_csize;
ub4 ol_o_id_csize;

OCIStmt *curo0;
OCIStmt *curo1;
OCIStmt *curo2;
OCIStmt *curo3;
OCIStmt *curo4;
OCIBind *w_id_bp0;
OCIBind *w_id_bp2;
OCIBind *w_id_bp3;
OCIBind *w_id_bp4;
OCIBind *d_id_bp0;
OCIBind *d_id_bp2;
OCIBind *d_id_bp3;
OCIBind *d_id_bp4;
OCIBind *c_id_bp;
OCIBind *byln_bp;
OCIBind *c_last_bp;
OCIBind *c_last_bp4;
OCIBind *c_first_bp;
OCIBind *c_middle_bp;
OCIBind *c_balance_bp;
OCIBind *o_id_bp;
OCIBind *o_entry_d_bp;
OCIBind *o_cr_id_bp;
OCIBind *o_ol_cnt_bp;
OCIBind *ol_s_w_id_bp;
OCIBind *ol_i_id_bp;
OCIBind *ol_quantity_bp;
OCIBind *ol_amount_bp;
OCIBind *ol_d_d_bp;
   OCIBind *c_rowid_bp;
   OCIDefine *c_rowid_dp;
   OCIDefine *c_last_dp;
   OCIDefine *c_last_dp1;
   OCIDefine *c_id_dp;
   OCIDefine *c_id_dp1;
   OCIDefine *c_first_dp1;
   OCIDefine *c_first_dp2;
   OCIDefine *c_middle_dp1;
   OCIDefine *c_middle_dp2;
   OCIDefine *c_balance_dp1;
   OCIDefine *c_balance_dp2;
   OCIDefine *o_id_dp1;
   OCIDefine *o_id_dp2;
   OCIDefine *o_entry_d_dp1;
   OCIDefine *o_entry_d_dp2;
   OCIDefine *o_cr_id_dp1;
   OCIDefine *o_cr_id_dp2;
   OCIDefine *o_ol_cnt_dp1;
   OCIDefine *o_ol_cnt_dp2;
   OCIDefine *ol_d_d_dp;
   OCIDefine *ol_i_id_dp;
   OCIDefine *ol_supply_w_id_dp;
   OCIDefine *ol_quantity_dp;
   OCIDefine *ol_amount_dp;
   OCIDefine *ol_d_base_dp;
   OCIDefine *c_count_dp;

   OCIRowid *c_rowid_ptr[100];
   OCIRowid *middle_cust;
   int cs;
   int cust_idx;
   int norow;
   int rcount;
   int somerows;
};
typedef struct _ordctx ordctx;



struct _defctx {
  boolean reexec;
  ub4 count;
};
typedef struct _defctx defctx;

struct _payctx {
  OCIStmt *curpi;
  OCIStmt *curp0;
  OCIStmt *curp1;
  OCIBind *w_id_bp;
```

```
OCIBind *w_id_bp1;
sb2 w_id_ind;
ub2 w_id_len;
ub2 w_id_rc;

OCIBind *d_id_bp;
OCIBind *d_id_bp1;
sb2 d_id_ind;
ub2 d_id_len;
ub2 d_id_rc;

OCIBind *c_w_id_bp;
OCIBind *c_w_id_bp1;
sb2 c_w_id_ind;
ub2 c_w_id_len;
ub2 c_w_id_rc;

OCIBind *c_d_id_bp;
OCIBind *c_d_id_bp1;
sb2 c_d_id_ind;
ub2 c_d_id_len;
ub2 c_d_id_rc;

OCIBind *c_id_bp;
OCIBind *c_id_bp1;
sb2 c_id_ind;
ub2 c_id_len;
ub2 c_id_rc;

OCIBind *h_amount_bp;
OCIBind *h_amount_bp1;
sb2 h_amount_ind;
ub2 h_amount_len;
ub2 h_amount_rc;

OCIBind *c_last_bp;
OCIBind *c_last_bp1;
sb2 c_last_ind;
ub2 c_last_len;
ub2 c_last_rc;

OCIBind *w_street_1_bp;
OCIBind *w_street_1_bp1;
sb2 w_street_1_ind;
ub2 w_street_1_len;
ub2 w_street_1_rc;

OCIBind *w_street_2_bp;
OCIBind *w_street_2_bp1;
sb2 w_street_2_ind;
ub2 w_street_2_len;
ub2 w_street_2_rc;

OCIBind *w_city_bp;
OCIBind *w_city_bp1;
sb2 w_city_ind;
ub2 w_city_len;
ub2 w_city_rc;

OCIBind *w_state_bp;
OCIBind *w_state_bp1;
sb2 w_state_ind;
ub2 w_state_len;
ub2 w_state_rc;

OCIBind *w_zip_bp;
OCIBind *w_zip_bp1;
sb2 w_zip_ind;
ub2 w_zip_len;
ub2 w_zip_rc;

OCIBind *d_street_1_bp;
OCIBind *d_street_1_bp1;
sb2 d_street_1_ind;
ub2 d_street_1_len;
ub2 d_street_1_rc;

OCIBind *d_street_2_bp;
OCIBind *d_street_2_bp1;
sb2 d_street_2_ind;
ub2 d_street_2_len;
ub2 d_street_2_rc;

OCIBind *d_city_bp;
OCIBind *d_city_bp1;
sb2 d_city_ind;
ub2 d_city_len;
ub2 d_city_rc;

OCIBind *d_state_bp;
OCIBind *d_state_bp1;
sb2 d_state_ind;
ub2 d_state_len;
ub2 d_state_rc;

OCIBind *d_zip_bp;
OCIBind *d_zip_bp1;
sb2 d_zip_ind;
ub2 d_zip_len;
ub2 d_zip_rc;
```

```
OCIBind *c_first_bp;
OCIBind *c_first_bp1;
sb2 c_first_ind;
ub2 c_first_len;
ub2 c_first_rc;

OCIBind *c_middle_bp;
OCIBind *c_middle_bp1;
sb2 c_middle_ind;
ub2 c_middle_len;
ub2 c_middle_rc;

OCIBind *c_street_1_bp;
OCIBind *c_street_1_bp1;
sb2 c_street_1_ind;
ub2 c_street_1_len;
ub2 c_street_1_rc;

OCIBind *c_street_2_bp;
OCIBind *c_street_2_bp1;
sb2 c_street_2_ind;
ub2 c_street_2_len;
ub2 c_street_2_rc;

OCIBind *c_city_bp;
OCIBind *c_city_bp1;
sb2 c_city_ind;
ub2 c_city_len;
ub2 c_city_rc;

OCIBind *c_state_bp;
OCIBind *c_state_bp1;
sb2 c_state_ind;
ub2 c_state_len;
ub2 c_state_rc;

OCIBind *c_zip_bp;
OCIBind *c_zip_bp1;
sb2 c_zip_ind;
ub2 c_zip_len;
ub2 c_zip_rc;

OCIBind *c_phone_bp;
OCIBind *c_phone_bp1;
sb2 c_phone_ind;
ub2 c_phone_len;
ub2 c_phone_rc;

OCIBind *c_since_bp;
OCIBind *c_since_bp1;
sb2 c_since_ind;
ub2 c_since_len;
ub2 c_since_rc;

OCIBind *c_credit_bp;
OCIBind *c_credit_bp1;
sb2 c_credit_ind;
ub2 c_credit_len;
ub2 c_credit_rc;

OCIBind *c_credit_lim_bp;
OCIBind *c_credit_lim_bp1;
sb2 c_credit_lim_ind;
ub2 c_credit_lim_len;
ub2 c_credit_lim_rc;

OCIBind *c_discount_bp;
OCIBind *c_discount_bp1;
sb2 c_discount_ind;
ub2 c_discount_len;
ub2 c_discount_rc;

OCIBind *c_balance_bp;
OCIBind *c_balance_bp1;
sb2 c_balance_ind;
ub2 c_balance_len;
ub2 c_balance_rc;

OCIBind *c_data_bp;
OCIBind *c_data_bp1;
sb2 c_data_ind;
ub2 c_data_len;
ub2 c_data_rc;

OCIBind *h_date_bp;
OCIBind *h_date_bp1;
sb2 h_date_ind;
ub2 h_date_len;
ub2 h_date_rc;

OCIBind *retries_bp;
OCIBind *retries_bp1;
sb2 retries_ind;
ub2 retries_len;
ub2 retries_rc;

OCIBind *cr_date_bp;
OCIBind *cr_date_bp1;
sb2 cr_date_ind;
```

```
  ub2 cr_date_len;
  ub2 cr_date_rc;

  OCIBind *byln_bp;
  sb2 byln_ind;
  ub2 byln_len;
  ub2 byln_rc;
};
typedef struct _payctx payctx;

struct _stoctx {
  OCIStmt *curs;
  OCIBind *w_id_bp;
  OCIBind *d_id_bp;
  OCIBind *threshold_bp;
  OCIDefine *low_stock_bp;
  int norow;
};
typedef struct _stoctx stoctx;

  /* temporary structures needed since oracle binds to some vars
differently
     than we store in our tpcc structures from tpccstruct.h */

typedef struct _deltemp {
  char cvtcr_date[DATE_SIZ];
  OCIDate cr_date;
} deltemp;

typedef struct _newtemp {
  char entry_date[DATE_SIZ + 1];
  OCIDate cr_date;
  int nol_i_id[MAX_OL];
  int nol_supply_w_id[MAX_OL];
  int nol_quantity[MAX_OL];
  char i_name[MAX_OL][25];
  int s_quantity[MAX_OL];
  int i_price[MAX_OL];
  int nol_amount[MAX_OL];
  char brand_generic[MAX_OL];
  double c_discount;
  double w_tax;
  double d_tax;
  int n_retry;
} newtemp;

typedef struct _ordtemp {
  OCIDate entry_date;
  char entry_date_str[DATE_SIZ + 1];
  int loc_ol_i_id[MAX_OL];
  int loc_ol_supply_w_id[MAX_OL];
  int loc_ol_quantity[MAX_OL];
  int loc_ol_amount[MAX_OL];
  OCIDate loc_ol_delivery_date[MAX_OL];
  char ol_delivery_date_str[MAX_OL][11];
} ordtemp;

typedef struct _paytemp {
  char h_date[DATE_SIZ];
  OCIDate customer_sdate;
  char c_since_str[11];
  OCIDate cr_date;
  double c_discount;
  int h_amount;
  int c_credit_lim;
  int p_retry;
} paytemp;

typedef struct _oracontext {
  /* V8 handles for talking to Oracle */
  OCIEnv *tpcenv;
  OCIServer *tpcsrv;
  OCIError *errhp;
  OCIError *datecvterrhp;
  OCISvcCtx *tpcsvc;
  OCISession *tpcusr;
  OCIStmt *curi;
  /* other V8 additions */
  dvoid *xmem;
  /* are these really needed since we do not malloc and therefore
do not
     need to free in *txn*done  ???*/
  int del_init;
  int new_init;
  int pay_init;
  int ord_init;
  int sto_init;
  /* data areas where cursors will find data */
  TransactionData   bindvars;
  /* oracle structures for bind data information during a
transaction */
  ordctx octx;
  delctx dctx;
  delctx dctx2;
  newctx nctx;
  payctx pctx;
  stoctx sctx;
  defctx cbctx;
  amtctx actx;
  /* temporary data areas for cursor data - oracle stores/binds
     differently than tpcc */
```

```
  union {
    deltemp del;
    newtemp new;
    ordtemp ord;
    paytemp pay;
  } tempvars;
} OraContext;



#define OCIERROR(p,function)\
        ocierror(__FILE__,__LINE__,(p),(function))


#define OCIBND(stmp, bndp, p, sqlvar, progv, progvl, ftype)\
       ocierror(__FILE__,__LINE__, (p), \
             OCIBindByName((stmp), &(bndp), (p->errhp), \
                         (text *)(sqlvar), strlen((sqlvar)),\
                         (progv), (progvl),
(ftype),0,0,0,0,0,OCI_DEFAULT))


#define
OCIBNDRA(stmp,bndp,p,sqlvar,progv,progvl,ftype,indp,alen,arcode) \
       ocierror(__FILE__,__LINE__,(p), \
            OCIBindByName((stmp),&(bndp),(p->errhp),(text
*)(sqlvar),strlen((sqlvar)),\

(progv),(progvl),(ftype),(indp),(alen),(arcode),0,0,OCI_DEFAULT))


#define
OCIBNDRAD(stmp,bndp,p,sqlvar,progvl,ftype,indp,ctxp,cbf_nodata,cbf_
data) \
       ocierror(__FILE__,__LINE__,(p), \
            OCIBindByName((stmp),&(bndp),(p->errhp),(text
*)(sqlvar), \
                          strlen((sqlvar)),0,(progvl),(ftype), \
                          indp,0,0,0,0,OCI_DATA_AT_EXEC)); \
       ocierror(__FILE__,__LINE__,(p), \
            OCIBindDynamic((bndp),(p-
>errhp),(ctxp),(cbf_nodata),(ctxp),(cbf_data)))




#define
OCIBNDR(stmp,bndp,p,sqlvar,progv,progvl,ftype,indp,alen,arcode) \
       ocierror(__FILE__,__LINE__,(p), \
          OCIBindByName((stmp),&(bndp),(p->errhp),(text
*)(sqlvar),strlen((sqlvar)),\

(progv),(progvl),(ftype),(indp),(alen),(arcode),0,0,OCI_DEFAULT))




#define
OCIBNDRAA(stmp,bndp,p,sqlvar,progv,progvl,ftype,indp,alen,arcode,ms
,cu) \
       ocierror(__FILE__,__LINE__,(p), \
             OCIBindByName((stmp), &(bndp), (p->errhp), \
                         (text *)(sqlvar), strlen((sqlvar)),\
                         (progv), (progvl),
(ftype),(indp),(alen),(arcode),\
                        (ms),(cu),OCI_DEFAULT))




#define OCIDEFINE(stmp,dfnp,errp,pos,progv,progvl,ftype)\

OCIDefineByPos((stmp),&(dfnp),(errp),(pos),(progv),(progvl),(ftype)
,\
                           0,0,0,OCI_DEFAULT)



#define OCIDEF(stmp,dfnp,errp,pos,progv,progvl,ftype) \

OCIDefineByPos((stmp),&(dfnp),(errp),(pos),(progv),(progvl),\
                            (ftype),NULL,NULL,NULL,OCI_DEFAULT)



#define
OCIDFNRA(stmp,dfnp,errp,pos,progv,progvl,ftype,indp,alen,arcode) \
       OCIDefineByPos((stmp),&(dfnp),(errp),(pos),(progv),\

(progvl),(ftype),(indp),(alen),\
                                             (arcode),OCI_DEFAULT)



#define
OCIDFNDYN(stmp,dfnp,errp,pos,progv,progvl,ftype,indp,ctxp,cbf_data)
\
       ocierror(__FILE__,__LINE__,(errp), \

       OCIHandleAlloc((stmp),(dvoid**)&(dfnp),OCI_HTYPE_DEFINE,0,\
                                             (dvoid**)0));\
       ocierror(__FILE__,__LINE__,(errp), \
       OCIDefineByPos((stmp),&(dfnp),(errp),(pos),(progv),
(progvl),(ftype),\
                                        (indp),NULL,NULL,
OCI_DYNAMIC_FETCH));\
       ocierror(__FILE__,__LINE__,(errp), \
       OCIDefineDynamic((dfnp),(errp),(ctxp),(cbf_data)));



  /* old defines for v7 */
                                             /******


#define OBNDRV(lda,cursor,sqlvar,progv,progvl,ftype)\
    if
(obndrv((cursor),(text*)(sqlvar),NA,(ub1*)(progv),(progvl),(ftype),
NA,\
       (sb2 *)0, (text *)0, NA, NA))\
       {ErrRpt(lda,cursor->rc);return(ERR_DB_ERROR);}\
    else\
       DISCARD 0


#define
OBNDRA(lda,cursor,sqlvar,progv,progvl,ftype,indp,alen,arcode)\
```

```
    if
(obndra((cursor),(text*)(sqlvar),NA,(ub1*)(progv),(progvl),(ftype),
NA,\
       (indp),(alen),(arcode),(ub4)0,(ub4*)0,(text*)0,NA,NA))\
       {ErrRpt(lda,cursor->rc);return(ERR_DB_ERROR);}\
    else\
       DISCARD 0


#define
OBNDRAA(lda,cursor,sqlvar,progv,progvl,ftype,indp,alen,arcode,ms,cs
)\
    if
(obndra((cursor),(text*)(sqlvar),NA,(ub1*)(progv),(progvl),(ftype),
NA,\

(indp),(alen),(arcode),(ub4)(ms),(ub4*)(cs),(text*)0,NA,NA))\
       {ErrRpt(lda,cursor->rc);return(ERR_DB_ERROR);}\
    else\
       DISCARD 0


#define
ODEFIN(lda,cursor,pos,buf,bufl,ftype,scale,indp,fmt,fmtl,fmtt,rlen,
rcode)\
    if
(odefin((cursor),(pos),(ub1*)(buf),(bufl),(ftype),(scale),(indp),\
       (text*)(fmt),(fmtl),(fmtt),(rlen),(rcode)))\
       {ErrRpt(lda,cursor->rc);return(ERR_DB_ERROR);}\
    else\
       DISCARD 0


#define OEXFET(lda,cursor,nrows,cancel,exact)\
    if (oexfet((cursor),(nrows),(cancel),(exact)))\
       {if ((cursor)->rc == 1403) DISCARD 0; \
        else if (ErrRpt(lda,cursor->rc)==RECOVERR) \
           {orol(lda);return(RECOVERR);} \
         else{orol(lda);return(ERR_DB_ERROR);}}\
    else\
       DISCARD 0


#define OOPEN(lda,cursor)\
    if (oopen((cursor),(lda),(text*)0,NA,NA,(text*)0,NA))\
       {ErrRpt(lda,cursor->rc);return(ERR_DB_ERROR);}\
    else\
       DISCARD 0


#define OPARSE(lda,cursor,sqlstm,sqll,defflg,lngflg)\
    if
(oparse((cursor),(sqlstm),(sb4)(sqll),(defflg),(ub4)(lngflg)))\
       {ErrRpt(lda,cursor->rc);return(ERR_DB_ERROR);}\
    else\
       DISCARD 0


#define OFEN(lda,cursor,nrows)\
    if (ofen((cursor),(nrows)))\
       {if (ErrRpt(lda,cursor->rc)==RECOVERR) \
           {orol(lda);return(RECOVERR);} \
         else{orol(lda);return(ERR_DB_ERROR);}}\
    else\
       DISCARD 0


#define OEXEC(lda,cursor)\
    if (oexec((cursor)))\
       {if (ErrRpt(lda,cursor->rc)==RECOVERR) \
           {orol(lda);return(RECOVERR);} \
         else{orol(lda);return(ERR_DB_ERROR);}}\
    else\
       DISCARD 0


#define OCOM(lda,cursor)\
    if (ocom((lda))) \
       {ErrRpt(lda,cursor->rc);orol(lda);return(-1);}\
    else\
       DISCARD 0


#define OEXN(lda,cursor,iters,rowoff)\
    if (oexn((cursor),(iters),(rowoff))) \
       {if (ErrRpt(lda,cursor->rc)==RECOVERR) \
           {orol(lda);return(RECOVERR);} \
         else{orol(lda);return(-1);}}\
    else\
       DISCARD 0

       ***************/


/* prototypes */
extern int tkvcninit (NewOrderData *pNew,
                      OraContext *p);

extern int tkvcn (NewOrderData *pNew, OraContext *p);

extern void tkvcndone (newctx *pnctx);

extern int tkvcpinit (PaymentData *pPay,
                      OraContext *p);

extern int tkvcp (PaymentData *pPay, OraContext *p);

extern void tkvcpdone (payctx *ppctx);

extern int tkvcoinit(OrderStatusData *pOrd,
                      OraContext *p);

extern int tkvco (OrderStatusData *pOrd, OraContext *p);
```

```
extern void tkvcodone (ordctx *poctx);


extern int tkvcsinit(StockLevelData *pOrd,
                          OraContext *p);


extern int tkvcs (OraContext *p);


extern void tkvcsdone (stoctx *psctx);



extern int tkvcdinit (DeliveryData *pDel,
                          OraContext *p);


extern int tkvcd (DeliveryData *pDel, OraContext *p);


extern void tkvcddone (delctx *pdctx);



int ocierror(char *fname, int lineno, OraContext *p, sword status);

extern int ErrRpt(Lda_Def *pLda, int rc);

void TPCCErr( char *fmt, ...);

void TPCCLog( char *fmt, ...);







#endif /* ORACLE_DB_H */


**************************
oracle_txns8.c
**************************

/*+ file: oracle_txns8.c  based on Oracle files - plpay.c plnew.c
plord.c
                                                    pldel.c plsto.c
-*/

/*+================================================================
=+

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+================================================================
+

 | DESCRIPTION

 |    OCI version (using PL/SQL stored procedure) of

 |    PAYMENT transaction in TPC-C benchmark.

 |    OCI version (using PL/SQL stored procedure) of

 |    NEW ORDER transaction in TPC-C benchmark.

 |    OCI version (using PL/SQL anynomous block) of

 |    ORDER STATUS transaction in TPC-C benchmark.

 |    OCI version of DELIVERY transaction in TPC-C benchmark.

 |    OCI version of STOCK LEVEL transaction in TPC-C benchmark.


+================================================================-
*/

/*+**************************************************************
**********

 *
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*********/



/*+

 * Abstract: This file contains the transaction routines for
connection

 *           to the oracle v8 database - for the tpcc benchmark.

 *

 *

 * Modification history:

 *

 *

 *      08/01/2002      Andrew Bond, HP Corporation

 *                      - Conversion to run under Linux

 *

 */
```

```
#include <stdio.h>
#include <stdlib.h>
#include <time.h>

#include <oci.h>
#include <ocidfn.h>
#include <ociapr.h>

#include <tpccerr.h>
#include <tpccstruct.h>
#include <oracle_db8.h>

#include <tpcc.h>

#ifdef OL_CHECK
# include <httpext.h>
extern int iMaxWareHouses;
#endif

/* prototypes */
int getfile(char *filename, text *filebuf);


void vgetdate (unsigned char *oradt)
{
 struct tm *loctime;
 time_t  int_time;

 struct ORADATE {
 unsigned char      century;
 unsigned char      year;
 unsigned char      month;
 unsigned char      day;
 unsigned char      hour;
 unsigned char      minute;
 unsigned char      second;
 } Date;
int century;
int cnvrtOK;

/* assume convert is successful */
cnvrtOK = 1;

/* get the current date and time as an integer */
time( &int_time);

/* Convert the current date and time into local time */
loctime = localtime( &int_time);

century = (1900+loctime->tm_year) / 100;

Date.century = (unsigned char)(century + 100);
if (Date.century < 119 || Date.century > 120) cnvrtOK = 0;
Date.year  = (unsigned char)(loctime->tm_year%100+100);
if (Date.year < 100 || Date.year > 199) cnvrtOK = 0;
Date.month = (unsigned char)(loctime->tm_mon + 1);
if (Date.month < 1 || Date.month > 12) cnvrtOK = 0;
Date.day   = (unsigned char)loctime->tm_mday;
if (Date.day < 1 || Date.day > 31) cnvrtOK = 0;
Date.hour  = (unsigned char)(loctime->tm_hour + 1);
if (Date.hour < 1 || Date.hour > 24) cnvrtOK = 0;
Date.minute= (unsigned char)(loctime->tm_min + 1);
if (Date.minute < 1 || Date.minute > 60) cnvrtOK = 0;
Date.second= (unsigned char)(loctime->tm_sec + 1);
if (Date.second < 1 || Date.second > 60) cnvrtOK = 0;



if (cnvrtOK)
  memcpy(oradt,&Date,7);
  else
  *oradt = '\0';

 return;

}
void cvtdmy (unsigned char *oradt, char *outdate)
{

        struct ORADATE {
                unsigned char   century;
                unsigned char   year;
                unsigned char   month;
                unsigned char   day;
                unsigned char   hour;
                unsigned char   minute;
                unsigned char   second;
        } Date;



        int day,month,year;

        memcpy(&Date,oradt,7);

        year = (Date.century-100)*100 + Date.year-100;
        month = Date.month;
        day = Date.day;
        /* sprintf(outdate,"%02d-%02d-%4d\0",day,month,year); */
        sprintf(outdate,"%02d-%02d-%4d",day,month,year);
```

```
        return;
}

void cvtdmyhms (unsigned char *oradt, char *outdate)
{

        struct ORADATE {
                unsigned char   century;
                unsigned char   year;
                unsigned char   month;
                unsigned char   day;
                unsigned char   hour;
                unsigned char   minute;
                unsigned char   second;
        } Date;



        int day,month,year;
        int hour,min,sec;

        memcpy(&Date,oradt,7);

        year = (Date.century-100)*100 + Date.year-100;
        month = Date.month;
        day = Date.day;
        hour = Date.hour - 1;
        min = Date.minute - 1;
        sec = Date.second - 1;

        /*sprintf(outdate,"%02d-%02d-%4d %02d:%02d:%02d\0", */
        sprintf(outdate,"%02d-%02d-%4d %02d:%02d:%02d",
                        day,month,year,hour,min,sec);

        return;
}

swapitemstock (int i, int j, int *i_price, char i_name[][25],
                        int *s_quantity, newctx *nctx)
{

   int tempi;
   int tempf;
   char tempstr[52];
   ub2 tempub2;
   sb2 tempsb2;
   OCIRowid  *tmprid;

   tempsb2 = nctx->cons_ind[i];
   nctx->cons_ind[i] = nctx->cons_ind[j];
   nctx->cons_ind[j] = tempsb2;
   tempub2 = nctx->cons_len[i];
   nctx->cons_len[i] = nctx->cons_len[j];
   nctx->cons_len[j] = tempub2;
   tempub2 = nctx->cons_rcode[i];
   nctx->cons_rcode[i] = nctx->cons_rcode[j];
   nctx->cons_rcode[j] = tempub2;
   tempi = nctx->cons[i];
   nctx->cons[i] = nctx->cons[j];
   nctx->cons[j] = tempi;

   tempsb2 = nctx->s_rowid_ind[i];
   nctx->s_rowid_ind[i] = nctx->s_rowid_ind[j];
   nctx->s_rowid_ind[j] = tempsb2;
   tempub2 = nctx->s_rowid_len[i];
   nctx->s_rowid_len[i] = nctx->s_rowid_len[j];
   nctx->s_rowid_len[j] = tempub2;
   tempub2 = nctx->s_rowid_rcode[i];
   nctx->s_rowid_rcode[i] = nctx->s_rowid_rcode[j];
   nctx->s_rowid_rcode[j] = tempub2;
   tmprid = nctx->s_rowid_ptr[i];
   nctx->s_rowid_ptr[i]= nctx->s_rowid_ptr[j];
   nctx->s_rowid_ptr[j]=tmprid;

   tempsb2 = nctx->i_price_ind[i];
   nctx->i_price_ind[i] = nctx->i_price_ind[j];
   nctx->i_price_ind[j] = tempsb2;
   tempub2 = nctx->i_price_len[i];
   nctx->i_price_len[i] = nctx->i_price_len[j];
   nctx->i_price_len[j] = tempub2;
   tempub2 = nctx->i_price_rcode[i];
   nctx->i_price_rcode[i] = nctx->i_price_rcode[j];
   nctx->i_price_rcode[j] = tempub2;
   tempf = i_price[i];
   i_price[i] = i_price[j];
   i_price[j] = tempf;

   tempsb2 = nctx->i_name_ind[i];
   nctx->i_name_ind[i] = nctx->i_name_ind[j];
   nctx->i_name_ind[j] = tempsb2;
   tempub2 = nctx->i_name_len[i];
   nctx->i_name_len[i] = nctx->i_name_len[j];
   nctx->i_name_len[j] = tempub2;
   tempub2 = nctx->i_name_rcode[i];
   nctx->i_name_rcode[i] = nctx->i_name_rcode[j];
   nctx->i_name_rcode[j] = tempub2;
   strncpy (tempstr, i_name[i], 25);
   strncpy (i_name[i], i_name[j], 25);
   strncpy (i_name[j], tempstr, 25);

   tempsb2 = nctx->i_data_ind[i];
```

```
nctx->i_data_ind[i] = nctx->i_data_ind[j];
nctx->i_data_ind[j] = tempsb2;
tempub2 = nctx->i_data_len[i];
nctx->i_data_len[i] = nctx->i_data_len[j];
nctx->i_data_len[j] = tempub2;
tempub2 = nctx->i_data_rcode[i];
nctx->i_data_rcode[i] = nctx->i_data_rcode[j];
nctx->i_data_rcode[j] = tempub2;
strncpy (tempstr, nctx->i_data[i], 51);
strncpy (nctx->i_data[i], nctx->i_data[j], 51);
strncpy (nctx->i_data[j], tempstr, 51);

tempsb2 = nctx->s_quantity_ind[i];
nctx->s_quantity_ind[i] = nctx->s_quantity_ind[j];
nctx->s_quantity_ind[j] = tempsb2;
tempub2 = nctx->s_quantity_len[i];
nctx->s_quantity_len[i] = nctx->s_quantity_len[j];
nctx->s_quantity_len[j] = tempub2;
tempub2 = nctx->s_quantity_rcode[i];
nctx->s_quantity_rcode[i] = nctx->s_quantity_rcode[j];
nctx->s_quantity_rcode[j] = tempub2;
tempi = s_quantity[i];
s_quantity[i] = s_quantity[j];
s_quantity[j] = tempi;

tempsb2 = nctx->s_dist_info_ind[i];
nctx->s_dist_info_ind[i] = nctx->s_dist_info_ind[j];
nctx->s_dist_info_ind[j] = tempsb2;
tempub2 = nctx->s_dist_info_len[i];
nctx->s_dist_info_len[i] = nctx->s_dist_info_len[j];
nctx->s_dist_info_len[j] = tempub2;
tempub2 = nctx->s_dist_info_rcode[i];
nctx->s_dist_info_rcode[i] = nctx->s_dist_info_rcode[j];
nctx->s_dist_info_rcode[j] = tempub2;
strncpy (tempstr, nctx->s_dist_info[i], 25);
strncpy (nctx->s_dist_info[i], nctx->s_dist_info[j], 25);
strncpy (nctx->s_dist_info[j], tempstr, 25);

tempsb2 = nctx->s_data_ind[i];
nctx->s_data_ind[i] = nctx->s_data_ind[j];
nctx->s_data_ind[j] = tempsb2;
tempub2 = nctx->s_data_len[i];
nctx->s_data_len[i] = nctx->s_data_len[j];
nctx->s_data_len[j] = tempub2;
tempub2 = nctx->s_data_rcode[i];
nctx->s_data_rcode[i] = nctx->s_data_rcode[j];
nctx->s_data_rcode[j] = tempub2;
strncpy (tempstr, nctx->s_data[i], 51);
strncpy (nctx->s_data[i], nctx->s_data[j], 51);
strncpy (nctx->s_data[j], tempstr, 51);
   return 0;
}

/* the arrays are initialized based on a successful select from */
/* stock/item. We need to shift the values in the orderline array
*/
/* one position up to compensate when we have an invalid item */

shiftitemstock (int i, int j, newctx *nctx, OraContext *p)
{
  newtemp *ntemp = &(p->tempvars.new);

  /* shift up the values for the stock table */
  nctx->s_remote[i] =  nctx->s_remote[j];

  /* shift up the order_line values */

  nctx->nol_i_id_ind[i]=nctx->nol_i_id_ind[j];
  ntemp->nol_i_id[i] = ntemp->nol_i_id[j];

  nctx->nol_quantity_ind[i] =  nctx->nol_quantity_ind[j];
  ntemp->nol_quantity[i] = ntemp->nol_quantity[j];

  nctx->nol_supply_w_id_ind [i] =  nctx->nol_supply_w_id_ind[j];
  ntemp->nol_supply_w_id[i] = ntemp->nol_supply_w_id[j];
  return 0;
}

int SelItemStk (NewOrderData *pNew,
                   int *pstatus,
                   int retries, int proc_no, newctx *nctx,
OraContext *p)
{

   int i, j, rpc3,rcount;
   int errcode;
   int execstatus;

#ifdef OL_CHECK
   newtemp *ntemp = &(p->tempvars.new);
   for (i = 0; i < MAX_OL; i++) {
     if((TRUE == nctx->nol_supply_w_id_ind[i]) &&
     ( ntemp->nol_supply_w_id[i] > iMaxWareHouses )) {
       TPCCErr( "Bad supply warehouse ol: %d, s_w_id: %d, query:
%s",
                   i+1, ntemp->nol_supply_w_id[i],
                   ((EXTENSION_CONTROL_BLOCK *)pNew->pCC)-
>lpszQueryString );
     }
   }
#endif
```

```
    /* array select from item and stock tables */

   execstatus=OCIStmtExecute(p->tpcsvc,(nctx->curn3)[pNew->d_id-
1],p->errhp,
                                  pNew-
>o_ol_cnt,0,0,0,OCI_DEFAULT);

   if((execstatus != OCI_SUCCESS) && (execstatus != OCI_NO_DATA)) {

     errcode = OCIERROR(p,execstatus);

     if((errcode == NOT_SERIALIZABLE) || (errcode == RECOVERR))

     {

     /* In case of NO_DATA this should NOT return, but simply fall
through */

        OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);

        return (RECOVERR);


     }

     else

     {

        OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);

        return (IRRECERR);

     }

   }

   /* mark invalid items */

   OCIAttrGet((nctx->curn3)[pNew->d_id-1],
OCI_HTYPE_STMT,&rcount,NULL,

                OCI_ATTR_ROW_COUNT, p->errhp);

   rpc3 = rcount;


   /* the result is in order, so we have to shift up to fill    */

   /* the slot for the line with the invalid item.              */

   /* If more than one item is wrong, this is not an simulated  */

   /* error and we'll blow off */


   if ((*pstatus = pNew->o_ol_cnt - rcount) >1)

   {

      TPCCErr ("TPC-C server %d: more than 1 invalid item?\n",
proc_no);

      return (rpc3);

   }

   if (*pstatus == 0) return (rpc3);


   /* find the invalid item, transfer the rowid information */


   for (i = 0; i < pNew->o_ol_cnt; i++) {

     if (nctx->cons[i] != i) break;   /* this item is invalid */

   }

   /***

   TPCCErr("TPC-C server %d: reordering items and stocks\n",

            proc_no);   ***/


   /* not the last item - shift up */


   for (j = i; j < pNew->o_ol_cnt-1; j++)

   {

      shiftitemstock (j, j+1, nctx, p);

    }

    /* zero the last item */

      i = pNew->o_ol_cnt-1;

      nctx->nol_i_id_ind[i] = NA;

      nctx->nol_supply_w_id_ind[i] = NA;

      nctx->nol_quantity_ind[i] = NA;

      nctx->nol_amount_ind[i] = NA;

      nctx->ol_w_id_ind[i] = NA;

      nctx->ol_d_id_ind[i] = NA;

      nctx->ol_o_id_ind[i] = NA;

      nctx->null_date_ind[i]= NA;

      nctx->ol_number_ind[i] = NA;

      nctx->ol_dist_info_ind[i] = NA;

      nctx->s_remote_ind[i] = NA;

      nctx->s_quant_ind[i] = NA;


      nctx->nol_i_id_len[i] = 0;

      nctx->nol_supply_w_id_len[i] = 0;

      nctx->nol_quantity_len[i] = 0;

      nctx->nol_amount_len[i] = 0;

      nctx->ol_w_id_len[i] = 0;

      nctx->ol_d_id_len[i] = 0;

      nctx->ol_o_id_len[i] = 0;

      nctx->ol_number_len[i] = 0;

      nctx->ol_dist_info_len[i] = 0;

      nctx->null_date_ind[i] = 0;

      nctx->s_remote_len[i] = 0;

      nctx->s_quant_len[i] = 0;


    return (rpc3);

}



UpdStk (OraContext *p, NewOrderData *pNew, int proc_no)

{

  int rcount;

  int execstatus;

  int errcode;

  newctx *nctx = &(p->nctx);


#ifdef OL_CHECK

  int i;

   newtemp *ntemp = &(p->tempvars.new);

   for (i = 0; i < MAX_OL; i++) {

     if((TRUE == nctx->nol_supply_w_id_ind[i]) &&

     ( ntemp->nol_supply_w_id[i] > iMaxWareHouses )) {

       TPCCErr( "Bad supply warehouse ol in updstk: %d, s_w_id: %d,
query: %s",

                    i+1, ntemp->nol_supply_w_id[i],
```

```
                    ((EXTENSION_CONTROL_BLOCK *)pNew->pCC)-
>lpszQueryString );
     }
   }
#endif
   /* array update of stock table */

  execstatus = OCIStmtExecute(p->tpcsvc,nctx->curn2,p->errhp,pNew-
>o_ol_cnt,
                              0,0,0,OCI_DEFAULT);
   if(execstatus != OCI_SUCCESS) {
     OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
     errcode = OCIERROR(p, execstatus);
     if((errcode == NOT_SERIALIZABLE) || (errcode == RECOVERR)) {
          return (RECOVERR);
     } else {
        return (IRRECERR);
     }
   }
  OCIAttrGet(nctx->curn2,OCI_HTYPE_STMT,&rcount,NULL,
            OCI_ATTR_ROW_COUNT, p->errhp);
  if (rcount != (pNew->o_ol_cnt) ) {
     TPCCErr ("Error in TPC-C server %d: array update failed in
UpdStk()\n",
               proc_no);
      OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
      return (IRRECERR);
   }
   return (rcount);
}



UpdStk2 (OraContext *p, NewOrderData *pNew, int status, int
proc_no)
{

  int rcount;
  int execstatus;
  int errcode;
  newctx *nctx = &(p->nctx);

#ifdef OL_CHECK
  int i;
   newtemp *ntemp = &(p->tempvars.new);
   for (i = 0; i < MAX_OL; i++) {
     if((TRUE == nctx->nol_supply_w_id_ind[i]) &&
     ( ntemp->nol_supply_w_id[i] > iMaxWareHouses )) {
       TPCCErr( "Bad supply warehouse ol in updstk2: %d, s_w_id:
%d, query: %S",
                    i+1, ntemp->nol_supply_w_id[i],
                    ((EXTENSION_CONTROL_BLOCK *)pNew->pCC)-
>lpszQueryString );
     }
   }
#endif
  /* array update of stock table */

  execstatus = OCIStmtExecute(p->tpcsvc,nctx->curn2,p->errhp,
                                    pNew->o_ol_cnt-
status,0,0,0,OCI_DEFAULT);
   if(execstatus != OCI_SUCCESS) {
     OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
     errcode = OCIERROR(p,execstatus);
     if(errcode == NOT_SERIALIZABLE) {
          return (RECOVERR);
     } else if (errcode == RECOVERR) {
          return (RECOVERR);
     } else {
        return (IRRECERR);
     }
   }
   OCIAttrGet(nctx->curn2,OCI_HTYPE_STMT,&rcount,NULL,
OCI_ATTR_ROW_COUNT,
               p->errhp);

   if (rcount != (pNew->o_ol_cnt - status)) {
      TPCCErr("Error in TPC-C server %d: array update failed in
UpdStk2()\n",
              proc_no);
      OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
      return (NO_COMMIT);
   }

   return (rcount);

}

/* stock level transaction */

#define SLSQLTXT "SELECT /*+ nocache(stok) */ count (DISTINCT
s_i_id) \
            FROM ordl, stok, dist \
            WHERE d_id = :d_id AND d_w_id = :w_id AND \
                  d_id = ol_d_id AND d_w_id = ol_w_id AND \
                  ol_i_id = s_i_id AND ol_w_id = s_w_id AND \
                  s_quantity < :threshold AND \
                  ol_o_id BETWEEN (d_next_o_id - 20) AND
(d_next_o_id - 1)"

#define SQLTXTTEST "BEGIN stocklevel.getstocklevel (:w_id, :d_id, \
:threshold); END;"

tkvcsinit (StockLevelData *pSL,
```

```
            OraContext *p)

{
  stoctx *sctx = &(p->sctx);
  text stmbuf[SQL_BUF_SIZE];

  sctx->curs = NULL;

  memset(sctx,(char)0,sizeof(stoctx));
  sctx->norow=0;

  OCIERROR(p, OCIHandleAlloc(p->tpcenv,(dvoid**)&(sctx->curs),OCI_HTYPE_STMT,0,
                                  (dvoid**)0));
  sprintf ((char *) stmbuf, SLSQLTXT);
  OCIERROR(p,OCIStmtPrepare(sctx->curs,p->errhp,stmbuf,strlen((char *)stmbuf),
                                OCI_NTV_SYNTAX,OCI_DEFAULT));
  OCIERROR(p, OCIAttrSet(sctx->curs,OCI_HTYPE_STMT,(dvoid*)&sctx->norow,0,
                               OCI_ATTR_PREFETCH_ROWS,p->errhp));

  /* bind variables */

  OCIBND(sctx->curs,sctx->w_id_bp,p, ":w_id", ADR(pSL->w_id),sizeof(int),
           SQLT_INT);
  OCIBND(sctx->curs,sctx->d_id_bp,p, ":d_id", ADR(pSL->ld_id),sizeof(int),
           SQLT_INT);
  OCIBND(sctx->curs,sctx->threshold_bp,p, ":threshold", ADR(pSL->threshold),
           sizeof(int),SQLT_INT);
  OCIDEF(sctx->curs,sctx->low_stock_bp,p->errhp, 1, ADR(pSL->low_stock),
      sizeof(int), SQLT_INT);

  return (ERR_DB_SUCCESS);

}

tkvcs (OraContext *p)
{
  stoctx *sctx = &(p->sctx);

  int execstatus = 0;
  int errcode = 0;

  execstatus = OCIStmtExecute(p->tpcsvc,sctx->curs,p->errhp,1,0,0,0,
                                   OCI_COMMIT_ON_SUCCESS | OCI_DEFAULT);
  if(execstatus != OCI_SUCCESS) {
    OCITransCommit(p->tpcsvc,p->errhp,OCI_DEFAULT);
    errcode = OCIERROR(p,execstatus);
    if(errcode == NOT_SERIALIZABLE) {
      return (RECOVERR);
     } else if (errcode == RECOVERR) {
      return (RECOVERR);
     } else if (errcode == SNAPSHOT_TOO_OLD) {
      return (RECOVERR);
     } else {
      return (ERR_DB_ERROR);
     }
  }

  return (ERR_DB_SUCCESS);

}

void tkvcsdone (stoctx *psctx)

{
  stoctx sctx = *psctx;

  if(NULL != sctx.curs)
    OCIHandleFree((dvoid *)sctx.curs,OCI_HTYPE_STMT);

}

#define SQLTXT_PAY_ZERO "BEGIN apayment.adopayment(:w_id, :d_id, :c_w_id, :c_d_id, \
   :c_id, 0, \
   :h_amount, :c_last, :w_street_1, :w_street_2, :w_city, :w_state, \
   :w_zip, :d_street_1, :d_street_2, :d_city, :d_state, :d_zip, :c_first, \
   :c_middle, :c_street_1, :c_street_2, :c_city, :c_state, :c_zip, :c_phone, \
   :c_since, :c_credit, :c_credit_lim, :c_discount, :c_balance, :c_data, \
   :h_date, :retry, :cr_date); END;"

#define SQLTXT_PAY_NONZERO "BEGIN apayment.adopayment(:w_id, :d_id, :c_w_id, :c_d_id, \
   :c_id, 1, \
   :h_amount, :c_last, :w_street_1, :w_street_2, :w_city, :w_state, \
   :w_zip, :d_street_1, :d_street_2, :d_city, :d_state, :d_zip, :c_first, \
   :c_middle, :c_street_1, :c_street_2, :c_city, :c_state, :c_zip, :c_phone, \
   :c_since, :c_credit, :c_credit_lim, :c_discount, :c_balance, :c_data, \
   :h_date, :retry, :cr_date); END;"

#define SQLTXT_PAY_INIT "BEGIN initpay.pay_init; END;"
```

```
tkvcpinit (PaymentData *pPay,
             OraContext *p)

{
  payctx *pctx = &(p->pctx);
  paytemp *ptemp = &(p->tempvars.pay);

  text stmbuf[SQL_BUF_SIZE];

  pctx->curpi = NULL;
  pctx->curp0 = NULL;
  pctx->curp1 = NULL;

  memset(pctx,(char)0,sizeof(payctx));

/* cursor for init */
   OCIERROR(p,OCIHandleAlloc(p->tpcenv, (dvoid **)(&(pctx->curpi)),
            OCI_HTYPE_STMT,0,(dvoid**)0));

   OCIERROR(p,OCIHandleAlloc(p->tpcenv, (dvoid **)(&(pctx->curp0)),
            OCI_HTYPE_STMT,0,(dvoid**)0));
   OCIERROR(p,OCIHandleAlloc(p->tpcenv, (dvoid **)(&(pctx->curp1)),
            OCI_HTYPE_STMT,0,(dvoid**)0));

   /*  build the init statement  and execute it */

   sprintf ((char*)stmbuf, SQLTXT_PAY_INIT);
   OCIERROR(p,OCIStmtPrepare(pctx->curpi, p->errhp, stmbuf,
            strlen((char *)stmbuf), OCI_NTV_SYNTAX, OCI_DEFAULT));
   OCIERROR(p,
     OCIStmtExecute(p->tpcsvc,pctx->curpi,p-
>errhp,1,0,0,0,OCI_DEFAULT));

   /* customer id !=  0, go by customer id */
   if(ERR_DB_ERROR == getfile("paynz.sql",stmbuf))
  {
    TPCCErr("Error opening the file paynz.sql");
    return ERR_DB_ERROR;
  }

   OCIERROR(p,OCIStmtPrepare(pctx->curp0, p->errhp, stmbuf,
            strlen((char *)stmbuf), OCI_NTV_SYNTAX, OCI_DEFAULT));

   /* customer id ==  0, go by last name */
   if(ERR_DB_ERROR == getfile("payz.sql",stmbuf))
  {
    TPCCErr("Error opening the file payz.sql");
    return ERR_DB_ERROR;
  }

   OCIERROR(p,OCIStmtPrepare(pctx->curp1, p->errhp, stmbuf,
            strlen((char *)stmbuf), OCI_NTV_SYNTAX, OCI_DEFAULT));

  pctx->w_id_ind = TRUE;
  pctx->w_id_len = SIZ(pPay->w_id);
  pctx->d_id_ind = TRUE;
  pctx->d_id_len = SIZ(pPay->d_id);
  pctx->c_w_id_ind = TRUE;
  pctx->c_w_id_len = SIZ(pPay->c_w_id);
  pctx->c_d_id_ind = TRUE;
  pctx->c_d_id_len = SIZ(pPay->c_d_id);
  pctx->c_id_ind = TRUE;
  pctx->c_id_len = 0;
  pctx->h_amount_len = SIZ(ptemp->h_amount);
  pctx->h_amount_ind = TRUE;
  pctx->c_last_ind = TRUE;
  pctx->c_last_len = 0;
  pctx->w_street_1_ind = TRUE;
  pctx->w_street_1_len = 0;
  pctx->w_street_2_ind = TRUE;
  pctx->w_street_2_len = 0;
  pctx->w_city_ind = TRUE;
  pctx->w_city_len = 0;
  pctx->w_state_ind = TRUE;
  pctx->w_state_len = 0;
  pctx->w_zip_ind = TRUE;
  pctx->w_zip_len = 0;
  pctx->d_street_1_ind = TRUE;
  pctx->d_street_1_len = 0;
  pctx->d_street_2_ind = TRUE;
  pctx->d_street_2_len = 0;
  pctx->d_city_ind = TRUE;
  pctx->d_city_len = 0;
  pctx->d_state_ind = TRUE;
  pctx->d_state_len = 0;
  pctx->d_zip_ind = TRUE;
  pctx->d_zip_len = 0;
  pctx->c_first_ind = TRUE;
  pctx->c_first_len = 0;
  pctx->c_middle_ind = TRUE;
  pctx->c_middle_len = 0;
  pctx->c_street_1_ind = TRUE;
  pctx->c_street_1_len = 0;
  pctx->c_street_2_ind = TRUE;
  pctx->c_street_2_len = 0;
  pctx->c_city_ind = TRUE;
  pctx->c_city_len = 0;
  pctx->c_state_ind = TRUE;
  pctx->c_state_len = 0;
  pctx->c_zip_ind = TRUE;
  pctx->c_zip_len = 0;
```

```
  pctx->c_phone_ind = TRUE;
  pctx->c_phone_len = 0;
  pctx->c_since_ind = TRUE;
  pctx->c_since_len = 0;
  pctx->c_credit_ind = TRUE;
  pctx->c_credit_len = 0;
  pctx->c_credit_lim_ind = TRUE;
  pctx->c_credit_lim_len = 0;
  pctx->c_discount_ind = TRUE;
  pctx->c_discount_len = 0;
  pctx->c_balance_ind = TRUE;
  pctx->c_balance_len = sizeof(double);
  pctx->c_data_ind = TRUE;
  pctx->c_data_len = 0;
  pctx->h_date_ind = TRUE;
  pctx->h_date_len = 0;
  pctx->retries_ind = TRUE;
  pctx->retries_len = 0;
  pctx->cr_date_ind = TRUE;
  /* pctx->cr_date_len = 7; */
  pctx->cr_date_len = sizeof(ptemp->cr_date);









   /* bind variables */



   OCIBNDR(pctx->curp0, pctx->w_id_bp, p,":w_id",ADR(pPay->w_id),
             SIZ(int), SQLT_INT, &pctx->w_id_ind, NULL, NULL);
   OCIBNDR(pctx->curp0, pctx->d_id_bp, p,":d_id",ADR(pPay->d_id),
             SIZ(int), SQLT_INT, &pctx->d_id_ind, NULL, NULL);
   OCIBND(pctx->curp0, pctx->c_w_id_bp, p,":c_w_id",ADR(pPay-
>c_w_id),
            SIZ(int), SQLT_INT);
   OCIBND(pctx->curp0, pctx->c_d_id_bp, p,":c_d_id",ADR(pPay-
>c_d_id),
            SIZ(int), SQLT_INT);
   OCIBND(pctx->curp0, pctx->c_id_bp, p,":c_id",ADR(pPay->c_id),
           SIZ(int),  SQLT_INT);
   OCIBNDR(pctx->curp0, pctx->h_amount_bp, p,":h_amount",
             ADR(ptemp->h_amount), SIZ(ptemp->h_amount),SQLT_INT,
             &pctx->h_amount_ind, &pctx->h_amount_len, &pctx-
>h_amount_rc);
   OCIBNDR(pctx->curp0, pctx->c_last_bp, p,":c_last",pPay->c_last,
             SIZ(pPay->c_last), SQLT_STR, &pctx->c_last_ind, &pctx-
>c_last_len,
             &pctx->c_last_rc);
   OCIBNDR(pctx->curp0, pctx->w_street_1_bp, p,":w_street_1",
             pPay->w_street_1, SIZ(pPay->w_street_1),SQLT_STR,
             &pctx->w_street_1_ind, &pctx->w_street_1_len, &pctx-
>w_street_1_rc);
   OCIBNDR(pctx->curp0, pctx->w_street_2_bp, p,":w_street_2",
             pPay->w_street_2, SIZ(pPay->w_street_2),SQLT_STR,
             &pctx->w_street_2_ind, &pctx->w_street_2_len, &pctx-
>w_street_2_rc);
   OCIBNDR(pctx->curp0, pctx->w_city_bp, p,":w_city",pPay->w_city,
             SIZ(pPay->w_city),
           SQLT_STR, &pctx->w_city_ind, &pctx->w_city_len, &pctx-
>w_city_rc);
   OCIBNDR(pctx->curp0, pctx->w_state_bp, p,":w_state",pPay-
>w_state,
             SIZ(pPay->w_state), SQLT_STR, &pctx->w_state_ind,
             &pctx->w_state_len, &pctx->w_state_rc);
   OCIBNDR(pctx->curp0, pctx->w_zip_bp, p,":w_zip",pPay->w_zip,
             SIZ(pPay->w_zip),
           SQLT_STR, &pctx->w_zip_ind, &pctx->w_zip_len, &pctx-
>w_zip_rc);
   OCIBNDR(pctx->curp0, pctx->d_street_1_bp, p,":d_street_1",
             pPay->d_street_1,
           SIZ(pPay->d_street_1),SQLT_STR, &pctx->d_street_1_ind,
           &pctx->d_street_1_len, &pctx->d_street_1_rc);
   OCIBNDR(pctx->curp0, pctx->d_street_2_bp, p,":d_street_2",
             pPay->d_street_2,
           SIZ(pPay->d_street_2),SQLT_STR, &pctx->d_street_2_ind,
           &pctx->d_street_2_len, &pctx->d_street_2_rc);
   OCIBNDR(pctx->curp0, pctx->d_city_bp, p,":d_city",pPay->d_city,
             SIZ(pPay->d_city),
           SQLT_STR, &pctx->d_city_ind, &pctx->d_city_len, &pctx-
>d_city_rc);
   OCIBNDR(pctx->curp0, pctx->d_state_bp, p,":d_state",pPay-
>d_state,
             SIZ(pPay->d_state), SQLT_STR,
           &pctx->d_state_ind, &pctx->d_state_len, &pctx-
>d_state_rc);
   OCIBNDR(pctx->curp0, pctx->d_zip_bp, p,":d_zip",pPay->d_zip,
             SIZ(pPay->d_zip),
           SQLT_STR, &pctx->d_zip_ind, &pctx->d_zip_len, &pctx-
>d_zip_rc);
   OCIBNDR(pctx->curp0, pctx->c_first_bp, p,":c_first",pPay-
>c_first,
             SIZ(pPay->c_first), SQLT_STR,
             &pctx->c_first_ind, &pctx->c_first_len, &pctx-
>c_first_rc);
   OCIBNDR(pctx->curp0, pctx->c_middle_bp, p,":c_middle",
             pPay->c_middle,2,
           SQLT_AFC, &pctx->c_middle_ind, &pctx->c_middle_len,
           &pctx->c_middle_rc);
   OCIBNDR(pctx->curp0, pctx->c_street_1_bp, p,":c_street_1",
             pPay->c_street_1,
           SIZ(pPay->c_street_1),SQLT_STR, &pctx->c_street_1_ind,
           &pctx->c_street_1_len, &pctx->c_street_1_rc);
   OCIBNDR(pctx->curp0, pctx->c_street_2_bp, p,":c_street_2",
             pPay->c_street_2,
           SIZ(pPay->c_street_2),SQLT_STR, &pctx->c_street_2_ind,
           &pctx->c_street_2_len, &pctx->c_street_2_rc);
   OCIBNDR(pctx->curp0, pctx->c_city_bp, p,":c_city",pPay->c_city,
             SIZ(pPay->c_city),
```

```
          SQLT_STR, &pctx->c_city_ind, &pctx->c_city_len, &pctx-
>c_city_rc);

   OCIBNDR(pctx->curp0, pctx->c_state_bp, p,":c_state",pPay-
>c_state,

             SIZ(pPay->c_state),

          SQLT_STR,&pctx->c_state_ind, &pctx->c_state_len, &pctx-
>c_state_rc);

   OCIBNDR(pctx->curp0, pctx->c_zip_bp, p,":c_zip",pPay->c_zip,

             SIZ(pPay->c_zip),

          SQLT_STR, &pctx->c_zip_ind, &pctx->c_zip_len, &pctx-
>c_zip_rc);

   OCIBNDR(pctx->curp0, pctx->c_phone_bp, p,":c_phone",pPay-
>c_phone,

             SIZ(pPay->c_phone), SQLT_STR,

             &pctx->c_phone_ind, &pctx->c_phone_len, &pctx-
>c_phone_rc);

   OCIBNDR(pctx->curp0, pctx->c_since_bp, p,":c_since",

             ADR(ptemp->customer_sdate),SIZ(ptemp->customer_sdate),
SQLT_ODT,

             &pctx->c_since_ind, &pctx->c_since_len, &pctx-
>c_since_rc);

   OCIBNDR(pctx->curp0, pctx->c_credit_bp, p,":c_credit",pPay-
>c_credit,

          SIZ(pPay->c_credit),SQLT_CHR,

             &pctx->c_credit_ind, &pctx->c_credit_len, &pctx-
>c_credit_rc);

   OCIBNDR(pctx->curp0, pctx->c_credit_lim_bp, p,":c_credit_lim",

          ADR(ptemp->c_credit_lim),SIZ(ptemp->c_credit_lim),
SQLT_INT,

             &pctx->c_credit_lim_ind,

             &pctx->c_credit_lim_len, &pctx->c_credit_lim_rc);

   OCIBNDR(pctx->curp0, pctx->c_discount_bp, p,":c_discount",

          ADR(ptemp->c_discount),SIZ(ptemp->c_discount), SQLT_FLT,

             &pctx->c_discount_ind,

          &pctx->c_discount_len, &pctx->c_discount_rc);

   OCIBNDR(pctx->curp0, pctx->c_balance_bp, p,":c_balance",

             ADR(pPay->c_balance), SIZ(pPay->c_balance),SQLT_FLT,

             &pctx->c_balance_ind, &pctx->c_balance_len,

          &pctx->c_balance_rc);

   OCIBNDR(pctx->curp0, pctx->c_data_bp, p,":c_data",pPay->c_data,

             SIZ(pPay->c_data),

          SQLT_STR, &pctx->c_data_ind, &pctx->c_data_len, &pctx-
>c_data_rc);

/*   OCIBNDR(pctx->curp0, pctx->h_date_bp, p,":h_date",ptemp-
>h_date,

             SIZ(ptemp->h_date),

          SQLT_STR, &pctx->h_date_ind, &pctx->h_date_len, &pctx-
>h_date_rc);  */

   OCIBNDR(pctx->curp0, pctx->retries_bp, p,":retry",

             ADR(ptemp->p_retry),SIZ(ptemp->p_retry), SQLT_INT,

          &pctx->retries_ind, &pctx->retries_len, &pctx-
>retries_rc);

   OCIBNDR(pctx->curp0, pctx->cr_date_bp, p,":cr_date",

             ADR(ptemp->cr_date), SIZ(ptemp->cr_date),SQLT_ODT,

             &pctx->cr_date_ind, &pctx->cr_date_len,

          &pctx->cr_date_rc);
```

```
/* ---- Binds for  the second cursor   */



   OCIBNDR(pctx->curp1, pctx->w_id_bp1, p,":w_id",

             ADR(pPay->w_id),SIZ(pPay->w_id),

          SQLT_INT, &pctx->w_id_ind, &pctx->w_id_len, &pctx-
>w_id_rc);

   OCIBNDR(pctx->curp1, pctx->d_id_bp1, p,":d_id",ADR(pPay->d_id),

             SIZ(pPay->d_id),

          SQLT_INT, &pctx->d_id_ind, &pctx->d_id_len, &pctx-
>d_id_rc);

   OCIBND(pctx->curp1, pctx->c_w_id_bp1, p,":c_w_id",ADR(pPay-
>c_w_id),

             SIZ(pPay->c_w_id),

             SQLT_INT);

   OCIBND(pctx->curp1, pctx->c_d_id_bp1, p,":c_d_id",ADR(pPay-
>c_d_id),

             SIZ(pPay->c_d_id),

             SQLT_INT);

   OCIBNDR(pctx->curp1, pctx->c_id_bp1, p,":c_id",ADR(pPay->c_id),

             SIZ(int),

          SQLT_INT, &pctx->c_id_ind, &pctx->c_id_len, &pctx-
>c_id_rc);

   OCIBNDR(pctx->curp1, pctx->h_amount_bp1, p,":h_amount",

             ADR(ptemp->h_amount),

          SIZ(int),SQLT_INT, &pctx->h_amount_ind, &pctx-
>h_amount_len,

          &pctx->h_amount_rc);

   OCIBND(pctx->curp1, pctx->c_last_bp1, p,":c_last",pPay->c_last,

             SIZ(pPay->c_last),

             SQLT_STR);

   OCIBNDR(pctx->curp1, pctx->w_street_1_bp1, p,":w_street_1",

             pPay->w_street_1,

          SIZ(pPay->w_street_1),SQLT_STR, &pctx->w_street_1_ind,

          &pctx->w_street_1_len, &pctx->w_street_1_rc);

   OCIBNDR(pctx->curp1, pctx->w_street_2_bp1, p,":w_street_2",

             pPay->w_street_2,

          SIZ(pPay->w_street_2),SQLT_STR, &pctx->w_street_2_ind,

          &pctx->w_street_2_len, &pctx->w_street_2_rc);

   OCIBNDR(pctx->curp1, pctx->w_city_bp1, p,":w_city",pPay->w_city,

             SIZ(pPay->w_city),

          SQLT_STR, &pctx->w_city_ind, &pctx->w_city_len, &pctx-
>w_city_rc);

   OCIBNDR(pctx->curp1, pctx->w_state_bp1, p,":w_state",pPay-
>w_state,

             SIZ(pPay->w_state), SQLT_STR,

             &pctx->w_state_ind, &pctx->w_state_len, &pctx-
>w_state_rc);

   OCIBNDR(pctx->curp1, pctx->w_zip_bp1, p,":w_zip",pPay->w_zip,

             SIZ(pPay->w_zip),

          SQLT_STR, &pctx->w_zip_ind, &pctx->w_zip_len, &pctx-
>w_zip_rc);

   OCIBNDR(pctx->curp1, pctx->d_street_1_bp1, p,":d_street_1",

             pPay->d_street_1,

          SIZ(pPay->d_street_1),SQLT_STR, &pctx->d_street_1_ind,
```

```
          &pctx->d_street_1_len, &pctx->d_street_1_rc);
   OCIBNDR(pctx->curp1, pctx->d_street_2_bp1, p,":d_street_2",
             pPay->d_street_2,
          SIZ(pPay->d_street_2),SQLT_STR, &pctx->d_street_2_ind,
          &pctx->d_street_2_len, &pctx->d_street_2_rc);
   OCIBNDR(pctx->curp1, pctx->d_city_bp1, p,":d_city",
             pPay->d_city,SIZ(pPay->d_city),
          SQLT_STR, &pctx->d_city_ind, &pctx->d_city_len, &pctx-
>d_city_rc);
   OCIBNDR(pctx->curp1, pctx->d_state_bp1, p,":d_state",
             pPay->d_state, SIZ(pPay->d_state), SQLT_STR,
             &pctx->d_state_ind, &pctx->d_state_len,
          &pctx->d_state_rc);
   OCIBNDR(pctx->curp1, pctx->d_zip_bp1, p,":d_zip",pPay->d_zip,
             SIZ(pPay->d_zip),
          SQLT_STR, &pctx->d_zip_ind, &pctx->d_zip_len, &pctx-
>d_zip_rc);
   OCIBNDR(pctx->curp1, pctx->c_first_bp1, p,":c_first",pPay-
>c_first,
          SIZ(pPay->c_first), SQLT_STR,
             &pctx->c_first_ind, &pctx->c_first_len,
          &pctx->c_first_rc);
   OCIBNDR(pctx->curp1, pctx->c_middle_bp1, p,":c_middle",
             pPay->c_middle,2,
          SQLT_AFC, &pctx->c_middle_ind, &pctx->c_middle_len,
          &pctx->c_middle_rc);
   OCIBNDR(pctx->curp1, pctx->c_street_1_bp1, p,":c_street_1",
             pPay->c_street_1,
          SIZ(pPay->c_street_1),SQLT_STR, &pctx->c_street_1_ind,
          &pctx->c_street_1_len, &pctx->c_street_1_rc);
   OCIBNDR(pctx->curp1, pctx->c_street_2_bp1, p,":c_street_2",
             pPay->c_street_2,
          SIZ(pPay->c_street_2),SQLT_STR, &pctx->c_street_2_ind,
          &pctx->c_street_2_len, &pctx->c_street_2_rc);
   OCIBNDR(pctx->curp1, pctx->c_city_bp1, p,":c_city",pPay->c_city,
             SIZ(pPay->c_city),SQLT_STR,
             &pctx->c_city_ind, &pctx->c_city_len, &pctx-
>c_city_rc);
   OCIBNDR(pctx->curp1, pctx->c_state_bp1, p,":c_state",pPay-
>c_state,
             SIZ(pPay->c_state),SQLT_STR, &pctx->c_state_ind,
&pctx->c_state_len,
             &pctx->c_state_rc);
   OCIBNDR(pctx->curp1, pctx->c_zip_bp1, p,":c_zip",pPay->c_zip,
             SIZ(pPay->c_zip),
          SQLT_STR, &pctx->c_zip_ind, &pctx->c_zip_len, &pctx-
>c_zip_rc);
   OCIBNDR(pctx->curp1, pctx->c_phone_bp1, p,":c_phone",pPay-
>c_phone,
             SIZ(pPay->c_phone), SQLT_STR,
             &pctx->c_phone_ind, &pctx->c_phone_len,
             &pctx->c_phone_rc);
   OCIBNDR(pctx->curp1, pctx->c_since_bp1, p,":c_since",
             ADR(ptemp->customer_sdate), SIZ(ptemp-
>customer_sdate), SQLT_ODT,
             &pctx->c_since_ind, &pctx->c_since_len, &pctx-
>c_since_rc);
   OCIBNDR(pctx->curp1, pctx->c_credit_bp1, p,":c_credit",
             pPay->c_credit,
          SIZ(pPay->c_credit),SQLT_CHR,
             &pctx->c_credit_ind, &pctx->c_credit_len,
          &pctx->c_credit_rc);
   OCIBNDR(pctx->curp1, pctx->c_credit_lim_bp1, p,":c_credit_lim",
          ADR(ptemp->c_credit_lim),SIZ(int), SQLT_INT,
             &pctx->c_credit_lim_ind,
          &pctx->c_credit_lim_len, &pctx->c_credit_lim_rc);
   OCIBNDR(pctx->curp1, pctx->c_discount_bp1, p,":c_discount",
          ADR(ptemp->c_discount),SIZ(ptemp->c_discount), SQLT_FLT,
&pctx->c_discount_ind,
          &pctx->c_discount_len, &pctx->c_discount_rc);
   OCIBNDR(pctx->curp1, pctx->c_balance_bp1, p,":c_balance",
             ADR(pPay->c_balance),
          SIZ(double),SQLT_FLT, &pctx->c_balance_ind, &pctx-
>c_balance_len,
          &pctx->c_balance_rc);
   OCIBNDR(pctx->curp1, pctx->c_data_bp1, p,":c_data",pPay->c_data,
             SIZ(pPay->c_data),
          SQLT_STR, &pctx->c_data_ind, &pctx->c_data_len, &pctx-
>c_data_rc);
/*   OCIBNDR(pctx->curp1, pctx->h_date_bp1, p,":h_date",
             ptemp->h_date,SIZ(ptemp->h_date),
          SQLT_STR, &pctx->h_date_ind, &pctx->h_date_len, &pctx-
>h_date_rc); */
   OCIBNDR(pctx->curp1, pctx->retries_bp1, p,":retry",
             ADR(ptemp->p_retry),SIZ(int), SQLT_INT,
             &pctx->retries_ind, &pctx->retries_len, &pctx-
>retries_rc);
   OCIBNDR(pctx->curp1, pctx->cr_date_bp1, p,":cr_date",
             ADR(ptemp->cr_date), SIZ(ptemp->cr_date), SQLT_ODT,
             &pctx->cr_date_ind, &pctx->cr_date_len,
          &pctx->cr_date_rc);


 return (ERR_DB_SUCCESS);


}



tkvcp (PaymentData *pPay, OraContext *p)


{
  int execstatus;
  int errcode;
  payctx *pctx = &(p->pctx);
  paytemp *ptemp = &(p->tempvars.pay);
  unsigned char localcr_date[7];
  OCIError *datecvterrhp = p->datecvterrhp;


/*  vgetdate(ptemp->cr_date); */
```

```
  vgetdate(localcr_date);
  cvtdmyhms(localcr_date,ptemp->h_date);
  OCIDateFromText(datecvterrhp,ptemp->h_date,strlen(ptemp-
>h_date),"DD-MM-YYYY HH24:MI:SS",21,(text *) 0, 0,&ptemp->cr_date);



  pctx->w_id_ind = TRUE;
  pctx->w_id_len = SIZ(pPay->w_id);
  pctx->d_id_ind = TRUE;
  pctx->d_id_len = SIZ(pPay->d_id);
  pctx->c_w_id_ind = TRUE;
  pctx->c_w_id_len = 0;
  pctx->c_d_id_ind = TRUE;
  pctx->c_d_id_len = 0;
  pctx->c_id_ind = TRUE;
  pctx->c_id_len = 0;
  pctx->h_amount_len = SIZ(ptemp->h_amount);
  pctx->h_amount_ind = TRUE;
  pctx->c_last_ind = TRUE;
  pctx->c_last_len = SIZ(pPay->c_last);
  pctx->w_street_1_ind = NA;
  pctx->w_street_1_len = 0;
  pctx->w_street_2_ind = NA;
  pctx->w_street_2_len = 0;
  pctx->w_city_ind = NA;
  pctx->w_city_len = 0;
  pctx->w_state_ind = NA;
  pctx->w_state_len = 0;
  pctx->w_zip_ind = NA;
  pctx->w_zip_len = 0;
  pctx->d_street_1_ind = NA;
  pctx->d_street_1_len = 0;
  pctx->d_street_2_ind = NA;
  pctx->d_street_2_len = 0;
  pctx->d_city_ind = NA;
  pctx->d_city_len = 0;
  pctx->d_state_ind = NA;
  pctx->d_state_len = 0;
  pctx->d_zip_ind = NA;
  pctx->d_zip_len = 0;
  pctx->c_first_ind = NA;
  pctx->c_first_len = 0;
  pctx->c_middle_ind = NA;
  pctx->c_middle_len = 0;
  pctx->c_street_1_ind = NA;
  pctx->c_street_1_len = 0;
  pctx->c_street_2_ind = NA;
  pctx->c_street_2_len = 0;
  pctx->c_city_ind = NA;
  pctx->c_city_len = 0;
  pctx->c_state_ind = NA;
  pctx->c_state_len = 0;
  pctx->c_zip_ind = NA;
  pctx->c_zip_len = 0;
  pctx->c_phone_ind = NA;
  pctx->c_phone_len = 0;
  pctx->c_since_ind = NA;
  pctx->c_since_len = 0;
  pctx->c_credit_ind = NA;
  pctx->c_credit_len = 0;
  pctx->c_credit_lim_ind = NA;
  pctx->c_credit_lim_len = 0;
  pctx->c_discount_ind = NA;
  pctx->c_discount_len = 0;
  pctx->c_balance_ind = NA;
  pctx->c_balance_len = sizeof(double);
  pctx->c_data_ind = NA;
  pctx->c_data_len = 0;
  pctx->h_date_ind = TRUE;
  pctx->h_date_len = 0;
  pctx->retries_ind = TRUE;
  pctx->retries_len = 0;
  pctx->cr_date_ind = TRUE;
/*  pctx->cr_date_len = 7; */
  pctx->cr_date_len = sizeof(ptemp->cr_date);



  if(pPay->byname)
  {
    pctx->c_id_ind = NA;
    execstatus=OCIStmtExecute(p->tpcsvc,pctx->curp1,p->errhp,
1,0,0,0,OCI_DEFAULT|OCI_COMMIT_ON_SUCCESS);
  }
  else
  {
    pctx->c_last_ind = NA;
    execstatus=OCIStmtExecute(p->tpcsvc,pctx->curp0,p->errhp,
1,0,0,0,OCI_DEFAULT|OCI_COMMIT_ON_SUCCESS);
  }

  if(execstatus != OCI_SUCCESS) {
     OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
     errcode = OCIERROR(p,execstatus);
     if(errcode == NOT_SERIALIZABLE) {
        return(RECOVERR);
     } else if (errcode == RECOVERR) {
        return(RECOVERR);
     } else if (errcode == SNAPSHOT_TOO_OLD) {
        return(RECOVERR);
```

```
    } else {
       return ERR_DB_ERROR;
    }
  }

  return (ERR_DB_SUCCESS);

}




void tkvcpdone (payctx *ppctx)
{
   payctx pctx = *ppctx;

   if(NULL != pctx.curpi)
     OCIHandleFree((dvoid *)pctx.curpi,OCI_HTYPE_STMT);
   if(NULL != pctx.curp0)
     OCIHandleFree((dvoid *)pctx.curp0,OCI_HTYPE_STMT);
   if(NULL != pctx.curp1)
     OCIHandleFree((dvoid *)pctx.curp1,OCI_HTYPE_STMT);

}



/*
------------------------------------------------------------------------
-----------
Orderstatus transaction
*/


#define SQL_ORD_CUR0 "SELECT /*+ no_index(ICUST1) index (cust
icust2) */ rowid FROM cust \
                WHERE c_d_id = :d_id AND c_w_id = :w_id AND c_last
= :c_last \
                ORDER BY c_w_id, c_d_id, c_last, c_first"


#define SQL_ORD_CUR1 "SELECT c_id, c_balance, c_first, c_middle,
c_last, \
                o_id, o_entry_d, o_carrier_id, o_ol_cnt \
                FROM cust, ordr \
                WHERE cust.rowid = :cust_rowid \
                AND   o_d_id = c_d_id AND o_w_id = c_w_id AND
o_c_id = c_id \
                ORDER BY o_w_id, o_d_id, o_c_id, o_id DESC"



#define SQL_ORD_CUR2 "SELECT c_balance, c_first, c_middle, c_last,
\
                o_id, o_entry_d, o_carrier_id, o_ol_cnt, c_id \
                FROM cust, ordr \
                WHERE c_id = :c_id AND c_d_id = :d_id AND c_w_id =
:w_id \
                AND o_d_id = c_d_id AND o_w_id = c_w_id AND o_c_id
= c_id \
                ORDER BY o_c_id, o_d_id, o_w_id, o_id DESC"



#define SQL_ORD_CUR3 "SELECT
ol_i_id,ol_supply_w_id,ol_quantity,ol_amount, \
                ol_delivery_d\
                FROM ordl \
                WHERE ol_d_id = :d_id AND ol_w_id = :w_id AND
ol_o_id = :o_id"


#define SQL_ORD_CUR4 "SELECT count (c_last) FROM cust \
                WHERE c_d_id = :d_id AND c_w_id = :w_id AND c_last
= :c_last "



sb4 rid_data(dvoid *ctxp, OCIDefine *dp, ub4 iter, dvoid **bufpp,
ub4 **alenp,
          ub1 *piecep, dvoid **indpp, ub2 **rcodepp)
{
ub4 i;

ordctx *octx = &(((OraContext *)ctxp)->octx);
defctx *cbctx = &(((OraContext *)ctxp)->cbctx);

if (cbctx->reexec)  /* if this is the second execute - use entry 0
*/
{
  i=0;
  cbctx->count--;   /* count down */
}
else
  i=iter;

*bufpp = octx->c_rowid_ptr[i];
*indpp = &octx->c_rowid_ind[i] ;
*alenp = &octx->c_rowid_len[i] ;
*rcodepp = &octx->c_rowid_rcode[i] ;
*piecep = OCI_ONE_PIECE;

return (OCI_CONTINUE);
}

tkvcoinit (OrderStatusData *pOrd,
             OraContext *p)
{

  int i;
  text stmbuf[8192];
  ordtemp *otemp = &(p->tempvars.ord);
  ordctx *octx = &(p->octx);
```

```
  memset(octx,(char)0,sizeof(ordctx));
  octx->cs = 1;
  octx->norow = 0;
  octx->somerows = 10;
  octx->curo0 = NULL;
  octx->curo1 = NULL;
  octx->curo2 = NULL;
  octx->curo3 = NULL;
  octx->curo4 = NULL;


/* get the rowid handles */
  for(i=0;i<100;i++) {
    OCIERROR(p, OCIDescriptorAlloc(p->tpcenv,(dvoid**)&octx->c_rowid_ptr[i],

OCI_DTYPE_ROWID,0,(dvoid**)0));
  }



   OCIERROR(p,OCIHandleAlloc(p->tpcenv,(dvoid**)&octx->curo0,OCI_HTYPE_STMT,
                          0,(dvoid**)0));
   OCIERROR(p,OCIHandleAlloc(p->tpcenv,(dvoid**)&octx->curo1,OCI_HTYPE_STMT,
                                    0,(dvoid**)0));
   OCIERROR(p,OCIHandleAlloc(p->tpcenv,(dvoid**)&octx->curo2,OCI_HTYPE_STMT,
                                    0,(dvoid**)0));
   OCIERROR(p,OCIHandleAlloc(p->tpcenv,(dvoid**)&octx->curo3,OCI_HTYPE_STMT,
                                    0,(dvoid**)0));
   OCIERROR(p,OCIHandleAlloc(p->tpcenv,(dvoid**)&octx->curo4,OCI_HTYPE_STMT,
                                    0,(dvoid**)0));


/*  c_id = 0, use find customer by lastname. Get an array or rowid's back*/
   sprintf((char *) stmbuf, SQL_ORD_CUR0);
   OCIERROR(p,OCIStmtPrepare(octx->curo0,p->errhp,stmbuf,
                                    strlen((char *)stmbuf),
                                    OCI_NTV_SYNTAX,OCI_DEFAULT));
   OCIERROR(p,OCIAttrSet(octx->curo0,OCI_HTYPE_STMT,(dvoid*)&octx->norow,0,
                                OCI_ATTR_PREFETCH_ROWS,p->errhp));


/* get order/customer info back based on rowid */
   sprintf((char *) stmbuf, SQL_ORD_CUR1);
   OCIERROR(p,OCIStmtPrepare(octx->curo1,p->errhp,stmbuf,
                                    strlen((char *)stmbuf),
                                    OCI_NTV_SYNTAX,OCI_DEFAULT));
   OCIERROR(p,OCIAttrSet(octx->curo1,OCI_HTYPE_STMT,(dvoid*)&octx->norow,0,
                                OCI_ATTR_PREFETCH_ROWS,p->errhp));


/*  c_id != 0, use id to find customer  */
   sprintf((char *) stmbuf, SQL_ORD_CUR2);
   OCIERROR(p,OCIStmtPrepare(octx->curo2,p->errhp,stmbuf,
                                    strlen((char *)stmbuf),
                                    OCI_NTV_SYNTAX,OCI_DEFAULT));
   OCIERROR(p,OCIAttrSet(octx->curo2,OCI_HTYPE_STMT,(dvoid*)&octx->norow,0,
                                OCI_ATTR_PREFETCH_ROWS,p->errhp));


   sprintf((char *) stmbuf, SQL_ORD_CUR3);
   OCIERROR(p,OCIStmtPrepare(octx->curo3,p->errhp,stmbuf,
                                    strlen((char *)stmbuf),
                                    OCI_NTV_SYNTAX,OCI_DEFAULT));
   OCIERROR(p,OCIAttrSet(octx->curo3,OCI_HTYPE_STMT,(dvoid*)&octx->norow,0,
                                OCI_ATTR_PREFETCH_ROWS,p->errhp));


   sprintf((char *) stmbuf, SQL_ORD_CUR4);
   OCIERROR(p,OCIStmtPrepare(octx->curo4,p->errhp,stmbuf,
                                    strlen((char *)stmbuf),
                                    OCI_NTV_SYNTAX,OCI_DEFAULT));
   OCIERROR(p,OCIAttrSet(octx->curo4,OCI_HTYPE_STMT,(dvoid*)&octx->norow,0,
                                OCI_ATTR_PREFETCH_ROWS,p->errhp));


   for (i = 0; i < NITEMS; i++) {
      octx->ol_supply_w_id_ind[i] = TRUE;
      octx->ol_i_id_ind[i] = TRUE;
      octx->ol_quantity_ind[i] = TRUE;
      octx->ol_amount_ind[i] = TRUE;
      octx->ol_delivery_d_ind[i] = TRUE;

      octx->ol_supply_w_id_len[i] = sizeof(int);
      octx->ol_i_id_len[i] = sizeof(int);
      octx->ol_quantity_len[i] = sizeof(int);
      octx->ol_amount_len[i] = sizeof(int);
      octx->ol_delivery_d_len[i] = sizeof(OCIDate);
      /* octx->ol_delivery_d_len[i] = sizeof(pOrd->s_ol->ol_delivery_d); */
   }
   octx->ol_supply_w_id_csize = NITEMS;
   octx->ol_i_id_csize = NITEMS;
   octx->ol_quantity_csize = NITEMS;
   octx->ol_amount_csize = NITEMS;
   octx->ol_delivery_d_csize = NITEMS;
   octx->ol_w_id_csize = NITEMS;
   octx->ol_o_id_csize = NITEMS;
   octx->ol_d_id_csize = NITEMS;
   octx->ol_w_id_ind = TRUE;
   octx->ol_d_id_ind = TRUE;
   octx->ol_o_id_ind = TRUE;
   octx->ol_w_id_len = sizeof(int);
```

```
   octx->ol_d_id_len = sizeof(int);

   octx->ol_o_id_len = sizeof(int);


   /* bind variables */


   /* c_id (customer id) is not known */

   /* cursor 0 */

   OCIBND(octx->curo0,octx->w_id_bp0,p,":w_id",ADR(pOrd-
>w_id),SIZ(int),

            SQLT_INT);

   OCIBND(octx->curo0,octx->d_id_bp0,p,":d_id",ADR(pOrd-
>d_id),SIZ(int),

            SQLT_INT);


   OCIBND(octx->curo0,octx->c_last_bp,p,":c_last",pOrd->c_last,

            SIZ(pOrd->c_last),SQLT_STR);


       ocierror(__FILE__,__LINE__,p, \

       OCIDefineByPos(octx->curo0,&octx->c_rowid_dp,p->errhp,1, \

          octx->c_rowid_ptr, sizeof(OCIRowid*),SQLT_RDD,octx-
>c_rowid_ind,\

          NULL,NULL, OCI_DYNAMIC_FETCH));

       ocierror(__FILE__,__LINE__,p, OCIDefineDynamic(octx-
>c_rowid_dp,\

          p->errhp,\

          p,rid_data));


/** sth   OCIDFNDYN(  octx->curo0,

                    octx->c_rowid_dp,

                    p,

                    1,

                    octx->c_rowid_ptr,

                    sizeof(OCIRowid*),

                    SQLT_RDD,

                    octx->c_rowid_ind,

                    p,

                    rid_data);

**/




   OCIBND(octx->curo1,octx->c_rowid_bp,p,":cust_rowid",

          &octx->middle_cust,sizeof(octx->middle_cust),SQLT_RDD);


   OCIDEF(octx->curo1,octx->c_id_dp,p->errhp,1,ADR(pOrd-
>c_id),SIZ(int),

            SQLT_INT);

   OCIDEF(octx->curo1,octx->c_balance_dp1,p->errhp,2,ADR(pOrd-
>c_balance),

            SIZ(double),SQLT_FLT);

   OCIDEF(octx->curo1,octx->c_first_dp1,p->errhp,3,pOrd->c_first,

            SIZ(pOrd->c_first)-1,

            SQLT_CHR);

   OCIDEF(octx->curo1,octx->c_middle_dp1,p->errhp,4,pOrd->c_middle,

            SIZ(pOrd->c_middle)-1,SQLT_AFC);

   OCIDEF(octx->curo1,octx->c_last_dp1,p->errhp,5,pOrd->c_last,

            SIZ(pOrd->c_last)-1, SQLT_CHR);


   OCIDEF(octx->curo1,octx->o_id_dp1,p->errhp,6,ADR(pOrd-
>o_id),SIZ(int),

            SQLT_INT);

   OCIDEF(octx->curo1,octx->o_entry_d_dp1,p->errhp,7,

            &otemp->entry_date,SIZ(otemp->entry_date),SQLT_ODT);

   OCIDEF(octx->curo1,octx->o_cr_id_dp1,p->errhp,8,ADR(pOrd-
>o_carrier_id),

            SIZ(int),SQLT_INT);

   OCIDEF(octx->curo1,octx->o_ol_cnt_dp1,p->errhp,9,ADR(pOrd-
>o_ol_cnt),

            SIZ(int),SQLT_INT);




/* Bind for cursor 2 , no-zero customer id */

   OCIBND(octx->curo2,octx->w_id_bp2,p,":w_id",ADR(pOrd-
>w_id),SIZ(int),

            SQLT_INT);

   OCIBND(octx->curo2,octx->d_id_bp2,p,":d_id",ADR(pOrd-
>d_id),SIZ(int),

            SQLT_INT);

   OCIBND(octx->curo2,octx->c_id_bp,p,":c_id",ADR(pOrd-
>c_id),SIZ(int),

            SQLT_INT);

   OCIDEF(octx->curo2,octx->c_balance_dp2,p->errhp,1,ADR(pOrd-
>c_balance),

           SIZ(double),SQLT_FLT);

   OCIDEF(octx->curo2,octx->c_first_dp2,p->errhp,2,pOrd->c_first,

            SIZ(pOrd->c_first)-1,

            SQLT_CHR);

   OCIDEF(octx->curo2,octx->c_middle_dp2,p->errhp,3,pOrd->c_middle,

           SIZ(pOrd->c_middle)-1,SQLT_AFC);

   OCIDEF(octx->curo2,octx->c_last_dp,p->errhp,4,pOrd->c_last,

            SIZ(pOrd->c_last)-1,

            SQLT_CHR);

   OCIDEF(octx->curo2,octx->o_id_dp2,p->errhp,5,ADR(pOrd-
>o_id),SIZ(int),

            SQLT_INT);

   OCIDEF(octx->curo2,octx->o_entry_d_dp2,p->errhp,6,

           &otemp->entry_date,SIZ(otemp->entry_date),SQLT_ODT);

   OCIDEF(octx->curo2, octx->o_cr_id_dp2,p->errhp,7,ADR(pOrd-
>o_carrier_id),

            SIZ(int), SQLT_INT);

   OCIDEF(octx->curo2,octx->o_ol_cnt_dp2,p->errhp,8,ADR(pOrd-
>o_ol_cnt),

            SIZ(int),SQLT_INT);

   OCIDEF(octx->curo2,octx->c_id_dp1,p->errhp,9,ADR(pOrd-
>c_id),SIZ(int),

            SQLT_INT);


/* Bind for last cursor - 3 */
```

```
   OCIBND(octx->curo3,octx->w_id_bp3,p,":w_id",ADR(pOrd-
>w_id),SIZ(int),
            SQLT_INT);
   OCIBND(octx->curo3,octx->d_id_bp3,p,":d_id",ADR(pOrd-
>d_id),SIZ(int),
            SQLT_INT);
   OCIBND(octx->curo3,octx->o_id_bp,p,":o_id",ADR(pOrd-
>o_id),SIZ(int),
            SQLT_INT);


   OCIDFNRA(octx->curo3, octx->ol_i_id_dp, p->errhp, 1, otemp-
>loc_ol_i_id,
              SIZ(int), SQLT_INT,
              octx->ol_i_id_ind,octx->ol_i_id_len, octx-
>ol_i_id_rcode);
   OCIDFNRA(octx->curo3,octx->ol_supply_w_id_dp,p->errhp,2,
              otemp->loc_ol_supply_w_id,
            SIZ(int),SQLT_INT, octx->ol_supply_w_id_ind,
            octx->ol_supply_w_id_len, octx->ol_supply_w_id_rcode);
   OCIDFNRA(octx->curo3, octx->ol_quantity_dp,p->errhp,3,
              otemp->loc_ol_quantity, SIZ(int),
            SQLT_INT, octx->ol_quantity_ind,octx->ol_quantity_len,
              octx->ol_quantity_rcode);
   OCIDFNRA(octx->curo3,octx->ol_amount_dp,p->errhp,4,otemp-
>loc_ol_amount,
              SIZ(int),
            SQLT_INT,octx->ol_amount_ind, octx->ol_amount_len,
            octx->ol_amount_rcode);
   OCIDFNRA(octx->curo3,octx->ol_d_base_dp,p->errhp,5,
              otemp->loc_ol_delivery_date,SIZ(OCIDate), SQLT_ODT,
            octx->ol_delivery_d_ind,octx->ol_delivery_d_len,
              octx->ol_delivery_d_rcode);


   OCIBND(octx->curo4, octx->w_id_bp4, p, ":w_id", ADR(pOrd->w_id),
SIZ(int),
                    SQLT_INT);
   OCIBND(octx->curo4,octx->d_id_bp4,p,":d_id",ADR(pOrd-
>d_id),SIZ(int),
              SQLT_INT);
   OCIBND(octx->curo4,octx->c_last_bp4,p,":c_last",ADR(pOrd-
>c_last),
              SIZ(pOrd->c_last), SQLT_STR);
   OCIDEF(octx->curo4,
                    octx->c_count_dp,
                    p,
                    1,
                    ADR(octx->rcount),
                    SIZ(int),
              SQLT_INT);


  return (ERR_DB_SUCCESS);


 }
```

```
   tkvco (OrderStatusData *pOrd, OraContext *p)
   {
     ordctx *octx = &(p->octx);
     defctx *cbctx = &(p->cbctx);
     ordtemp *otemp = &(p->tempvars.ord);
     int i;
     int execstatus;
     int errcode;
     int entry_date_str_len = sizeof (otemp->entry_date_str);



     int rcount;


     for (i = 0; i < NITEMS; i++) {
         octx->ol_supply_w_id_ind[i] = TRUE;
         octx->ol_i_id_ind[i] = TRUE;
         octx->ol_quantity_ind[i] = TRUE;
         octx->ol_amount_ind[i] = TRUE;
         octx->ol_delivery_d_ind[i] = TRUE;
         octx->ol_supply_w_id_len[i] = sizeof(int);
         octx->ol_i_id_len[i] = sizeof(int);
         octx->ol_quantity_len[i] = sizeof(int);
         octx->ol_amount_len[i] = sizeof(int);
         octx->ol_delivery_d_len[i] = sizeof(otemp-
>loc_ol_delivery_date[i]);
      }
      octx->ol_supply_w_id_csize = NITEMS;
      octx->ol_i_id_csize = NITEMS;
      octx->ol_quantity_csize = NITEMS;
      octx->ol_amount_csize = NITEMS;
      octx->ol_delivery_d_csize = NITEMS;


      /* initialize bound output variables to null for oracle v8 */
      /*   octx->o_ol_cnt_ind = NA;*/
      /*   pOrd->o_ol_cnt = 0;*/
      if(pOrd->byname)
        {
        cbctx->reexec = FALSE;
        execstatus=OCIStmtExecute(p->tpcsvc,octx->curo0,p->errhp,
                                        100,0,0,0,OCI_DEFAULT);
        if ((execstatus != OCI_NO_DATA) && (execstatus !=
OCI_SUCCESS))
                /* will get OCI_NO_DATA if <100 found */
        {
            errcode = OCIERROR(p,execstatus);
            if ((errcode == NOT_SERIALIZABLE) || (errcode == RECOVERR)
||
               (errcode == SNAPSHOT_TOO_OLD))
            {
                OCITransCommit(p->tpcsvc,p->errhp,OCI_DEFAULT);
                  return RECOVERR;
```

```
        } else {
          return ERR_DB_ERROR;
        }
    }
    if (execstatus == OCI_NO_DATA)  /* there are no more rows */
    {
     /* get rowcount, find middle one */
    OCIAttrGet(octx->curo0,OCI_HTYPE_STMT,&rcount,NULL,OCI_ATTR_ROW_COUNT,
                    p->errhp);
/*
    if (rcount <1)
    {
    TPCCErr("No Data Found");
    return ERR_DB_ERROR;
    }
*/
    octx->cust_idx=(rcount-1)/2 ;
    }
    else
    {
    /* count  the number of rows */
    execstatus = OCIStmtExecute(p->tpcsvc,octx->curo4,p->errhp,
                                        1,0,0,0,OCI_DEFAULT);
    if ((execstatus != OCI_NO_DATA) && (execstatus != OCI_SUCCESS))
    {
     errcode = OCIERROR(p,execstatus);
     if ((errcode == NOT_SERIALIZABLE) || (errcode == RECOVERR)
        || (errcode == SNAPSHOT_TOO_OLD))
      {
        OCITransCommit(p->tpcsvc,p->errhp,OCI_DEFAULT);
          return RECOVERR;
      } else {
        return ERR_DB_ERROR;
      }
    }
    if (octx->rcount+1 < 200)
        octx->cust_idx=(octx->rcount-1)/2;
    else
    {
    cbctx->reexec = TRUE;
    cbctx->count = (octx->rcount+1)/2;
    execstatus = OCIStmtExecute(p->tpcsvc,octx->curo0,p->errhp,
                                        cbctx->count,0,0,0,OCI_DEFAULT);
    /* will get OCI_NO_DATA if <100 found */
    if (cbctx->count>0)
    {
    TPCCErr("Did not get all rows.");
    return ERR_DB_ERROR;
    }
    if ((execstatus != OCI_NO_DATA) && (execstatus != OCI_SUCCESS))
    {
     errcode=OCIERROR(p,execstatus);
     if ((errcode == NOT_SERIALIZABLE) || (errcode == RECOVERR)
          || (errcode == SNAPSHOT_TOO_OLD))
     {
        OCITransCommit(p->tpcsvc,p->errhp,OCI_DEFAULT);
          return RECOVERR;
      } else {
        return ERR_DB_ERROR;
      }
    }
    octx->cust_idx=0;
   }
  }

  octx->middle_cust=octx->c_rowid_ptr[octx->cust_idx];
  execstatus = OCIStmtExecute(p->tpcsvc,octx->curo1,p->errhp,
                                        1,0,0,0,OCI_DEFAULT);
  if (execstatus != OCI_SUCCESS)
   {
    errcode = OCIERROR(p,execstatus);
    OCITransCommit(p->tpcsvc,p->errhp,OCI_DEFAULT);
    if ((errcode == NOT_SERIALIZABLE) || (errcode == RECOVERR) ||
           (errcode == SNAPSHOT_TOO_OLD))
    {
     return RECOVERR;
    } else {
     return ERR_DB_ERROR;
    }
   }
}
else
{
/*     execstatus = OCIStmtExecute(p->tpcsvc,octx->curo2,p->errhp,
                                        1,0,0,0,OCI_DEFAULT); */
    execstatus = OCIStmtExecute(p->tpcsvc,octx->curo2,p->errhp,
                                        1,0,0,0,OCI_DEFAULT);
    if (execstatus != OCI_SUCCESS)
     {
        errcode = OCIERROR(p,execstatus);
        OCITransCommit(p->tpcsvc,p->errhp,OCI_DEFAULT);
        if ((errcode == NOT_SERIALIZABLE) || (errcode == RECOVERR)
             || (errcode == SNAPSHOT_TOO_OLD))
        {
            return RECOVERR;
        } else {
          return ERR_DB_ERROR;
        }
     }
```

```
   }

   octx->ol_w_id_ind = TRUE;

   octx->ol_d_id_ind = TRUE;

   octx->ol_o_id_ind = TRUE;

   octx->ol_w_id_len = sizeof(int);

   octx->ol_d_id_len = sizeof(int);

   octx->ol_o_id_len = sizeof(int);


   execstatus =   OCIStmtExecute(p->tpcsvc,octx->curo3,p->errhp,pOrd->o_ol_cnt,
                                       0,0,0, OCI_DEFAULT | OCI_COMMIT_ON_SUCCESS);
   if (execstatus != OCI_SUCCESS)
     {
         errcode = OCIERROR(p,execstatus);
         OCITransCommit(p->tpcsvc,p->errhp,OCI_DEFAULT);
         if ((errcode == NOT_SERIALIZABLE) || (errcode == RECOVERR)
              || (errcode == SNAPSHOT_TOO_OLD))
         {
             return RECOVERR;
         } else {
           return ERR_DB_ERROR;
         }
     }

/*
#ifdef NOTMORE

   OCIERROR(errhp,
      OCITransCommit(tpcsvc,errhp,OCI_DEFAULT));
#endif
*/


   /* clean up and convert the delivery dates */


  for (i = 0; i < pOrd->o_ol_cnt; i++) {
      if (octx->ol_delivery_d_ind[i] == -1) /* null date in field */
          strncpy(otemp->ol_delivery_date_str[i],"01-01-1811",10);
      else
/*  cvtdmy(otemp->loc_ol_delivery_date[i], otemp->ol_delivery_date_str[i]); */
      {
        octx->ol_delivery_d_len[i]=sizeof(otemp->ol_delivery_date_str[i]);
        OCIERROR(p, OCIDateToText(p->errhp,&otemp->loc_ol_delivery_date[i],
           (text*)"dd-mm-yyyy",strlen("dd-mm-yyyy"),(text*)0,0,
            &octx->ol_delivery_d_len[i],&otemp->ol_delivery_date_str[i]));
      }


   }

  /* convert the order entry date */

  /* cvtdmyhms(otemp->entry_date, otemp->entry_date_str);  */

    OCIERROR(p, OCIDateToText(p->errhp,&otemp->entry_date,
          (text*)"dd-mm-yyyy HH24:MI:SS",strlen("dd-mm-yyyy HH:MI:SS"),(text*)0,0,
           &entry_date_str_len,&otemp->entry_date_str));


  return (ERR_DB_SUCCESS);

  }



void tkvcodone (ordctx *poctx)
{
  ordctx octx = *poctx;


  if(NULL != octx.curo0)
    OCIHandleFree((dvoid *)octx.curo0,OCI_HTYPE_STMT);
  if(NULL != octx.curo1)
    OCIHandleFree((dvoid *)octx.curo1,OCI_HTYPE_STMT);
  if(NULL != octx.curo2)
    OCIHandleFree((dvoid *)octx.curo2,OCI_HTYPE_STMT);
  if(NULL != octx.curo3)
    OCIHandleFree((dvoid *)octx.curo3,OCI_HTYPE_STMT);
  if(NULL != octx.curo4)
    OCIHandleFree((dvoid *)octx.curo4,OCI_HTYPE_STMT);


}



/**** delivery transaction  */

#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)
#define SQLTXT0 "SELECT substr(value,1,5) FROM v$parameter \
   WHERE name = 'instance_number'"
#endif




#define SQLTXT1 "DELETE FROM nord WHERE no_d_id = :d_id \
        AND no_w_id=:w_id and rownum <=1 \
          RETURNING no_o_id into :o_id "


#define SQLTXT3 "UPDATE ordr SET o_carrier_id = :carrier_id \
   WHERE o_id=:o_id and o_d_id=:d_id and o_w_id=:w_id \
   returning o_c_id into :o_c_id"


#define SQLTXT4 "UPDATE /*+ buffer */ ordl SET ol_delivery_d = :cr_date \
   WHERE ol_w_id=:w_id and ol_d_id=:d_id and ol_o_id=:o_id \
   RETURNING ol_amount into :ol_amount "
```

```
#define SQLTXT6 "UPDATE cust SET c_balance = c_balance + :amt, \
   c_delivery_cnt = c_delivery_cnt + 1 WHERE c_w_id = :w_id AND \
   c_d_id = :d_id AND c_id = :c_id"



sb4 no_data(dvoid *ctxp, OCIBind *bp, ub4 iter, ub4 index,
               dvoid **bufpp, ub4 *alenp, ub1 *piecep,
               dvoid **indpp)
{
  *bufpp = (dvoid*)0;
  *alenp =0;
  *indpp = (dvoid*)0;
  *piecep =OCI_ONE_PIECE;
  return (OCI_CONTINUE);
}



sb4 TPC_oid_data(dvoid *ctxp, OCIBind *bp, ub4 iter, ub4 index,
               dvoid **bufpp, ub4 **alenp, ub1 *piecep,
               dvoid **indpp, ub2 **rcodepp)
{

  delctx *dctx;
  dctx=(delctx*)ctxp;

  *bufpp = &dctx->del_o_id[iter];
  *indpp= &dctx->del_o_id_ind[iter];
  dctx->del_o_id_len[iter]=sizeof(dctx->del_o_id[0]);
  *alenp= &dctx->del_o_id_len[iter];
  *rcodepp = &dctx->del_o_id_rcode[iter];
  *piecep =OCI_ONE_PIECE;
  return (OCI_CONTINUE);
}

sb4 cid_data(dvoid *ctxp, OCIBind *bp, ub4 iter, ub4 index,
               dvoid **bufpp, ub4 **alenp, ub1 *piecep,
               dvoid **indpp, ub2 **rcodepp)
{

  delctx *dctx;
  dctx=(delctx*)ctxp;

  *bufpp = &dctx->c_id[iter];
  *indpp= &dctx->c_id_ind[iter];
  dctx->c_id_len[iter]=sizeof(dctx->c_id[0]);
  *alenp= &dctx->c_id_len[iter];
  *rcodepp = &dctx->c_id_rcode[iter];
  *piecep =OCI_ONE_PIECE;
  return (OCI_CONTINUE);
}


sb4 amt_data(dvoid *ctxp, OCIBind *bp, ub4 iter, ub4 index,
               dvoid **bufpp, ub4 **alenp, ub1 *piecep,
               dvoid **indpp, ub2 **rcodepp)
{



  amtctx *actx;
  actx =(amtctx*)ctxp;
  actx->ol_cnt[iter]=actx->ol_cnt[iter]+1;
  *bufpp = &actx->ol_amt[iter][index];
  *indpp= &actx->ol_amt_ind[iter][index];
  actx->ol_amt_len[iter][index]=sizeof(actx->ol_amt[0][0]);
  *alenp= &actx->ol_amt_len[iter][index];
  *rcodepp = &actx->ol_amt_rcode[iter][index];
  *piecep =OCI_ONE_PIECE;
  return (OCI_CONTINUE);
}



void shiftdata(from,dctx)
int from;
delctx *dctx;
{
   int i;
   for (i=from;i<NDISTS-1; i++)
   {
     dctx->del_o_id_ind[i] = dctx->del_o_id_ind[i+1];
     dctx->del_o_id[i] = dctx->del_o_id[i+1];
     dctx->w_id[i] = dctx->w_id[i+1];
     dctx->d_id[i] = dctx->d_id[i+1];
     dctx->carrier_id[i] = dctx->carrier_id[i+1];
   }
}    /* end shiftdata */



tkvcdinit (DeliveryData *pDel,
             OraContext *p)
{
   delctx *dctx = &(p->dctx);
   amtctx *actx = &(p->actx);
   text stmbuf[8192];
   memset(dctx,(char)0,sizeof(delctx));
   memset(actx,(char)0,sizeof(amtctx));
```

```
   dctx->norow = 0;

   dctx->curd1 = NULL;

   dctx->curd2 = NULL;

   dctx->curd3 = NULL;

   dctx->curd4 = NULL;

   dctx->curd5 = NULL;

   dctx->curd6 = NULL;



#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)

   OCIHandleAlloc(tpcenv, (dvoid **)(&dctx->curd0), OCI_HTYPE_STMT,
0, (dvoid**)0);

   sprintf ((char *) stmbuf, SQLTXT0);

   OCIStmtPrepare(dctx->curd0, p->errhp, stmbuf, strlen((char
*)stmbuf),OCI_NTV_SYNTAX, OCI_DEFAULT);


   OCIDFNRA(dctx->curd0, dctx->inum_dp,p->errhp,1,dctx-
>inum,SIZ(dctx->inum),SQLT_STR,

          dctx->inum_ind,dctx->inum_len,dctx->inum_rcode);

#endif



   /* open first cursor */


   OCIHandleAlloc(p->tpcenv, (dvoid **)(&dctx->curd1),
OCI_HTYPE_STMT,

                       0, (dvoid**)0);

   sprintf ((char *) stmbuf, SQLTXT1);

   OCIStmtPrepare(dctx->curd1, p->errhp, stmbuf, strlen((char
*)stmbuf),

                       OCI_NTV_SYNTAX, OCI_DEFAULT);







   /* bind variables */


   OCIBND(dctx->curd1, dctx->w_id_bp,p,":w_id",dctx->w_id,SIZ(int),

            SQLT_INT);

   OCIBNDRA(dctx->curd1, dctx->d_id_bp,p,":d_id",dctx-
>d_id,SIZ(int),

            SQLT_INT,NULL,NULL,NULL);

   OCIBNDRAD(dctx->curd1, dctx->del_o_id_bp,p,":o_id",SIZ(int),

            SQLT_INT,NULL,dctx,no_data,TPC_oid_data);


   /* open third cursor */


   OCIHandleAlloc(p->tpcenv, (dvoid **)(&dctx->curd3),
OCI_HTYPE_STMT, 0,

                       (dvoid**)0);

   sprintf ((char *) stmbuf, SQLTXT3);

   OCIStmtPrepare(dctx->curd3, p->errhp, stmbuf, strlen((char
*)stmbuf),

                       OCI_NTV_SYNTAX, OCI_DEFAULT);
```

```
   /* bind variables */


   OCIBNDRA(dctx->curd3, dctx->carrier_id_bp,p,":carrier_id",dctx-
>carrier_id,

            SIZ(int),SQLT_INT,dctx->carrier_id_ind,

            dctx->carrier_id_len,dctx->carrier_id_rcode);

   OCIBNDRA(dctx->curd3, dctx->w_id_bp3,p,":w_id",dctx->w_id,

               SIZ(int),SQLT_INT,NULL,NULL,NULL);

   OCIBNDRA(dctx->curd3, dctx->d_id_bp3,p,":d_id",dctx->d_id,

               SIZ(int),SQLT_INT,NULL,NULL,NULL);

   OCIBNDRA(dctx->curd3, dctx->del_o_id_bp3,p,":o_id",dctx-
>del_o_id,

               SIZ(int),SQLT_INT,NULL,NULL,NULL);


   OCIBNDRAD(dctx->curd3, dctx->c_id_bp3,p,":o_c_id",SIZ(int),

            SQLT_INT,NULL,dctx,no_data,cid_data);




   /* open fourth cursor */


   OCIHandleAlloc(p->tpcenv, (dvoid **)(&dctx->curd4),
OCI_HTYPE_STMT, 0,

                       (dvoid**)0);

   sprintf ((char *) stmbuf, SQLTXT4);

   OCIStmtPrepare(dctx->curd4, p->errhp, stmbuf, strlen((char
*)stmbuf),

                       OCI_NTV_SYNTAX, OCI_DEFAULT);


   /* bind variables */


   OCIBND(dctx->curd4, dctx->w_id_bp4,p,":w_id",dctx-
>w_id,SIZ(dctx->w_id[0]),

               SQLT_INT);

   OCIBND(dctx->curd4, dctx->d_id_bp4,p,":d_id",dctx-
>d_id,SIZ(dctx->d_id[0]),

               SQLT_INT);

   OCIBND(dctx->curd4, dctx->o_id_bp,p,":o_id",dctx-
>del_o_id,SIZ(int),

               SQLT_INT);

   OCIBND(dctx->curd4, dctx->cr_date_bp,p,":cr_date",dctx-
>del_date,

               SIZ(OCIDate), SQLT_ODT);


   OCIBNDRAD(dctx->curd4, dctx->olamt_bp,p,":ol_amount",SIZ(int),

            SQLT_INT,NULL,actx,no_data,amt_data);




   /* open sixth cursor */


   OCIHandleAlloc(p->tpcenv, (dvoid **)(&dctx->curd6),
OCI_HTYPE_STMT, 0,

                       (dvoid**)0);

   sprintf ((char *) stmbuf, SQLTXT6);
```

```
   OCIStmtPrepare(dctx->curd6, p->errhp, stmbuf, strlen((char
*)stmbuf),
                       OCI_NTV_SYNTAX, OCI_DEFAULT);

   /* bind variables */

   OCIBND(dctx->curd6, dctx->amt_bp,p,":amt",dctx->amt,SIZ(int),
               SQLT_INT);
   OCIBND(dctx->curd6, dctx->w_id_bp6,p,":w_id",dctx-
>w_id,SIZ(int),
               SQLT_INT);
   OCIBND(dctx->curd6, dctx->d_id_bp6,p,":d_id",dctx-
>d_id,SIZ(int),
               SQLT_INT);
   OCIBND(dctx->curd6, dctx->c_id_bp,p,":c_id",dctx->c_id,SIZ(int),
               SQLT_INT);

   return (ERR_DB_SUCCESS);

}

tkvcd (DeliveryData *pDel, OraContext *p)
{
  delctx *dctx = &(p->dctx);
  amtctx *actx = &(p->actx);
  deltemp *dtemp = &(p->tempvars.del);
  int i, j;
  int rpc,rcount,count;
  int invalid;
  unsigned char localcr_date[7];
  OCIError *datecvterrhp = p->datecvterrhp;
  int execstatus;
  int errcode;
  int proc_no = 0;

  invalid = 0;

  vgetdate(localcr_date);
  cvtdmyhms(localcr_date,dtemp->cvtcr_date);
  OCIDateFromText(datecvterrhp,dtemp->cvtcr_date,strlen(dtemp-
>cvtcr_date),"DD-MM-YYYY HH24:MI:SS",21,(text *) 0, 0,&dtemp-
>cr_date);

#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)
   int hasno;
   int reread;
   char sdate[30];
   OCIStmtExecute(p->tpcsvc,dctx->curd0,p-
>errhp,1,0,0,0,OCI_DEFAULT);
   sysdate(sdate);
   printf ("Delivery started at %s on node %s\n",sdate,dctx->inum);
#endif

#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)
  reread = 1;
#endif

#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)
iso:
#endif

   /* initialization for array operations */

   for (i = 0; i < NDISTS; i++) {
      dctx->del_o_id_ind[i] = TRUE;
      dctx->cons_ind[i] = TRUE;
      dctx->w_id_ind[i] = TRUE;
      dctx->d_id_ind[i] = TRUE;
      dctx->c_id_ind[i] = TRUE;
      dctx->del_date_ind[i] = TRUE;
      dctx->carrier_id_ind[i] = TRUE;
      dctx->amt_ind[i] = TRUE;
      dctx->no_rowid_ind[i] = TRUE;
      dctx->o_rowid_ind[i] = TRUE;

      dctx->del_o_id_len[i] = SIZ(dctx->del_o_id[0]);
      dctx->cons_len[i] = SIZ(dctx->cons[0]);
      dctx->w_id_len[i] = SIZ(dctx->w_id[0]);
      dctx->d_id_len[i] = SIZ(dctx->d_id[0]);
      dctx->c_id_len[i] = SIZ(dctx->c_id[0]);
      dctx->del_date_len[i] = DEL_DATE_LEN;
      dctx->carrier_id_len[i] = SIZ(dctx->carrier_id[0]);
      dctx->amt_len[i] = SIZ(dctx->amt[0]);
      dctx->no_rowid_len[i] = ROWIDLEN;
      dctx->o_rowid_len[i] = ROWIDLEN;
      dctx->o_rowid_ptr_len[i] = SIZ(dctx->o_rowid_ptr[0]);
      dctx->no_rowid_ptr_len[i] = SIZ(dctx->no_rowid_ptr[0]);

      dctx->w_id[i] = pDel->w_id;
      dctx->d_id[i] = i+1;
      dctx->carrier_id[i] = pDel->o_carrier_id;
      memcpy(&dctx->del_date[i],&dtemp->cr_date,sizeof(OCIDate));

      actx->ol_cnt[i]=0;
   }
```

```
   /* array select from new_order and orders tables */


   execstatus=OCIStmtExecute(p->tpcsvc,dctx->curd1,p-
>errhp,NDISTS,0,0,0,
                                    OCI_DEFAULT);
   if((execstatus != OCI_SUCCESS) && (execstatus != OCI_NO_DATA))
   {
     OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
     errcode = OCIERROR(p,execstatus);
     if(errcode == NOT_SERIALIZABLE)
     {
       return(RECOVERR);
     }
     else if (errcode == RECOVERR)
     {
       return(RECOVERR);
     }
     else if (errcode == SNAPSHOT_TOO_OLD)
     {
       return(RECOVERR);
     }
     else
     {
        return (ERR_DB_ERROR);
     }
   }



   /* mark districts with no new order */
   OCIAttrGet(dctx-
>curd1,OCI_HTYPE_STMT,&rcount,0,OCI_ATTR_ROW_COUNT,p->errhp);
   rpc = rcount;


   if (rcount != NDISTS)
   {
     int j=0;
     for (i=0;i<NDISTS;i++)
     {
      if (dctx->del_o_id_ind[j] == 0)   /* there is data here  */
        j++;
      else
        shiftdata(j,dctx);
     }
   }


#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)
  if (invalid)
  {
   sysdate(sdate);
   for (i=1;i<=NDISTS;i++)
   {
     hasno=0;
     for (j=0;j<rpc;j++)
     {
      if (dctx->d_id[j] == i)
      {
       hasno=1;
       break;
      }
     }
     if (!hasno)
       printf ("Delivery [dist %d] found no new order at
%s\n",i,sdate);
   }
   if (reread)
   {
     sleep (60);
     sysdate(sdate);
     printf ("Delivery wake up at %s\n",sdate);
     reread=0;
     goto iso;
   }
  }   /* end if (invalid) */
#endif



   execstatus=OCIStmtExecute(p->tpcsvc,dctx->curd3,p-
>errhp,rpc,0,0,0,
                                       OCI_DEFAULT);
   if(execstatus != OCI_SUCCESS)
   {
     OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
     errcode = OCIERROR(p,execstatus);
     if(errcode == NOT_SERIALIZABLE)
     {
       return(RECOVERR);
     }
     else if (errcode == RECOVERR)
     {
       return (RECOVERR);
     }
     else if (errcode == SNAPSHOT_TOO_OLD)
     {
       return (RECOVERR);
     }
     else
     {
        return (ERR_DB_ERROR);
     }
   }
```

```
   OCIAttrGet(dctx-
>curd3,OCI_HTYPE_STMT,&rcount,0,OCI_ATTR_ROW_COUNT,p->errhp);


   if (rcount != rpc)
   {
      TPCCErr( "Error in TPC-C server %d: %d rows selected, %d ords
updated\n",
               proc_no, rpc, rcount);
      OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
      return (ERR_DB_ERROR);
   }


   /* array update of order_line table */
   execstatus=OCIStmtExecute(p->tpcsvc,dctx->curd4,p-
>errhp,rpc,0,0,0,
                                    OCI_DEFAULT);
   if(execstatus != OCI_SUCCESS)
   {
     OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
     errcode = OCIERROR(p,execstatus);
     if(errcode == NOT_SERIALIZABLE)
     {
       return(RECOVERR);
     }
     else if (errcode == RECOVERR)
     {
       return(RECOVERR);
     }
     else if (errcode == SNAPSHOT_TOO_OLD)
     {
       return(RECOVERR);
     }
     else
     {
        return (ERR_DB_ERROR);
     }
   }


   OCIAttrGet(dctx-
>curd4,OCI_HTYPE_STMT,&rcount,NULL,OCI_ATTR_ROW_COUNT,p->errhp);
   /* add up amounts */
   count=0;
   for (i=0;i<rpc;i++)
   {
     dctx->amt[i]=0;
     for (j=0;j<actx->ol_cnt[i];j++)
       if (actx->ol_amt_rcode[i][j] == 0)
       {
         dctx->amt[i] = dctx->amt[i] + actx->ol_amt[i][j];
         count = count+1;
       }
   }
   if (rcount > rpc*NITEMS)
   {
      TPCCErr( "Error in TPC-C server %d: %d ordnrs updated, %d
ordl updated\n",
               proc_no, rpc, rcount);
   }



#if defined(ISO5) || defined(ISO6)
   printf 9"d_id:amount\n";
   for (i=0;i<rpc;i++)
     printf ("%d:%.2f ", dctx->d_id[i], (float)dctx->amt[i]/100);
   printf ("\n");
#endif



   /* array update of customer table */


#if defined(ISO5) || defined(ISO6)
   execstatus=OCIStmtExecute(p->tpcsvc,dctx->curd6,p-
>errhp,rpc,0,0,0,
                                    OCI_DEFAULT);
#else
   execstatus=OCIStmtExecute(p->tpcsvc,dctx->curd6,p-
>errhp,rpc,0,0,0,
                                    OCI_COMMIT_ON_SUCCESS |
OCI_DEFAULT);
#endif



   if(execstatus != OCI_SUCCESS)
   {
     OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
     errcode = OCIERROR(p,execstatus);
     if(errcode == NOT_SERIALIZABLE)
     {
       return (RECOVERR);
     }
     else if (errcode == RECOVERR)
     {
       return (RECOVERR);
     }
     else if (errcode == SNAPSHOT_TOO_OLD)
     {
       return (RECOVERR);
     }
     else
     {
        return (ERR_DB_ERROR);
     }
```

```
   }

   OCIAttrGet(dctx-
>curd6,OCI_HTYPE_STMT,&rcount,0,OCI_ATTR_ROW_COUNT,p->errhp);

   if (rcount != rpc) {
      TPCCErr ("Error in TPC-C server %d: %d rows selected, %d cust
updated\n",
               proc_no, rpc, rcount);
      OCITransRollback(p->tpcsvc, p->errhp, OCI_DEFAULT);
      return (ERR_DB_ERROR);
   }

#if defined(ISO5) || defined(ISO6)
   sysdate;

#ifdef ISO5
   printf ("Delivery sleep before commit at %s\n"sdate);
#else
   printf ("Delivery sleep before abort at %s\n"sdate);
#endif
   sleep (60);
   sysdate (sdate);
   printf ("Delivery wake up at %s\n",sdate);
#endif

#ifdef ISO6
   printf ("Delivery ISO6 is rolling back.\n";
   OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
#endif

#ifdef ISO5
   OCITransCommit(p->tpcsvc,p->errhp,OCI_DEFAULT);
#endif

#if defined(ISO5) || defined(ISO6)
   sysdate(sdate);
   printf ("Delivery completed at: %s\n",sdate);
#endif

   /* return o_id's in district id order */

   for (i = 0; i < NDISTS; i++)
      pDel->o_id[i] = 0;
   for (i = 0; i < rpc; i++)
      pDel->o_id[dctx->d_id[i] - 1] = dctx->del_o_id[i];

   return (ERR_DB_SUCCESS);
}

void tkvcddone (delctx *pdctx)
{
  delctx dctx = *pdctx;

#if defined(ISO) || defined(ISO5) || defined(ISO6) || defined(ISO8)
  OCIHandleFree((dvoid *)dctx->curd0,OCI_HTYPE_STMT);
#endif

  if(NULL != dctx.curd1)
    OCIHandleFree((dvoid *)dctx.curd1,OCI_HTYPE_STMT);
  if(NULL != dctx.curd2)
    OCIHandleFree((dvoid *)dctx.curd2,OCI_HTYPE_STMT);
  if(NULL != dctx.curd3)
    OCIHandleFree((dvoid *)dctx.curd3,OCI_HTYPE_STMT);
  if(NULL != dctx.curd4)
    OCIHandleFree((dvoid *)dctx.curd4,OCI_HTYPE_STMT);
  if(NULL != dctx.curd5)
    OCIHandleFree((dvoid *)dctx.curd5,OCI_HTYPE_STMT);
  if(NULL != dctx.curd6)
    OCIHandleFree((dvoid *)dctx.curd6,OCI_HTYPE_STMT);
}

/*
------------------------------------------------------------------
----------
NEW ORDER TRANSACTION
------------------------------------------------------------------
----------
*/

#define NOSQLTXT2ops "UPDATE stok SET s_order_cnt = s_order_cnt +
1, \
   s_ytd = s_ytd + :ol_quantity, s_remote_cnt = s_remote_cnt +
:s_remote, \
   s_quantity = s_quantity - :ol_quantity + \
   DECODE (SIGN (s_quantity - :ol_quantity - 10), -1, 91, 0) \
   WHERE s_i_id = :ol_i_id AND s_w_id = :ol_supply_w_id"

#define NOSQLTXT2 "BEGIN initnew.new_init(:idx1arr); END;"

int tkvcninit (NewOrderData *pNew,
                  OraContext *p)
{
  newctx *nctx = &(p->nctx);
```

```
  newtemp *ntemp = &(p->tempvars.new);
  int i;
  int execstatus;
  int errcode;
  text stmbuf[16384];

  memset(nctx,(char)0,sizeof(newctx));
  nctx->cs = 1;
  nctx->norow=0;
  nctx->curn1 = NULL;
  nctx->curn2 = NULL;
  for (i = 0; i < 100; i++)
    (nctx->curn3)[i] = NULL;
  nctx->curn4 = NULL;

  for(i=0;i<NITEMS;i++) {
    OCIERROR(p, OCIDescriptorAlloc(p->tpcenv,
                                          (dvoid**)&nctx-
>s_rowid_ptr[i],

OCI_DTYPE_ROWID,0,(dvoid**)0));
  }
  nctx->w_id_ind = TRUE;
  nctx->w_id_len = sizeof(pNew->w_id);
  nctx->d_id_ind = TRUE;
  nctx->d_id_len = sizeof(pNew->d_id);
  nctx->c_id_ind = TRUE;
  nctx->c_id_len = sizeof(pNew->c_id);
  nctx->o_all_local_ind = TRUE;
  nctx->o_all_local_len = sizeof(pNew->o_all_local);
  nctx->o_ol_cnt_ind = TRUE;
  nctx->o_ol_cnt_len = sizeof(pNew->o_ol_cnt);
  nctx->w_tax_ind = TRUE;
  nctx->w_tax_len = 0;
  nctx->d_tax_ind = TRUE;
  nctx->d_tax_len = 0;
  nctx->o_id_ind = TRUE;
  nctx->o_id_len = sizeof(pNew->o_id);
  nctx->c_discount_ind = TRUE;
  nctx->c_discount_len = 0;
  nctx->c_credit_ind = TRUE;
  nctx->c_credit_len = 0;
  nctx->c_last_ind = TRUE;

  nctx->c_last_len = 0;
  nctx->retries_ind = TRUE;
  nctx->retries_len = sizeof(ntemp->n_retry);
  nctx->cr_date_ind = TRUE;
  nctx->cr_date_len = sizeof(ntemp->cr_date);

  /* open first cursor */
  OCIERROR(p,OCIHandleAlloc(p->tpcenv,(dvoid **)(&nctx->curn1),
                                          OCI_HTYPE_STMT, 0,
(dvoid**)0));
  if(ERR_DB_ERROR == getfile("tkvcpnew.sql",stmbuf))
  {
    TPCCErr("Error opening the file tkvcpnew.sql");
    return ERR_DB_ERROR;
  }

  OCIERROR(p,OCIStmtPrepare(nctx->curn1, p->errhp, stmbuf,
                                          strlen((char *)stmbuf),
                                          OCI_NTV_SYNTAX,
OCI_DEFAULT));

  /* bind variables */

  OCIBNDR(nctx->curn1, nctx->w_id_bp, p, ":w_id",ADR(pNew->w_id),
            SIZ(pNew->w_id),
          SQLT_INT, &nctx->w_id_ind, &nctx->w_id_len, &nctx-
>w_id_rc);
  OCIBNDR(nctx->curn1, nctx->d_id_bp, p, ":d_id",ADR(pNew->d_id),
            SIZ(pNew->d_id),
          SQLT_INT, &nctx->d_id_ind, &nctx->d_id_len, &nctx-
>d_id_rc);
  OCIBNDR(nctx->curn1, nctx->c_id_bp, p, ":c_id",ADR(pNew->c_id),
            SIZ(pNew->c_id),
          SQLT_INT, &nctx->c_id_ind, &nctx->c_id_len, &nctx-
>c_id_rc);
  OCIBNDR(nctx->curn1, nctx->o_all_local_bp, p, ":o_all_local",
          ADR(pNew->o_all_local), SIZ(pNew->o_all_local),SQLT_INT,
            &nctx->o_all_local_ind,
          &nctx->o_all_local_len, &nctx->o_all_local_rc);
  OCIBNDR(nctx->curn1, nctx->o_all_cnt_bp, p, ":o_ol_cnt",
          ADR(pNew->o_ol_cnt), SIZ(pNew->o_ol_cnt),SQLT_INT,
            &nctx->o_ol_cnt_ind, &nctx->o_ol_cnt_len, &nctx-
>o_ol_cnt_rc);

  OCIBNDR(nctx->curn1, nctx->w_tax_bp, p, ":w_tax",ADR(ntemp-
>w_tax),
            SIZ(ntemp->w_tax),
          SQLT_FLT, &nctx->w_tax_ind, &nctx->w_tax_len, &nctx-
>w_tax_rc);
  OCIBNDR(nctx->curn1, nctx->d_tax_bp, p, ":d_tax",ADR(ntemp-
>d_tax),
            SIZ(ntemp->d_tax),
          SQLT_FLT, &nctx->d_tax_ind, &nctx->d_tax_len, &nctx-
>d_tax_rc);
  OCIBNDR(nctx->curn1, nctx->o_id_bp, p, ":o_id",ADR(pNew->o_id),
            SIZ(pNew->o_id),
          SQLT_INT, &nctx->o_id_ind, &nctx->o_id_len, &nctx-
>o_id_rc);
  OCIBNDR(nctx->curn1, nctx->c_discount_bp, p, ":c_discount",
          ADR(ntemp->c_discount), SIZ(ntemp->c_discount),SQLT_FLT,
            &nctx->c_discount_ind, &nctx->c_discount_len, &nctx-
>c_discount_rc);
  OCIBNDR(nctx->curn1, nctx->c_credit_bp, p, ":c_credit",pNew-
>c_credit,
```

```
          SIZ(pNew->c_credit),SQLT_CHR,
            &nctx->c_credit_ind, &nctx->c_credit_len, &nctx-
>c_credit_rc);
  OCIBNDR(nctx->curn1, nctx->c_last_bp, p, ":c_last",pNew->c_last,
            SIZ(pNew->c_last),
          SQLT_STR, &nctx->c_last_ind, &nctx->c_last_len, &nctx-
>c_last_rc);
  OCIBNDR(nctx->curn1, nctx->retries_bp, p, ":retry",ADR(ntemp-
>n_retry),
          SIZ(ntemp->n_retry),SQLT_INT,
            &nctx->retries_ind, &nctx->retries_len, &nctx-
>retries_rc);
  OCIBNDR(nctx->curn1, nctx->cr_date_bp, p, ":cr_date",ADR(ntemp-
>cr_date),
          SIZ(ntemp->cr_date), SQLT_ODT,
            &nctx->cr_date_ind, &nctx->cr_date_len, &nctx-
>cr_date_rc);


  OCIBNDRAA(nctx->curn1, nctx->ol_i_id_bp, p, ":ol_i_id",ntemp-
>nol_i_id,
          SIZ(int), SQLT_INT, nctx->nol_i_id_ind, nctx-
>nol_i_id_len,
            nctx->nol_i_id_rcode, NITEMS,&nctx->nol_i_count);


  OCIBNDRAA(nctx->curn1, nctx->ol_supply_w_id_bp, p,
":ol_supply_w_id",
            ntemp->nol_supply_w_id, SIZ(int), SQLT_INT,
            nctx->nol_supply_w_id_ind, nctx->nol_supply_w_id_len,
            nctx->nol_supply_w_id_rcode, NITEMS,&nctx-
>nol_s_count);


  OCIBNDRAA(nctx->curn1, nctx->ol_quantity_bp, p, ":ol_quantity",
            ntemp->nol_quantity, SIZ(int), SQLT_INT, nctx-
>nol_quantity_ind,
            nctx->nol_quantity_len, nctx->nol_quantity_rcode,
NITEMS,
            &nctx->nol_q_count);


  OCIBNDRAA(nctx->curn1, nctx->i_price_bp, p, ":i_price",
            ntemp->i_price, SIZ(int), SQLT_INT, nctx->i_price_ind,
            nctx->i_price_len, nctx->i_price_rcode, NITEMS,
            &nctx->nol_item_count);


  OCIBNDRAA(nctx->curn1, nctx->i_name_bp, p, ":i_name",
            ntemp->i_name, SIZ(pNew->o_ol[0].i_name), SQLT_STR,
            nctx->i_name_ind,
            nctx->i_name_len, nctx->i_name_rcode, NITEMS,
            &nctx->nol_name_count);


  OCIBNDRAA(nctx->curn1, nctx->s_quantity_bp, p, ":s_quantity",
            ntemp->s_quantity, SIZ(int), SQLT_INT, nctx-
>s_quant_ind,
            nctx->s_quant_len, nctx->s_quant_rcode, NITEMS,
            &nctx->nol_qty_count);


  OCIBNDRAA(nctx->curn1, nctx->s_bg_bp, p, ":brand_generic",
            ntemp->brand_generic, SIZ(char), SQLT_CHR, nctx-
>s_bg_ind,
            nctx->s_bg_len, nctx->s_bg_rcode, NITEMS,
            &nctx->nol_bg_count);


  OCIBNDRAA(nctx->curn1, nctx->ol_amount_bp, p, ":ol_amount",
            ntemp->nol_amount, SIZ(int), SQLT_INT, nctx-
>nol_amount_ind,
            nctx->nol_amount_len, nctx->nol_amount_rcode, NITEMS,
            &nctx->nol_am_count);


  OCIBNDRAA(nctx->curn1, nctx->s_remote_bp, p, ":s_remote",
            nctx->s_remote, SIZ(int), SQLT_INT, nctx->s_remote_ind,
            nctx->s_remote_len, nctx->s_remote_rcode, NITEMS,
            &nctx->s_remote_count);









  /* open second cursor */
  OCIERROR(p,OCIHandleAlloc(p->tpcenv, (dvoid **)(&nctx->curn2),
                                          OCI_HTYPE_STMT, 0,
(dvoid**)0));
  sprintf ((char *) stmbuf, NOSQLTXT2);
  OCIERROR(p,OCIStmtPrepare(nctx->curn2, p->errhp, stmbuf,
           strlen((char *)stmbuf), OCI_NTV_SYNTAX, OCI_DEFAULT));



/* execute second cursor to init newinit package */
{
  int idx1arr[NITEMS];
  OCIBind *idx1arr_bp;
  ub2 idx1arr_len[NITEMS];
  ub2 idx1arr_rcode[NITEMS];
  sb2 idx1arr_ind[NITEMS];
  ub4 idx1arr_count;
  ub2 idx;


  for (idx=0;idx<NITEMS;idx++)
  {
   idx1arr[idx] = idx + 1;
   idx1arr_ind[idx] = TRUE;
   idx1arr_len[idx] = sizeof(int);
  }
  idx1arr_count=NITEMS;
  pNew->o_ol_cnt=NITEMS;


/* Bind array */
  OCIBNDRAA(nctx-
>curn2,idx1arr_bp,p,":idx1arr",idx1arr,SIZ(int),SQLT_INT,
    idx1arr_ind,idx1arr_len,idx1arr_rcode,NITEMS,&idx1arr_count);
```

```
  execstatus = OCIStmtExecute(p->tpcsvc,nctx->curn2,p->errhp,1,0,0,0,
                                      OCI_DEFAULT);
  if(execstatus != OCI_SUCCESS)
  {
   OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
   errcode = OCIERROR(p,execstatus);
   return ERR_DB_ERROR;
  }
}



return (ERR_DB_SUCCESS);


}




int tkvcn (NewOrderData *pNew, OraContext *p)
{
  int statusCnt;
  int execstatus;
  int errcode;
  newctx *nctx = &(p->nctx);
  newtemp *ntemp = &(p->tempvars.new);

  int proc_no = 0;
  int retries = 0;
  int i;
  int rcount;

  statusCnt = 0;                        /* number of invalid items */

   /* get number of order lines, and check if all are local */
  /*  this section of code is needed for cprime, but we have
      already calculated the number of order lines back in web_ui
      no need to recalculate. */
  /*  pNew->o_ol_cnt = NITEMS;
  pNew->o_all_local = 1;
  for (i = 0; i < NITEMS; i++) {
    if (ntemp->nol_i_id[i] == 0) {
      pNew->o_ol_cnt = i;
      break;
    }
    */

  for (i = 0; i < pNew->o_ol_cnt; i++) {
    if (ntemp->nol_supply_w_id[i] != pNew->w_id) {
      nctx->s_remote[i] = 1;
      pNew->o_all_local = 0;
    }
    else {
      nctx->s_remote[i] = 0;
    }
  }

  nctx->w_id_ind = TRUE;
  nctx->w_id_len = sizeof(pNew->w_id);
  nctx->d_id_ind = TRUE;
  nctx->d_id_len = sizeof(pNew->d_id);
  nctx->c_id_ind = TRUE;
  nctx->c_id_len = sizeof(pNew->c_id);
  nctx->o_all_local_ind = TRUE;
  nctx->o_all_local_len = sizeof(pNew->o_all_local);
  nctx->o_ol_cnt_ind = TRUE;
  nctx->o_ol_cnt_len = sizeof(pNew->o_ol_cnt);
  nctx->w_tax_ind = TRUE;
  nctx->w_tax_len = 0;
  nctx->d_tax_ind = TRUE;
  nctx->d_tax_len = 0;
  nctx->o_id_ind = TRUE;
  nctx->o_id_len = sizeof(pNew->o_id);
  nctx->c_discount_ind = TRUE;
  nctx->c_discount_len = 0;
  nctx->c_credit_ind = TRUE;
  nctx->c_credit_len = 0;
  nctx->c_last_ind = TRUE;
  nctx->c_last_len = 0;
  nctx->retries_ind = TRUE;
  nctx->retries_len = sizeof(retries);
  nctx->cr_date_ind = TRUE;
  nctx->cr_date_len = sizeof(ntemp->cr_date);



  /* this is the row count */
  rcount = pNew->o_ol_cnt;
  nctx->nol_i_count = pNew->o_ol_cnt;
  nctx->nol_q_count = pNew->o_ol_cnt;
  nctx->nol_s_count = pNew->o_ol_cnt;
  nctx->s_remote_count = pNew->o_ol_cnt;

  nctx->nol_qty_count  = 0;
  nctx->nol_bg_count = 0;
  nctx->nol_item_count = 0;
  nctx->nol_name_count = 0;
  nctx->nol_am_count   = 0;
  /* following not relevant */
  nctx->s_data_count = pNew->o_ol_cnt;
  nctx->i_data_count = pNew->o_ol_cnt;
```

```
/* initialization for array operations */
for (i = 0; i < pNew->o_ol_cnt; i++) {
   nctx->ol_w_id[i] = pNew->w_id;
   nctx->ol_d_id[i] = pNew->d_id;
   nctx->ol_number[i] = i + 1;
   nctx->null_date_ind[i]= TRUE;
   nctx->nol_i_id_ind[i] = 0;
   nctx->nol_supply_w_id_ind[i] = TRUE;
   nctx->nol_quantity_ind[i] = TRUE;
   nctx->nol_amount_ind[i] = TRUE;
   nctx->ol_w_id_ind[i] = TRUE;
   nctx->ol_d_id_ind[i] = TRUE;
   nctx->ol_o_id_ind[i] = TRUE;
   nctx->ol_number_ind[i] = TRUE;
   nctx->ol_dist_info_ind[i] = TRUE;
   nctx->s_remote_ind[i] = TRUE;
   nctx->s_data_ind[i] = TRUE;
   nctx->i_data_ind[i] = TRUE;
   nctx->s_quant_ind[i] = TRUE;
   nctx->s_bg_ind[i] = TRUE;
   nctx->cons_ind[i] = TRUE;
   nctx->s_rowid_ind[i] = TRUE;
   nctx->nol_i_id_len[i] = sizeof(int);
   nctx->nol_supply_w_id_len[i] = sizeof(int);
   nctx->nol_quantity_len[i] = sizeof(int);
   nctx->nol_amount_len[i] = sizeof(int);
   nctx->ol_w_id_len[i] = sizeof(int);
   nctx->ol_d_id_len[i] = sizeof(int);
   nctx->ol_o_id_len[i] = sizeof(int);
   nctx->ol_number_len[i] = sizeof(int);
   nctx->ol_dist_info_len[i] = nctx->s_dist_info_len[i];
   nctx->null_date_len[i]=sizeof(OCIDate);
   nctx->s_remote_len[i] = sizeof(int);
   nctx->s_data_len[i] = sizeof(int);
   nctx->i_data_len[i] = sizeof(int);
   nctx->s_quant_len[i] = sizeof(int);
   nctx->s_rowid_len[i] = sizeof(nctx->s_rowid_ptr[0]);
   nctx->cons_len[i] = sizeof(int);
   nctx->i_name_len[i]=0;
   nctx->s_bg_len[i] = 0;
}
for (i = pNew->o_ol_cnt; i < NITEMS; i++) {
   nctx->nol_i_id_ind[i] = NA;
   nctx->nol_supply_w_id_ind[i] = NA;
   nctx->nol_quantity_ind[i] = NA;
   nctx->nol_amount_ind[i] = NA;
   nctx->ol_w_id_ind[i] = NA;
   nctx->ol_d_id_ind[i] = NA;
   nctx->ol_o_id_ind[i] = NA;
   nctx->ol_number_ind[i] = NA;
   nctx->ol_dist_info_ind[i] = NA;
   nctx->null_date_ind[i]= NA;
   nctx->s_remote_ind[i] = NA;
   nctx->s_data_ind[i] = NA;
   nctx->i_data_ind[i] = NA;
   nctx->s_quant_ind[i] = NA;
   nctx->s_bg_ind[i] = NA;
   nctx->cons_ind[i] = NA;
   nctx->s_rowid_ind[i] = NA;

   nctx->nol_i_id_len[i] = 0;
   nctx->nol_supply_w_id_len[i] = 0;
   nctx->nol_quantity_len[i] = 0;
   nctx->nol_amount_len[i] = 0;
   nctx->ol_w_id_len[i] = 0;
   nctx->ol_d_id_len[i] = 0;
   nctx->ol_o_id_len[i] = 0;
   nctx->ol_number_len[i] = 0;
   nctx->ol_dist_info_len[i] = 0;
   nctx->null_date_len[i]= 0;
   nctx->s_remote_len[i] = 0;
   nctx->i_data_len[i] = 0;
   nctx->s_data_len[i] = 0;
   nctx->s_quant_len[i] = 0;
   nctx->s_rowid_len[i] = 0;
   nctx->cons_len[i] = 0;
   nctx->i_name_len[i]=0;
   nctx->s_bg_len[i] = 0;
  }

  execstatus = OCIStmtExecute(p->tpcsvc,nctx->curn1,p->errhp,1,0,0,0,
                                    OCI_DEFAULT |
OCI_COMMIT_ON_SUCCESS);

   /* did the txn succeed? */
   /* sth added return of ERR_DB_NOT_COMMITED for Invalid Item */
   if (rcount != pNew->o_ol_cnt)
   {
    statusCnt = rcount - pNew->o_ol_cnt;
    pNew->o_ol_cnt = rcount;
    return (ERR_DB_NOT_COMMITED);
   }

   if(execstatus != OCI_SUCCESS) {
     OCITransRollback(p->tpcsvc,p->errhp,OCI_DEFAULT);
     errcode = OCIERROR(p,execstatus);
     if(errcode == NOT_SERIALIZABLE)
     {
          retries++;
```

```
          return (RECOVERR);
     }
     else if (errcode == RECOVERR)
     {
          retries++;
          return (RECOVERR);
     }
     else if (errcode == SNAPSHOT_TOO_OLD)
     {
          retries++;
          return (RECOVERR);
     }
     else
     {
          return (ERR_DB_ERROR);
     }
   }
```

```
#ifdef ISO1
   else {
     OCITransCommit(p->tpcsvc, p->errhp, OCI_DEFAULT);
   }
#endif

#if defined(ISO1) || defined(ISO7)
   sysdate (sdate);
   printf ("New Order completed at: %s\n", sdate);
#endif
```

```
/* calculate total amount */
  pNew->total_amount = 0.0;
  for (i=0;i<pNew->o_ol_cnt;i++)
  {
   if (nctx->nol_amount_ind[i] != NA)
   {
     pNew->total_amount += ntemp->nol_amount[i];
   }
  }
  pNew->total_amount *= ((double)(1-ntemp->c_discount)) *
(double)(1.0 + ((double)(ntemp->d_tax))+((double)(ntemp->w_tax)));
  pNew->total_amount = pNew->total_amount/100;



  return (ERR_DB_SUCCESS);
```

```
   }
```

```
void tkvcndone (newctx *pnctx)

{
   int i;
   newctx nctx = *pnctx;

   if(NULL != nctx.curn1)
     OCIHandleFree((dvoid *)nctx.curn1,OCI_HTYPE_STMT);
   if(NULL != nctx.curn2)
     OCIHandleFree((dvoid *)nctx.curn2,OCI_HTYPE_STMT);
   for (i = 0; i < 10; i++)
     if(NULL != ((nctx.curn3)[i]))
       OCIHandleFree((dvoid *)(nctx.curn3)[i],OCI_HTYPE_STMT);
   if(NULL != nctx.curn4)
     OCIHandleFree((dvoid *)nctx.curn4,OCI_HTYPE_STMT);

}
```

```
**************************
tpcc.c
**************************
/*+       FILE:     TPCC.C
 *                  Microsoft TPC-C Kit Ver. 3.00.000
 *                  Audited 08/23/96    By Francois Raab
 *
 *                  Copyright Microsoft, 1996
 *                  Copyright Digital Equipment Corp., 1997
 *
 *        PURPOSE:  Main module for TPCC.DLL which is an ISAPI
service dll.
 *        Author:             Philip Durr
 *                                      philipdu@Microsoft.com
 *
 *        MODIFICATIONS:
 *
 *                  Routines substantially modified by:
 *                            Anne Bradley        Digital Equipment
Corp.
 *                            Bill Carr Digital Equipment Corp.
 *
 */
/*+*************************************************************
**********
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```

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**********************************************************************
*********/


/*
 *
 *
 * Modification history:
 *
 *
 *      08/01/2002      Andrew Bond, HP
 *                      - Conversion to run under Linux and Apache
 *
 */


#include <stdio.h>
#include <stdarg.h>
#include <malloc.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>


#include "apr_thread_mutex.h"


#include <oci.h>
#include <ocidfn.h>
#include <ociapr.h>


#define TPCC_C


#include <tpccerr.h>
#include <tpccstruct.h>
#include <oracle_db8.h>
#include <tpccapi.h>


#include <tpcc.h>
#include <mod_tpcc.h>


#define _strupr(x)      { \
                        int strupr_pos; \
                        for (strupr_pos=0; strupr_pos <
strlen(x);strupr_pos++) \
                          x[strupr_pos] = toupper(x[strupr_pos]); \
                        }


/* FUNCTION: void FormatString(char *szDest, char *szPic, char
*szSrc)
 *
 * PURPOSE:         This function formats a character string for
inclusion in the
 *                  HTML formatted page being constructed.
 *
 * ARGUMENTS:       char      *szDest
         Destination buffer where
 *
         formatted string is to be
 *                                                              placed
 *                  char      *szPic                        picture
string which describes
 *                                                              how
character value is to be
 *
         formatted.
 *                  char      *szSrc
         character string value.
 *
 * RETURNS:         None
 *
 * COMMENTS:        This functions is used to format TPC-C phone
and zip value
 *                  strings.
 *
 */


void FormatString(char *szDest, char *szPic, char *szSrc)
{
  while( *szPic )
  {
    if ( *szPic == 'X' )
    {
      if ( *szSrc )
```

```
          *szDest++ = *szSrc++;
      else
          *szDest++ = ' ';
    }
    else
      *szDest++ = *szPic;
    szPic++;
  }
  *szDest = 0;

  return;
}

/* FUNCTION: int ParseNewOrderQuery( char *pProcessedQuery[],
 *                                        NewOrderData
*pNewOrderData )
 *
 * PURPOSE:         This function extracts and validates the new
order query
 *                  from an http command string.
 *
 * ARGUMENTS:       char      *pProcessedQuery[]  array of char*
that points to
 *                                                        the
value of each name-value
 *                                                        pair.
 *                  NewOrderData  *pNewOrderData  pointer to new
order data
 *
          structure
 *
 * RETURNS:         int       ERR_SUCCESS                   input
data successfully parsed
 *                            error_code                    reason
for failure
 *
 * COMMENTS:        None
 *
 */

int ParseNewOrderQuery(char *pQueryString, NewOrderData
*pNewOrderData)
{
  char    *ptr;
  int               i;
  short   items;
  char    *pProcessedQuery[MAXNEWORDERVALS];

  PARSE_QUERY_STRING(pQueryString, MAXNEWORDERVALS,
                        newOrderStrs, pProcessedQuery);

  if ( !GetValuePtr(pProcessedQuery, DID, &ptr) )
    return ERR_NEWORDER_FORM_MISSING_DID;

  GetNumeric(ptr, &pNewOrderData->d_id);
  if(0 == pNewOrderData->d_id)
    return ERR_NEWORDER_DISTRICT_INVALID;

  if ( !GetValuePtr(pProcessedQuery, CID, &ptr) )
    return ERR_NEWORDER_CUSTOMER_KEY;

  if( !GetNumeric(ptr, &pNewOrderData->c_id))
    return ERR_NEWORDER_CUSTOMER_INVALID;

  pNewOrderData->o_all_local = 1;

  for(i=0, items=0; i<15; i++)
  {
    if( !GetValuePtr(pProcessedQuery, i*3+IID00, &ptr))
      return ERR_NEWORDER_MISSING_IID_KEY;
    if(*ptr != '&' && *ptr)
    {
      if(!GetNumeric(ptr, &pNewOrderData->o_ol[items].ol_i_id))
          return ERR_NEWORDER_ITEMID_INVALID;

      if(!GetValuePtr(pProcessedQuery, i*3+SP00, &ptr))
          return ERR_NEWORDER_MISSING_SUPPW_KEY;
      if(!GetNumeric(ptr, &pNewOrderData-
>o_ol[items].ol_supply_w_id))
          return ERR_NEWORDER_SUPPW_INVALID;
      if ( pNewOrderData->o_all_local &&
             pNewOrderData->o_ol[items].ol_supply_w_id !=
             pNewOrderData->w_id )
          pNewOrderData->o_all_local = 0;
      if(!GetValuePtr(pProcessedQuery, i*3+QTY00, &ptr))
          return ERR_NEWORDER_MISSING_QTY_KEY;
      if(!GetNumeric(ptr, &pNewOrderData->o_ol[items].ol_quantity))
          return ERR_NEWORDER_QTY_INVALID;
      if ( pNewOrderData->o_ol[items].ol_i_id >= 1000000 ||
             pNewOrderData->o_ol[items].ol_i_id < 1 )
          return ERR_NEWORDER_ITEMID_RANGE;
      if ( pNewOrderData->o_ol[items].ol_quantity >= 100 ||
             pNewOrderData->o_ol[items].ol_quantity < 1 )
          return ERR_NEWORDER_QTY_RANGE;
      items++;
    }
    else
    {
      if(!GetValuePtr(pProcessedQuery, i*3+SP00, &ptr))
          return ERR_NEWORDER_MISSING_SUPPW_KEY;
      if(*ptr != '&' && *ptr)
          return ERR_NEWORDER_SUPPW_WITHOUT_ITEMID;
```

```
      if(!GetValuePtr(pProcessedQuery, i*3+QTY00, &ptr))
          return ERR_NEWORDER_MISSING_QTY_KEY;
      if(*ptr != '&' && *ptr)
          return ERR_NEWORDER_QTY_WITHOUT_ITEMID;
    }
  }
  if ( items == 0 )
    return ERR_NEWORDER_NOITEMS_ENTERED;

  pNewOrderData->o_ol_cnt = items;

  return ERR_SUCCESS;
}

/* FUNCTION: int ParseOrderStatusQuery( char *pProcessedQuery[],
 *                                          OrderStatusData
*pOrderStatusData )
 *
 * PURPOSE:         This function extracts and validates the order
status query
 *                  from an http command string.
 *
 * ARGUMENTS:       char      *pProcessedQuery[]  array of char*
that points to
 *                                                 the
value of each name-value
 *                                                 pair.
 *                  OrderStatusData *pOrderStatusData pointer to
new order data
 *
structure
 *
 * RETURNS:         int       ERR_SUCCESS                 input
data successfully parsed
 *                            error_code                  reason
for failure
 *
 * COMMENTS:        None
 *
 */
int ParseOrderStatusQuery(char *pQueryString,
                          OrderStatusData *pOrderStatusData)
{
  char    szTmp[26];
  char    *ptr;
  char    *pSzTmp;
  char    *pProcessedQuery[MAXORDERSTATUSVALS];

  PARSE_QUERY_STRING(pQueryString, MAXORDERSTATUSVALS,
                     orderStatusStrs, pProcessedQuery);

  if ( !GetValuePtr(pProcessedQuery, DID, &ptr) )
    return ERR_ORDERSTATUS_MISSING_DID_KEY;
  if ( !GetNumeric(ptr, &pOrderStatusData->d_id) )
    return ERR_ORDERSTATUS_DID_INVALID;

  if ( !GetValuePtr(pProcessedQuery, CID, &ptr) )
    return ERR_ORDERSTATUS_MISSING_CID_KEY;

  if ( *ptr == '&' || !(*ptr))
  {
    pSzTmp = szTmp;
    pOrderStatusData->c_id = 0;
    if ( !GetValuePtr(pProcessedQuery, CLT_O, &ptr) )
      return ERR_ORDERSTATUS_MISSING_CLT_KEY;
    while(*ptr != '&' && *ptr)
    {
      *pSzTmp = *ptr;
      pSzTmp++;
      ptr++;
    }
    *pSzTmp = '\0';
    _strupr( szTmp );
    strcpy(pOrderStatusData->c_last, szTmp);
    if ( strlen(pOrderStatusData->c_last) > 16 )
      return ERR_ORDERSTATUS_CLT_RANGE;
  }
  else
  {
    if (!GetNumeric(ptr, &pOrderStatusData->c_id))
      return ERR_ORDERSTATUS_CID_INVALID;
    if ( !GetValuePtr(pProcessedQuery, CLT_O, &ptr) )
      return ERR_ORDERSTATUS_MISSING_CLT_KEY;
    if ( *ptr != '&' && *ptr)
      return ERR_ORDERSTATUS_CID_AND_CLT;
  }

  return ERR_SUCCESS;
}

/* FUNCTION: int ParsePaymentQuery( char *pProcessedQuery[],
 *                                      PaymentData
*pPaymentData )
 *
 * PURPOSE:         This function extracts and validates the
payment query
 *                  from an http command string.
 *
 * ARGUMENTS:       char      *pProcessedQuery[]  array of char*
that points to
 *                                                 the
value of each name-value
 *                                                 pair.
 *                  PaymentData  *pPaymentData    pointer to
payment data
 *
          structure
```

```
 *
 * RETURNS:         int       ERR_SUCCESS                   input
data successfully parsed
 *                            error_code                    reason
for failure
 *
 * COMMENTS:        None
 *
 */


int ParsePaymentQuery(char *pQueryString, PaymentData
*pPaymentData)
{
  char    szTmp[26];
  char    *ptr;
  char    *pPtr;
  char    *pSzTmp;
  char    *pProcessedQuery[MAXPAYMENTVALS];



  PARSE_QUERY_STRING(pQueryString, MAXPAYMENTVALS,
                        paymentStrs, pProcessedQuery);


  if ( !GetValuePtr(pProcessedQuery, DID, &ptr) )
    return ERR_PAYMENT_MISSING_DID_KEY;
  if ( !GetNumeric(ptr, &pPaymentData->d_id) )
    return ERR_PAYMENT_DISTRICT_INVALID;


  if ( !GetValuePtr(pProcessedQuery, CID, &ptr) )
    return ERR_PAYMENT_MISSING_CID_KEY;



  if(*ptr == '&' || !(*ptr))
  {
    pPaymentData->c_id = 0;
    pSzTmp = szTmp;
    if ( !GetValuePtr(pProcessedQuery, CLT_P, &ptr) )
      return ERR_PAYMENT_MISSING_CLT;

    if (*ptr == '&' || !(*ptr))
      return ERR_PAYMENT_MISSING_CID_CLT;
    while(*ptr != '&' && *ptr)
    {
      *pSzTmp = *ptr;
      pSzTmp++;
      ptr++;
    }
    *pSzTmp = '\0';
    _strupr( szTmp );


    strcpy(pPaymentData->c_last, szTmp);
    if ( strlen(pPaymentData->c_last) > 16 )
      return ERR_PAYMENT_LAST_NAME_TO_LONG;
  }
  else
  {
    if (!GetNumeric(ptr, &pPaymentData->c_id))
       return ERR_PAYMENT_CUSTOMER_INVALID;
    if ( !GetValuePtr(pProcessedQuery, CLT_P, &ptr) )
      return ERR_PAYMENT_MISSING_CLT_KEY;
    if(*ptr != '&' && *ptr)
      return ERR_PAYMENT_CID_AND_CLT;
  }

  if ( !GetValuePtr(pProcessedQuery, CDI, &ptr) )
    return ERR_PAYMENT_MISSING_CDI_KEY;
  if ( !GetNumeric(ptr, &pPaymentData->c_d_id) )
    return ERR_PAYMENT_CDI_INVALID;

  if ( !GetValuePtr(pProcessedQuery, CWI, &ptr) )
    return ERR_PAYMENT_MISSING_CWI_KEY;

  if ( !GetNumeric(ptr, &pPaymentData->c_w_id) )
    return ERR_PAYMENT_CWI_INVALID;



  if ( !GetValuePtr(pProcessedQuery, HAM, &ptr) )
    return ERR_PAYMENT_MISSING_HAM_KEY;

  pPtr = ptr;
  while( *pPtr != '&' && *pPtr)
  {
    if ( *pPtr == '.' )
    {
      pPtr++;
      if ( !*pPtr )
          break;
      if ( *pPtr < '0' || *pPtr > '9' )
          return ERR_PAYMENT_HAM_INVALID;
      pPtr++;
      if ( !*pPtr )
          break;
      if ( *pPtr < '0' || *pPtr > '9' )
          return ERR_PAYMENT_HAM_INVALID;
      if ( !*pPtr )
          return ERR_PAYMENT_HAM_INVALID;
    }
    else if ( *pPtr < '0' || *pPtr > '9' )
      return ERR_PAYMENT_HAM_INVALID;
    pPtr++;
  }
```

```
  pPaymentData->h_amount = atof(ptr);
  if ( pPaymentData->h_amount >= 10000.00 || pPaymentData->h_amount
< 0 )
    return ERR_PAYMENT_HAM_RANGE;

  return ERR_SUCCESS;
}

/* FUNCTION: BOOL ReadRegistrySettings(void)
 *
 * PURPOSE:         This function reads the Linux TPCC
configuration file for
 *                  startup parameters.
 *
 * ARGUMENTS:   None
 *
 * RETURNS:         None
 *
 * COMMENTS:        This function also sets up required operation
variables to
 *                  their default value so if registry is not setup
the default
 *                  values will be used.
 *
 */

int ReadRegistrySettings(void)
{
  char    szTmp[FILENAMESIZE];
  int   status;
  int     iTmp;

  status = GetConfigValue("PATH", (char *)&szTmp);
  if ( status != ERROR_SUCCESS )
    return ERR_CANT_FIND_PATH_VALUE;
  strcpy(szTpccLogPath, szTmp);

  status = GetConfigValue("Server", (char *)&szTmp);
  if ( status != ERROR_SUCCESS )
    /* required */
    return ERR_CANT_FIND_SERVER_VALUE;
  strcpy(gszServer, szTmp);

  status = GetConfigValue("Database", (char *)&szTmp);
  if ( status != ERROR_SUCCESS )
    /* required */
    return ERR_CANT_FIND_DATABASE_VALUE;
  strcpy(gszDatabase, szTmp);

  status = GetConfigValue("User", (char *)&szTmp);
  if ( status != ERROR_SUCCESS )
    /* required */
    return ERR_CANT_FIND_USER_VALUE;
  strcpy(gszUser, szTmp);

  status = GetConfigValue("Password", (char *)&szTmp);
  if ( status != ERROR_SUCCESS )
    /* required */
    return ERR_CANT_FIND_PASSWORD_VALUE;
  strcpy(gszPassword, szTmp);

  status = GetConfigValue("LOG", (char *)&szTmp);
  if ( status == ERROR_SUCCESS  && 0 == strcmp(szTmp, "ON") )
    bLog = TRUE;

  status = GetConfigValue("MaxConnections", (char *)&szTmp);
  if ( status == ERROR_SUCCESS && 0 != (iTmp = atoi(szTmp)) )
    iMaxConnections = iTmp;

  return ERR_SUCCESS;

}

**************************
tpcc.h
**************************

#ifndef TPCC_H
#define TPCC_H

/*+**********************************************************
**********

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**********************************************************************
*********/


/*+
 * Abstract: This is the header file for web_ui.c.  it contains the
 *        function prototypes for the routines that are called
outside web_ui.c
 *
 * Author: A Bradley
 * Creation Date: May 1997
 *
 *
 * Modification history:
 *
 *
 *      08/01/2002      Andrew Bond, HP
 *                        Conversion to run under Linux and Apache
 *
*/


#define ERROR_SUCCESS 1
#define FILENAMESIZE 256



#define DEBUG 0
#define MAXPAD 6


#define itoa(x,y)       sprintf(y, "%d", x)


#if defined WEB_UI_C || defined TPCC_C


void FormatString(char *szDest, char *szPic, char *szSrc);


int ParseNewOrderQuery(char *pQueryString, NewOrderData
*pNewOrderData);
int ParsePaymentQuery(char *pQueryString, PaymentData
*pPaymentData);
int ParseOrderStatusQuery(char *pQueryString,
                                OrderStatusData *pOrderStatusData);
#endif /* defined WEB_UI_C || defined TPCC_C */
```

```
BOOL ReadRegistrySettings(void);


/* global variables */
#ifdef MOD_TPCC_C
#define GLOBAL(thing,initializer) thing = initializer
#else
#define GLOBAL(thing,initializer) extern thing
#endif /* TPCC_C */


GLOBAL(int iMaxConnections,25);
GLOBAL(BOOL bLog,FALSE);
GLOBAL(int iDeadlockRetry,3);
GLOBAL(char szTpccLogPath[FILENAMESIZE],{'\0'});
GLOBAL(int iMaxWareHouses,500);
GLOBAL(char gszServer[32],{'\0'});
GLOBAL(char gszDatabase[32],"tpcc");
GLOBAL(char gszUser[32],"oracle");
GLOBAL(char gszPassword[32],{'\0'});
GLOBAL(pTransactionPoolStruct gpTransactionPool,{0});
GLOBAL(FILE *MyLogFile, {0});


#endif /* TPCC_H */


**************************
tpccapi.h
**************************
#ifndef TPCCAPI_H
#define TPCCAPI_H
/*+**************************************************************
**********
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 *
*


*********************************************************************
*********/


/*+*****************************************************************
**********

*****************************  tpccapi.h
*********************************

*********************************************************************
**********

*

**  tpccapi.h:  This header file declares function calls between
TPCC

**            application and server

*

*

*  Authors: Tareef Kawaf and Bill Carr

**

**

**  02-05-97 FWM Added bQueueDelivery flag to startup call.

**  18-Feb-98 WCarr Introduced TPCCAPI V2.0

**

 *

 * Modification history:

 *

 *

 *      08/01/2002      Andrew Bond, HP

 *                        Conversion to run under Linux and Apache

 *

*/



#define DELIVERY_RESPONSE_COUNT 2


int TPCCGetTransportData( pTransportData pTransport );


int TPCCStartup( );

int TPCCStartupDB( );


int TPCCConnect( pLoginData pLogin );

int TPCCConnectDB(OraContext  **dbproc, pLoginData pLogin );


int TPCCDelivery( pDeliveryData pDelivery);

int TPCCDeliveryDeferred( pDeliveryData ppDelivery );

int TPCCDeliveryDB( OraContext *dbproc, pDeliveryData pDelivery );


int TPCCNewOrder( pNewOrderData pNewOrder );

int TPCCNewOrderDB( OraContext *dbproc, pNewOrderData pNewOrder );


int TPCCOrderStatus( pOrderStatusData pOrderStatus );

int TPCCOrderStatusDB( OraContext *dbproc, pOrderStatusData
pOrderStatus );


int TPCCPayment( pPaymentData pPayment );

int TPCCPaymentDB( OraContext *dbproc, pPaymentData pPayment );


int TPCCStockLevel( pStockLevelData pStockLevel );

int TPCCStockLevelDB( OraContext *dbproc, pStockLevelData
pStockLevel );


int TPCCCheckpoint( pCheckpointData pCheckpoint );

int TPCCCheckpointDB( OraContext *dbproc, pCheckpointData
pCheckpoint );


int TPCCDisconnect( pCallersContext pCC );

int TPCCDisconnectDB( OraContext *dbproc, pCallersContext pCC );


int TPCCShutdown( void );

int TPCCShutdownDB( void );


void TPCCDeliveryResponse( int retcode, pDeliveryData pDelivery,

                        pDeliveryData
CompletedDeliveries[DELIVERY_RESPONSE_COUNT] );


void TPCCDeliveryDeferredResponse( int retcode, pDeliveryData
pDelivery );


void TPCCNewOrderResponse( int retcode, pNewOrderData pNewOrder );


void TPCCOrderStatusResponse( int retcode, pOrderStatusData
pOrderStatus );


void TPCCPaymentResponse( int retcode, pPaymentData pPayment );


void TPCCStockLevelResponse( int retcode, pStockLevelData
pStockLevel );


void TPCCResponseComplete( CallersContext *pCC );


void ErrorMessage( CallersContext *pCC, int iError, int iErrorType,

                        char *pszMesasge );


int TPCCGetTransportErrorString( int iErrorCode, int iBufSize, char
*pBuffer );

int TPCCGetDBErrorString( int iErrorCode, int iBufSize, char
*pBuffer );


BOOL TPCCOpenLog( apr_pool_t *pool );
```

```
BOOL TPCCCloseLog( void );


void TPCCLog( char *fmt, ... );


void TPCCErr( char *fmt, ... );


void TPCCTransactionErr( pConnData pConn, char *fmt, ... );


int GetConfigValue(char *option, char *value);


#endif /* TPCCAPI_H */
```

```
**************************
tpccerr.h
**************************

#ifndef TPCCERR_H

#define TPCCERR_H


/*        FILE:               TPCCERR.H

 *

 *                            Copyright Microsoft, 1996

 *                            Copyright Digital Equipment Corp.,
1997

 *

 *        PURPOSE:  Header file for ISAPI TPCC.DLL, defines
structures

 *                            and error messages used by tpcc
benchmark code.

 *        Author:             Philip Durr

 *                                      philipdu@Microsoft.com

 *

 *        Modified by:        William D. Carr

 *                                      carr@perfom.enet.dec.com

 *

 * Modification history:

 *

 *

 *

*/


#pragma message ("FIXME: the error types need to be made DB non-
specific")

#define   ERR_TYPE_WEBDLL
                            1

#define   ERR_TYPE_SQL
                            2

#define   ERR_TYPE_DBLIB
                            3


#define ERR_DB_SUCCESS                                      0

#define ERR_DB_ERROR                                        1

#define ERR_TRANSPORT_ERROR                         2

#define ERR_DB_INTERFACE                            3

#define ERR_DB_DEADLOCK_LIMIT                       4

#define ERR_DB_NOT_COMMITED                         5

#define ERR_DB_DEAD                                 6

#define ERR_DB_PENDING                                      7

#define ERR_DB_NOT_LOGGED_IN                        8

#define ERR_DB_LOGIN_FAILED                         9

#define ERR_DB_USE_FAILED                          10

#define ERR_DB_LOGOUT_FAILED                       11

/* NOTE: Be sure to update MAX_ERR if new error code is added. */

#define ERR_DB_MAX_ERR                                     11


#define VALID_DB_ERR(err) (((err) >= ERR_DB_SUCCESS)&&((err) <=
ERR_DB_MAX_ERR))


#define   ERR_SUCCESS                                    1000

#define   ERR_COMMAND_UNDEFINED                          1001

#define   ERR_NOT_IMPLEMENTED_YET                        1002

#define   ERR_CANNOT_INIT_TERMINAL              1003

#define   ERR_OUT_OF_MEMORY                     1004

#define   ERR_NEW_ORDER_NOT_PROCESSED           1005

#define   ERR_PAYMENT_NOT_PROCESSED             1006

#define   ERR_NO_SERVER_SPECIFIED                        1007

#define   ERR_ORDER_STATUS_NOT_PROCESSED                 1008

#define   ERR_W_ID_INVALID                      1009

#define   ERR_CAN_NOT_SET_MAX_CONNECTIONS                1010

#define   ERR_NOSUCH_CUSTOMER                   1011

#define   ERR_D_ID_INVALID                      1012

#define   ERR_MAX_CONNECT_PARAM                          1013

#define   ERR_INVALID_SYNC_CONNECTION           1014

#define   ERR_INVALID_TERMID                    1015

#define   ERR_PAYMENT_INVALID_CUSTOMER          1016

#define   ERR_SQL_OPEN_CONNECTION                        1017

#define   ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY  1018

#define   ERR_STOCKLEVEL_THRESHOLD_INVALID      1019

#define   ERR_STOCKLEVEL_THRESHOLD_RANGE                 1020

#define   ERR_STOCKLEVEL_NOT_PROCESSED          1021

#define   ERR_NEWORDER_FORM_MISSING_DID         1022

#define   ERR_NEWORDER_DISTRICT_INVALID         1023

#define   ERR_NEWORDER_DISTRICT_RANGE           1024

#define   ERR_NEWORDER_CUSTOMER_KEY             1025

#define   ERR_NEWORDER_CUSTOMER_INVALID         1026

#define   ERR_NEWORDER_CUSTOMER_RANGE           1027

#define   ERR_NEWORDER_MISSING_IID_KEY          1028

#define   ERR_NEWORDER_ITEM_BLANK_LINES         1029

#define   ERR_NEWORDER_ITEMID_INVALID           1030

#define   ERR_NEWORDER_MISSING_SUPPW_KEY                 1031

#define   ERR_NEWORDER_SUPPW_INVALID            1032

#define   ERR_NEWORDER_MISSING_QTY_KEY          1033

#define   ERR_NEWORDER_QTY_INVALID              1034

#define   ERR_NEWORDER_SUPPW_RANGE              1035

#define   ERR_NEWORDER_ITEMID_RANGE             1036
```

```
#define   ERR_NEWORDER_QTY_RANGE                    1037
#define   ERR_PAYMENT_DISTRICT_INVALID              1038
#define   ERR_NEWORDER_SUPPW_WITHOUT_ITEMID         1039
#define   ERR_NEWORDER_QTY_WITHOUT_ITEMID           1040
#define   ERR_NEWORDER_NOITEMS_ENTERED              1041
#define   ERR_PAYMENT_MISSING_DID_KEY               1042
#define   ERR_PAYMENT_DISTRICT_RANGE                1043
#define   ERR_PAYMENT_MISSING_CID_KEY               1044
#define   ERR_PAYMENT_CUSTOMER_INVALID              1045
#define   ERR_PAYMENT_MISSING_CLT                   1046
#define   ERR_PAYMENT_LAST_NAME_TO_LONG             1047
#define   ERR_PAYMENT_CUSTOMER_RANGE                1048
#define   ERR_PAYMENT_CID_AND_CLT                   1049
#define   ERR_PAYMENT_MISSING_CDI_KEY               1050
#define   ERR_PAYMENT_CDI_INVALID                   1051
#define   ERR_PAYMENT_CDI_RANGE                     1052
#define   ERR_PAYMENT_MISSING_CWI_KEY               1053
#define   ERR_PAYMENT_CWI_INVALID                   1054
#define   ERR_PAYMENT_CWI_RANGE                     1055
#define   ERR_PAYMENT_MISSING_HAM_KEY               1056
#define   ERR_PAYMENT_HAM_INVALID                   1057
#define   ERR_PAYMENT_HAM_RANGE                     1058
#define   ERR_ORDERSTATUS_MISSING_DID_KEY           1059
#define   ERR_ORDERSTATUS_DID_INVALID               1060
#define   ERR_ORDERSTATUS_DID_RANGE                 1061
#define   ERR_ORDERSTATUS_MISSING_CID_KEY           1062
#define   ERR_ORDERSTATUS_MISSING_CLT_KEY           1063
#define   ERR_ORDERSTATUS_CLT_RANGE                 1064
#define   ERR_ORDERSTATUS_CID_INVALID               1065
#define   ERR_ORDERSTATUS_CID_RANGE                 1066
#define   ERR_ORDERSTATUS_CID_AND_CLT               1067
#define   ERR_DELIVERY_MISSING_OCD_KEY              1068
#define   ERR_DELIVERY_CARRIER_INVALID              1069
#define   ERR_DELIVERY_CARRIER_ID_RANGE             1070
#define ERR_PAYMENT_MISSING_CLT_KEY                 1071
#define ERR_CANT_FIND_TPCC_KEY                      1072
#define ERR_CANT_FIND_INETINFO_KEY                  1073
#define ERR_CANT_FIND_POOLTHREADLIMIT               1074
#define ERR_DB_DELIVERY_NOT_QUEUED                  1075
#define ERR_DELIVERY_NOT_PROCESSED                  1076
#define ERR_TERM_ALLOCATE_FAILED                    1077
#define ERR_PENDING                                 1078
#define ERR_CANT_START_FRCDINIT_THREAD              1079
#define ERR_CANT_START_DELIVERY_THREAD              1080
#define ERR_GOVERNOR_VALUE_NOT_FOUND                1081
#define ERR_SERVER_MISMATCH                         1082
#define ERR_DATABASE_MISMATCH                       1083
#define ERR_USER_MISMATCH                           1084
#define ERR_PASSWORD_MISMATCH                       1085
#define ERR_CANT_CREATE_ALL_THREADS_EVENT           1086
#define ERR_CANT_CREATE_FORCE_THRED_STRT_EVENT      1087
#define ERR_CANT_ALLOCATE_THREAD_LOCAL_STORAGE      1088
#define ERR_CANT_SET_THREAD_LOCAL_STORAGE           1089
#define ERR_FORCE_CONNECT_THREAD_FAILED             1090
#define ERR_CANT_FIND_SERVER_VALUE                  1091
#define ERR_NO_MESSAGE                              1092
#define ERR_CANT_FIND_PATH_VALUE                    1093
#define   ERR_CANNOT_CREATE_RESULTS_FILE            1094
#define ERR_DELIVERY_PIPE_SECURITY                  1095
#define ERR_DELIVERY_PIPE_CREATE                    1096
#define ERR_DELIVERY_PIPE_OPEN                      1097
#define ERR_DELIVERY_PIPE_READ                      1098
#define ERR_DELIVERY_PIPE_DISCONNECT                1099
#define ERR_CANT_FIND_DATABASE_VALUE                1100
#define ERR_CANT_FIND_USER_VALUE                    1101
#define ERR_CANT_FIND_PASSWORD_VALUE                1102
#define ERR_DELIVERY_OUTPUT_PIPE_WRITE              1103
#define ERR_DELIVERY_OUTPUT_PIPE_READ               1104
#define ERR_DELIVERY_MISSING_QUEUETIME_KEY          1105
#define ERR_DELIVERY_QUEUETIME_INVALID              1106
#define ERR_ALREADY_LOGGED_IN                       1107
#define ERR_INVALID_FORM                            1109
#define ERR_DELIVERY_MUST_CONNECTDB                 1110
#define ERR_INVALID_FORM_AND_CMD_NOT_BEGIN          1111
#define ERR_MAX_CONNECTIONS_EXCEEDED                1112
#define ERR_CANNOT_FIND_CONNECTION                  1113
#define ERR_CKPT_NOT_INITIALIZED                    1114
#define   ERR_PAYMENT_MISSING_CID_CLT               1115
#define ERR_CANT_FIND_MAXDBCONNECTIONS_VALUE        1116


/* error message structure used in ErrorMessage API */

typedef struct _SERRORMSG

{

  int               iError;             /* error id of message */

  char              szMsg[80];          /* message to sent to
browser */

} SERRORMSG;



#ifdef TPCC_C

SERRORMSG errorMsgs[] =

{

  { ERR_SUCCESS, "Success, no error." },

  { ERR_NO_MESSAGE, "No message string available for the specified
error code." },

  { ERR_COMMAND_UNDEFINED, "Command undefined." },

  { ERR_NOT_IMPLEMENTED_YET, "Not Implemented Yet." },

  { ERR_CANNOT_INIT_TERMINAL, "Cannot initialize client
connection." },

  { ERR_OUT_OF_MEMORY, "Insufficient memory." },

  { ERR_NEW_ORDER_NOT_PROCESSED, "Cannot process new Order form."
},
```

```
  { ERR_PAYMENT_NOT_PROCESSED, "Cannot process payment form." },

  { ERR_NO_SERVER_SPECIFIED, "No Server name specified." },

  { ERR_ORDER_STATUS_NOT_PROCESSED, "Cannot process order status
form." },

  { ERR_W_ID_INVALID, "Invalid Warehouse ID." },

  { ERR_CAN_NOT_SET_MAX_CONNECTIONS, "Insufficient memory to
allocate # connections." },

  { ERR_NOSUCH_CUSTOMER, "No such customer." },

  { ERR_D_ID_INVALID, "Invalid District ID Must be 1 to 10." },

  { ERR_MAX_CONNECT_PARAM, "Max client connections exceeded, run
install to increase." },

  { ERR_INVALID_SYNC_CONNECTION, "Invalid Terminal Sync ID." },

  { ERR_INVALID_TERMID, "Invalid Terminal ID." },

  { ERR_PAYMENT_INVALID_CUSTOMER, "Payment Form, No such Customer."
},

  { ERR_SQL_OPEN_CONNECTION, "SQLOpenConnection API Failed." },

  { ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY, "Stock Level missing
Threshold key \"TT*\"." },

  { ERR_STOCKLEVEL_THRESHOLD_INVALID, "Stock Level Threshold
invalid data type range = 1 - 99." },

  { ERR_STOCKLEVEL_THRESHOLD_RANGE, "Stock Level Threshold out of
range, range must be 1 - 99." },

  { ERR_STOCKLEVEL_NOT_PROCESSED, "Stock Level not processed." },

  { ERR_NEWORDER_FORM_MISSING_DID, "New Order missing District key
\"DID*\"." },

  { ERR_NEWORDER_DISTRICT_INVALID, "New Order District ID Invalid
range 1 - 10." },

  { ERR_NEWORDER_DISTRICT_RANGE, "New Order District ID out of
Range. Range = 1 - 10." },

  { ERR_NEWORDER_CUSTOMER_KEY, "New Order missing Customer key
\"CID*\"." },

  { ERR_NEWORDER_CUSTOMER_INVALID, "New Order customer id invalid
data type, range = 1 to 3000." },

  { ERR_NEWORDER_CUSTOMER_RANGE, "New Order customer id out of
range, range = 1 to 3000." },

  { ERR_NEWORDER_MISSING_IID_KEY, "New Order missing Item Id key
\"IID*\"." },

  { ERR_NEWORDER_ITEM_BLANK_LINES, "New Order blank order lines all
orders must be continuous." },

  { ERR_NEWORDER_ITEMID_INVALID, "New Order Item Id is wrong data
type, must be numeric." },

  { ERR_NEWORDER_MISSING_SUPPW_KEY, "New Order missing Supp_W key
\"SP##*\"." },

  { ERR_NEWORDER_SUPPW_INVALID, "New Order Supp_W invalid data type
must be numeric." },

  { ERR_NEWORDER_MISSING_QTY_KEY, "New Order Missing Qty key
\"Qty##*\"." },

  { ERR_NEWORDER_QTY_INVALID, "New Order Qty invalid must be
numeric range 1 - 99." },

  { ERR_NEWORDER_SUPPW_RANGE, "New Order Supp_W value out of range
range = 1 - Max Warehouses." },

  { ERR_NEWORDER_ITEMID_RANGE, "New Order Item Id is out of range.
Range = 1 to 999999." },

  { ERR_NEWORDER_QTY_RANGE, "New Order Qty is out of range. Range =
1 to 99." },

  { ERR_PAYMENT_DISTRICT_INVALID, "Payment District ID is invalid
must be 1 - 10." },

  { ERR_NEWORDER_SUPPW_WITHOUT_ITEMID, "New Order Supp_W field
entered without a corrisponding Item_Id." },

  { ERR_NEWORDER_QTY_WITHOUT_ITEMID, "New Order Qty entered without
a corrisponding Item_Id." },


  { ERR_NEWORDER_NOITEMS_ENTERED, "New Order Blank Items between
items, items must be continuous." },

  { ERR_PAYMENT_MISSING_DID_KEY, "Payment missing District Key
\"DID*\"." },

  { ERR_PAYMENT_DISTRICT_RANGE, "Payment District Out of range,
range = 1 - 10." },

  { ERR_PAYMENT_MISSING_CID_KEY, "Payment missing Customer Key
\"CID*\"." },

  { ERR_PAYMENT_CUSTOMER_INVALID, "Payment Customer data type
invalid, must be numeric." },

  { ERR_PAYMENT_MISSING_CLT, "Payment missing Customer Last Name
Key \"CLT*\"." },

  { ERR_PAYMENT_MISSING_CID_CLT, "Payment entered without Customer
ID or last Name. " },

  { ERR_PAYMENT_LAST_NAME_TO_LONG, "Payment Customer last name
longer than 16 characters." },

  { ERR_PAYMENT_CUSTOMER_RANGE, "Payment Customer ID out of range,
must be 1 to 3000." },

  { ERR_PAYMENT_CID_AND_CLT, "Payment Customer ID and Last Name
entered must be one or other." },

  { ERR_PAYMENT_MISSING_CDI_KEY, "Payment missing Customer district
key \"CDI*\"." },

  { ERR_PAYMENT_CDI_INVALID, "Payment Customer district invalid
must be numeric." },

  { ERR_PAYMENT_CDI_RANGE, "Payment Customer district out of range
must be 1 - 10." },

  { ERR_PAYMENT_MISSING_CWI_KEY, "Payment missing Customer
Warehouse key \"CWI*\"." },

  { ERR_PAYMENT_CWI_INVALID, "Payment Customer Warehouse invalid
must be numeric." },

  { ERR_PAYMENT_CWI_RANGE, "Payment Customer Warehouse out of
range, 1 to Max Warehouses." },

  { ERR_PAYMENT_MISSING_HAM_KEY, "Payment missing Amount key
\"HAM*\"." },

  { ERR_PAYMENT_HAM_INVALID, "Payment Amount invalid data type must
be numeric." },

  { ERR_PAYMENT_HAM_RANGE, "Payment Amount out of range, 0 -
9999.99." },

  { ERR_ORDERSTATUS_MISSING_DID_KEY, "Order Status missing District
key \"DID*\"." },

  { ERR_ORDERSTATUS_DID_INVALID, "Order Status District invalid,
value must be numeric 1 - 10." },

  { ERR_ORDERSTATUS_DID_RANGE, "Order Status District out of range
must be 1 - 10." },

  { ERR_ORDERSTATUS_MISSING_CID_KEY, "Order Status missing Customer
key \"CID*\"." },


  { ERR_ORDERSTATUS_MISSING_CLT_KEY, "Order Status missing Customer
Last Name key \"CLT*\"." },

  { ERR_ORDERSTATUS_CLT_RANGE, "Order Status Customer last name
longer than 16 characters." },

  { ERR_ORDERSTATUS_CID_INVALID, "Order Status Customer ID invalid,
range must be numeric 1 - 3000." },

  { ERR_ORDERSTATUS_CID_RANGE, "Order Status Customer ID out of
range must be 1 - 3000." },

  { ERR_ORDERSTATUS_CID_AND_CLT, "Order Status Customer ID and
LastName entered must be only one." },

  { ERR_DELIVERY_MISSING_OCD_KEY, "Delivery missing Carrier ID key
\"OCD*\"." },

  { ERR_DELIVERY_CARRIER_INVALID, "Delivery Carrier ID invalid must
be numeric 1 - 10." },

  { ERR_DELIVERY_CARRIER_ID_RANGE, "Delivery Carrier ID out of
range must be 1 - 10." },

  { ERR_PAYMENT_MISSING_CLT_KEY, "Payment missing Customer Last
Name key \"CLT*\"." },

  { ERR_DB_ERROR, "A Database error has occurred." },

  { ERR_DELIVERY_NOT_PROCESSED, "Delivery not processed." },

  { ERR_DB_DELIVERY_NOT_QUEUED, "Delivery not queued." },
```

```
  { ERR_CANT_FIND_TPCC_KEY, "TPCC key not found in registry." },

  { ERR_CANT_FIND_INETINFO_KEY, "inetinfo key not found in
registry." },

  { ERR_CANT_FIND_POOLTHREADLIMIT, "PoolThreadLimit value not set
in inetinfo\\Parameters key." },

  { ERR_TERM_ALLOCATE_FAILED, "Failed to allocate terminal data
structure." },

  { ERR_DELIVERY_PIPE_SECURITY, "Failed to initialize delivery pipe
security." },

  { ERR_DELIVERY_PIPE_CREATE, "Failed to create delivery pipe." },

  { ERR_DELIVERY_PIPE_OPEN, "Failed to open delivery pipe." },

  { ERR_DELIVERY_PIPE_READ, "Failed to read delivery pipe." },

  { ERR_DELIVERY_PIPE_DISCONNECT, "Failed to start delivery pipe
disconnect thread."},

  { ERR_PENDING, "Transaction pending."},

  { ERR_CANT_START_FRCDINIT_THREAD, "Can't start Forced
Initialization thread." },

  { ERR_CANT_START_DELIVERY_THREAD, "Can't start delivery thread."
},

  { ERR_GOVERNOR_VALUE_NOT_FOUND, "Governor value not found in
Registry." },

  { ERR_SERVER_MISMATCH, "Server does not match registry value." },

  { ERR_DATABASE_MISMATCH, "Database name does not match registry
value." },

  { ERR_USER_MISMATCH, "User name does not match registry value."
},

  { ERR_PASSWORD_MISMATCH, "Password does not match registry
value." },


  { ERR_CANT_CREATE_ALL_THREADS_EVENT, "Can't create All Threads
Event." },

  { ERR_CANT_CREATE_FORCE_THRED_STRT_EVENT, "Can't create Force
Thread Start Event." },

  { ERR_CANT_ALLOCATE_THREAD_LOCAL_STORAGE, "Can't allocate thread
local storage" },

  { ERR_CANT_SET_THREAD_LOCAL_STORAGE, "Can't set thread local
storage." },

  { ERR_FORCE_CONNECT_THREAD_FAILED, "At least one database connect
call failed, check log files for specific error." },

  { ERR_CANT_FIND_SERVER_VALUE, "Server value not set in TPCC key."
},

  { ERR_CANT_FIND_PATH_VALUE, "PATH value not set in TPCC key." },

  { ERR_CANNOT_CREATE_RESULTS_FILE, "Cannot create results file."
},

  { ERR_CANT_FIND_DATABASE_VALUE, "Database value not set in TPCC
key." },

  { ERR_CANT_FIND_USER_VALUE, "User value not set in TPCC key." },

  { ERR_CANT_FIND_PASSWORD_VALUE, "Password value not set in TPCC
key." },

  { ERR_DELIVERY_OUTPUT_PIPE_WRITE, "Failed to write output
delivery pipe." },

  { ERR_DELIVERY_OUTPUT_PIPE_READ, "Failed to read output delivery
pipe." },

  { ERR_DELIVERY_MISSING_QUEUETIME_KEY, "Delivery queue time
missing from query." },

  { ERR_DELIVERY_QUEUETIME_INVALID, "Delivery queue time is
invalid." },

  { ERR_ALREADY_LOGGED_IN, "TPCCConnectDB has already been called."
},

  { ERR_DB_NOT_LOGGED_IN, "TPCCConnectDB has not yet been called."
},

  { ERR_INVALID_FORM, "The FORM field is missing or invalid." },

  { ERR_DELIVERY_MUST_CONNECTDB, "Synchronous transport requires
delivery server connect to database." },

  { ERR_INVALID_FORM_AND_CMD_NOT_BEGIN, "The FORM field is missing
and CMD is not Begin." },

  { ERR_MAX_CONNECTIONS_EXCEEDED, "The maximum number of
connections has been exceeded." },

  { ERR_CANT_FIND_MAXDBCONNECTIONS_VALUE, "MaxDBConnections value
not set in TPCC key." },

  { ERR_CANNOT_FIND_CONNECTION, "Transport layer unable to find a
DBContext coresponding to the CallersContext." },

  { ERR_CKPT_NOT_INITIALIZED, "The checkpoint subsystem has not
been started." },

  {       0, "" }

};

#else

extern SERRORMSG errorMsgs[];

#endif /* TPCC_C */


#endif /* TPCCERR_H */


**************************
tpccstruct.h
**************************

#ifndef TPCCSTRUCT_H

#define TPCCSTRUCT_H


#include "apr_thread_mutex.h"


/*****************************************************************
**********

*****************************  tpccstruct.h
*********************************

*****************************************************************
**********/

/*

**  tpccstruct.h:  This header file declares data structures for
use in

**            application and server

*/

/* Copyright 1996 Digital Equipment Corporation */

/*

**  Author: Bill Carr

**              (Majority of content from previous work by Ruth
Morgenstein)

**

 *

 * Modification history:

 *

 *

 *      08/01/2002      Andrew Bond, HP

 *                      - Conversion to run under Linux and Apache

 *

 */


#include <time.h>


/*

#include <sys/types.h>
```

```
*/


#define BOOLEAN int

#define BOOL int

#define VMS     0

#define LINEMAX 256

#define FALSE   0

#ifndef TRUE

#define TRUE    1

#endif


#define MAX_OL  15



#ifdef FFE_DEBUG


# define CALLING_LH 0x0001

# define IN_LH                0x0002

# define IN_RH                0x0004

# define IN_DB                0x0008

# define LEAVING_DB 0x0010

# define LEAVING_RH 0x0020

# define LEAVING_LH 0x0040

# define CALLING_RESP         0x0080

# define UNRESERVING          0x0100


# define ALL_STAGES 0x01ff


  /*                           users * scale * hours * min * txn/no
*/

# define HISTORY_SIZE ((int)( 5000 *   1.2 *     2 *  60 *
2.22222))


# define TRANSACTION_DEBUG_INFO\

  int iStage;\

  int dwThreadId;\

  int dwXPThreadId;\

  int iSynchronous;\

  int iType;\

  int iReserveHistoryId;\

  int iUnreserveHistoryId;\


# define INIT_TRANSACTION(type,pData)\

  gpTransactionPool->iHistoryId++;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iFailure = 0;\

  _ASSERT( gpTransactionPool->iNextFree <= gpTransactionPool-
>iMaxIndex );\

  memset( pData, 0x01, gpTransactionPool->iTransactionSize );\

  pData->iStage = 0;\

  pData->dwThreadId = GetCurrentThreadId();\

  pData->dwXPThreadId = 0;\

  pData->iType = type;\

  pData->iReserveHistoryId = gpTransactionPool->iHistoryId;\

  pData->iUnreserveHistoryId = 0;\

  gpTransactionPool->History[gpTransactionPool->iHistoryId].iOpCode
= 1;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iReserveHistoryId = gpTransactionPool->iHistoryId;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iUnreserveHistoryId = 0;\

  gpTransactionPool->History[gpTransactionPool->iHistoryId].iType =
type;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].dwThreadId = pData->dwThreadId;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].dwXPThreadId = pData->dwXPThreadId;\

  gpTransactionPool->History[gpTransactionPool->iHistoryId].pTrans
= pData;


# define CHECK_TRANSACTION(type,pData)\

  gpTransactionPool->iHistoryId++;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iFailure++;\

  _ASSERT( gpTransactionPool->iNextFree > 0 );\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iFailure++;\

  _ASSERT(((pData->iStage) | ALL_STAGES) == ALL_STAGES);\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iFailure++;\

  if( pData->iSynchronous == 1 )\

    _ASSERT((pData->dwThreadId == GetCurrentThreadId( )));\

  else if( pData->iSynchronous == 0 )\

    _ASSERT((pData->dwXPThreadId == GetCurrentThreadId( )));\

  else\

    _ASSERT(FALSE);\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iFailure++;\

  _ASSERT((pData->iType==type));\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iFailure++;\

  _ASSERT((gpTransactionPool->History[pData-
>iReserveHistoryId].pTrans) == pData);\

  pData->iUnreserveHistoryId = gpTransactionPool->iHistoryId;\

  gpTransactionPool->History[gpTransactionPool->iHistoryId].iOpCode
= 2;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iReserveHistoryId = pData->iReserveHistoryId;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].iUnreserveHistoryId = gpTransactionPool->iHistoryId;\

  gpTransactionPool->History[gpTransactionPool->iHistoryId].iType =
type;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].dwThreadId = pData->dwThreadId;\

  gpTransactionPool->History[gpTransactionPool-
>iHistoryId].dwXPThreadId = pData->dwXPThreadId;\

  gpTransactionPool->History[gpTransactionPool->iHistoryId].pTrans
= pData;


#else /* FFE_DEBUG */


# define TRANSACTION_DEBUG_INFO
```

```
# define INIT_TRANSACTION(type,pData)


# define CHECK_TRANSACTION(type,pData)


#endif /* FFE_DEBUG */


# define NUMBER_POOL_TRANS_TYPES 5
# define DELIVERY_TRANS 0
# define NEW_ORDER_TRANS 1
# define ORDER_STATUS_TRANS 2
# define PAYMENT_TRANS 3
# define STOCK_LEVEL_TRANS 4


#define RESERVE_TRANSACTION_STRUCT(type,pData)\
  apr_thread_mutex_lock( gpTransactionPool->critSec );\
  pData = gpTransactionPool->index[gpTransactionPool->iNextFree];\
  INIT_TRANSACTION(type,pData);\
  gpTransactionPool->iNextFree++;\
  apr_thread_mutex_unlock( gpTransactionPool->critSec );


#define UNRESERVE_TRANSACTION_STRUCT(type,pData)\
  apr_thread_mutex_lock( gpTransactionPool->critSec );\
  CHECK_TRANSACTION(type,pData);\
  gpTransactionPool->index[--gpTransactionPool->iNextFree] =
pData;\
  apr_thread_mutex_unlock( gpTransactionPool->critSec );


typedef struct
{
  apr_thread_mutex_t * critSec;
  int     iNextFree;
#ifdef FFE_DEBUG
  int     iMaxIndex;
  int     iTransactionSize;
  int     iHistoryId;
  struct
  {
    int             iOpCode;
    int             iFailure;
    int             iReserveHistoryId;
    int             iUnreserveHistoryId;
    int             iType;
    int   dwThreadId;
    int   dwXPThreadId;
    void  *pTrans;
  }                 History[HISTORY_SIZE];
#endif
  void    *index[1];
  char    data[1];
} TransactionPoolStruct, *pTransactionPoolStruct;
```

```
/*
**  Data structures descriptions for IO data for each transaction
type
**
*/


typedef void CallersContext;
typedef void *pCallersContext;
typedef void *DBContext;


#define INVALID_DB_CONTEXT NULL


typedef struct _DBDate {
          int year;     /* 1900 - 2100 */
          int month;              /* 1 - 12 */
          int day;      /* 1 - 31 */
          int hour;     /* 0 - 23 */
          int minute;             /* 0 - 59 */
          int second;             /* 0 - 59 */
} DBDateData, *pDBDateData;


/* Data common to all transactions that represents the connection
to the UI */
/* and the database are built as a macro to reduce duplication. */
#define CONN_DATA \
    TRANSACTION_DEBUG_INFO\
    int     w_id;\
    int     ld_id;\
    CallersContext *pCC;\
    int     status;\
    int     dbstatus;



typedef struct _ConnData
{
    CONN_DATA
} ConnData, *pConnData;


/* DELIVERY is built as a macro so that i_delivery struct is
consistant with */
/* the io_delivery struct.  Note also that the input portion of the
delivery */
/* data can be simply memcpyed from the input to the input/output
struct. */
#define I_DELIVERY \
    CONN_DATA\
    time_t                    queue_time;\
    int                       delta_time;        /* in milliseconds
*/\
    struct timeval  tbegin;\
    struct timeval  tend;\
    int                       o_carrier_id;


typedef struct _DeliveryDataInput {
    I_DELIVERY
} DeliveryDataInput, *pDeliveryDataInput;


typedef struct _DeliveryData {
    I_DELIVERY                          /* see comment above */
    int     o_id[10];
} DeliveryData, *pDeliveryData;


struct io_order_line {
    int     ol_i_id;
    int     ol_supply_w_id;
    int     ol_quantity;
    char    i_name[25];
    int     s_quantity;
    char    b_g[2];
    double  i_price;
    double  ol_amount;
};


typedef struct _NewOrderData {
    CONN_DATA
    int     d_id;
    int     c_id;
    int     o_ol_cnt;
    int     o_all_local;
    struct io_order_line o_ol[MAX_OL];
    DBDateData o_entry_d;
    char    c_last[17];
    char    c_credit[3];
    double  c_discount;
    double  w_tax;
    double  d_tax;
    int     o_id;
    double  tax_n_discount;
    double  total_amount;
} NewOrderData, *pNewOrderData;


struct status_order_line {
    int     ol_supply_w_id;
    int     ol_i_id;
    int     ol_quantity;
    double  ol_amount;
    DBDateData    ol_delivery_d;
};


typedef struct _OrderStatusData {
    CONN_DATA
```

```
    BOOLEAN byname;
    int     d_id;
    int     c_id;
    char    c_last[17];
    char    c_first[17];
    char    c_middle[3];
    double  c_balance;
    int     o_id;
    DBDateData    o_entry_d;
    int     o_carrier_id;
    int     o_ol_cnt;
    struct status_order_line    s_ol[MAX_OL];
} OrderStatusData, *pOrderStatusData;

typedef struct _PaymentData {
    CONN_DATA
    BOOLEAN byname;
    int     d_id;
    int     c_id;
    char    c_last[17];
    int     c_w_id;
    int     c_d_id;
    double  h_amount;
    DBDateData h_date;
    char    w_street_1[21];
    char    w_street_2[21];
    char    w_city[21];
    char    w_state[3];
    char    w_zip[10];
    char    d_street_1[21];
    char    d_street_2[21];
    char    d_city[21];
    char    d_state[3];
    char    d_zip[10];
    char    c_first[17];
    char    c_middle[3];
    char    c_street_1[21];
    char    c_street_2[21];
    char    c_city[21];
    char    c_state[3];
    char    c_zip[10];
    char    c_phone[17];
    DBDateData    c_since;
    char    c_credit[3];
    double  c_credit_lim;
    double  c_discount;
    double  c_balance;
    char    c_data[201];
} PaymentData, *pPaymentData;

typedef struct _StockLevelData {
    CONN_DATA
    int     threshold;
    int     low_stock;
} StockLevelData, *pStockLevelData;

typedef struct _CheckpointData {
    CONN_DATA
    int     how_many;
    int     interval;
} CheckpointData, *pCheckpointData;

/*
**  Data structure for input & output data
*/

typedef struct _TransactionData {
    int type;
    union {
          DeliveryData delivery;
          NewOrderData newOrder;
          OrderStatusData orderStatus;
          PaymentData payment;
          StockLevelData stockLevel;
         CheckpointData checkpoint;
   }  info;
} TransactionData, *pTransactionData;


typedef struct _TransportData {
  BOOLEAN asynchronous;
  BOOLEAN generic;
  int               num_gc;
  int               num_dy;
  int               num_no;
  int               num_os;
  int               num_pt;
  int               num_sl;
  BOOLEAN dy_use_transport;
  int               num_dy_servers;
  int               num_queued_deliveries;
  int               num_queued_responses;
} TransportData, *pTransportData;

/* Data structure for passing connection information */
typedef struct _LoginData {
  CONN_DATA
  char                      szServer[32];
  char                      szDatabase[32];
  char                      szUser[32];
```

```
  char                        szPassword[32];
  char                        szApplication[32];
} LoginData, *pLoginData;


#endif /* TPCCSTRUCT_H */


**************************
tux_cli.c
**************************

/*+**********************************************************************
**********


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 *
*
 *  Updated November 20, 2001 - Susan Georgson
*
 *  Converted tpcc_fct.c file to tux_cli.c
*
 *  Changed transaction monitor from DB Web Connector to Tuxedo
*


**********************************************************************
*********/


/*
 *
 *
 * Modification history:
 *
 *
 *      08/01/2002      Andrew Bond, HP
 *                      - Conversion to run under Linux
 *
 */


#include <stdlib.h>   /* stg - added for change to Tuxedo */
#include <string.h>
#include <stdio.h>
#include <sys/time.h>


#include <oci.h>
#include <ocidfn.h>
#include <ociapr.h>


#include <tpccstruct.h>
#include <oracle_db8.h>
#include <tpccapi.h>
#include <tpccerr.h>


#include <tpcc.h>


#include <pthread.h>


/* tuxedo include files */
#include <atmi.h>


#ifdef FFE_DEBUG
# include <crtdbg.h>
#endif


#define TOTAL_ADMIN_CONNECTIONS 1


#define FILENAMESIZE 256


static pthread_key_t initkey;


static pthread_once_t initkey_once = PTHREAD_ONCE_INIT;


static void doinit(void)
{
  pthread_key_create(&initkey, NULL);
}


/* Returns non-zero if thread has been initialized already. */
static int IsInited(void)
{
```

```
  void *p;
  pthread_once(&initkey_once, doinit);
  p = pthread_getspecific(initkey);
  return (p == NULL);
}


static void NowInited(void)
{
  pthread_setspecific(initkey, (void *)1); /* non-NULL value. */
}


/* stg - IsTuxInit is added to check if Tuxedo has been initialized
*/
/* If Tuxedo has not been initialized, then Tuxedo is initialized
during */
/* this function.  */
/*
 * FUNCTION int IsTuxInit
 */
int
IsTuxInit()
{
  TPINIT *tpinitbuf;


  int retcode = -1;
  int count = 0;
  static int num_tpinits = 0;


#if (DEBUG == 1)
        fprintf(MyLogFile, "Entering IsTuxInit\n");
          fflush(MyLogFile);
#endif
  if(IsInited())
    {
      while(count < 20)
      {
            if(NULL == (tpinitbuf = (TPINIT *) tpalloc("TPINIT",
NULL,

sizeof(TPINIT))))
            {
              TPCCErr("error with tpalloc - %d - %d",
tperrno,count);
            }
            else
            {
              tpinitbuf->flags |= TPMULTICONTEXTS;
              itoa(++num_tpinits, tpinitbuf->cltname);
              retcode = tpinit(tpinitbuf);
#if (DEBUG == 1)
        fprintf(MyLogFile, "Back from tpinit, retcode=%d\n",
retcode);
          fflush(MyLogFile);
#endif
              if(-1 != retcode)
              {
                NowInited();
                tpfree((char*)tpinitbuf);
                break;
              }
              else
              {
                TPCCErr("error with TPINIT - %s (%d) -
%d\n\t\t..%s..",
                            tpstrerror(tperrno),
                            tperrno,
                            count,
                            tpstrerrordetail( tperrordetail( 0 ), 0
));
                tpfree((char*)tpinitbuf);
              }
            }

            count++;
            if(count > 50)
              {
                retcode = -1;
                TPCCErr("exceeded 50 trys in TPINIT");
              }



            sleep(10);
      }
/*
      sleep(50);
*/
      if( -1 != retcode)
          return ERR_DB_SUCCESS;
      else
          return(retcode);


    }
  return ERR_DB_SUCCESS;
}


/* stg - end IsTuxInit function */



/* FUNCTION: void DELIErrorMessage(int iError)
 *
 * PURPOSE:     This function writes an error message to the error
log file.
 *
 * ARGUMENTS:   int             iError  error id to be logged
 *
```

```
 * RETURNS:     None
 *
 * COMMENTS:    None
 *
 */

void
DELIErrorMessage(int iError)
{

  int ii;

  for( ii = 0; errorMsgs[ii].szMsg[0]; ii++ ) {
    if ( iError == errorMsgs[ii].iError ) {
      TPCCErr( "*Error(%d): %s\r\n", iError, errorMsgs[ii].szMsg );
      return;
    }
  }

  TPCCErr( "*Error(%d): Unknown Error.\r\n", iError );
  return;
}



int TPCCDelivery( pDeliveryData pDelivery)
{
  int                           retcode;
  struct timezone             tz;

  time( &pDelivery->queue_time );

  gettimeofday(&pDelivery->tbegin, &tz);

  retcode = TPCCDeliveryDeferred(pDelivery);

  if ( ERR_DB_PENDING != retcode )
  {
    if( ERR_DB_SUCCESS != retcode)
    {
      /* send a flag to the reducer to mark an error on the
delivery */
      pDelivery->queue_time = 1;
      DELIErrorMessage(retcode);
    }

  }

  return ERR_DB_SUCCESS;
}
```

```
/* stg - begin Tuxedo change of TPCCDelivery Deferred */
/*
 * FUNCTION int TPCCDelivery
 */

int
TPCCDeliveryDeferred( pDeliveryData ppDelivery )
{
  int retcode = ERR_DB_SUCCESS;

  pDeliveryData retptr;
  int dysiz = sizeof(DeliveryData);

#if (DEBUG == 1)
        fprintf(MyLogFile, "Entering TPCCDeliveryDeferred\n");
          fflush(MyLogFile);
#endif

  /* check to see that the database is connected. */
  if( ERR_DB_SUCCESS != IsTuxInit() )
    {
      TPCCErr("IsTuxInit - delivery ");
      return ERR_DB_ERROR;
    }

  /* allocate memory and copy over data */
  if(NULL == ( retptr= (pDeliveryData) tpalloc("CARRAY", NULL,
dysiz)))
    {

      TPCCErr("tp alloc in delivery");
      return ERR_DB_ERROR;
    }
  memcpy( retptr, ppDelivery, dysiz);

  /* Call tuxedo for Delivery */

  retcode = tpacall("dy_transaction", (char
*)retptr,dysiz,TPNOREPLY|TPSIGRSTRT|TPNOTIME);
  if( -1 == retcode )
    {
      TPCCErr("tpcall - delivery: %d", tperrno);
      tpfree((char*) retptr);
      return ERR_DB_ERROR;
    }
/*
  memcpy(ppDelivery, retptr, dysiz);
*/
  tpfree((char*) retptr);
  return ERR_DB_SUCCESS;
}
```

```
/* stg - end Tuxedo change of TPCCDelivery Deferred */



/* stg - begin Tuxedo change of TPCCNewOrder */
/*
 * FUNCTION int TPCCNewOrder
 */
int
TPCCNewOrder( pNewOrderData ppNewOrder )
{
  int retcode = ERR_DB_SUCCESS;

  pNewOrderData retptr;
  int nosiz = sizeof(NewOrderData);

#if (DEBUG == 1)
        fprintf(MyLogFile, "Entering TPCCNewOrder\n");
          fflush(MyLogFile);
#endif

  /* check to see that the database is connected. */
  if( ERR_DB_SUCCESS != IsTuxInit() )
    {
      TPCCErr("IsTuxInit - new order: %d ", tperrno);
      return ERR_DB_ERROR;
    }

  /* allocate memory and copy over data */
  if(NULL == ( retptr= (pNewOrderData) tpalloc("CARRAY", NULL,
nosiz)))
    {
      TPCCErr("tp alloc in neworder: %d ", tperrno);
      return ERR_DB_ERROR;
    }
  memcpy( retptr, ppNewOrder, nosiz);

  /* Call tuxedo for New Order */
  retcode = tpcall("no_transaction", (char *)retptr, nosiz,
                     (char**)&retptr, (long *)&nosiz,
TPSIGRSTRT|TPNOTIME);

  if( -1 == retcode )
    {
      TPCCErr("tpcall - new order: %d", tperrno);
      tpfree((char*) retptr);
      return ERR_DB_ERROR;
    }
  memcpy(ppNewOrder, retptr, nosiz);
  tpfree((char*) retptr);
  return ERR_DB_SUCCESS;
}

/* stg - end Tuxedo change of TPCCNewOrder */



/* stg - begin Tuxedo change of TPCCOrderStatus */
/*
 * FUNCTION int TPCCOrderStatus
 */
int
TPCCOrderStatus( pOrderStatusData ppOrderStatus )
{
  int retcode = ERR_DB_SUCCESS;

  pOrderStatusData retptr;
  int ossiz = sizeof(OrderStatusData);

#if (DEBUG == 1)
        fprintf(MyLogFile, "Entering TPCCOrderStatus\n");
          fflush(MyLogFile);
#endif

  /* check to see that the database is connected. */
  if( ERR_DB_SUCCESS != IsTuxInit() )
    {
      TPCCErr("IsTuxInit - order status");
      return ERR_DB_ERROR;
    }

  /* allocate memory and copy over data */
  if(NULL == ( retptr= (pOrderStatusData) tpalloc("CARRAY", NULL,
ossiz)))
    {
      TPCCErr("tp alloc in order status: %d", tperrno);
      return ERR_DB_ERROR;
    }
  memcpy( retptr, ppOrderStatus, ossiz);

  /* Call tuxedo for Order Status */
  retcode = tpcall("os_transaction", (char *)retptr, ossiz,
                     (char**)&retptr, (long *)&ossiz,
TPSIGRSTRT|TPNOTIME);
#if (DEBUG == 1)
        fprintf(MyLogFile, "TPCCOrderStatus:tpcall returned $d\n",
retcode);
          fflush(MyLogFile);
#endif
  if( -1 == retcode )
    {
      TPCCErr("tpcall - order status");
```

```
      tpfree((char*) retptr);
      return ERR_DB_ERROR;
    }
  memcpy(ppOrderStatus, retptr, ossiz);
  tpfree((char*) retptr);
  return ERR_DB_SUCCESS;
}

/* stg - end Tuxedo change of TPCCOrderStatus */



/* stg - begin Tuxedo change of TPCCPayment */
/*
 * FUNCTION int TPCCPayment
 */
int
TPCCPayment( pPaymentData ppPayment )
{
  int retcode = ERR_DB_SUCCESS;

  pPaymentData retptr;
  long ptsiz = sizeof(PaymentData);

#if (DEBUG == 1)
        fprintf(MyLogFile, "Entering TPCCPayment\n");
          fflush(MyLogFile);
#endif

  /* check to see that the database is connected. */
  if( ERR_DB_SUCCESS != IsTuxInit() )
    {
      TPCCErr("IsTuxInit - payment ");
      return ERR_DB_ERROR;

    }

  /* allocate memory and copy over data */
  if(NULL == ( retptr= (pPaymentData) tpalloc("CARRAY", NULL,
ptsiz)))
    {
      TPCCErr("tp alloc in payment");
      return ERR_DB_ERROR;
    }
  memcpy( retptr, ppPayment, ptsiz);


  /* Call tuxedo for Payment */
  retcode = tpcall("pt_transaction", (char *)retptr, ptsiz,
                       (char**)&retptr, &ptsiz,
TPSIGRSTRT|TPNOTIME);
  if( -1 == retcode )
    {
      TPCCErr("tpcall - payment: %d ", tperrno);
      tpfree((char*) retptr);
      return ERR_DB_ERROR;
    }
  memcpy(ppPayment, retptr, ptsiz);
  tpfree((char*) retptr);
  return ERR_DB_SUCCESS;
}

/* stg - end Tuxedo change of TPCCPayment */



/* stg - begin Tuxedo change of TPCCStockLevel */
/*
 * FUNCTION int TPCCStockLevel
 */
int
TPCCStockLevel( pStockLevelData ppStockLevel )
{
  int retcode = ERR_DB_SUCCESS;

  pStockLevelData retptr;
  int slsiz = sizeof(StockLevelData);



#if (DEBUG == 1)
        fprintf(MyLogFile, "Entering TPCCStockLevel\n");
          fflush(MyLogFile);
#endif
  /* check to see that the database is connected. */
  if( ERR_DB_SUCCESS != IsTuxInit() )
    {
      TPCCErr("IsTuxInit - stock level ");
      return ERR_DB_ERROR;
    }

  /* allocate memory and copy over data */
  if(NULL == ( retptr= (pStockLevelData) tpalloc("CARRAY", NULL,
slsiz)))
    {
      TPCCErr("tp alloc in stock level");
      return ERR_DB_ERROR;
    }
  memcpy( retptr, ppStockLevel, slsiz);

  /* Call tuxedo for Stock Level */
  retcode = tpcall("sl_transaction", (char *)retptr, slsiz,
                       (char**)&retptr, (long *)&slsiz,
TPSIGRSTRT|TPNOTIME);
  if( -1 == retcode )
    {
```

```
      TPCCErr("tpcall - stock level: %d", tperrno);
      tpfree((char*) retptr);
      return ERR_DB_ERROR;
    }
  memcpy(ppStockLevel, retptr, slsiz);
  tpfree((char*) retptr);
  return ERR_DB_SUCCESS;
}

/* stg - end Tuxedo change of TPCCStockLevel */


/*
**++
**  FUNCTION NAME: TPCCStartup
**--
*/
int
TPCCStartup()
{
  return ERR_SUCCESS;
}


/*
**++
**  FUNCTION NAME: TPCCConnect
**--
*/
int
TPCCConnect( pLoginData pLogin )
{

  if( 0 != strcmp( pLogin->szServer, gszServer ))
    return ERR_SERVER_MISMATCH;

  if( 0 != strcmp( pLogin->szDatabase, gszDatabase ))
    return ERR_DATABASE_MISMATCH;

  if( 0 != strcmp( pLogin->szUser, gszUser ))
    return ERR_USER_MISMATCH;

  if( 0 != strcmp( pLogin->szPassword, gszPassword ))
    return ERR_PASSWORD_MISMATCH;

  return ERR_DB_SUCCESS;
}

/*
**++
**  FUNCTION NAME: TPCCDisconnect
**--
*/
int
TPCCDisconnect( pCallersContext pCC )
{
  return ERR_DB_SUCCESS;
}


/* stg - added for TuxShutdown function for Tuxedo */
/*
 *  FUNCTION int TuxShutdown
 */
int
TuxShutdown()
{
  return ERR_DB_SUCCESS;
}

/*
**++
**  FUNCTION NAME: TPCCShutdown
**--
*/
int
TPCCShutdown( void )
{
  int                       retcode;

  /* shut down the servers listed in the TUXCONFIG file (ubb* file)
*/
  retcode = system("tmshutdown -y");
  if (retcode != 0)
    {
      TPCCErr("Error shutting the tuxedo servers down.");
      return retcode;
    }

  return(TuxShutdown());
}

/* stg - don't need the following for Tuxedo - I think! */
#if 0
void __cdecl
force_connect( void *arglist )
{
  LoginData                 login;
  int                       txnType;

  login.w_id = 0;
```

```
  login.ld_id = 0;
  login.pCC = 0;
  login.szApplication[0] = '\0';
  strcpy( login.szServer, gszServer );
  strcpy( login.szDatabase, gszDatabase );
  strcpy( login.szUser, gszUser );
  strcpy( login.szPassword, gszPassword );

  txnType = (int) arglist;
  switch ( txnType ) {
  case TYPE_DY:
    dy_transaction_init( STDL_SYNCHRONOUS, &login,
                         (struct io_login_wksp *)&login );
    break;

  case TYPE_NO:
    no_transaction_init( STDL_SYNCHRONOUS, &login,
                         (struct io_login_wksp *)&login );
    break;

  case TYPE_OS:
    os_transaction_init( STDL_SYNCHRONOUS, &login,
                         (struct io_login_wksp *)&login );
    break;

  case TYPE_PT:
    pt_transaction_init( STDL_SYNCHRONOUS, &login,
                         (struct io_login_wksp *)&login );
    break;

  case TYPE_SL:
    sl_transaction_init( STDL_SYNCHRONOUS, &login,
                         (struct io_login_wksp *)&login );
    break;

  case TYPE_GC:
    gc_transaction_init( STDL_SYNCHRONOUS, &login,
                         (struct io_login_wksp *)&login );
    break;
  }
  if ( login.status != ERR_DB_SUCCESS) {
    /** Only store the first failure **/
    if ( ERR_DB_SUCCESS == gInitRetStatus )
      gInitRetStatus = ERR_FORCE_CONNECT_THREAD_FAILED;

    TPCCErr( "Connect Transaction returned %8X\r\n", login.status
);
  }
  if ( InterlockedDecrement( &gForceAllThreadsCtr ) == 0 )
    SetEvent( gForceAllThreadsEvent );
  return;
}
#endif /*stg - end #if 0 section */


**************************
tux_srv.c
**************************

/*+*************************************************************
**********

 *
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 *
*
 *
*

*****************************************************************
*******-*/


/*
 *
 *
 * Modification history:
 *
 *
 *      08/01/2002      Andrew Bond, HP
 *                      - Conversion to run under Linux
 *
 */
```

```
#include <errno.h>
#include <unistd.h>
#include <string.h>
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <sys/time.h>

#include <oci.h>
#include <ocidfn.h>
#include <ociapr.h>

#include <tpccstruct.h>
#include <oracle_db8.h>
#include <tpccapi.h>
#include <tpccerr.h>

#include <tpcc.h>

#include <atmi.h>

#ifdef FFE_DEBUG
# include <crtdbg.h>
#endif

/* dbproc pointer for db connection */
DBContext DBC;

static FILE  *fpLog = NULL;                  /* pointer to log file
*/

FILE  *LogFile;
FILE  *MyLogFile;

#define MAXNUMDIGITS 10

char                            szTpccLogPath[FILENAMESIZE];
char                            szNumber[MAXNUMDIGITS];




/* FUNCTION: void DELILog( pDeliveryData pDelivery )
 *
 * PURPOSE:     Writes the delivery results to the delivery log
file.
 *
 * ARGUMENTS:   LPSYSTEMTIME    lpBegin         Local delivery
start time.
 *              pDeliveryData   pDelivery       Delivery data to be
written.
 *
 * RETURNS:     None
 *
 * COMMENTS:    None
 *
 */

void
DELILog( pDeliveryData pDelivery )
{
  struct tm             start;
  struct tm             end;
  time_t                endt;
  unsigned              delta_time_seconds;
  unsigned              delta_time_milliseconds;



  pDelivery->delta_time = ((pDelivery->tend.tv_sec - pDelivery-
>tbegin.tv_sec) * 1000) + (int)ceil((pDelivery->tend.tv_usec -
pDelivery->tbegin.tv_usec)/1000);


  memcpy( &start, localtime( &pDelivery->tbegin.tv_sec), sizeof(
start ));
  memcpy( &end, localtime( &pDelivery->tend.tv_sec), sizeof( end
));


  fprintf( fpLog,
           "%4.4d/%2.2d/%2.2d,"
           "%2.2d:%2.2d:%2.2d:%3.3d,"
           "%2.2d:%2.2d:%2.2d:%3.3d,"
           "%8.8d,"
           "%5.5d,%2.2d,"
           "%4.4d,%4.4d,%4.4d,%4.4d,%4.4d,"
           "%4.4d,%4.4d,%4.4d,%4.4d,%4.4d\r\n",
           1900+start.tm_year, start.tm_mon+1, start.tm_mday,
           start.tm_hour, start.tm_min, start.tm_sec, pDelivery-
>tbegin.tv_usec/1000,
           end.tm_hour, end.tm_min, end.tm_sec, pDelivery-
>tend.tv_usec/1000,
           pDelivery->delta_time,
           pDelivery->w_id, pDelivery->o_carrier_id,
           pDelivery->o_id[0], pDelivery->o_id[1],
           pDelivery->o_id[2], pDelivery->o_id[3],
           pDelivery->o_id[4], pDelivery->o_id[5],
           pDelivery->o_id[6], pDelivery->o_id[7],
           pDelivery->o_id[8], pDelivery->o_id[9] );


  fflush(fpLog);


  return;
}
```

```
/*
**++
**  FUNCTION NAME: tpsvrinit
**--
*/
int
tpsvrinit( int argc, char *argv[] )
{
  BOOL                        bLog;
          /* stg next two lines not needed for v6 web ora tux app
code
            StartupData                 Startup;
            pStartupData                pStartup = &Startup; */
            int status;
            char  szTmp[FILENAMESIZE];
            LoginData  login;

            /* to avoid compiler errors */
            argc = argc;
            argv = argv;


            /* used for debugging the server code */
/*
            sleep(30000);
*/


            userlog("Starting tpcc server");

            /* Get login data from file settings */
  status = GetConfigValue("Server", (char *)&szTmp);
  if ( status != ERROR_SUCCESS )
    return ERR_CANT_FIND_SERVER_VALUE;
  strcpy(login.szServer, szTmp);



  status = GetConfigValue("Database", (char *)&szTmp);
  if ( status != ERROR_SUCCESS )
    return ERR_CANT_FIND_DATABASE_VALUE;
  strcpy(login.szDatabase, szTmp);



  status = GetConfigValue("User", (char *)&szTmp);
  if ( status != ERROR_SUCCESS )
    return ERR_CANT_FIND_USER_VALUE;
  strcpy(login.szUser, szTmp);



  status = GetConfigValue("Password", (char *)&szTmp);
  if ( status != ERROR_SUCCESS )
    return ERR_CANT_FIND_PASSWORD_VALUE;
  strcpy(login.szPassword, szTmp);

  /* Get Path registry value */
  status = GetConfigValue("PATH", (char *)&szTmp);
  if (status != ERROR_SUCCESS )
    return ERR_CANT_FIND_PATH_VALUE;
  strcpy (szTpccLogPath, szTmp);

  if (ERROR_SUCCESS == status)
  {
    /* set application name */
/*     strcpy( pStartup->Login.databaseLogin.szApplication,
"TUX_SRV" ); */

    TPCCStartupDB();

/* populate LoginData login structure like in tpcc_fct.c */
/* Server, Database, User and Password already populated into login
above */
   login.w_id = 0;
   login.ld_id = 0;
   login.pCC = 0;
   login.szApplication[0] = '\0';

   strcpy(szTmp, szTpccLogPath);
   strcat(szTmp, "delilog");
   itoa(getpid(), szNumber);
   strcat(szTmp, szNumber);
   fpLog = fopen(szTmp, "wb");
   if ( NULL == fpLog )
      return ERR_CANNOT_CREATE_RESULTS_FILE;

    status = TPCCConnectDB( (OraContext  **)&DBC, &login );

    if(ERR_DB_SUCCESS != status)
    {
      TPCCErr( "tpsvrinit : Error logging into db." );
      return ERR_DB_ERROR;
    }
    TPCCErr( "Finished TPCCConnectDB, dbprocptr = %8X\r\n", DBC );
  }
  else
  {
    TPCCErr("tpsvrinit : could not get configuration settings");
  }
```

```
  return (0);
}


/*
**++
**  FUNCTION NAME: tpsvrdone
**--
*/
void tpsvrdone(void)
{
  TPCCShutdownDB();
  return;
}

/*
**++
**  FUNCTION NAME: dy_transaction
**--
*/
void
dy_transaction( TPSVCINFO *dy_wksp )
{
  struct timeval    tend;
  struct timezone   tz;

  pDeliveryData ptr;

  ptr = (pDeliveryData)dy_wksp->data;

  ptr->status = TPCCDeliveryDB( DBC, ptr );

  gettimeofday(&ptr->tend, &tz);

  /* update log */
  DELILog( ptr );

  if(ERR_DB_ERROR != ptr->status)
    tpreturn(TPSUCCESS, ptr->status, dy_wksp->data, dy_wksp->len,
0);
  else
    tpreturn(TPFAIL, ptr->status, dy_wksp->data, 0L, 0);
}

/*
**++
**  FUNCTION NAME: no_transaction
**--
*/
void
no_transaction( TPSVCINFO *no_wksp )
{
  pNewOrderData ptr;

  ptr = (pNewOrderData)no_wksp->data;

  ptr->status = TPCCNewOrderDB( DBC, ptr );
  if(ERR_DB_ERROR != ptr->status)
    tpreturn(TPSUCCESS, ptr->status, no_wksp->data, no_wksp->len,
0);
  else
    tpreturn(TPFAIL, ptr->status, no_wksp->data, 0L, 0);
}

/*
**++
**  FUNCTION NAME: os_transaction
**--
*/
void
os_transaction( TPSVCINFO *os_wksp )
{
  pOrderStatusData ptr;

  ptr = (pOrderStatusData)os_wksp->data;

  ptr->status = TPCCOrderStatusDB( DBC, ptr );
  if(ERR_DB_ERROR != ptr->status)
    tpreturn(TPSUCCESS, ptr->status, os_wksp->data, os_wksp->len,
0);
  else
    tpreturn(TPFAIL, ptr->status, os_wksp->data, 0L, 0);
}

/*
**++
**  FUNCTION NAME: pt_transaction
**--
*/
void
pt_transaction( TPSVCINFO *pt_wksp )
{
  pPaymentData ptr;

  ptr = (pPaymentData)pt_wksp->data;

  ptr->status = TPCCPaymentDB( DBC, ptr );
  if(ERR_DB_ERROR != ptr->status)
    tpreturn(TPSUCCESS, ptr->status, pt_wksp->data,
sizeof(PaymentData), 0);
```

```
  else

    tpreturn(TPFAIL, ptr->status, pt_wksp->data, 0L, 0);


}


/*

**++

**  FUNCTION NAME: sl_transaction

**--

*/

void

sl_transaction( TPSVCINFO *sl_wksp )

{

  pStockLevelData ptr;


  ptr = (pStockLevelData)sl_wksp->data;


  ptr->status = TPCCStockLevelDB( DBC, ptr );

  if(ERR_DB_ERROR != ptr->status)

    tpreturn(TPSUCCESS, ptr->status, sl_wksp->data, sl_wksp->len,
0);

  else

    tpreturn(TPFAIL, ptr->status, sl_wksp->data, 0L, 0);

}



**************************
util.c
**************************

/*
 *
 *
 *      08/01/2002      Andrew Bond, HP
 *                      - Configuration values are stored in a
filesystem file under Linux
 *                        rather than the Windows registry.
 *
 */

#include <stdio.h>


#define MAXCFGLINE 255
#define CONFIGFILENAME "/usr/local/etc/tpcc.conf"


/*  FUNCTION:  int GetConfigValue(char *option, char *value)
 *
 *  Read the Linux tpcc configuration file
 *
*/
int GetConfigValue(char *option, char *value)
{
FILE    *cfFD;
char    line[MAXCFGLINE];
char optname[MAXCFGLINE];
char *poptname, *tmpValue, *linep;
int full_len, half_len, len;
short notfound=1;

poptname=(char *)&optname;

cfFD=fopen(CONFIGFILENAME, "r");

if (cfFD == NULL)
{
        printf("Error opening file\n");
        return -1;
}
linep=(char *)&line;

while ((fgets(linep, MAXCFGLINE, cfFD) != NULL) && (notfound))
{
  tmpValue=(char *)index(linep, '=');

  if (tmpValue==NULL)
  {
        printf("Equals sign not found\n");
        continue;
  }

  full_len=strlen(linep);
  half_len=strlen(tmpValue);

  strncpy(poptname,linep, full_len-half_len);
  optname[full_len-half_len] = '\0';
  tmpValue++;

  if (!strcmp(optname, option))
  {
        len=strlen(tmpValue);
        strncpy(value, tmpValue, len-1);
        value[len-1] = '\0';
        notfound=0;
  }
}

fclose(cfFD);

if (notfound)
  return(0);
else
  return(1);


}


**************************
Makefile
**************************

##
##  Makefile -- Build procedure for sample tpcc Apache module
##  Autogenerated via ``apxs -n tpcc -O2''.
##

builddir=.
top_srcdir=/usr/src/redhat/BUILD/httpd-2.0.36
top_builddir=/usr/src/redhat/BUILD/httpd-2.0.36
include /usr/src/redhat/BUILD/httpd-2.0.36/build/special.mk

#   the used tools
#APXS=/usr/sbin/apxs
APXS=/usr/local/ap2/sbin/apxs
APACHECTL=/usr/sbin/apachectl
TUXDIR=/home/bea/tuxedo8.0
ORAHOME=/home/oracle/OraHome1

#   additional user defines, includes and libraries
#DEF=-Dmy_define=my_value
#LIB=-Lmy/lib/dir -lmylib
APACHEINC=-I/usr/local/ap2/include/apache
INC=-I. $(APACHEINC) $(ORAINC) $(TUXINC)
DEF=-Wall
TUXINC=-I/home/bea/tuxedo8.0/include
ORAINC=-I/home/oracle/OraHome1/rdbms/demo -
I/home/oracle/OraHome1/rdbms/public

AP_LIBS =           $(top_builddir)/lib/libapr.a

TUX_LIBS =      $(TUXDIR)/lib/libtux.a \
                $(TUXDIR)/lib/libbuft.a \
                $(TUXDIR)/lib/libengine.a \
                $(TUXDIR)/lib/libtrpc.a \
                $(TUXDIR)/lib/libfml.a \
                $(TUXDIR)/lib/libfml32.a

LINUX_LIBS =        /usr/lib/libpthread.a \
                    /usr/lib/libdl.a \
                    /usr/lib/libm.a

ORA_LIBS =          $(ORAHOME)/lib/libclient9.a \
                    $(ORAHOME)/lib/libcore9.a \
                    $(ORAHOME)/lib/libgeneric9.a \
                    $(ORAHOME)/lib/libcommon9.a \
                    $(ORAHOME)/lib/libnls9.a

TUX_SRV_OBJS =      tux_srv.o \
                    oracle_db8.o \
                    oracle_txns8.o \
                    logfile_tux.o \
                    util.o

MOD_TPCC_OBJS =     mod_tpcc.o \
                    logfile_mod.o \
                    tpcc.o \
                    tux_cli.o \
                    util.o

#   the default target
tpcc: local-shared-build

#   compile the DSO file
mod_tpcc.so: $(MOD_TPCC_OBJS)
        $(APXS) -Wc,-O2 -c $(DEF) $(INC) $(LIB) -L$(TUXDIR)/lib
$(MOD_TPCC_OBJS) -ltux -lbuft -lfml -lfml32 -lengine -ldl -lpthread
```

```
mod_tpcc.o: mod_tpcc.c
          gcc -O2 -c -DEAPI $(DEF) $(INC) $(LIB) mod_tpcc.c

logfile_mod.o: logfile_mod.c
          gcc -O2 -c $(DEF) $(INC) $(LIB) logfile_mod.c


logfile_tux.o: logfile_tux.c
          gcc -O2 -c $(DEF) $(INC) $(LIB) logfile_tux.c

tpcc.o: tpcc.c
          gcc -O2 -c $(DEF) $(INC) $(LIB) tpcc.c

util.o: util.c
          gcc -O2 -c $(DEF) $(INC) $(LIB) util.c

tux_cli.o: tux_cli.c
          gcc -O2 -c $(DEF) $(INC) $(LIB) tux_cli.c

oracle_db8.o: oracle_db8.c
          gcc -O2 -c $(DEF) $(INC) $(LIB) oracle_db8.c

oracle_txns8.o: oracle_txns8.c
          gcc -O2 -c $(DEF) $(INC) $(LIB) oracle_txns8.c

tux_srv.o: tux_srv.c
          gcc -O2 -c $(DEF) $(INC) $(LIB) tux_srv.c

delirpt: delirpt.c
          gcc -O2 -o delirpt delirpt.c

#tuxora: $(TUX_SRV_OBJS)
#          gcc  $(TUX_SRV_OBJS) $(TUX_LIBS) -Wl,-rpath $(TUXDIR)/lib
$(ORAHOME)/lib/libclntst9.a $(LINUX_LIBS) -o tuxora

BS-7dc9.o: BS-7dc9.c
          gcc -c  -I$(TUXDIR)/include BS-7dc9.c

BS-deli.o: BS-deli.c
          gcc -c  -I$(TUXDIR)/include BS-deli.c

BS-payo.o: BS-payo.c
          gcc -c  -I$(TUXDIR)/include BS-payo.c

BS-ordo.o: BS-ordo.c
          gcc -c  -I$(TUXDIR)/include BS-ordo.c

BS-stoo.o: BS-stoo.c
          gcc -c  -I$(TUXDIR)/include BS-stoo.c

BS-newo.o: BS-newo.c
          gcc -c  -I$(TUXDIR)/include BS-newo.c

BS-tpcc.o: BS-tpcc.c
          gcc -c  -I$(TUXDIR)/include BS-tpcc.c

tuxora: $(TUX_SRV_OBJS)
          gcc -o tuxora -L${TUXDIR}/lib $(TUX_SRV_OBJS) BS-7dc9.o -
ltux -lbuft -lfml -lfml32 -lengine -ldl -lpthread
/usr/lib/libcrypt.a $(ORAHOME)/lib/libclntst9.a $(LINUX_LIBS)

tpccora: $(TUX_SRV_OBJS) BS-tpcc.o
          gcc -o tpccora -L${TUXDIR}/lib $(TUX_SRV_OBJS) BS-tpcc.o
-ltux -lbuft -lfml -lfml32 -lengine -ldl -lpthread
/usr/lib/libcrypt.a $(ORAHOME)/lib/libclntst9.a $(LINUX_LIBS)

deliora: $(TUX_SRV_OBJS) BS-deli.o
          gcc -o deliora -L${TUXDIR}/lib $(TUX_SRV_OBJS) BS-deli.o
-ltux -lbuft -lfml -lfml32 -lengine -ldl -lpthread
/usr/lib/libcrypt.a $(ORAHOME)/lib/libclntst9.a $(LINUX_LIBS)

stoora: $(TUX_SRV_OBJS) BS-stoo.o
          gcc -o stoora -L${TUXDIR}/lib $(TUX_SRV_OBJS) BS-stoo.o -
ltux -lbuft -lfml -lfml32 -lengine -ldl -lpthread
/usr/lib/libcrypt.a $(ORAHOME)/lib/libclntst9.a $(LINUX_LIBS)

ordora: $(TUX_SRV_OBJS) BS-ordo.o
          gcc -o ordora -L${TUXDIR}/lib $(TUX_SRV_OBJS) BS-ordo.o -
ltux -lbuft -lfml -lfml32 -lengine -ldl -lpthread
/usr/lib/libcrypt.a $(ORAHOME)/lib/libclntst9.a $(LINUX_LIBS)

payora: $(TUX_SRV_OBJS) BS-payo.o
          gcc -o payora -L${TUXDIR}/lib $(TUX_SRV_OBJS) BS-payo.o -
ltux -lbuft -lfml -lfml32 -lengine -ldl -lpthread
/usr/lib/libcrypt.a $(ORAHOME)/lib/libclntst9.a $(LINUX_LIBS)

newora: $(TUX_SRV_OBJS) BS-newo.o
          gcc -o newora -L${TUXDIR}/lib $(TUX_SRV_OBJS) BS-newo.o -
ltux -lbuft -lfml -lfml32 -lengine -ldl -lpthread
/usr/lib/libcrypt.a $(ORAHOME)/lib/libclntst9.a $(LINUX_LIBS)

tpccora:
#   install the shared object file into Apache
install: install-modules

replace:
          cp .libs/mod_tpcc.so /etc/httpd/modules
          cp tuxora $(TUXDIR)

#   cleanup
clean:
          -rm -f mod_tpcc.o mod_tpcc.so

#   simple test
test: reload
          lynx -mime_header http://localhost/tpcc

#   reload the module by installing and restarting Apache
reload: install restart

#   the general Apache start/restart/stop procedures
start:
          $(APACHECTL) start
restart:
          $(APACHECTL) restart
stop:
          $(APACHECTL) stop



**************************
modules.mk
**************************

mod_tpcc.la: mod_tpcc.slo
          $(SH_LINK) -rpath $(libexecdir) -module -avoid-version
mod_tpcc.lo
DISTCLEAN_TARGETS = modules.mk
shared =  mod_tpcc.la

**************************
linux_8.pr
**************************

echo


##################################################################
#############
#
#
#
#
#                       PRTE COMMAND FILE FOR v6-1-0
#
#
#
#
#
##################################################################
#############


noecho



##################################################################
####
#
#
# PRTE internal variables.
#
#
#
#   set {var} {val}
#
#
#
##################################################################
####
#
# startup_interval must be set (before connects).  It controls the
rate at
#                 which prte user processes are forked off
initially.
#
# start_interval   controls the rate at which prte users are
started when the
#                 "start" command is issued at the console level.
#
# resume_interval  controls how fast resumes are done when the
"resume"
#                 command is issued at the console level.  (NOTE:
resumes
#                 done on the tester's behalf by the master user
are
#                 controlled by the network variable RESUME_DELAY
set below).
#
# stop_interval    controls how fast stops are done when the "stop"
#                 command is issued at the console level.  (NOTE:
stops done
#                 on the tester's behalf by the master user are
controlled by
#                 the network variable STOP_DELAY set below).
#
# type_rate        is the typing delay between each character???

# .0001 .0002 .001 .001 ko
set startup_interval          0.0005
```

```
set start_interval  0.0005
set resume_interval 0.05
set stop_interval   0.005
set type_rate                0.0




echo


#####################################################################
#############
#
#
# Initializing connections.
#
#
#
#####################################################################
#############


noecho

#####################################################################
####
#
#
# Connect commands.
#
#
#
#   connect {exe} {prte to run on} {# users} {machine to connect
to}  #
#
#
#####################################################################
####
#
# delay between the fork for each user process is startup_interval,
# defined above in the "PRTE internal variables" section.
#
# NOTE: The order of the connect statements is relevant since it
determines
#       the order in which prte user id's get assigned.  All
connect statements
#       for tpcc users (web_user, unix_user) should come first,
followed by
#       the connect statement for reduce, followed by the connect
#       statement for tpcc_master.
#

disable init

connect   ~tpcc/bin/web_user  l1        900       lc1
connect   ~tpcc/bin/web_user  l1        900       lc1
connect   ~tpcc/bin/web_user  l1        900       lc1
connect   ~tpcc/bin/web_user  l1        900       lc1
connect   ~tpcc/bin/web_user  l1        900       lc1
connect   ~tpcc/bin/web_user  l1        900       lc1
connect   ~tpcc/bin/web_user  l1        900       lc1
connect   ~tpcc/bin/web_user  l1        900       lc1
connect   ~tpcc/bin/web_user  l1        900       lc2
connect   ~tpcc/bin/web_user  l1        900       lc2
connect   ~tpcc/bin/web_user  l1        900       lc2
connect   ~tpcc/bin/web_user  l1        900       lc2
connect   ~tpcc/bin/web_user  l1        900       lc2
connect   ~tpcc/bin/web_user  l1        900       lc2
connect   ~tpcc/bin/web_user  l1        900       lc2

connect   ~tpcc/bin/web_user  l2        900       lc3
connect   ~tpcc/bin/web_user  l2        900       lc3
connect   ~tpcc/bin/web_user  l2        900       lc3
connect   ~tpcc/bin/web_user  l2        900       lc3
connect   ~tpcc/bin/web_user  l2        900       lc3
connect   ~tpcc/bin/web_user  l2        900       lc3
connect   ~tpcc/bin/web_user  l2        900       lc3
connect   ~tpcc/bin/web_user  l2        900       lc3
connect   ~tpcc/bin/web_user  l2        900       lc4
connect   ~tpcc/bin/web_user  l2        900       lc4
connect   ~tpcc/bin/web_user  l2        900       lc4
connect   ~tpcc/bin/web_user  l2        900       lc4
connect   ~tpcc/bin/web_user  l2        900       lc4
connect   ~tpcc/bin/web_user  l2        900       lc4
connect   ~tpcc/bin/web_user  l2        900       lc4

connect   ~tpcc/bin/web_user  l3        900       lc5
connect   ~tpcc/bin/web_user  l3        900       lc5
connect   ~tpcc/bin/web_user  l3        900       lc5
connect   ~tpcc/bin/web_user  l3        900       lc5
connect   ~tpcc/bin/web_user  l3        900       lc5
connect   ~tpcc/bin/web_user  l3        900       lc5
connect   ~tpcc/bin/web_user  l3        900       lc5
connect   ~tpcc/bin/web_user  l3        900       lc5
connect   ~tpcc/bin/web_user  l3        900       lc6
connect   ~tpcc/bin/web_user  l3        900       lc6
connect   ~tpcc/bin/web_user  l3        900       lc6
connect   ~tpcc/bin/web_user  l3        900       lc6

connect   ~tpcc/bin/web_user  l4        900       lc7
connect   ~tpcc/bin/web_user  l4        900       lc7
connect   ~tpcc/bin/web_user  l4        900       lc7
connect   ~tpcc/bin/web_user  l4        900       lc7
connect   ~tpcc/bin/web_user  l4        900       lc7
connect   ~tpcc/bin/web_user  l4        900       lc7
connect   ~tpcc/bin/web_user  l4        900       lc7
connect   ~tpcc/bin/web_user  l4        900       lc7
connect   ~tpcc/bin/web_user  l4        900       lc8
connect   ~tpcc/bin/web_user  l4        900       lc8
connect   ~tpcc/bin/web_user  l4        900       lc8
connect   ~tpcc/bin/web_user  l4        900       lc8
connect   ~tpcc/bin/web_user  l4        900       lc8
connect   ~tpcc/bin/web_user  l4        900       lc8
connect   ~tpcc/bin/web_user  l4        900       lc8

connect   ~tpcc/bin/web_user  l5        900       lc9
connect   ~tpcc/bin/web_user  l5        900       lc9
connect   ~tpcc/bin/web_user  l5        900       lc9
connect   ~tpcc/bin/web_user  l5        900       lc9
connect   ~tpcc/bin/web_user  l5        900       lc9
connect   ~tpcc/bin/web_user  l5        900       lc9
connect   ~tpcc/bin/web_user  l5        900       lc9
connect   ~tpcc/bin/web_user  l5        900       lc9
connect   ~tpcc/bin/web_user  l5        900       lc10
connect   ~tpcc/bin/web_user  l5        900       lc10
connect   ~tpcc/bin/web_user  l5        900       lc10
connect   ~tpcc/bin/web_user  l5        900       lc10
connect   ~tpcc/bin/web_user  l5        900       lc10
connect   ~tpcc/bin/web_user  l5        900       lc10
connect   ~tpcc/bin/web_user  l5        900       lc10
connect   ~tpcc/bin/web_user  l5        900       lc10

connect   ~tpcc/bin/web_user  l6        900       lc11
connect   ~tpcc/bin/web_user  l6        900       lc11
connect   ~tpcc/bin/web_user  l6        900       lc11
connect   ~tpcc/bin/web_user  l6        900       lc11
connect   ~tpcc/bin/web_user  l6        900       lc11
connect   ~tpcc/bin/web_user  l6        900       lc11
connect   ~tpcc/bin/web_user  l6        900       lc11
connect   ~tpcc/bin/web_user  l6        900       lc11
connect   ~tpcc/bin/web_user  l6        900       lc12
connect   ~tpcc/bin/web_user  l6        900       lc12
connect   ~tpcc/bin/web_user  l6        900       lc12
connect   ~tpcc/bin/web_user  l6        900       lc12
connect   ~tpcc/bin/web_user  l6        900       lc12
connect   ~tpcc/bin/web_user  l6        900       lc12
connect   ~tpcc/bin/web_user  l6        900       lc12

connect   ~tpcc/bin/web_user  l7        900       lc13
connect   ~tpcc/bin/web_user  l7        900       lc13
connect   ~tpcc/bin/web_user  l7        900       lc13
connect   ~tpcc/bin/web_user  l7        900       lc13
connect   ~tpcc/bin/web_user  l7        900       lc13
connect   ~tpcc/bin/web_user  l7        900       lc13
connect   ~tpcc/bin/web_user  l7        900       lc13
connect   ~tpcc/bin/web_user  l7        900       lc13
connect   ~tpcc/bin/web_user  l7        900       lc14
connect   ~tpcc/bin/web_user  l7        900       lc14
connect   ~tpcc/bin/web_user  l7        900       lc14
connect   ~tpcc/bin/web_user  l7        900       lc14
connect   ~tpcc/bin/web_user  l7        900       lc14
connect   ~tpcc/bin/web_user  l7        900       lc14
connect   ~tpcc/bin/web_user  l7        900       lc14

connect   ~tpcc/bin/web_user  l8        900       lc15
connect   ~tpcc/bin/web_user  l8        900       lc15
connect   ~tpcc/bin/web_user  l8        900       lc15
connect   ~tpcc/bin/web_user  l8        900       lc15
connect   ~tpcc/bin/web_user  l8        900       lc15
connect   ~tpcc/bin/web_user  l8        900       lc15
connect   ~tpcc/bin/web_user  l8        900       lc15
connect   ~tpcc/bin/web_user  l8        900       lc15
connect   ~tpcc/bin/web_user  l8        900       lc16
connect   ~tpcc/bin/web_user  l8        900       lc16
connect   ~tpcc/bin/web_user  l8        900       lc16
connect   ~tpcc/bin/web_user  l8        900       lc16
connect   ~tpcc/bin/web_user  l8        900       lc16
connect   ~tpcc/bin/web_user  l8        900       lc16
connect   ~tpcc/bin/web_user  l8        900       lc16

#
connect ~tpcc/bin/reduce      localhost 1         localhost

#connect ~tpcc/bin/aide                localhost 1         fe_21

connect ~tpcc/bin/tpcc_master localhost 1         localhost

# NOTE:             timeout MUST be set after the connect
statements for it to
#                   take effect.
#
```

```
# timeout          is how long prte will wait for an outstanding
command to
#                  return its expected prompt before timing out.
#

set timeout 180



echo


#####################################################################
#############
#
#
# Setting PRTE network variables.
#
#
#
#####################################################################
#############


noecho


#####################################################################
####
#
#
# PRTE network variables.
#
#
#
#   set network_variable {name} {val}
#
#
#
#####################################################################
####


##################################
#                                #
#  FRONT END NETWORK VARIABLES  #
#                                #
##################################
#
# FE_NAMES       A comma seperated list of the front end network
node names.
#
# FE_USER_COUNTS A comma seperated list of the users to run on each
front end.
#                NOTE: The order of counts in this list should
match the order
#                      of names in FE_NAMES.
# ADMIN_USER_COUNT is the number of aides to run.
#
# ADMIN_FE_NAMES is a comma seperated list of FEs on which the
aides will
#                    operated.

set network_variable FE_NAMES
lc1,lc2,lc3,lc4,lc5,lc6,lc7,lc8,lc9,lc10,lc11,lc12,lc13,lc14,lc15,l
c16
set network_variable FE_USER_COUNTS
          7200,7200,7200,7200,7200,7200,7200,7200,7200,7200,7200,72
00,7200,7200,7200,7200

set network_variable ADMIN_USER_COUNT 0
set network_variable ADMIN_FE_NAMES c1


###############################
#                             #
#  REDUCER NETWORK VARIABLES  #
#                             #
###############################
#
# REDUCER_UPDATE_INTERVAL       The interval, in seconds, between
updates
#                               displayed on the console.
#
# REDUCER_HEADER_INTERVAL       Every REDUCER_HEADER_INTERVAL
updates the
#                               column headers will be displayed on
the
#                               console.
#

set network_variable REDUCER_UPDATE_INTERVAL 30
set network_variable REDUCER_HEADER_INTERVAL 6


##################################
#                                #
#  TPCC USER NETWORK VARIABLES  #
#                                #
##################################
#
# TPCC_USER_LOG_TYPE controls what information the prte users log
to thier
#                    respective files. This is a bit mask.
#
#                    0 - no logging
#                    1 - timer logging (required for asci data
reduction)
#                    2 - sut data logging (required for durability)
#                    4 - script logging (required by the tpcc user
script)
#                    8 - user sut data logging (required by web
users for
#                        error checking)
#
#                    In general, leave this at 12 for web clients
doing binary
#                    data reduction, and 13 for web clients doing
asci data
#                    reduction.
#
# TPCC_USER_FLUSH_LOG is whether or not to flush every write to the
log.
#
# DURABILITY_LOGGING is whether or not to parse new order response
pages for
#                    durability data (to be sent to reducer). This
variable
#                        is a boolean so legal values are 0,f,F and
1,t,T.
#
# C_LAST  is the constant value used for customer last names.
#                  This value must be chosen with care.  It must
be based on
#                  the value you used when populating your
database.


set network_variable TPCC_USER_LOG_TYPE           0
set network_variable TPCC_USER_FLUSH_LOG          0
#set network_variable TPCC_USER_LOG_TYPE          12
#set network_variable TPCC_USER_FLUSH_LOG         1
set network_variable DURABILITY_LOGGING           0
set network_variable C_LAST                       87


###################################
#                                 #
#  CONFIGURATION NETWORK VARIABLES  #
#                                 #
###################################
#
# CGI_SCRIPT_NAME is the name of the application to run on the
front ends.
#
# LOAD_DLL_TIMEOUT is how long master should wait (in seconds) for
the dll
#                     to initially load before timing out.
#

#set network_variable CGI_SCRIPT_NAME   /webacmsxploop.dll
#set network_variable CGI_SCRIPT_NAME   /webacmsxploop1500.dll
#set network_variable CGI_SCRIPT_NAME   /webacmsxpora84.dll
#set network_variable CGI_SCRIPT_NAME   /webacmsxpora8.dll
set network_variable CGI_SCRIPT_NAME    /tpcc
set network_variable LOAD_DLL_TIMEOUT   600

###################################
#                                 #
#  TEST CONTROL NETWORK VARIABLES  #
#                                 #
###################################
#
# LOOPBACK_MODE
#                   0 - Full end-to-end runs.
#                   1 - Back end loopback runs (not implemented
yet)
#                   2 - Front end loopback runs
#                   3 - RTE loopback runs
#
# RUN_NUMBER          is used to tag all output files with the run
number.
#
#                 1 - the primary measurement run.
#                 2 - the repeatability run.
#                 5 - the 50% run.
#                 8 - the 80% run.
#
#                     If you are unsure which run this really will
end up being,
#                     just leave it at 1, and you can rename files
later if you
#                     need to.
#
# VERSION_NUMBER      is used to tag all output files with the
version number.
#                     This is used if you submit files to the
auditor, and then
#                     need to rerun the test, and resubmit files to
the auditor,
#                     for some reason.  For example, you submit a
repeatability
```

```
#                       run (RUN_NUMBER 2, VERSION_NUMBER 1) and the
auditor finds
#                       a problem and asks you to re-run the test
(RUN_NUMBER 1,
#                       VERSION_NUMBER 2).
#                       Under normal circumstances, this can just be
left at 1.
#
# TEST_RESULTS_DIR      is the full directory path where the test's
run directory
#                       will be created.  All files (data, log, etc)
will be
#                       put into the run directory.
#
# WARMUP_TIME           is the time in seconds to warm up.  This is
the period
#                       of time after all users have started doing
transactions
#                       and before the measurement interval begins.
#
# STEADY_STATE_TIME is the time for which the test is considered to
be
#                               in a steady running state.  It is
during this time
#                               that all data for measurement
intervals will be
#                               collected.
#
# MEASUREMENT_INTERVAL          defines the length of a test period
within the
#                               STEADY_STATE_TIME. The steady state
time may have 1
#                               or more measurement intervals. Each
measurement
#                               interval can be thought of as a
seperate measurement
#                               run.
#
# COOLDOWN_TIME         is the length of time the test will continue
to run
#                       after the measurement interval is over.  This
time can
#                       be used for doing various types of data
collection by
#                       hand if desired that might otherwise have a
negative
#                       impact on the measured test results. Even if
you are
#                       not collecting any extra data by hand, it is
recommended
#                       that you keep this value at something like
300 or 600
#                       to avoid "clipping" effects at the end of the
measurement
#                       interval.
#
# CHECKPOINT_INTERVAL           is the total time between the start
of each
#                               checkpoint command.
#
# CKPT_PROXIMITY_ADDITIONAL_OFFSET      This value will be added to
any
#                               required proximity time to give the
actual start
#                               time of the first checkpoint in the
measurement
#                               interval.
#
# LOGIN_DELAY           is the delay between logins on a per front
end basis.
#                       NOTE: This is similar to the prte internal
variable
#                       resume_interval (tpcc users start, then
immediately
#                       pause, so the act of logging in is just a
resume) but
#                       not exactly the same.
#
# RESUME_DELAY          is the delay between resumes on a per front
end basis.
#                       NOTE: This is similar to the prte internal
variable
#                       resume_interval but not exactly the same.
#
# STOP_DELAY            is the delay between stops on a per front end
basis.
#                       NOTE: This is similar to the prte internal
variable
#                       stop_interval but not exactly the same.
#
# SYNC_OFFSET                   how many users we'll allow to have
outstanding
#                               when doing crowd control.
#
# SYNC_UPDATE                   how often user login/resume/stop
progress is printed
#                               out to the console (heartbeat of user
synchronization
#                               effectively).
#
# MSG_TIMEOUT                   how long we'll wait for status and
sync messages.
#

set network_variable LOOPBACK_MODE       0

set network_variable RUN_NUMBER          1
set network_variable VERSION_NUMBER      1
#set network_variable TEST_RESULTS_DIR    /usr/users/tpcc/results/
set network_variable TEST_RESULTS_DIR    /results/

#set network_variable WARMUP_TIME                 300.0
#set network_variable STEADY_STATE_TIME           120.0
#set network_variable MEASUREMENT_INTERVAL        120.0
#set network_variable COOLDOWN_TIME               120.0

set network_variable WARMUP_TIME                 3600.0
set network_variable STEADY_STATE_TIME           10800.0
set network_variable MEASUREMENT_INTERVAL        7500.0
set network_variable COOLDOWN_TIME               600.0

set network_variable CHECKPOINT_INTERVAL 0
set network_variable CKPT_PROXIMITY_ADDITIONAL_OFFSET       0
# .05 .08 .04 ko
set network_variable LOGIN_DELAY         0.05
#set network_variable RESUME_DELAY        0.75 w2k
set network_variable RESUME_DELAY        1.50
set network_variable STOP_DELAY          0.05
# 100 5000
set network_variable SYNC_OFFSET                 32
set network_variable SYNC_UPDATE                 5000

set network_variable MSG_TIMEOUT                 300.0

set network_variable NO_THINK_TIME 30.0
#set network_variable NO_THINK_TIME 12.02
set network_variable NO_THINK_TIME_UPDATE_INTERVAL 15.0



# In general, the SEED network variable should not be set. A random
value
# based on process id and the current time will be used.  This
varaible is
# really only exposed in case you want to exactly reproduce a
previous run
# using that previous run's seed.
#set network_variable         SEED                123127777

#####################################################################
####
#
# AUDIT UTILITIES -- these are the replacement for the audit
# shell scripts -- they currently only work for Oracle on DUNIX.
# They do the following:
#     Collect logspace info
#     Write data to audit table for later use in runcheck
#     Collect checkpoint info
#     Run optional custom scripts on back-end before or after the
test
#     For Oracle, collect bstat/estat (optional)
#
#####################################################################
####
#
# GET_ALL_AUDIT_FILES if True (or 1) will create the following:
#                               Audit table for doing runcheck later
#                               m1log.v1 -- a before & after snapshot
of the logsize
#
# BE_NAMES            Comma-separated list of back-ends
#
# BE_USERNAME         Username to use when logging into back-ends
#                     NOTE: you must have .rhosts configured so no
password
#                     is needed.
#
# DATABASE_TYPE       Oracle, Sybase or MsSql
#
# DATABASE_USERNAME   Username and password for database.
# DATABASE_PASSWORD   Defaults are: tpcc/tpcc for Oracle and sa/<no-
passwd>
#                     for Sybase and MsSql
#
# Optional variables -- if you don't want them, comment them out or
set to ""
#
# ORACLE_STATS_SCRIPT_PATH
#                     Path to directory on back-end containing
Oracle's
#                     orst_<xxx>.sql files.
#                     For example: $ORACLE_HOME/bench/gen/sql
#
# CUSTOM_BEFORE_TEST_SCRIPT
# CUSTOM_AFTER_TEST_SCRIPT
#                     Path of executable file on back-end to be run
before/after
#                     the test.  For example, if you wanted to run
processor
#                     affinity and load some stored procedures
before a test,
```

```
#                    you could put the commands in a shell script
on the BE
#                    and call put the path to that shell script
into the
#                    CUSTOM_BEFORE_TEST_SCRIPT variable
#
#####################################################################
####

set network_variable GET_ALL_AUDIT_FILES FALSE


set network_variable BE_NAMES         ra1 ra2 ra3 ra4 ra5 ra6 ra7
ra8
set network_variable BE_USERNAME        tpcc tpcc tpcc tpcc tpcc
tpcc tpcc tpcc

set network_variable DATABASE_TYPE      Oracle
set network_variable DATABASE_USERNAME  tpcc
set network_variable DATABASE_PASSWORD  tpcc

#set network_variable DATABASE_TYPE     MsSql
#set network_variable DATABASE_USERNAME  tpcc
#set network_variable DATABASE_PASSWORD  tpcc

set network_variable ORACLE_STATS_SCRIPT_PATH     ""
set network_variable CUSTOM_BEFORE_TEST_SCRIPT  ""
set network_variable CUSTOM_AFTER_TEST_SCRIPT   ""



#####################################################################
####


# now start all the users.  delay between each user being started
is controled
# by start_interval defined above in the "PRTE internal variables"
section.
#



echo


#####################################################################
#############
#
#
# Starting all PRTE users (may take a while, depending on the
number of users) #
#
#
#####################################################################
#############

noecho

disable stop

#start
```

Appendix B: Database Design

```
*************************

addtempts.sh
*************************

#!/bin/sh

sqlplus tpcc/tpcc <<!
   spool step5createts_$1.log
   set echo on
   drop tablespace $1 including contents;
   create temporary tablespace $1 tempfile '$2' size $3 reuse
extent management local uniform size $4;
   set echo off
   spool off
   exit ;
!


*************************
addts.sh
*************************

#!/bin/sh



sqlplus tpcc/tpcc <<!

   spool log/step5createts_$1.log

   set echo on

   drop tablespace $1 including contents;

   create tablespace $1 datafile '$2' size $3 reuse extent
management local uniform size $4 segment space management auto
nologging ;

   set echo off

   spool off

   exit ;

!



*************************
c_stat.sql
*************************

rem
rem
rem================================================================
==+
rem        Copyright (c) 1997  Oracle Corp, Redwood Shores, CA
|
rem                         All Rights Reserved
|
rem================================================================
==+
rem FILENAME
rem      cs_tpcc.sq
rem DESCRIPTION
rem      Create tables for saving TPC-C results.
rem================================================================
==
rem  Usage: sqlplus user/password @cs_tpcc.sql
rem spool log/cs_tpcc.log

connect tpcc/tpcc;
set echo on

DROP TABLE tpcc_run_desc;
DROP TABLE tpcc_run_int;
DROP TABLE bench_run_int;
DROP TABLE tpcc_back_res;
DROP TABLE tpcc_user_res;
DROP TABLE bench_user_res;
DROP TABLE tpcc_tpm;
DROP TABLE tpcc_new_res;
DROP TABLE bench_new_res;
DROP TABLE tpcc_pay_res;
DROP TABLE bench_pay_res;
DROP TABLE tpcc_ord_res;
DROP TABLE bench_ord_res;
DROP TABLE tpcc_del_res;
DROP TABLE bench_del_res;
DROP TABLE tpcc_sto_res;
DROP TABLE bench_sto_res;

rem
rem  description of a run
rem
          CREATE TABLE tpcc_run_desc
          (
              run_name        VARCHAR2(20),
              rundate         DATE,
              time            NUMBER,
              rampup          NUMBER,
              rampdown        NUMBER,
              warehouses      NUMBER,
              customers       NUMBER,
              users           NUMBER,
              driver          VARCHAR2(40),
              commnt          VARCHAR2(80)
          );

rem
rem  throughput of new order transactions
rem
          CREATE TABLE tpcc_run_int
          (
              run_name        VARCHAR2(20),
              interval        NUMBER,
              interval_count  NUMBER,
              response_time   NUMBER,
              think_time      NUMBER
          );

rem
rem  throughput of new order transactions
rem
          CREATE TABLE bench_run_int
          (
              run_name        VARCHAR2(20),
              proc_no         NUMBER,
              interval        NUMBER,
              interval_count  NUMBER,
              response_time   NUMBER,
              think_time      NUMBER
          );

rem
rem  Results from delivery servers
rem
          CREATE TABLE tpcc_back_res
          (
              run_name        VARCHAR2(20),
              in_timing_int   NUMBER,
              fast            NUMBER,
              resp_time       NUMBER,
            retries         NUMBER
          );

rem
rem  Aggregate results for all generators.
rem  These results are from the measurement interval only.
rem  These results are used to calculate the TPS rate over
rem  the measurement interval.
rem
          CREATE TABLE tpcc_user_res
          (
              run_name        VARCHAR2(20),
              no_men          NUMBER,
              fast_men        NUMBER,
              in_flight_men   NUMBER,
            retry_men       NUMBER,
              min_time_men    NUMBER,
              max_time_men    NUMBER,
              sum_time_men    NUMBER,
            ninety_per_men  NUMBER,
            think_min_men   NUMBER,
            think_max_men   NUMBER,
              think_sum_men   NUMBER,
            key_min_men     NUMBER,
            key_max_men     NUMBER,
              key_sum_men     NUMBER,
              no_new          NUMBER,
              fast_new        NUMBER,
              in_flight_new   NUMBER,

            retry_new       NUMBER,
              min_time_new    NUMBER,
              max_time_new    NUMBER,
              sum_time_new    NUMBER,
            ninety_per_new  NUMBER,
            think_min_new   NUMBER,
            think_max_new   NUMBER,
```

```
              think_sum_new   NUMBER,
            key_min_new     NUMBER,
            key_max_new     NUMBER,
              key_sum_new     NUMBER,
              remote_new      NUMBER,
              rollback_new    NUMBER,
              sum_ol_new      NUMBER,
              remote_ol_new   NUMBER,
            allrollback_new NUMBER,
              no_pay          NUMBER,
              fast_pay        NUMBER,
              in_flight_pay   NUMBER,
            retry_pay       NUMBER,
              min_time_pay    NUMBER,
              max_time_pay    NUMBER,
              sum_time_pay    NUMBER,
            ninety_per_pay  NUMBER,
            think_min_pay   NUMBER,
            think_max_pay   NUMBER,
              think_sum_pay   NUMBER,
            key_min_pay     NUMBER,
            key_max_pay     NUMBER,
              key_sum_pay     NUMBER,
              remote_pay      NUMBER,
              bylast_pay      NUMBER,
              no_ord          NUMBER,
              fast_ord        NUMBER,
              in_flight_ord   NUMBER,
            retry_ord       NUMBER,
              min_time_ord    NUMBER,
              max_time_ord    NUMBER,
              sum_time_ord    NUMBER,
            ninety_per_ord  NUMBER,
            think_min_ord   NUMBER,
            think_max_ord   NUMBER,
              think_sum_ord   NUMBER,
            key_min_ord     NUMBER,
            key_max_ord     NUMBER,
              key_sum_ord     NUMBER,
              bylast_ord      NUMBER,
              no_del          NUMBER,
              fast_del        NUMBER,
              in_flight_del   NUMBER,
            retry_del       NUMBER,
              min_time_del    NUMBER,
              max_time_del    NUMBER,
              sum_time_del    NUMBER,
            ninety_per_del  NUMBER,
            think_min_del   NUMBER,
            think_max_del   NUMBER,
              think_sum_del   NUMBER,
            key_min_del     NUMBER,
            key_max_del     NUMBER,
              key_sum_del     NUMBER,
              no_sto          NUMBER,
              fast_sto        NUMBER,
              in_flight_sto   NUMBER,
            retry_sto       NUMBER,
              min_time_sto    NUMBER,
              max_time_sto    NUMBER,
              sum_time_sto    NUMBER,
            ninety_per_sto  NUMBER,
            think_min_sto   NUMBER,
            think_max_sto   NUMBER,
              think_sum_sto   NUMBER,
            key_min_sto     NUMBER,
            key_max_sto     NUMBER,
              key_sum_sto     NUMBER,
              cpu_time        NUMBER,
             deadlocks       NUMBER
           );

rem
rem  Results from individual generators.
rem  These results are from the measurement interval only.
rem  These results are used to calculate the TPS rate over
rem  the measurement interval.
rem
          CREATE TABLE bench_user_res
          (
              run_name        VARCHAR2(20),
              audit_str       VARCHAR2(10),
              proc_no         NUMBER,
              hid             NUMBER,
              no_men          NUMBER,
              fast_men        NUMBER,
              in_flight_men   NUMBER,
            retry_men       NUMBER,
              min_time_men    NUMBER,
              max_time_men    NUMBER,
              sum_time_men    NUMBER,
            ninety_per_men  NUMBER,
            think_min_men   NUMBER,
            think_max_men   NUMBER,
              think_sum_men   NUMBER,
            key_min_men     NUMBER,
            key_max_men     NUMBER,
              key_sum_men     NUMBER,
              no_new          NUMBER,
              fast_new        NUMBER,
              in_flight_new   NUMBER,
              retry_new       NUMBER,
                min_time_new    NUMBER,
                max_time_new    NUMBER,
                sum_time_new    NUMBER,
              ninety_per_new  NUMBER,
              think_min_new   NUMBER,
              think_max_new   NUMBER,
                think_sum_new   NUMBER,
              key_min_new     NUMBER,
              key_max_new     NUMBER,
                key_sum_new     NUMBER,
                remote_new      NUMBER,
                rollback_new    NUMBER,
                sum_ol_new      NUMBER,
                remote_ol_new   NUMBER,
              allrollback_new NUMBER,
                no_pay          NUMBER,
                fast_pay        NUMBER,
                in_flight_pay   NUMBER,
              retry_pay       NUMBER,
                min_time_pay    NUMBER,
                max_time_pay    NUMBER,
                sum_time_pay    NUMBER,
              ninety_per_pay  NUMBER,
              think_min_pay   NUMBER,
              think_max_pay   NUMBER,
                think_sum_pay   NUMBER,
              key_min_pay     NUMBER,
              key_max_pay     NUMBER,
                key_sum_pay     NUMBER,
                remote_pay      NUMBER,
                bylast_pay      NUMBER,
                no_ord          NUMBER,
                fast_ord        NUMBER,
                in_flight_ord   NUMBER,
              retry_ord       NUMBER,
                min_time_ord    NUMBER,
                max_time_ord    NUMBER,
                sum_time_ord    NUMBER,
              ninety_per_ord  NUMBER,
              think_min_ord   NUMBER,
              think_max_ord   NUMBER,
                think_sum_ord   NUMBER,
              key_min_ord     NUMBER,
              key_max_ord     NUMBER,
                key_sum_ord     NUMBER,
                bylast_ord      NUMBER,
                no_del          NUMBER,
                fast_del        NUMBER,
                in_flight_del   NUMBER,
              retry_del       NUMBER,
                min_time_del    NUMBER,
                max_time_del    NUMBER,
                sum_time_del    NUMBER,
              ninety_per_del  NUMBER,
              think_min_del   NUMBER,
              think_max_del   NUMBER,
                think_sum_del   NUMBER,
              key_min_del     NUMBER,
              key_max_del     NUMBER,
                key_sum_del     NUMBER,
                no_sto          NUMBER,
                fast_sto        NUMBER,
                in_flight_sto   NUMBER,
              retry_sto       NUMBER,
                min_time_sto    NUMBER,
                max_time_sto    NUMBER,
                sum_time_sto    NUMBER,
              ninety_per_sto  NUMBER,
              think_min_sto   NUMBER,
              think_max_sto   NUMBER,
                think_sum_sto   NUMBER,
              key_min_sto     NUMBER,
              key_max_sto     NUMBER,
                key_sum_sto     NUMBER,
                cpu_time        NUMBER,
               deadlocks       NUMBER
             );

    rem
    rem  Aggregate results for generators on each host.
    rem  These results are from the measurement interval only.
    rem  These results are used to calculate the TPM rate over
    rem  the measurement interval.
    rem
              CREATE TABLE tpcc_tpm
              (
                  run_name        VARCHAR2(20),
                  hid             NUMBER,
                  no_new          NUMBER
              );

    rem
    rem  Aggregate results for new order transactions.
    rem  These results are from the measurement interval only.
    rem
              CREATE TABLE tpcc_new_res
              (
                  run_name        VARCHAR2(20),
                  rep1            NUMBER,
                  rep2            NUMBER,
```

```
    rep3            NUMBER,
    rep4            NUMBER,
    rep5            NUMBER,
    rep6            NUMBER,
    rep7            NUMBER,
    rep8            NUMBER,
    rep9            NUMBER,
    rep10           NUMBER,
    rep11           NUMBER,
    rep12           NUMBER,
    rep13           NUMBER,
    rep14           NUMBER,
    rep15           NUMBER,
    rep16           NUMBER,
    rep17           NUMBER,
    rep18           NUMBER,
    rep19           NUMBER,
    rep20           NUMBER,
    rep21           NUMBER,
    rep22           NUMBER,
    rep23           NUMBER,
    rep24           NUMBER,
    rep25           NUMBER,
    rep26           NUMBER,
    rep27           NUMBER,
    rep28           NUMBER,
    rep29           NUMBER,
    rep30           NUMBER,
    rep31           NUMBER,
    rep32           NUMBER,
    rep33           NUMBER,
    rep34           NUMBER,
    rep35           NUMBER,
    rep36           NUMBER,
    rep37           NUMBER,
    rep38           NUMBER,
    rep39           NUMBER,
    rep40           NUMBER,
    rep41           NUMBER,
    rep42           NUMBER,
    rep43           NUMBER,
    rep44           NUMBER,
    rep45           NUMBER,
    rep46           NUMBER,
    rep47           NUMBER,
    rep48           NUMBER,
    rep49           NUMBER,
    rep50           NUMBER,
    rep51           NUMBER,
    rep52           NUMBER,
    rep53           NUMBER,
    rep54           NUMBER,
    rep55           NUMBER,
    rep56           NUMBER,
    rep57           NUMBER,
    rep58           NUMBER,
    rep59           NUMBER,
    rep60           NUMBER,
    rep61           NUMBER,
    rep62           NUMBER,
    rep63           NUMBER,
    rep64           NUMBER,
    rep65           NUMBER,
    rep66           NUMBER,
    rep67           NUMBER,
    rep68           NUMBER,
    rep69           NUMBER,
    rep70           NUMBER,
    rep71           NUMBER,
    rep72           NUMBER,
    rep73           NUMBER,
    rep74           NUMBER,
    rep75           NUMBER,
    rep76           NUMBER,
    rep77           NUMBER,
    rep78           NUMBER,
    rep79           NUMBER,
    rep80           NUMBER,
    rep81           NUMBER,
    rep82           NUMBER,
    rep83           NUMBER,
    rep84           NUMBER,
    rep85           NUMBER,
    rep86           NUMBER,
    rep87           NUMBER,
    rep88           NUMBER,
    rep89           NUMBER,
    rep90           NUMBER,
    rep91           NUMBER,
    rep92           NUMBER,
    rep93           NUMBER,
    rep94           NUMBER,
    rep95           NUMBER,
    rep96           NUMBER,
    rep97           NUMBER,
    rep98           NUMBER,
    rep99           NUMBER,
    rep100          NUMBER,
    thk1            NUMBER,
    thk2            NUMBER,
    thk3            NUMBER,
    thk4            NUMBER,
    thk5            NUMBER,
    thk6            NUMBER,
    thk7            NUMBER,
    thk8            NUMBER,
    thk9            NUMBER,
    thk10           NUMBER,
    thk11           NUMBER,
    thk12           NUMBER,
    thk13           NUMBER,
    thk14           NUMBER,
    thk15           NUMBER,
    thk16           NUMBER,
    thk17           NUMBER,
    thk18           NUMBER,
    thk19           NUMBER,
    thk20           NUMBER,
    thk21           NUMBER,
    thk22           NUMBER,
    thk23           NUMBER,
    thk24           NUMBER,
    thk25           NUMBER,
    key1            NUMBER,
    key2            NUMBER,
    key3            NUMBER,
    key4            NUMBER,
    key5            NUMBER,
    key6            NUMBER,
    key7            NUMBER,
    key8            NUMBER,
    key9            NUMBER,
    key10           NUMBER
);

rem
rem  Results for new order transactions.
rem  These results are from the measurement interval only.
rem
CREATE TABLE bench_new_res
(
    run_name        VARCHAR2(20),
    audit_str       VARCHAR2(10),
    proc_no         NUMBER,
    rep1            NUMBER,
    rep2            NUMBER,
    rep3            NUMBER,
    rep4            NUMBER,
    rep5            NUMBER,
    rep6            NUMBER,
    rep7            NUMBER,
    rep8            NUMBER,
    rep9            NUMBER,
    rep10           NUMBER,
    rep11           NUMBER,
    rep12           NUMBER,
    rep13           NUMBER,
    rep14           NUMBER,
    rep15           NUMBER,
    rep16           NUMBER,
    rep17           NUMBER,
    rep18           NUMBER,
    rep19           NUMBER,
    rep20           NUMBER,
    rep21           NUMBER,
    rep22           NUMBER,
    rep23           NUMBER,
    rep24           NUMBER,
    rep25           NUMBER,
    rep26           NUMBER,
    rep27           NUMBER,
    rep28           NUMBER,
    rep29           NUMBER,
    rep30           NUMBER,
    rep31           NUMBER,
    rep32           NUMBER,
    rep33           NUMBER,
    rep34           NUMBER,
    rep35           NUMBER,
    rep36           NUMBER,
    rep37           NUMBER,
    rep38           NUMBER,
    rep39           NUMBER,
    rep40           NUMBER,
    rep41           NUMBER,
    rep42           NUMBER,
    rep43           NUMBER,
    rep44           NUMBER,
    rep45           NUMBER,
    rep46           NUMBER,
    rep47           NUMBER,
    rep48           NUMBER,
    rep49           NUMBER,
    rep50           NUMBER,
    rep51           NUMBER,
    rep52           NUMBER,
    rep53           NUMBER,
    rep54           NUMBER,
    rep55           NUMBER,
    rep56           NUMBER,
    rep57           NUMBER,
    rep58           NUMBER,
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            rep59           NUMBER,
            rep60           NUMBER,
            rep61           NUMBER,
            rep62           NUMBER,
            rep63           NUMBER,
            rep64           NUMBER,
            rep65           NUMBER,
            rep66           NUMBER,
            rep67           NUMBER,
            rep68           NUMBER,
            rep69           NUMBER,
            rep70           NUMBER,
            rep71           NUMBER,
            rep72           NUMBER,
            rep73           NUMBER,
            rep74           NUMBER,
            rep75           NUMBER,
            rep76           NUMBER,
            rep77           NUMBER,
            rep78           NUMBER,
            rep79           NUMBER,
            rep80           NUMBER,
            rep81           NUMBER,
            rep82           NUMBER,
            rep83           NUMBER,
            rep84           NUMBER,
            rep85           NUMBER,
            rep86           NUMBER,
            rep87           NUMBER,
            rep88           NUMBER,
            rep89           NUMBER,
            rep90           NUMBER,
            rep91           NUMBER,
            rep92           NUMBER,
            rep93           NUMBER,
            rep94           NUMBER,
            rep95           NUMBER,
            rep96           NUMBER,
            rep97           NUMBER,
            rep98           NUMBER,
            rep99           NUMBER,
            rep100          NUMBER,
            thk1            NUMBER,
            thk2            NUMBER,
            thk3            NUMBER,
            thk4            NUMBER,
            thk5            NUMBER,
            thk6            NUMBER,
            thk7            NUMBER,
            thk8            NUMBER,

            thk9            NUMBER,
            thk10           NUMBER,
            thk11           NUMBER,
            thk12           NUMBER,
            thk13           NUMBER,
            thk14           NUMBER,
            thk15           NUMBER,
            thk16           NUMBER,
            thk17           NUMBER,
            thk18           NUMBER,
            thk19           NUMBER,
            thk20           NUMBER,
            thk21           NUMBER,
            thk22           NUMBER,
            thk23           NUMBER,
            thk24           NUMBER,
            thk25           NUMBER,
            key1            NUMBER,
            key2            NUMBER,
            key3            NUMBER,
            key4            NUMBER,
            key5            NUMBER,
            key6            NUMBER,
            key7            NUMBER,
            key8            NUMBER,
            key9            NUMBER,
            key10           NUMBER
        );

rem
rem  Aggregate results for payment transactions.
rem  These results are from the measurement interval only.
rem
         CREATE TABLE tpcc_pay_res
         (
            run_name        VARCHAR2(20),
            rep1            NUMBER,
            rep2            NUMBER,
            rep3            NUMBER,
            rep4            NUMBER,
            rep5            NUMBER,
            rep6            NUMBER,
            rep7            NUMBER,
            rep8            NUMBER,
            rep9            NUMBER,
            rep10           NUMBER,
            rep11           NUMBER,
            rep12           NUMBER,
            rep13           NUMBER,
            rep14           NUMBER,
            rep15           NUMBER,
            rep16           NUMBER,
            rep17           NUMBER,
            rep18           NUMBER,
            rep19           NUMBER,
            rep20           NUMBER,
            rep21           NUMBER,
            rep22           NUMBER,
            rep23           NUMBER,
            rep24           NUMBER,
            rep25           NUMBER,
            rep26           NUMBER,
            rep27           NUMBER,
            rep28           NUMBER,
            rep29           NUMBER,
            rep30           NUMBER,
            rep31           NUMBER,
            rep32           NUMBER,
            rep33           NUMBER,
            rep34           NUMBER,
            rep35           NUMBER,
            rep36           NUMBER,
            rep37           NUMBER,
            rep38           NUMBER,
            rep39           NUMBER,
            rep40           NUMBER,
            rep41           NUMBER,
            rep42           NUMBER,
            rep43           NUMBER,
            rep44           NUMBER,
            rep45           NUMBER,
            rep46           NUMBER,
            rep47           NUMBER,
            rep48           NUMBER,
            rep49           NUMBER,
            rep50           NUMBER,
            rep51           NUMBER,
            rep52           NUMBER,
            rep53           NUMBER,
            rep54           NUMBER,
            rep55           NUMBER,
            rep56           NUMBER,
            rep57           NUMBER,
            rep58           NUMBER,
            rep59           NUMBER,
            rep60           NUMBER,
            rep61           NUMBER,
            rep62           NUMBER,
            rep63           NUMBER,
            rep64           NUMBER,
            rep65           NUMBER,
            rep66           NUMBER,
            rep67           NUMBER,
            rep68           NUMBER,
            rep69           NUMBER,
            rep70           NUMBER,
            rep71           NUMBER,
            rep72           NUMBER,
            rep73           NUMBER,
            rep74           NUMBER,
            rep75           NUMBER,
            rep76           NUMBER,
            rep77           NUMBER,
            rep78           NUMBER,
            rep79           NUMBER,
            rep80           NUMBER,
            rep81           NUMBER,
            rep82           NUMBER,
            rep83           NUMBER,
            rep84           NUMBER,
            rep85           NUMBER,
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            rep87           NUMBER,
            rep88           NUMBER,
            rep89           NUMBER,
            rep90           NUMBER,
            rep91           NUMBER,
            rep92           NUMBER,
            rep93           NUMBER,
            rep94           NUMBER,
            rep95           NUMBER,
            rep96           NUMBER,
            rep97           NUMBER,
            rep98           NUMBER,
            rep99           NUMBER,
            rep100          NUMBER,
            thk1            NUMBER,
            thk2            NUMBER,
            thk3            NUMBER,
            thk4            NUMBER,
            thk5            NUMBER,
            thk6            NUMBER,
            thk7            NUMBER,
            thk8            NUMBER,
            thk9            NUMBER,
            thk10           NUMBER,
            thk11           NUMBER,
            thk12           NUMBER,
            thk13           NUMBER,
            thk14           NUMBER,
```

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            thk15           NUMBER,
            thk16           NUMBER,
            thk17           NUMBER,
            thk18           NUMBER,
            thk19           NUMBER,
            thk20           NUMBER,
            thk21           NUMBER,
            thk22           NUMBER,
            thk23           NUMBER,
            thk24           NUMBER,
            thk25           NUMBER,
            key1            NUMBER,
            key2            NUMBER,
            key3            NUMBER,
            key4            NUMBER,
            key5            NUMBER,
            key6            NUMBER,
            key7            NUMBER,
            key8            NUMBER,
            key9            NUMBER,
            key10           NUMBER
        );

rem
rem  Results for payment transactions.
rem  These results are from the measurement interval only.
rem
        CREATE TABLE bench_pay_res
        (
            run_name        VARCHAR2(20),
            audit_str       VARCHAR2(10),
            proc_no         NUMBER,
            rep1            NUMBER,
            rep2            NUMBER,
            rep3            NUMBER,
            rep4            NUMBER,
            rep5            NUMBER,
            rep6            NUMBER,
            rep7            NUMBER,
            rep8            NUMBER,
            rep9            NUMBER,
            rep10           NUMBER,
            rep11           NUMBER,
            rep12           NUMBER,
            rep13           NUMBER,
            rep14           NUMBER,
            rep15           NUMBER,
            rep16           NUMBER,
            rep17           NUMBER,
            rep18           NUMBER,
            rep19           NUMBER,
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            rep22           NUMBER,
            rep23           NUMBER,
            rep24           NUMBER,
            rep25           NUMBER,
            rep26           NUMBER,
            rep27           NUMBER,
            rep28           NUMBER,
            rep29           NUMBER,
            rep30           NUMBER,
            rep31           NUMBER,
            rep32           NUMBER,
            rep33           NUMBER,
            rep34           NUMBER,
            rep35           NUMBER,
            rep36           NUMBER,
            rep37           NUMBER,
            rep38           NUMBER,
            rep39           NUMBER,
            rep40           NUMBER,
            rep41           NUMBER,
            rep42           NUMBER,
            rep43           NUMBER,
            rep44           NUMBER,
            rep45           NUMBER,
            rep46           NUMBER,
            rep47           NUMBER,
            rep48           NUMBER,
            rep49           NUMBER,
            rep50           NUMBER,
            rep51           NUMBER,
            rep52           NUMBER,
            rep53           NUMBER,
            rep54           NUMBER,
            rep55           NUMBER,
            rep56           NUMBER,
            rep57           NUMBER,
            rep58           NUMBER,
            rep59           NUMBER,
            rep60           NUMBER,
            rep61           NUMBER,
            rep62           NUMBER,
            rep63           NUMBER,
            rep64           NUMBER,
            rep65           NUMBER,
            rep66           NUMBER,
            rep67           NUMBER,
            rep68           NUMBER,
            rep69           NUMBER,
            rep70           NUMBER,
            rep71           NUMBER,
            rep72           NUMBER,
            rep73           NUMBER,
            rep74           NUMBER,
            rep75           NUMBER,
            rep76           NUMBER,
            rep77           NUMBER,
            rep78           NUMBER,
            rep79           NUMBER,
            rep80           NUMBER,
            rep81           NUMBER,
            rep82           NUMBER,
            rep83           NUMBER,
            rep84           NUMBER,
            rep85           NUMBER,
            rep86           NUMBER,
            rep87           NUMBER,
            rep88           NUMBER,
            rep89           NUMBER,
            rep90           NUMBER,
            rep91           NUMBER,
            rep92           NUMBER,
            rep93           NUMBER,
            rep94           NUMBER,
            rep95           NUMBER,
            rep96           NUMBER,
            rep97           NUMBER,
            rep98           NUMBER,
            rep99           NUMBER,
            rep100          NUMBER,
            thk1            NUMBER,
            thk2            NUMBER,
            thk3            NUMBER,
            thk4            NUMBER,
            thk5            NUMBER,
            thk6            NUMBER,
            thk7            NUMBER,
            thk8            NUMBER,
            thk9            NUMBER,
            thk10           NUMBER,
            thk11           NUMBER,
            thk12           NUMBER,
            thk13           NUMBER,
            thk14           NUMBER,
            thk15           NUMBER,
            thk16           NUMBER,
            thk17           NUMBER,
            thk18           NUMBER,
            thk19           NUMBER,
            thk20           NUMBER,
            thk21           NUMBER,
            thk22           NUMBER,
            thk23           NUMBER,
            thk24           NUMBER,
            thk25           NUMBER,
            key1            NUMBER,
            key2            NUMBER,
            key3            NUMBER,
            key4            NUMBER,
            key5            NUMBER,
            key6            NUMBER,
            key7            NUMBER,
            key8            NUMBER,
            key9            NUMBER,
            key10           NUMBER
        );

rem
rem  Aggregate results for order status transactions.
rem  These results are from the measurement interval only.
rem
        CREATE TABLE tpcc_ord_res
        (
            run_name        VARCHAR2(20),
            rep1            NUMBER,
            rep2            NUMBER,
            rep3            NUMBER,
            rep4            NUMBER,
            rep5            NUMBER,
            rep6            NUMBER,
            rep7            NUMBER,
            rep8            NUMBER,
            rep9            NUMBER,
            rep10           NUMBER,
            rep11           NUMBER,
            rep12           NUMBER,
            rep13           NUMBER,
            rep14           NUMBER,
            rep15           NUMBER,
            rep16           NUMBER,
            rep17           NUMBER,
            rep18           NUMBER,
            rep19           NUMBER,
            rep20           NUMBER,
            rep21           NUMBER,
            rep22           NUMBER,
            rep23           NUMBER,
            rep24           NUMBER,
            rep25           NUMBER,
            rep26           NUMBER,
```

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    rep27           NUMBER,
    rep28           NUMBER,
    rep29           NUMBER,
    rep30           NUMBER,
    rep31           NUMBER,
    rep32           NUMBER,
    rep33           NUMBER,
    rep34           NUMBER,
    rep35           NUMBER,
    rep36           NUMBER,
    rep37           NUMBER,
    rep38           NUMBER,
    rep39           NUMBER,
    rep40           NUMBER,
    rep41           NUMBER,
    rep42           NUMBER,
    rep43           NUMBER,
    rep44           NUMBER,
    rep45           NUMBER,
    rep46           NUMBER,
    rep47           NUMBER,
    rep48           NUMBER,
    rep49           NUMBER,
    rep50           NUMBER,
    rep51           NUMBER,
    rep52           NUMBER,
    rep53           NUMBER,
    rep54           NUMBER,
    rep55           NUMBER,
    rep56           NUMBER,
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    rep58           NUMBER,
    rep59           NUMBER,
    rep60           NUMBER,
    rep61           NUMBER,
    rep62           NUMBER,
    rep63           NUMBER,
    rep64           NUMBER,
    rep65           NUMBER,
    rep66           NUMBER,
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    rep69           NUMBER,
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    rep73           NUMBER,
    rep74           NUMBER,
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    rep79           NUMBER,
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    rep81           NUMBER,
    rep82           NUMBER,
    rep83           NUMBER,
    rep84           NUMBER,
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    rep88           NUMBER,
    rep89           NUMBER,
    rep90           NUMBER,
    rep91           NUMBER,
    rep92           NUMBER,
    rep93           NUMBER,
    rep94           NUMBER,
    rep95           NUMBER,
    rep96           NUMBER,
    rep97           NUMBER,
    rep98           NUMBER,
    rep99           NUMBER,
    rep100          NUMBER,
    thk1            NUMBER,
    thk2            NUMBER,
    thk3            NUMBER,
    thk4            NUMBER,
    thk5            NUMBER,
    thk6            NUMBER,
    thk7            NUMBER,
    thk8            NUMBER,
    thk9            NUMBER,
    thk10           NUMBER,
    thk11           NUMBER,
    thk12           NUMBER,
    thk13           NUMBER,
    thk14           NUMBER,
    thk15           NUMBER,
    thk16           NUMBER,
    thk17           NUMBER,
    thk18           NUMBER,
    thk19           NUMBER,
    thk20           NUMBER,
    thk21           NUMBER,
    thk22           NUMBER,
    thk23           NUMBER,
    thk24           NUMBER,
    thk25           NUMBER,
    key1            NUMBER,
    key2            NUMBER,
    key3            NUMBER,
    key4            NUMBER,
    key5            NUMBER,
    key6            NUMBER,
    key7            NUMBER,
    key8            NUMBER,
    key9            NUMBER,
    key10           NUMBER
    );

rem
rem  Results for order status transactions.
rem  These results are from the measurement interval only.
rem
    CREATE TABLE bench_ord_res
    (
        run_name        VARCHAR2(20),
        audit_str       VARCHAR2(10),
        proc_no         NUMBER,
        rep1            NUMBER,
        rep2            NUMBER,
        rep3            NUMBER,
        rep4            NUMBER,
        rep5            NUMBER,
        rep6            NUMBER,
        rep7            NUMBER,
        rep8            NUMBER,
        rep9            NUMBER,
        rep10           NUMBER,
        rep11           NUMBER,
        rep12           NUMBER,
        rep13           NUMBER,
        rep14           NUMBER,
        rep15           NUMBER,
        rep16           NUMBER,
        rep17           NUMBER,
        rep18           NUMBER,
        rep19           NUMBER,
        rep20           NUMBER,
        rep21           NUMBER,
        rep22           NUMBER,
        rep23           NUMBER,
        rep24           NUMBER,
        rep25           NUMBER,
        rep26           NUMBER,
        rep27           NUMBER,
        rep28           NUMBER,
        rep29           NUMBER,
        rep30           NUMBER,
        rep31           NUMBER,
        rep32           NUMBER,
        rep33           NUMBER,
        rep34           NUMBER,
        rep35           NUMBER,
        rep36           NUMBER,
        rep37           NUMBER,
        rep38           NUMBER,
        rep39           NUMBER,
        rep40           NUMBER,
        rep41           NUMBER,
        rep42           NUMBER,
        rep43           NUMBER,
        rep44           NUMBER,
        rep45           NUMBER,
        rep46           NUMBER,
        rep47           NUMBER,
        rep48           NUMBER,
        rep49           NUMBER,
        rep50           NUMBER,

        rep51           NUMBER,
        rep52           NUMBER,
        rep53           NUMBER,
        rep54           NUMBER,
        rep55           NUMBER,
        rep56           NUMBER,
        rep57           NUMBER,
        rep58           NUMBER,
        rep59           NUMBER,
        rep60           NUMBER,
        rep61           NUMBER,
        rep62           NUMBER,
        rep63           NUMBER,
        rep64           NUMBER,
        rep65           NUMBER,
        rep66           NUMBER,
        rep67           NUMBER,
        rep68           NUMBER,
        rep69           NUMBER,
        rep70           NUMBER,
        rep71           NUMBER,
        rep72           NUMBER,
        rep73           NUMBER,
        rep74           NUMBER,
        rep75           NUMBER,
        rep76           NUMBER,
        rep77           NUMBER,
        rep78           NUMBER,
        rep79           NUMBER,
        rep80           NUMBER,
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            rep81           NUMBER,
            rep82           NUMBER,
            rep83           NUMBER,
            rep84           NUMBER,
            rep85           NUMBER,
            rep86           NUMBER,
            rep87           NUMBER,
            rep88           NUMBER,
            rep89           NUMBER,
            rep90           NUMBER,
            rep91           NUMBER,
            rep92           NUMBER,
            rep93           NUMBER,
            rep94           NUMBER,
            rep95           NUMBER,
            rep96           NUMBER,
            rep97           NUMBER,
            rep98           NUMBER,
            rep99           NUMBER,
            rep100          NUMBER,
            thk1            NUMBER,
            thk2            NUMBER,
            thk3            NUMBER,
            thk4            NUMBER,
            thk5            NUMBER,
            thk6            NUMBER,
            thk7            NUMBER,
            thk8            NUMBER,
            thk9            NUMBER,
            thk10           NUMBER,
            thk11           NUMBER,
            thk12           NUMBER,
            thk13           NUMBER,
            thk14           NUMBER,
            thk15           NUMBER,
            thk16           NUMBER,
            thk17           NUMBER,
            thk18           NUMBER,
            thk19           NUMBER,
            thk20           NUMBER,
            thk21           NUMBER,
            thk22           NUMBER,
            thk23           NUMBER,
            thk24           NUMBER,
            thk25           NUMBER,
            key1            NUMBER,
            key2            NUMBER,
            key3            NUMBER,
            key4            NUMBER,
            key5            NUMBER,
            key6            NUMBER,
            key7            NUMBER,
            key8            NUMBER,
            key9            NUMBER,
            key10           NUMBER
        );

rem
rem  Aggregate results for delivery transactions.
rem  These results are from the measurement interval only.
rem
        CREATE TABLE tpcc_del_res
        (
            run_name        VARCHAR2(20),
            rep1            NUMBER,
            rep2            NUMBER,
            rep3            NUMBER,
            rep4            NUMBER,
            rep5            NUMBER,
            rep6            NUMBER,
            rep7            NUMBER,
            rep8            NUMBER,
            rep9            NUMBER,
            rep10           NUMBER,
            rep11           NUMBER,
            rep12           NUMBER,
            rep13           NUMBER,
            rep14           NUMBER,
            rep15           NUMBER,
            rep16           NUMBER,
            rep17           NUMBER,
            rep18           NUMBER,
            rep19           NUMBER,
            rep20           NUMBER,
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            rep22           NUMBER,
            rep23           NUMBER,
            rep24           NUMBER,
            rep25           NUMBER,
            rep26           NUMBER,
            rep27           NUMBER,
            rep28           NUMBER,
            rep29           NUMBER,
            rep30           NUMBER,
            rep31           NUMBER,
            rep32           NUMBER,
            rep33           NUMBER,
            rep34           NUMBER,
            rep35           NUMBER,
            rep36           NUMBER,
            rep37           NUMBER,
            rep38           NUMBER,
            rep39           NUMBER,
            rep40           NUMBER,
            rep41           NUMBER,
            rep42           NUMBER,
            rep43           NUMBER,
            rep44           NUMBER,
            rep45           NUMBER,
            rep46           NUMBER,
            rep47           NUMBER,
            rep48           NUMBER,
            rep49           NUMBER,
            rep50           NUMBER,
            rep51           NUMBER,
            rep52           NUMBER,
            rep53           NUMBER,
            rep54           NUMBER,
            rep55           NUMBER,
            rep56           NUMBER,
            rep57           NUMBER,
            rep58           NUMBER,
            rep59           NUMBER,
            rep60           NUMBER,
            rep61           NUMBER,
            rep62           NUMBER,
            rep63           NUMBER,
            rep64           NUMBER,
            rep65           NUMBER,
            rep66           NUMBER,
            rep67           NUMBER,
            rep68           NUMBER,
            rep69           NUMBER,
            rep70           NUMBER,
            rep71           NUMBER,
            rep72           NUMBER,
            rep73           NUMBER,
            rep74           NUMBER,
            rep75           NUMBER,
            rep76           NUMBER,
            rep77           NUMBER,
            rep78           NUMBER,
            rep79           NUMBER,
            rep80           NUMBER,
            rep81           NUMBER,
            rep82           NUMBER,
            rep83           NUMBER,
            rep84           NUMBER,
            rep85           NUMBER,
            rep86           NUMBER,
            rep87           NUMBER,
            rep88           NUMBER,
            rep89           NUMBER,
            rep90           NUMBER,
            rep91           NUMBER,
            rep92           NUMBER,
            rep93           NUMBER,
            rep94           NUMBER,
            rep95           NUMBER,
            rep96           NUMBER,
            rep97           NUMBER,
            rep98           NUMBER,
            rep99           NUMBER,
            rep100          NUMBER,
            thk1            NUMBER,
            thk2            NUMBER,
            thk3            NUMBER,
            thk4            NUMBER,
            thk5            NUMBER,
            thk6            NUMBER,
            thk7            NUMBER,
            thk8            NUMBER,
            thk9            NUMBER,
            thk10           NUMBER,
            thk11           NUMBER,
            thk12           NUMBER,
            thk13           NUMBER,
            thk14           NUMBER,
            thk15           NUMBER,
            thk16           NUMBER,
            thk17           NUMBER,
            thk18           NUMBER,
            thk19           NUMBER,
            thk20           NUMBER,
            thk21           NUMBER,
            thk22           NUMBER,
            thk23           NUMBER,
            thk24           NUMBER,
            thk25           NUMBER,
            key1            NUMBER,
            key2            NUMBER,
            key3            NUMBER,
            key4            NUMBER,
            key5            NUMBER,
            key6            NUMBER,
            key7            NUMBER,
            key8            NUMBER,
            key9            NUMBER,
            key10           NUMBER
        );

rem
```

```
rem  Results for delivery transactions.
rem  These results are from the measurement interval only.
rem

          CREATE TABLE bench_del_res
          (
              run_name        VARCHAR2(20),
              audit_str       VARCHAR2(10),
              proc_no         NUMBER,
              rep1            NUMBER,
              rep2            NUMBER,
              rep3            NUMBER,
              rep4            NUMBER,
              rep5            NUMBER,
              rep6            NUMBER,
              rep7            NUMBER,
              rep8            NUMBER,
              rep9            NUMBER,
              rep10           NUMBER,
              rep11           NUMBER,
              rep12           NUMBER,
              rep13           NUMBER,
              rep14           NUMBER,
              rep15           NUMBER,
              rep16           NUMBER,
              rep17           NUMBER,
              rep18           NUMBER,
              rep19           NUMBER,
              rep20           NUMBER,
              rep21           NUMBER,
              rep22           NUMBER,
              rep23           NUMBER,
              rep24           NUMBER,
              rep25           NUMBER,
              rep26           NUMBER,
              rep27           NUMBER,
              rep28           NUMBER,
              rep29           NUMBER,
              rep30           NUMBER,
              rep31           NUMBER,
              rep32           NUMBER,
              rep33           NUMBER,
              rep34           NUMBER,
              rep35           NUMBER,
              rep36           NUMBER,
              rep37           NUMBER,
              rep38           NUMBER,
              rep39           NUMBER,
              rep40           NUMBER,
              rep41           NUMBER,
              rep42           NUMBER,
              rep43           NUMBER,
              rep44           NUMBER,
              rep45           NUMBER,
              rep46           NUMBER,
              rep47           NUMBER,
              rep48           NUMBER,
              rep49           NUMBER,
              rep50           NUMBER,
              rep51           NUMBER,
              rep52           NUMBER,
              rep53           NUMBER,
              rep54           NUMBER,
              rep55           NUMBER,
              rep56           NUMBER,
              rep57           NUMBER,
              rep58           NUMBER,
              rep59           NUMBER,
              rep60           NUMBER,
              rep61           NUMBER,
              rep62           NUMBER,
              rep63           NUMBER,
              rep64           NUMBER,
              rep65           NUMBER,
              rep66           NUMBER,
              rep67           NUMBER,
              rep68           NUMBER,
              rep69           NUMBER,
              rep70           NUMBER,
              rep71           NUMBER,
              rep72           NUMBER,
              rep73           NUMBER,
              rep74           NUMBER,
              rep75           NUMBER,
              rep76           NUMBER,
              rep77           NUMBER,
              rep78           NUMBER,
              rep79           NUMBER,
              rep80           NUMBER,
              rep81           NUMBER,
              rep82           NUMBER,
              rep83           NUMBER,
              rep84           NUMBER,
              rep85           NUMBER,
              rep86           NUMBER,
              rep87           NUMBER,
              rep88           NUMBER,
              rep89           NUMBER,
              rep90           NUMBER,
              rep91           NUMBER,
              rep92           NUMBER,
              rep93           NUMBER,
              rep94           NUMBER,
              rep95           NUMBER,
              rep96           NUMBER,
              rep97           NUMBER,
              rep98           NUMBER,
              rep99           NUMBER,
              rep100          NUMBER,
              thk1            NUMBER,
              thk2            NUMBER,
              thk3            NUMBER,
              thk4            NUMBER,
              thk5            NUMBER,
              thk6            NUMBER,
              thk7            NUMBER,
              thk8            NUMBER,
              thk9            NUMBER,
              thk10           NUMBER,
              thk11           NUMBER,
              thk12           NUMBER,
              thk13           NUMBER,
              thk14           NUMBER,
              thk15           NUMBER,
              thk16           NUMBER,
              thk17           NUMBER,
              thk18           NUMBER,
              thk19           NUMBER,
              thk20           NUMBER,
              thk21           NUMBER,
              thk22           NUMBER,
              thk23           NUMBER,
              thk24           NUMBER,
              thk25           NUMBER,
              key1            NUMBER,
              key2            NUMBER,
              key3            NUMBER,
              key4            NUMBER,
              key5            NUMBER,
              key6            NUMBER,
              key7            NUMBER,
              key8            NUMBER,
              key9            NUMBER,
              key10           NUMBER
          );

rem
rem  Aggregate results for stock level transactions.
rem  These results are from the measurement interval only.
rem
          CREATE TABLE tpcc_sto_res
          (
              run_name        VARCHAR2(20),
              rep1            NUMBER,
              rep2            NUMBER,
              rep3            NUMBER,
              rep4            NUMBER,
              rep5            NUMBER,
              rep6            NUMBER,
              rep7            NUMBER,
              rep8            NUMBER,
              rep9            NUMBER,
              rep10           NUMBER,
              rep11           NUMBER,
              rep12           NUMBER,
              rep13           NUMBER,
              rep14           NUMBER,
              rep15           NUMBER,
              rep16           NUMBER,
              rep17           NUMBER,
              rep18           NUMBER,
              rep19           NUMBER,
              rep20           NUMBER,
              rep21           NUMBER,
              rep22           NUMBER,
              rep23           NUMBER,
              rep24           NUMBER,
              rep25           NUMBER,
              rep26           NUMBER,
              rep27           NUMBER,
              rep28           NUMBER,
              rep29           NUMBER,
              rep30           NUMBER,
              rep31           NUMBER,
              rep32           NUMBER,
              rep33           NUMBER,
              rep34           NUMBER,
              rep35           NUMBER,
              rep36           NUMBER,
              rep37           NUMBER,
              rep38           NUMBER,
              rep39           NUMBER,
              rep40           NUMBER,
              rep41           NUMBER,
              rep42           NUMBER,
              rep43           NUMBER,
              rep44           NUMBER,
              rep45           NUMBER,
              rep46           NUMBER,
              rep47           NUMBER,
              rep48           NUMBER,
              rep49           NUMBER,
```

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            rep50           NUMBER,
            rep51           NUMBER,
            rep52           NUMBER,
            rep53           NUMBER,
            rep54           NUMBER,
            rep55           NUMBER,
            rep56           NUMBER,
            rep57           NUMBER,
            rep58           NUMBER,
            rep59           NUMBER,
            rep60           NUMBER,
            rep61           NUMBER,
            rep62           NUMBER,
            rep63           NUMBER,
            rep64           NUMBER,
            rep65           NUMBER,
            rep66           NUMBER,
            rep67           NUMBER,
            rep68           NUMBER,
            rep69           NUMBER,
            rep70           NUMBER,
            rep71           NUMBER,
            rep72           NUMBER,
            rep73           NUMBER,
            rep74           NUMBER,
            rep75           NUMBER,
            rep76           NUMBER,
            rep77           NUMBER,
            rep78           NUMBER,
            rep79           NUMBER,
            rep80           NUMBER,
            rep81           NUMBER,
            rep82           NUMBER,
            rep83           NUMBER,
            rep84           NUMBER,
            rep85           NUMBER,
            rep86           NUMBER,
            rep87           NUMBER,
            rep88           NUMBER,
            rep89           NUMBER,
            rep90           NUMBER,
            rep91           NUMBER,
            rep92           NUMBER,
            rep93           NUMBER,
            rep94           NUMBER,
            rep95           NUMBER,
            rep96           NUMBER,
            rep97           NUMBER,
            rep98           NUMBER,
            rep99           NUMBER,
            rep100          NUMBER,
            thk1            NUMBER,
            thk2            NUMBER,
            thk3            NUMBER,
            thk4            NUMBER,
            thk5            NUMBER,
            thk6            NUMBER,
            thk7            NUMBER,
            thk8            NUMBER,
            thk9            NUMBER,
            thk10           NUMBER,
            thk11           NUMBER,
            thk12           NUMBER,
            thk13           NUMBER,
            thk14           NUMBER,
            thk15           NUMBER,
            thk16           NUMBER,
            thk17           NUMBER,
            thk18           NUMBER,
            thk19           NUMBER,
            thk20           NUMBER,
            thk21           NUMBER,
            thk22           NUMBER,
            thk23           NUMBER,
            thk24           NUMBER,
            thk25           NUMBER,
            key1            NUMBER,
            key2            NUMBER,
            key3            NUMBER,
            key4            NUMBER,
            key5            NUMBER,
            key6            NUMBER,
            key7            NUMBER,
            key8            NUMBER,
            key9            NUMBER,
            key10           NUMBER
        );

rem
rem  Results for stock level transactions.
rem  These results are from the measurement interval only.
rem
        CREATE TABLE bench_sto_res
        (
            run_name        VARCHAR2(20),
            audit_str       VARCHAR2(10),
            proc_no         NUMBER,
            rep1            NUMBER,
            rep2            NUMBER,
            rep3            NUMBER,
            rep4            NUMBER,
            rep5            NUMBER,
            rep6            NUMBER,
            rep7            NUMBER,
            rep8            NUMBER,
            rep9            NUMBER,
            rep10           NUMBER,
            rep11           NUMBER,
            rep12           NUMBER,
            rep13           NUMBER,
            rep14           NUMBER,
            rep15           NUMBER,
            rep16           NUMBER,
            rep17           NUMBER,
            rep18           NUMBER,
            rep19           NUMBER,
            rep20           NUMBER,
            rep21           NUMBER,
            rep22           NUMBER,
            rep23           NUMBER,
            rep24           NUMBER,
            rep25           NUMBER,
            rep26           NUMBER,
            rep27           NUMBER,
            rep28           NUMBER,
            rep29           NUMBER,
            rep30           NUMBER,
            rep31           NUMBER,
            rep32           NUMBER,
            rep33           NUMBER,
            rep34           NUMBER,
            rep35           NUMBER,
            rep36           NUMBER,
            rep37           NUMBER,
            rep38           NUMBER,
            rep39           NUMBER,
            rep40           NUMBER,
            rep41           NUMBER,
            rep42           NUMBER,
            rep43           NUMBER,
            rep44           NUMBER,
            rep45           NUMBER,
            rep46           NUMBER,
            rep47           NUMBER,
            rep48           NUMBER,
            rep49           NUMBER,
            rep50           NUMBER,
            rep51           NUMBER,
            rep52           NUMBER,
            rep53           NUMBER,
            rep54           NUMBER,
            rep55           NUMBER,
            rep56           NUMBER,
            rep57           NUMBER,
            rep58           NUMBER,
            rep59           NUMBER,
            rep60           NUMBER,
            rep61           NUMBER,
            rep62           NUMBER,
            rep63           NUMBER,
            rep64           NUMBER,
            rep65           NUMBER,
            rep66           NUMBER,
            rep67           NUMBER,
            rep68           NUMBER,
            rep69           NUMBER,
            rep70           NUMBER,
            rep71           NUMBER,
            rep72           NUMBER,
            rep73           NUMBER,
            rep74           NUMBER,
            rep75           NUMBER,
            rep76           NUMBER,
            rep77           NUMBER,
            rep78           NUMBER,
            rep79           NUMBER,
            rep80           NUMBER,
            rep81           NUMBER,
            rep82           NUMBER,
            rep83           NUMBER,
            rep84           NUMBER,
            rep85           NUMBER,
            rep86           NUMBER,
            rep87           NUMBER,
            rep88           NUMBER,
            rep89           NUMBER,
            rep90           NUMBER,
            rep91           NUMBER,
            rep92           NUMBER,
            rep93           NUMBER,
            rep94           NUMBER,
            rep95           NUMBER,
            rep96           NUMBER,
            rep97           NUMBER,
            rep98           NUMBER,
            rep99           NUMBER,
            rep100          NUMBER,
            thk1            NUMBER,
            thk2            NUMBER,
            thk3            NUMBER,
            thk4            NUMBER,
            thk5            NUMBER,
```

```
              thk6            NUMBER,
              thk7            NUMBER,
              thk8            NUMBER,
              thk9            NUMBER,
              thk10           NUMBER,
              thk11           NUMBER,
              thk12           NUMBER,
              thk13           NUMBER,
              thk14           NUMBER,
              thk15           NUMBER,
              thk16           NUMBER,
              thk17           NUMBER,
              thk18           NUMBER,
              thk19           NUMBER,
              thk20           NUMBER,

              thk21           NUMBER,
              thk22           NUMBER,
              thk23           NUMBER,
              thk24           NUMBER,
              thk25           NUMBER,
              key1            NUMBER,
              key2            NUMBER,
              key3            NUMBER,
              key4            NUMBER,
              key5            NUMBER,
              key6            NUMBER,
              key7            NUMBER,
              key8            NUMBER,
              key9            NUMBER,
              key10           NUMBER
          );
commit;
set echo off;
rem spool off;
rem exit;


*************************
cre_tab.sql
*************************

rem
rem
================================================================+
rem         Copyright (c) 1995  Oracle Corp, Redwood Shores, CA
|
rem                   OPEN SYSTEMS PERFORMANCE GROUP
|
rem                        All Rights Reserved
|
rem
================================================================+
rem  FILENAME
rem       cre_tab.sql
rem  DESCRIPTION
rem       Create temporary tables for consistency tests.
rem
================================================================
rem
rem Usage:   sqlplus tpcc/tpcc @cre_tab
rem

connect tpcc/tpcc;
set echo on;

drop table temp_o1;
drop table temp_no;
drop table temp_o2;
drop table temp_ol;
drop table tpcc_audit_tab;

create table temp_o1 (
   o_w_id  integer,
   o_d_id  integer,
   o_o_id  integer);

create table temp_no (
   no_w_id integer,
   no_d_id integer,
   no_o_id integer);

create table temp_o2 (
   o_w_id  integer,
   o_d_id  integer,
   o_count integer);

create table temp_ol (
   ol_w_id  integer,
   ol_d_id  integer,
   ol_count integer);

create table tpcc_audit_tab (starttime date);

delete from tpcc_audit_tab;

set echo off;



*************************
create_cache_views.sql
*************************

rem This script creates four views that when queried will return
rem the total number of buffers in the buffer cache and the total
rem number of cloned buffers from each of the database's
tablespaces.
rem
rem This assumes that each table and index is in its own
tablespace.
rem If this is not the case, another query can be used which uses
the
rem database's object tables to decipher the different objects.
However,
rem this query is slower.
rem
rem This script assumes 7.3.x.  If you are using V7.2.x or below,
please
rem replace svrmgrl with sqldba lmode=y.
rem
rem Modification History:
rem
rem wbattist      16-Jun-1996     Create two additional views to
keep
rem                               track of the number of clones in
each
rem                               tablespace.
rem
rem wbattist      24-May-1995     Add the state check for the cbf
view
rem                               to ensure that cloned blocks are
not
rem                               counted.
rem

connect internal/internal;
set echo on;
drop view cbf;
create view cbf as
 select distinct(dbarfil) file#, count(1) blocks
 from x$bh
   where dbarfil > 0 and state <> 3
 group by dbarfil;
drop view cbt;
create view cbt as
  select ts$.name name,sum(cbf.blocks) buffers
  from cbf, file$, ts$
    where cbf.file#=file$.file# and file$.ts#=ts$.ts#
  group by file$.ts#, ts$.name;
drop view cbfcln;
create view cbfcln as
 select distinct(dbarfil) file#, count(1) blocks
 from x$bh
   where dbarfil > 0
 group by dbarfil;
drop view cbtcln;
create view cbtcln as
  select ts$.name name,sum(cbfcln.blocks) buffers
  from cbfcln, file$, ts$
    where cbfcln.file#=file$.file# and file$.ts#=ts$.ts#
  group by file$.ts#, ts$.name;

set echo off;


*************************
createcust.sql
*************************

spool log/step11createcust.log;
set echo on;
drop table cust;
drop cluster custcluster including tables;


set timing on;


create cluster custcluster (
c_id    number(5,0)
,c_d_id    number(2,0)
,c_w_id    number(5,0)
  )
  single    table
  hashkeys    345600000
  hash is   (c_w_id * 30000 + c_id * 10 + c_d_id - 30011)
  size    850
  initrans    3
  pctfree    0
  storage ( initial 1440002k next 1440000k buffer_pool recycle
freelists 10 freelist groups 4 maxextents 250 pctincrease 0)
  tablespace    cust_0;

create table cust (
        c_id            number(5,0),
        c_d_id          number(2,0),
        c_w_id          number(5,0),
        c_discount      number,
        c_credit        char(2),
        c_last          varchar2(16),
        c_first         varchar2(16),
```

```
        c_credit_lim    number,
        c_balance       number,
        c_ytd_payment   number,
        c_payment_cnt   number,
        c_delivery_cnt  number,
        c_street_1      varchar2(20),
        c_street_2      varchar2(20),
        c_city          varchar2(20),
        c_state         char(2),
        c_zip           char(9),
        c_phone         char(16),
        c_since         date,
        c_middle        char(2),
        c_data          varchar2(500)
)
cluster custcluster (c_id
,c_d_id
,c_w_id
);
spool off;
set echo off;

exit sql.sqlcode;


*************************
createdist.sql
*************************

spool step10createdist.log;
set echo on;
drop table dist;
drop cluster distcluster including tables;

set timing on;


create cluster distcluster (

          d_w_id    number(5,0),
          d_id      number(2,0)
)
          single table
          hashkeys  115200
          size              3072
          hash is           (d_w_id - 1) * 10 + d_id
          initrans  4
          pctfree           0
          storage ( initial 57602k next 57600k pctincrease 0
freelist groups 3)
          tablespace dist_0;

create table dist (
        d_id            number(2,0),
          d_w_id          number(5,0),
        d_ytd           number,
        d_tax           number,
        d_next_o_id     number,
        d_name          varchar2(10),
        d_street_1      varchar2(20),
        d_street_2      varchar2(20),
        d_city          varchar2(20),
        d_state         char(2),
        d_zip           char(9)
)
cluster distcluster (d_w_id, d_id);

spool off;
set echo off;
exit sql.sqlcode;


*************************
createhist.sql
*************************


spool log/step9createhist.log;
set echo on;
drop table hist;

set timing on;

create table hist(
        h_c_id          number,
        h_c_d_id        number,
        h_c_w_id        number,
        h_d_id          number,
        h_w_id          number,
        h_date          date,
        h_amount        number,
        h_data          varchar2(24)
)
  initrans    4
  pctfree    5
partition by range (h_w_id)
(
partition hist1 values less than (1441) tablespace hist_1,
partition hist2 values less than (2881) tablespace hist_2,
partition hist3 values less than (4321) tablespace hist_3,
partition hist4 values less than (5761) tablespace hist_4,
partition hist5 values less than (7201) tablespace hist_5,
partition hist6 values less than (8641) tablespace hist_6,
partition hist7 values less than (10081) tablespace hist_7,
partition hist8 values less than (MAXVALUE) tablespace hist_8
)
;
spool off;
set echo off;
exit sql.sqlcode;


*************************
createicust1.sql
*************************

spool log/step32createicust1.log;
set echo on;
drop index icust1;

set timing on;

create unique index icust1 on cust (c_w_id, c_d_id, c_id)
  initrans    3
  pctfree    1
  parallel 8
  storage ( freelists 22 freelist groups 43 )
  tablespace    indexes;
spool off;
set echo off;
exit sql.sqlcode;


*************************
createicust2.sql
*************************

spool log/step33createicust2.log;
set echo on;
drop index icust2;

set timing on;

create unique index icust2 on cust (c_last, c_w_id, c_d_id,
c_first, c_id)
  initrans    3
  pctfree    1
  parallel 8
  storage ( freelists 22 freelist groups 43 )
  tablespace    icust2_0;
spool off;
set echo off;
exit sql.sqlcode;


*************************
createidist.sql
*************************

spool log/step30createidist.log;
set echo on;
drop index idist;

set timing on;

create unique index idist on dist (d_w_id, d_id)
  initrans    3
  parallel    4
  pctfree    1
  storage ( freelists 22 freelist groups 43 )
  tablespace indexes
;
spool off;
set echo off;
exit sql.sqlcode;


*************************
createiitem.sql
*************************

spool log/step31createiitem.log;
set echo on;
drop index iitem;

set timing on;

create unique index iitem on item (i_id)
  initrans    4
  pctfree    1
  storage ( freelists 22 freelist groups 43 )
  tablespace    item_0;
spool off;
set echo off;
exit sql.sqlcode;


*************************
createiordr1.sql
*************************

spool log/step35createiordr1.log;
```

```
set echo on;
drop index iordr1;

set timing on;

create unique index iordr1 on ordr (o_w_id, o_d_id, o_id)
  initrans    3
  parallel    4
  pctfree    1
  storage ( freelists 22 freelist groups 43 )
  local
  (
    partition iordr11 tablespace iordr1_1,
    partition iordr12 tablespace iordr1_2,
    partition iordr13 tablespace iordr1_3,
    partition iordr14 tablespace iordr1_4,
    partition iordr15 tablespace iordr1_5,
    partition iordr16 tablespace iordr1_6,
    partition iordr17 tablespace iordr1_7,
    partition iordr18 tablespace iordr1_8
  )
;
spool off;
set echo off;
exit sql.sqlcode;


**************************
createiordr2.sql
**************************

spool log/step36createiordr2.log;
set echo on;
drop index iordr2;

set timing on;

create unique index iordr2 on ordr (o_w_id, o_d_id, o_c_id, o_id)
  initrans    4
  parallel    4
  pctfree    25
  storage ( freelists 22 freelist groups 43 )
  local
  (
    partition iordr21 tablespace iordr2_1,
    partition iordr22 tablespace iordr2_2,
    partition iordr23 tablespace iordr2_3,
    partition iordr24 tablespace iordr2_4,
    partition iordr25 tablespace iordr2_5,
    partition iordr26 tablespace iordr2_6,
    partition iordr27 tablespace iordr2_7,
    partition iordr28 tablespace iordr2_8
  )
;
spool off;
set echo off;
exit sql.sqlcode;


**************************
createistok.sql
**************************

spool log/createistok.log;
set echo on;
drop index istok;

set timing on;

create unique index istok on stok (s_i_id, s_w_id)
  initrans    3
  parallel    16
  pctfree    1
  storage ( freelists 22 freelist groups 43 )
  tablespace    indexes;
spool off;
set echo off;
exit sql.sqlcode;


**************************
createiware.sql
**************************

spool log/step29createiware.log;
set echo on;
drop index iware;

set timing on;

create unique index iware on ware (w_id)
  initrans    3
  parallel    4
  pctfree    1
  storage ( freelists 22 freelist groups 43 )
  tablespace indexes
;
spool off;
set echo off;
exit sql.sqlcode;


**************************
createnord.sql
**************************

spool log/step14createnord.log;
set echo on;
drop table nord;

set timing on;

create table nord (
        no_w_id         number,
        no_d_id         number,
        no_o_id         number,
          constraint inord primary key (no_w_id, no_d_id, no_o_id)
)
  organization index
  initrans    4
  pctfree    5
  storage ( freelists 22 freelist groups 43 )
  partition by range (no_w_id)
  (
partition nord1 values less than (1441) tablespace nord_1,
partition nord2 values less than (2881) tablespace nord_2,
partition nord3 values less than (4321) tablespace nord_3,
partition nord4 values less than (5761) tablespace nord_4,
partition nord5 values less than (7201) tablespace nord_5,
partition nord6 values less than (8641) tablespace nord_6,
partition nord7 values less than (10081) tablespace nord_7,
partition nord8 values less than (MAXVALUE) tablespace nord_8
)
;
spool off;
set echo off;
exit sql.sqlcode;


**************************
createordl.sql
**************************

spool log/step15createordl.log;
set echo on;
drop table ordl;

set timing on;

create table ordl (
        ol_w_id         number,
        ol_d_id         number,
        ol_o_id         number,
        ol_number       number,
        ol_i_id         number,
        ol_delivery_d   date,
        ol_amount       number,
        ol_supply_w_id  number,
        ol_quantity     number,
        ol_dist_info    char(24),
          constraint iordl primary key (ol_w_id, ol_d_id, ol_o_id,
ol_number)
)
  organization index
  initrans    4
  pctfree    5
  storage ( freelists 22 freelist groups 43 )
  partition by range (ol_w_id)
  (
partition ordl1 values less than (1441) tablespace ordl_1,
partition ordl2 values less than (2881) tablespace ordl_2,
partition ordl3 values less than (4321) tablespace ordl_3,
partition ordl4 values less than (5761) tablespace ordl_4,
partition ordl5 values less than (7201) tablespace ordl_5,
partition ordl6 values less than (8641) tablespace ordl_6,
partition ordl7 values less than (10081) tablespace ordl_7,
partition ordl8 values less than (MAXVALUE) tablespace ordl_8
)
;
spool off;
set echo off;
exit sql.sqlcode;


**************************
createordr.sql
**************************


spool log/step9createordr.log;
set echo on;
drop table ordr;

set timing on;

create table ordr(
        o_id            number,
        o_w_id          number,
        o_d_id          number,
        o_c_id          number,
        o_carrier_id    number,
        o_ol_cnt        number,
```

```
        o_all_local     number,
        o_entry_d       date
)
  initrans    4
  pctfree    5
partition by range (o_w_id)
(
partition ordr1 values less than (1441) tablespace ordr_1,
partition ordr2 values less than (2881) tablespace ordr_2,
partition ordr3 values less than (4321) tablespace ordr_3,
partition ordr4 values less than (5761) tablespace ordr_4,
partition ordr5 values less than (7201) tablespace ordr_5,
partition ordr6 values less than (8641) tablespace ordr_6,
partition ordr7 values less than (10081) tablespace ordr_7,
partition ordr8 values less than (MAXVALUE) tablespace ordr_8
)
;
spool off;
set echo off;
exit sql.sqlcode;


*************************
createstok.sql
*************************

spool log/step16createstok.log;
set echo on;
drop cluster stokcluster including tables;

set timing on;

create cluster stokcluster (
s_i_id    number(6,0)
,s_w_id    number(5,0)
  )
  single    table
  hashkeys    1152000000
  hash is   (abs(s_i_id - 1) * 1440  + mod((s_w_id  -1), 1440) +
trunc ((s_w_id - 1) / 1440) * 144000000)
  size    380
  initrans    3
  pctfree    0
  storage ( initial 1920002k next 1920000k buffer_pool keep
freelists 10 freelist groups 4 maxextents 250 pctincrease 0)
  tablespace    stok_0;

create table stok (
        s_i_id          number(6,0),
        s_w_id          number(5,0),
        s_quantity      number,
        s_ytd           number,
        s_order_cnt     number,
        s_remote_cnt    number,
        s_data          varchar2(50),
        s_dist_01       char(24),
        s_dist_02       char(24),
        s_dist_03       char(24),
        s_dist_04       char(24),
        s_dist_05       char(24),
        s_dist_06       char(24),
        s_dist_07       char(24),
        s_dist_08       char(24),
        s_dist_09       char(24),
        s_dist_10       char(24)
)
cluster stokcluster (s_i_id
,s_w_id
);
spool off;
set echo off;
exit sql.sqlcode;


*************************
createts.sh
*************************

!/bin/sh
sqlplus tpcc/tpcc @<<!
 create tablespace cust_0  datafile '/home/oracle/dev/raw/cust-1'
size 14100M reuse extent management dictionary;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-2'
size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-3'
size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-4'
size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-5'
size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-6'
size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-7'
size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-8'
size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-9'
size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
10' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
11' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
12' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
13' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
14' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
15' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
16' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
17' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
18' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
19' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
20' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
21' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
22' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
23' size 14100M reuse;
 alter tablespace cust_0 add datafile '/home/oracle/dev/raw/cust-
24' size 15600M reuse;

create tablespace stok_0  datafile '/home/oracle/dev/raw/stock-1'
size 9400M reuse extent management dictionary;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-2'
size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-3'
size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-4'
size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-5'
size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-6'
size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-7'
size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-8'
size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-9'
size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
10' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
11' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
12' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
13' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
14' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
15' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
16' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
17' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
18' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
19' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
20' size 9400M reuse;

alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
21' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
22' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
23' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
24' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
25' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
26' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
27' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
28' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
29' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
30' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
31' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
32' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
33' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
34' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
35' size 9400M reuse;
```

```
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
36' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
37' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
38' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
39' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
40' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
41' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
42' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
43' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
44' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
45' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
46' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
47' size 9400M reuse;
alter tablespace stok_0 add datafile '/home/oracle/dev/raw/stock-
48' size 11400M reuse;

create tablespace ware_0  datafile '/home/oracle/dev/raw/ware-1'
size 6M reuse extent management dictionary;
alter tablespace ware_0 add datafile '/home/oracle/dev/raw/ware-2'
size 6M reuse;
alter tablespace ware_0 add datafile '/home/oracle/dev/raw/ware-3'
size 6M reuse;
alter tablespace ware_0 add datafile '/home/oracle/dev/raw/ware-4'
size 6M reuse;
alter tablespace ware_0 add datafile '/home/oracle/dev/raw/ware-5'
size 6M reuse;
alter tablespace ware_0 add datafile '/home/oracle/dev/raw/ware-6'
size 6M reuse;
alter tablespace ware_0 add datafile '/home/oracle/dev/raw/ware-7'
size 6M reuse;
alter tablespace ware_0 add datafile '/home/oracle/dev/raw/ware-8'
size 12M reuse;

create tablespace dist_0  datafile '/home/oracle/dev/raw/dist-1'
size 60M reuse extent management dictionary;
alter tablespace dist_0 add datafile '/home/oracle/dev/raw/dist-2'
size 60M reuse;
alter tablespace dist_0 add datafile '/home/oracle/dev/raw/dist-3'
size 60M reuse;
alter tablespace dist_0 add datafile '/home/oracle/dev/raw/dist-4'
size 60M reuse;
alter tablespace dist_0 add datafile '/home/oracle/dev/raw/dist-5'
size 60M reuse;
alter tablespace dist_0 add datafile '/home/oracle/dev/raw/dist-6'
size 60M reuse;
alter tablespace dist_0 add datafile '/home/oracle/dev/raw/dist-7'
size 60M reuse;
alter tablespace dist_0 add datafile '/home/oracle/dev/raw/dist-8'
size 120M reuse;

create tablespace item_0  datafile '/home/oracle/dev/raw/item-1'
size 60M reuse extent management dictionary;
!

sh ./addts.sh ordl_1 /home/oracle/dev/raw/ordl-1-1 16010M 4002M
sh ./addfile.sh ordl_1 /home/oracle/dev/raw/ordl-1-2 16010M
sh ./addfile.sh ordl_1 /home/oracle/dev/raw/ordl-1-3 16010M

sh ./addts.sh   ordl_2 /home/oracle/dev/raw/ordl-2-1 16010M 4002M
sh ./addfile.sh ordl_2 /home/oracle/dev/raw/ordl-2-2 16010M
sh ./addfile.sh ordl_2 /home/oracle/dev/raw/ordl-2-3 16010M

sh ./addts.sh   ordl_3 /home/oracle/dev/raw/ordl-3-1 16010M 4002M
sh ./addfile.sh ordl_3 /home/oracle/dev/raw/ordl-3-2 16010M
sh ./addfile.sh ordl_3 /home/oracle/dev/raw/ordl-3-3 16010M

sh ./addts.sh   ordl_4 /home/oracle/dev/raw/ordl-4-1 16010M 4002M
sh ./addfile.sh ordl_4 /home/oracle/dev/raw/ordl-4-2 16010M
sh ./addfile.sh ordl_4 /home/oracle/dev/raw/ordl-4-3 16010M

sh ./addts.sh   ordl_5 /home/oracle/dev/raw/ordl-5-1 16010M 4002M
sh ./addfile.sh ordl_5 /home/oracle/dev/raw/ordl-5-2 16010M
sh ./addfile.sh ordl_5 /home/oracle/dev/raw/ordl-5-3 16010M

sh ./addts.sh   ordl_6 /home/oracle/dev/raw/ordl-6-1 16010M 4002M
sh ./addfile.sh ordl_6 /home/oracle/dev/raw/ordl-6-2 16010M
sh ./addfile.sh ordl_6 /home/oracle/dev/raw/ordl-6-3 16010M

sh ./addts.sh   ordl_7 /home/oracle/dev/raw/ordl-7-1 16010M 4002M
sh ./addfile.sh ordl_7 /home/oracle/dev/raw/ordl-7-2 16010M
sh ./addfile.sh ordl_7 /home/oracle/dev/raw/ordl-7-3 16010M

sh ./addts.sh   ordl_8 /home/oracle/dev/raw/ordl-8-1 16010M 4002M
sh ./addfile.sh ordl_8 /home/oracle/dev/raw/ordl-8-2 16010M
sh ./addfile.sh ordl_8 /home/oracle/dev/raw/ordl-8-3 16010M

sh ./addts.sh ordr_1 /home/oracle/dev/raw/ordr-1 3000M 999M
sh ./addts.sh ordr_2 /home/oracle/dev/raw/ordr-2 3000M 999M
sh ./addts.sh ordr_3 /home/oracle/dev/raw/ordr-3 3000M 999M
sh ./addts.sh ordr_4 /home/oracle/dev/raw/ordr-4 3000M 999M
sh ./addts.sh ordr_5 /home/oracle/dev/raw/ordr-5 3000M 999M
sh ./addts.sh ordr_6 /home/oracle/dev/raw/ordr-6 3000M 999M
sh ./addts.sh ordr_7 /home/oracle/dev/raw/ordr-7 3000M 999M
sh ./addts.sh ordr_8 /home/oracle/dev/raw/ordr-8 3000M 999M

sh ./addts.sh nord_1 /home/oracle/dev/raw/nord-1 600M 590M
sh ./addts.sh nord_2 /home/oracle/dev/raw/nord-2 600M 590M
sh ./addts.sh nord_3 /home/oracle/dev/raw/nord-3 600M 590M
sh ./addts.sh nord_4 /home/oracle/dev/raw/nord-4 600M 590M
sh ./addts.sh nord_5 /home/oracle/dev/raw/nord-5 600M 590M
sh ./addts.sh nord_6 /home/oracle/dev/raw/nord-6 600M 590M
sh ./addts.sh nord_7 /home/oracle/dev/raw/nord-7 600M 590M
sh ./addts.sh nord_8 /home/oracle/dev/raw/nord-8 600M 590M

sh ./addts.sh hist_1 /home/oracle/dev/raw/hist-1 4500M 1499M
sh ./addts.sh hist_2 /home/oracle/dev/raw/hist-2 4500M 1499M
sh ./addts.sh hist_3 /home/oracle/dev/raw/hist-3 4500M 1499M
sh ./addts.sh hist_4 /home/oracle/dev/raw/hist-4 4500M 1499M
sh ./addts.sh hist_5 /home/oracle/dev/raw/hist-5 4500M 1499M
sh ./addts.sh hist_6 /home/oracle/dev/raw/hist-6 4500M 1499M
sh ./addts.sh hist_7 /home/oracle/dev/raw/hist-7 4500M 1499M
sh ./addts.sh hist_8 /home/oracle/dev/raw/hist-8 4500M 1499M

sh ./addts.sh   icust2_0 /home/oracle/dev/raw/icust2-1 999M 332M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-2 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-3 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-4 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-5 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-6 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-7 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-8 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-9 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-10 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-11 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-12 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-13 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-14 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-15 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-16 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-17 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-18 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-19 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-20 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-21 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-22 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-23 999M
sh ./addfile.sh icust2_0 /home/oracle/dev/raw/icust2-24 999M

sh ./addts.sh   indexes /home/oracle/dev/raw/indexes-1 16300M 100M
sh ./addfile.sh indexes /home/oracle/dev/raw/indexes-2 16300M

sh ./addts.sh iordr1_1 /home/oracle/dev/raw/iordr1-1 1800M 598M
sh ./addts.sh iordr1_2 /home/oracle/dev/raw/iordr1-2 1800M 598M
sh ./addts.sh iordr1_3 /home/oracle/dev/raw/iordr1-3 1800M 598M
sh ./addts.sh iordr1_4 /home/oracle/dev/raw/iordr1-4 1800M 598M
sh ./addts.sh iordr1_5 /home/oracle/dev/raw/iordr1-5 1800M 598M
sh ./addts.sh iordr1_6 /home/oracle/dev/raw/iordr1-6 1800M 598M
sh ./addts.sh iordr1_7 /home/oracle/dev/raw/iordr1-7 1800M 598M
sh ./addts.sh iordr1_8 /home/oracle/dev/raw/iordr1-8 1800M 598M

sh ./addts.sh iordr2_1 /home/oracle/dev/raw/iordr2-1 2700M 898M
sh ./addts.sh iordr2_2 /home/oracle/dev/raw/iordr2-2 2700M 898M
sh ./addts.sh iordr2_3 /home/oracle/dev/raw/iordr2-3 2700M 898M
sh ./addts.sh iordr2_4 /home/oracle/dev/raw/iordr2-4 2700M 898M
sh ./addts.sh iordr2_5 /home/oracle/dev/raw/iordr2-5 2700M 898M
sh ./addts.sh iordr2_6 /home/oracle/dev/raw/iordr2-6 2700M 898M
sh ./addts.sh iordr2_7 /home/oracle/dev/raw/iordr2-7 2700M 898M
sh ./addts.sh iordr2_8 /home/oracle/dev/raw/iordr2-8 2700M 898M

sh ./addtempts.sh   temp_0 /home/oracle/dev/raw/temp-1 16300M 50M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-2 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-3 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-4 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-5 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-6 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-7 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-8 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-9 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-10 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-11 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-12 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-13 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-14 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-15 16300M
sh ./addtempfile.sh temp_0 /home/oracle/dev/raw/temp-16 16300M


*************************
createware.sql
*************************

spool step9createware.log;
set echo on;
drop table ware;
drop cluster warecluster including tables;

set timing on;

create cluster warecluster (
w_id      number(5,0)
)
```

```
          single table
          hashkeys  11520
          size               3072
          hash is   w_id - 1
          initrans  3
          pctfree            0
          storage (initial 5762k next 5760k pctincrease 0 freelist
groups 4)
          tablespace ware_0;

create table ware(
        w_id            number(5,0),
        w_ytd           number,
        w_tax           number,
        w_name          varchar2(10),
        w_street_1      varchar2(20),
        w_street_2      varchar2(20),
        w_city          varchar2(20),
        w_state         char(2),
        w_zip           char(9)
)
cluster warecluster (w_id);

spool off;
set echo off;
exit sql.sqlcode;


*************************
dml.sql
*************************

REM============================================================
==+
REM        Copyright (c) 1996  Oracle Corp, Redwood Shores, CA
|
REM                    OPEN SYSTEMS PERFORMANCE GROUP
|
REM                         All Rights Reserved
|
REM============================================================
==+
REM FILENAME
REM     dml.sql
REM DESCRIPTION
REM     Disable table locks for TPC-C tables.
REM USAGE
REM     sqlplus tpcc/tpcc dml.sql
REM============================================================
===

connect tpcc/tpcc;
set echo on;

   alter table ware disable table lock;
   alter table dist disable table lock;

   alter table cust disable table lock;
   alter table hist disable table lock;
   alter table item disable table lock;
   alter table stok disable table lock;
   alter table ordr disable table lock;
   alter table nord disable table lock;
   alter table ordl disable table lock;

set echo off;

connect internal/internal;


*************************
droprollsegs.sql
*************************

set echo on

drop rollback segment t1;
drop rollback segment t2;
drop rollback segment t3;
drop rollback segment t4;
drop rollback segment t5;
drop rollback segment t6;
drop rollback segment t7;
drop rollback segment t8;
drop rollback segment t9;
drop rollback segment t10;
drop rollback segment t11;
drop rollback segment t12;
drop rollback segment t13;
drop rollback segment t14;
drop rollback segment t15;
drop rollback segment t16;
drop rollback segment t17;
drop rollback segment t18;
drop rollback segment t19;
drop rollback segment t20;
drop rollback segment t21;
drop rollback segment t22;
drop rollback segment t23;
drop rollback segment t24;
drop rollback segment t25;
drop rollback segment t26;
drop rollback segment t27;
drop rollback segment t28;
drop rollback segment t29;
drop rollback segment t30;

spool off
set echo off
exit sql.sqlcode


*************************
init_1.ora
*************************

instance_number     =1
thread    =1
rollback_segments =  (
t_1_1,t_1_2,t_1_3,t_1_4,t_1_5,t_1_6,t_1_7,t_1_8,t_1_9,t_1_10,t_1_11
,t_1_12,t_1_13,t_1_14,t_1_15,t_1_16,t_1_17,t_1_18,t_1_19,t_1_20,
t_1_21,t_1_22,t_1_23,t_1_24,t_1_25,t_1_26,t_1_27,t_1_28,t_1_29,t_1_
30,t_1_31,t_1_32,t_1_33,t_1_34,t_1_35,t_1_36,t_1_37,t_1_38,t_1_39,t
_1_40,
t_1_41,t_1_42,t_1_43,t_1_44,t_1_45,t_1_46,t_1_47,t_1_48,t_1_49,t_1_
50,t_1_51,t_1_52,t_1_53,t_1_54,t_1_55,t_1_56,t_1_57,t_1_58,t_1_59,t
_1_60,t_1_61,t_1_62,t_1_63,t_1_64,t_1_65,t_1_66,t_1_67,t_1_68,t_1_6
9,t_1_70,t_1_71,t_1_72,t_1_73,t_1_74,t_1_75)
ifile=$HOME/p_run.ora


*************************
init_2.ora
*************************


instance_number     =2
thread    =2
rollback_segments =  (
t_2_1,t_2_2,t_2_3,t_2_4,t_2_5,t_2_6,t_2_7,t_2_8,t_2_9,t_2_10,t_2_11
,t_2_12,t_2_13,t_2_14,t_2_15,t_2_16,t_2_17,t_2_18,t_2_19,t_2_20,
t_2_21,t_2_22,t_2_23,t_2_24,t_2_25,t_2_26,t_2_27,t_2_28,t_2_29,t_2_
30,t_2_31,t_2_32,t_2_33,t_2_34,t_2_35,t_2_36,t_2_37,t_2_38,t_2_39,t
_2_40,
t_2_41,t_2_42,t_2_43,t_2_44,t_2_45,t_2_46,t_2_47,t_2_48,t_2_49,t_2_
50,t_2_51,t_2_52,t_2_53,t_2_54,t_2_55,t_2_56,t_2_57,t_2_58,t_2_59,t
_2_60,t_2_61,t_2_62,t_2_63,t_2_64,t_2_65,t_2_66,t_2_67,t_2_68,t_2_6
9,t_2_70,t_2_71,t_2_72,t_2_73,t_2_74,t_2_75)
ifile=$HOME/p_run.ora


*************************
init_3.ora
*************************

instance_number     =3
thread    =3
rollback_segments =  (
t_3_1,t_3_2,t_3_3,t_3_4,t_3_5,t_3_6,t_3_7,t_3_8,t_3_9,t_3_10,t_3_11
,t_3_12,t_3_13,t_3_14,t_3_15,t_3_16,t_3_17,t_3_18,t_3_19,t_3_20,
t_3_21,t_3_22,t_3_23,t_3_24,t_3_25,t_3_26,t_3_27,t_3_28,t_3_29,t_3_
30,t_3_31,t_3_32,t_3_33,t_3_34,t_3_35,t_3_36,t_3_37,t_3_38,t_3_39,t
_3_40,
t_3_41,t_3_42,t_3_43,t_3_44,t_3_45,t_3_46,t_3_47,t_3_48,t_3_49,t_3_
50,t_3_51,t_3_52,t_3_53,t_3_54,t_3_55,t_3_56,t_3_57,t_3_58,t_3_59,t
_3_60,t_3_61,t_3_62,t_3_63,t_3_64,t_3_65,t_3_66,t_3_67,t_3_68,t_3_6
9,t_3_70,t_3_71,t_3_72,t_3_73,t_3_74,t_3_75)
ifile=$HOME/p_run.ora


*************************
init_4.ora
*************************

instance_number     =4
thread    =4
rollback_segments =  (
t_4_1,t_4_2,t_4_3,t_4_4,t_4_5,t_4_6,t_4_7,t_4_8,t_4_9,t_4_10,t_4_11
,t_4_12,t_4_13,t_4_14,t_4_15,t_4_16,t_4_17,t_4_18,t_4_19,t_4_20,
t_4_21,t_4_22,t_4_23,t_4_24,t_4_25,t_4_26,t_4_27,t_4_28,t_4_29,t_4_
30,t_4_31,t_4_32,t_4_33,t_4_34,t_4_35,t_4_36,t_4_37,t_4_38,t_4_39,t
_4_40,
t_4_41,t_4_42,t_4_43,t_4_44,t_4_45,t_4_46,t_4_47,t_4_48,t_4_49,t_4_
50,t_4_51,t_4_52,t_4_53,t_4_54,t_4_55,t_4_56,t_4_57,t_4_58,t_4_59,t
_4_60,t_4_61,t_4_62,t_4_63,t_4_64,t_4_65,t_4_66,t_4_67,t_4_68,t_4_6
9,t_4_70,t_4_71,t_4_72,t_4_73,t_4_74,t_4_75)
ifile=$HOME/p_run.ora


*************************
init_5.ora
*************************

instance_number     =5
thread    =5
rollback_segments =  (
t_5_1,t_5_2,t_5_3,t_5_4,t_5_5,t_5_6,t_5_7,t_5_8,t_5_9,t_5_10,t_5_11
,t_5_12,t_5_13,t_5_14,t_5_15,t_5_16,t_5_17,t_5_18,t_5_19,t_5_20,
t_5_21,t_5_22,t_5_23,t_5_24,t_5_25,t_5_26,t_5_27,t_5_28,t_5_29,t_5_
30,t_5_31,t_5_32,t_5_33,t_5_34,t_5_35,t_5_36,t_5_37,t_5_38,t_5_39,t
_5_40,
t_5_41,t_5_42,t_5_43,t_5_44,t_5_45,t_5_46,t_5_47,t_5_48,t_5_49,t_5_
```

```
50,t_5_51,t_5_52,t_5_53,t_5_54,t_5_55,t_5_56,t_5_57,t_5_58,t_5_59,t
_5_60,t_5_61,t_5_62,t_5_63,t_5_64,t_5_65,t_5_66,t_5_67,t_5_68,t_5_6
9,t_5_70,t_5_71,t_5_72,t_5_73,t_5_74,t_5_75)
ifile=$HOME/p_run.ora


*************************
init_6.ora
*************************

instance_number     =6
thread    =6
rollback_segments =  (
t_6_1,t_6_2,t_6_3,t_6_4,t_6_5,t_6_6,t_6_7,t_6_8,t_6_9,t_6_10,t_6_11
,t_6_12,t_6_13,t_6_14,t_6_15,t_6_16,t_6_17,t_6_18,t_6_19,t_6_20,
t_6_21,t_6_22,t_6_23,t_6_24,t_6_25,t_6_26,t_6_27,t_6_28,t_6_29,t_6_
30,t_6_31,t_6_32,t_6_33,t_6_34,t_6_35,t_6_36,t_6_37,t_6_38,t_6_39,t
_6_40,
t_6_41,t_6_42,t_6_43,t_6_44,t_6_45,t_6_46,t_6_47,t_6_48,t_6_49,t_6_
50,t_6_51,t_6_52,t_6_53,t_6_54,t_6_55,t_6_56,t_6_57,t_6_58,t_6_59,t
_6_60,t_6_61,t_6_62,t_6_63,t_6_64,t_6_65,t_6_66,t_6_67,t_6_68,t_6_6
9,t_6_70,t_6_71,t_6_72,t_6_73,t_6_74,t_6_75)
ifile=$HOME/p_run.ora


*************************
init_7.ora
*************************

instance_number     =7
thread    =7
rollback_segments =  (
t_7_1,t_7_2,t_7_3,t_7_4,t_7_5,t_7_6,t_7_7,t_7_8,t_7_9,t_7_10,t_7_11
,t_7_12,t_7_13,t_7_14,t_7_15,t_7_16,t_7_17,t_7_18,t_7_19,t_7_20,
t_7_21,t_7_22,t_7_23,t_7_24,t_7_25,t_7_26,t_7_27,t_7_28,t_7_29,t_7_
30,t_7_31,t_7_32,t_7_33,t_7_34,t_7_35,t_7_36,t_7_37,t_7_38,t_7_39,t
_7_40,
t_7_41,t_7_42,t_7_43,t_7_44,t_7_45,t_7_46,t_7_47,t_7_48,t_7_49,t_7_
50,t_7_51,t_7_52,t_7_53,t_7_54,t_7_55,t_7_56,t_7_57,t_7_58,t_7_59,t
_7_60,t_7_61,t_7_62,t_7_63,t_7_64,t_7_65,t_7_66,t_7_67,t_7_68,t_7_6
9,t_7_70,t_7_71,t_7_72,t_7_73,t_7_74,t_7_75)
ifile=$HOME/p_run.ora


*************************
init_8.ora
*************************

instance_number     =8
thread    =8
rollback_segments =  (
t_8_1,t_8_2,t_8_3,t_8_4,t_8_5,t_8_6,t_8_7,t_8_8,t_8_9,t_8_10,t_8_11
,t_8_12,t_8_13,t_8_14,t_8_15,t_8_16,t_8_17,t_8_18,t_8_19,t_8_20,
t_8_21,t_8_22,t_8_23,t_8_24,t_8_25,t_8_26,t_8_27,t_8_28,t_8_29,t_8_
30,t_8_31,t_8_32,t_8_33,t_8_34,t_8_35,t_8_36,t_8_37,t_8_38,t_8_39,t
_8_40,
t_8_41,t_8_42,t_8_43,t_8_44,t_8_45,t_8_46,t_8_47,t_8_48,t_8_49,t_8_
50,t_8_51,t_8_52,t_8_53,t_8_54,t_8_55,t_8_56,t_8_57,t_8_58,t_8_59,t
_8_60,t_8_61,t_8_62,t_8_63,t_8_64,t_8_65,t_8_66,t_8_67,t_8_68,t_8_6
9,t_8_70,t_8_71,t_8_72,t_8_73,t_8_74,t_8_75)
ifile=$HOME/p_run.ora


*************************
initnew.sql
*************************

-- The initnew package for storing variables used in the
-- New Order anonymous block

CREATE OR REPLACE PACKAGE initnew
AS
 TYPE intarray IS TABLE OF INTEGER index by binary_integer;
 TYPE distarray IS TABLE OF VARCHAR(24) index by binary_integer;
 nulldate       DATE;
 s_dist                    distarray;
 idx1arr            intarray;
 s_remote           intarray;
 PROCEDURE new_init(idxarr intarray);
END initnew;
/
show errors;

CREATE OR REPLACE PACKAGE BODY initnew AS
  PROCEDURE new_init (idxarr  intarray)
  IS
  BEGIN
        -- initialize null date
   nulldate := TO_DATE('01-01-1811', 'MM-DD-YYYY');
    idx1arr := idxarr;
  END new_init;
END initnew;
/
show errors



*************************
initpay.sql
*************************

CREATE OR REPLACE PACKAGE initpay
AS
 TYPE rowidarray IS TABLE OF ROWID INDEX BY BINARY_INTEGER;
 row_id                    rowidarray;
 cust_rowid                ROWID;
 dist_name                 VARCHAR2(11);
 ware_name                 VARCHAR2(11);
 c_num                     BINARY_INTEGER;
 PROCEDURE pay_init;
END initpay;
/
show errors;

CREATE OR REPLACE PACKAGE BODY initpay AS
  PROCEDURE pay_init IS
  BEGIN
    NULL;
  END pay_init;
END initpay;
/
show errors;


*************************
loadcust.sh
*************************

#!/bin/sh
./tpccload.exe -M 11520 -c -b 1     -e 1440 >log/loadcust.log0 2>&1
&
./tpccload.exe -M 11520 -c -b 1441  -e 2880 >log/loadcust.log1 2>&1
&
./tpccload.exe -M 11520 -c -b 2881  -e 4320 >log/loadcust.log2 2>&1
&
./tpccload.exe -M 11520 -c -b 4321  -e 5760 >log/loadcust.log3 2>&1
&
./tpccload.exe -M 11520 -c -b 5761  -e 7200 >log/loadcust.log4 2>&1
&
./tpccload.exe -M 11520 -c -b 7201  -e 8640 >log/loadcust.log5 2>&1
&
./tpccload.exe -M 11520 -c -b 8641  -e 10080 >log/loadcust.log6
2>&1 &
./tpccload.exe -M 11520 -c -b 10081 -e 11520 >log/loadcust.log7
2>&1 &
wait


*************************
loadhist.sh
*************************

#!/bin/sh
./tpccload.exe -M 11520 -h -b 1     -e 1440 >log/loadhist.log0 2>&1
&
./tpccload.exe -M 11520 -h -b 1441  -e 2880 >log/loadhist.log1 2>&1
&
./tpccload.exe -M 11520 -h -b 2881  -e 4320 >log/loadhist.log2 2>&1
&
./tpccload.exe -M 11520 -h -b 4321  -e 5760 >log/loadhist.log3 2>&1
&
./tpccload.exe -M 11520 -h -b 5761  -e 7200 >log/loadhist.log4 2>&1
&
./tpccload.exe -M 11520 -h -b 7201  -e 8640 >log/loadhist.log5 2>&1
&
./tpccload.exe -M 11520 -h -b 8641  -e 10080 >log/loadhist.log6
2>&1 &
./tpccload.exe -M 11520 -h -b 10081 -e 11520 >log/loadhist.log7
2>&1 &
wait


*************************
loadnord.sh
*************************

#!/bin/sh
./tpccload.exe -M 11520 -n -b 1     -e 1440 >log/loadnord.log0 2>&1
&
./tpccload.exe -M 11520 -n -b 1441  -e 2880 >log/loadnord.log1 2>&1
&
./tpccload.exe -M 11520 -n -b 2881  -e 4320 >log/loadnord.log2 2>&1
&
./tpccload.exe -M 11520 -n -b 4321  -e 5760 >log/loadnord.log3 2>&1
&
./tpccload.exe -M 11520 -n -b 5761  -e 7200 >log/loadnord.log4 2>&1
&
./tpccload.exe -M 11520 -n -b 7201  -e 8640 >log/loadnord.log5 2>&1
&
./tpccload.exe -M 11520 -n -b 8641  -e 10080 >log/loadnord.log6
2>&1 &
./tpccload.exe -M 11520 -n -b 10081 -e 11520 >log/loadnord.log7
2>&1 &
wait


*************************
loadordrordl.sh
*************************

#!/bin/sh
```

```
./tpccload.exe -M 11520 -o temp1 -b 1    -e 1440
>log/loadordrordl.log0 2>&1 &
./tpccload.exe -M 11520 -o temp1 -b 1441 -e 2880
>log/loadordrordl.log1 2>&1 &
./tpccload.exe -M 11520 -o temp1 -b 2881 -e 4320
>log/loadordrordl.log2 2>&1 &
./tpccload.exe -M 11520 -o temp1 -b 4321 -e 5760
>log/loadordrordl.log3 2>&1 &
./tpccload.exe -M 11520 -o temp1 -b 5761 -e 7200
>log/loadordrordl.log4 2>&1 &
./tpccload.exe -M 11520 -o temp1 -b 7201 -e 8640
>log/loadordrordl.log5 2>&1 &
./tpccload.exe -M 11520 -o temp1 -b 8641 -e 10080
>log/loadordrordl.log6 2>&1 &
./tpccload.exe -M 11520 -o temp1 -b 10081 -e 11520
>log/loadordrordl.log7 2>&1 &
wait


*************************
loadstok-1.sh
*************************

./tpccload.exe -M 11520 -S -j 1 -k 25000 -b 1 -e 1440 >
log/loadstok1_1.log 2>&1 &
./tpccload.exe -M 11520 -S -j 25001 -k 50000 -b 1 -e 1440 >
log/loadstok1_2.log 2>&1 &
./tpccload.exe -M 11520 -S -j 50001 -k 75000 -b 1 -e 1440 >
log/loadstok1_3.log 2>&1 &
./tpccload.exe -M 11520 -S -j 75001 -k 100000 -b 1 -e 1440 >
log/loadstok1_4.log 2>&1 &
wait


*************************
loadstok-2.sh
*************************

./tpccload.exe -M 11520 -S -j 1 -k 25000 -b 1441 -e 2880 >
log/loadstok2_1.log 2>&1 &
./tpccload.exe -M 11520 -S -j 25001 -k 50000 -b 1441 -e 2880 >
log/loadstok2_2.log 2>&1 &
./tpccload.exe -M 11520 -S -j 50001 -k 75000 -b 1441 -e 2880 >
log/loadstok2_3.log 2>&1 &
./tpccload.exe -M 11520 -S -j 75001 -k 100000 -b 1441 -e 2880 >
log/loadstok2_4.log 2>&1 &
wait


*************************
loadstok-3.sh
*************************

./tpccload.exe -M 11520 -S -j 1 -k 25000 -b 2881 -e 4320 >
log/loadstok3_1.log 2>&1 &
./tpccload.exe -M 11520 -S -j 25001 -k 50000 -b 2881 -e 4320 >
log/loadstok3_2.log 2>&1 &
./tpccload.exe -M 11520 -S -j 50001 -k 75000 -b 2881 -e 4320 >
log/loadstok3_3.log 2>&1 &
./tpccload.exe -M 11520 -S -j 75001 -k 100000 -b 2881 -e 4320 >
log/loadstok3_4.log 2>&1 &
wait



*************************
loadstok-4.sh
*************************

./tpccload.exe -M 11520 -S -j 1 -k 25000 -b 4321 -e 5760 >
log/loadstok4_1.log 2>&1 &
./tpccload.exe -M 11520 -S -j 25001 -k 50000 -b 4321 -e 5760 >
log/loadstok4_2.log 2>&1 &
./tpccload.exe -M 11520 -S -j 50001 -k 75000 -b 4321 -e 5760 >
log/loadstok4_3.log 2>&1 &
./tpccload.exe -M 11520 -S -j 75001 -k 100000 -b 4321 -e 5760 >
log/loadstok4_4.log 2>&1 &
wait


*************************
loadstok-5.sh
*************************

./tpccload.exe -M 11520 -S -j 1 -k 25000 -b 5761 -e 7200 >
log/loadstok5_1.log 2>&1 &
./tpccload.exe -M 11520 -S -j 25001 -k 50000 -b 5761 -e 7200 >
log/loadstok5_2.log 2>&1 &
./tpccload.exe -M 11520 -S -j 50001 -k 75000 -b 5761 -e 7200 >
log/loadstok5_3.log 2>&1 &
./tpccload.exe -M 11520 -S -j 75001 -k 100000 -b 5761 -e 7200 >
log/loadstok5_4.log 2>&1 &
wait


*************************
loadstok-6.sh
*************************

./tpccload.exe -M 11520 -S -j 1 -k 25000 -b 7201 -e 8640 >
log/loadstok6_1.log 2>&1 &
./tpccload.exe -M 11520 -S -j 25001 -k 50000 -b 7201 -e 8640 >
log/loadstok6_2.log 2>&1 &
./tpccload.exe -M 11520 -S -j 50001 -k 75000 -b 7201 -e 8640 >
log/loadstok6_3.log 2>&1 &
./tpccload.exe -M 11520 -S -j 75001 -k 100000 -b 7201 -e 8640 >
log/loadstok6_4.log 2>&1 &
wait


*************************
loadstok-7.sh
*************************

./tpccload.exe -M 11520 -S -j 1 -k 25000 -b 8641 -e 10080 >
log/loadstok7_1.log 2>&1 &
./tpccload.exe -M 11520 -S -j 25001 -k 50000 -b 8641 -e 10080 >
log/loadstok7_2.log 2>&1 &
./tpccload.exe -M 11520 -S -j 50001 -k 75000 -b 8641 -e 10080 >
log/loadstok7_3.log 2>&1 &
./tpccload.exe -M 11520 -S -j 75001 -k 100000 -b 8641 -e 10080 >
log/loadstok7_4.log 2>&1 &
wait


*************************
loadstok-8.sh
*************************

./tpccload.exe -M 11520 -S -j 1 -k 25000 -b 10081 -e 11520 >
log/loadstok8_1.log 2>&1 &
./tpccload.exe -M 11520 -S -j 25001 -k 50000 -b 10081 -e 11520 >
log/loadstok8_2.log 2>&1 &
./tpccload.exe -M 11520 -S -j 50001 -k 75000 -b 10081 -e 11520 >
log/loadstok8_3.log 2>&1 &
./tpccload.exe -M 11520 -S -j 75001 -k 100000 -b 10081 -e 11520 >
log/loadstok8_4.log 2>&1 &
wait


*************************
orst_cre.sql
*************************


rem
rem
rem
================================================================+
rem         Copyright (c) 1996  Oracle Corp, Redwood Shores, CA
|
rem                   OPEN SYSTEMS PERFORMANCE GROUP
|
rem                        All Rights Reserved
|
rem
================================================================+
rem  FILENAME
rem       orst_cre.sql
rem  DESCRIPTION
rem       Drop and Create Tables for Oracle Statistics
rem
================================================================*
/
rem
rem  Usage: sqlplus internal/internal @orst_cre.sql
rem
        SET ECHO ON;
rem        SET TERMOUT OFF;

        DROP TABLE save_sysstat;
        DROP TABLE save_latch;
        DROP TABLE save_rollstat;
        DROP TABLE save_filestat;
        DROP TABLE save_rowcache;
        DROP TABLE save_parameter;
        DROP TABLE save_wait;
        DROP TABLE save_fwait;
        DROP TABLE save_event;
        DROP TABLE save_lockact;
        DROP TABLE save_fping;
        DROP TABLE save_fping2;
        DROP TABLE save_ping;
        DROP TABLE save_ping2;
        DROP TABLE save_blkping;
        DROP TABLE save_blkping2;
        DROP TABLE save_kclwait;
        DROP TABLE save_sqlarea;
        DROP TABLE save_time;
        DROP TABLE save_dfile;
        DROP TABLE save_rsrc;
        DROP TABLE save_circuit;
          DROP TABLE save_dispatcher;
          DROP TABLE save_queue;
          DROP TABLE save_server;

        DROP TABLE tmp_sysstat;
        DROP TABLE tmp_latch;
        DROP TABLE tmp_filestat;
        DROP TABLE tmp_rollstat;
        DROP TABLE tmp_rowcache;
        DROP TABLE tmp_wait;
```

```
        DROP TABLE tmp_fwait;
        DROP TABLE tmp_event;
        DROP TABLE tmp_fping;
        DROP TABLE tmp_fping2;
        DROP TABLE tmp_kclwait;
        DROP TABLE blockclass;
        DROP TABLE tmp_lockact;
        DROP TABLE zero_lockact;
        DROP TABLE tmp_sqlarea;
        DROP TABLE tmp_time;
        DROP TABLE tmp_circuit;
          DROP TABLE tmp_dispatcher;
          DROP TABLE tmp_queue;
          DROP TABLE tmp_server;
          DROP TABLE tmp_rsrc;

rem
rem  save_sysstat corresponds to v$sysstat and v$statname
rem
            CREATE TABLE save_sysstat
           (
               hid             NUMBER,
               run             NUMBER,
                   name                VARCHAR2(64),
               statistic#      NUMBER,
                   value               NUMBER
            );

rem
rem  save_latch corresponds to v$latch and v$latchname
rem

            CREATE TABLE save_latch
           (
               hid              NUMBER,
               run              NUMBER,
               name             VARCHAR2(64),
                   latch#               NUMBER,
                   gets                 NUMBER,
                   misses     NUMBER,
                   sleeps               NUMBER,
                   immediate_gets       NUMBER,
                   immediate_misses NUMBER

            );

rem
rem  save_rollstat corresponds to v$rollstat and v$rollname
rem
            CREATE TABLE save_rollstat
           (
               hid             NUMBER,
               run             NUMBER,
               name            VARCHAR2(30),
               USN             NUMBER,
               EXTENTS         NUMBER,
               RSSIZE          NUMBER,
               WRITES          NUMBER,
               XACTS           NUMBER,
               GETS            NUMBER,
               WAITS           NUMBER,
               OPTSIZE         NUMBER,
               HWMSIZE         NUMBER,
               SHRINKS         NUMBER,
               WRAPS           NUMBER,
               EXTENDS         NUMBER,
               AVESHRINK       NUMBER,
               AVEACTIVE       NUMBER
            );

rem
rem  save_filestat corresponds to v$filestat and v$dbfile;
rem
            CREATE TABLE save_filestat
           (
               hid             NUMBER,
               run             NUMBER,
               FILE#           NUMBER,
               PHYRDS          NUMBER,
               PHYWRTS         NUMBER,
               PHYBLKRD        NUMBER,
               PHYBLKWRT       NUMBER,
               READTIM         NUMBER,
               WRITETIM        NUMBER,
               NAME            VARCHAR2(257)
           );

rem
rem  save_rowcache corresponds to v$rowcache
rem
           CREATE TABLE save_rowcache
           (
               hid             NUMBER,
               run             NUMBER,
               cache#          NUMBER,
               type            VARCHAR2(11),
               subordinate#    NUMBER,
               parameter       VARCHAR2(32),
               count           NUMBER,
               usage           NUMBER,
               fixed           NUMBER,
               gets            NUMBER,
               getmisses       NUMBER,
               scans           NUMBER,
               scanmisses      NUMBER,
               scancompletes   NUMBER,
               modifications   NUMBER,
               flushes         NUMBER
           );

rem
rem Create table to hold values in v$parameter
rem

           CREATE TABLE save_parameter
           (
               hid             NUMBER,
               run             NUMBER,
               NAME            VARCHAR2(64),
               VALUE           VARCHAR2(512)
           );

rem
rem  save_wait corresponds to v$wait_stat
rem
           CREATE TABLE save_wait
           (
               hid             NUMBER,
               run             NUMBER,
               class           VARCHAR2(18),
               count           NUMBER,
               time            NUMBER
           );

rem
rem  save_fwait corresponds to X$KCBFWAIT
rem
           CREATE TABLE save_fwait
           (
               hid             NUMBER,
               run             NUMBER,
               addr            VARCHAR2(20),
               indx            NUMBER,
               count           NUMBER,
               time            NUMBER
           );

rem
rem  save_event corresponds to v$system_event
rem
           CREATE TABLE save_event
           (
               hid             NUMBER,
               run             NUMBER,
               event           VARCHAR2(64),
               total_waits     NUMBER,
               time_waited     NUMBER,
               average_wait    NUMBER
           );

rem
rem  save_lockact corresponds to v$lock_activity
rem
           CREATE TABLE save_lockact
           (
               hid             NUMBER,
               run             NUMBER,
               from_val        VARCHAR2(4),
               to_val          VARCHAR2(4),
               action_val      VARCHAR2(51),
               counter         NUMBER
           );

rem
rem  save_fping corresponds to file_ping
rem
           CREATE TABLE save_fping
           (
               hid             NUMBER,
               run             NUMBER,
               file_id         NUMBER,
               file_name       VARCHAR2(257),
               ts_name         VARCHAR2(30),
               x_to_n          NUMBER
           );

rem
rem  save_fping2 corresponds to file_ping with extended ping stats
rem
           CREATE TABLE save_fping2
           (
               hid             NUMBER,
               run             NUMBER,
               file_id         NUMBER,
               file_name       VARCHAR2(257),
               ts_name         VARCHAR2(30),
               x2n             NUMBER,
               x2s             NUMBER,
               x2ssx           NUMBER,
               s2n             NUMBER,
               cic             NUMBER,
               crt             NUMBER,
```

```
            hping           NUMBER,
            sping           NUMBER
        );

rem
rem  save_ping corresponds to v$ping
rem
        CREATE TABLE save_ping
        (
            hid             NUMBER,
            run             NUMBER,
            tablespace_name VARCHAR2(30),
            file_name       VARCHAR2(257),
            kind            VARCHAR2(12),
            status          VARCHAR2(4),
            xnc             NUMBER
        );

rem
rem  save_ping2 corresponds to v$ping with extended ping stats
rem
        CREATE TABLE save_ping2
        (
            hid             NUMBER,
            run             NUMBER,
            tablespace_name VARCHAR2(30),
            file#           NUMBER,
            kind            VARCHAR2(12),
            status          VARCHAR2(4),
            hping           NUMBER,
            sping           NUMBER
        );

rem
rem  save_blkping corresponds to v$ping
rem
        CREATE TABLE save_blkping
        (
            hid             NUMBER,
            run             NUMBER,
            tablespace_name VARCHAR2(30),
            file_name       VARCHAR2(257),
            kind            VARCHAR2(12),
            block#          NUMBER,
            status          VARCHAR2(4),
            xnc             NUMBER
        );

rem
rem  save_blkping2 corresponds to v$ping with extended ping stats
rem
        CREATE TABLE save_blkping2
        (
            hid             NUMBER,
            run             NUMBER,
            tablespace_name VARCHAR2(30),
            file#           NUMBER,
            kind            VARCHAR2(12),
            block#          NUMBER,
            status          VARCHAR2(4),
            hping           NUMBER,
            sping           NUMBER,
            lock_element_addr  RAW(4)
        );

rem
rem  save_kclwait corresponds to v$kclwait
rem
        CREATE TABLE save_kclwait
        (
            hid             NUMBER,
            run             NUMBER,
            indx            NUMBER,
            pings           NUMBER,
            hpings          NUMBER,
            spings          NUMBER,
            wpings          NUMBER
        );

rem
rem  save_sqlarea corresponds to v$sqlarea
rem
        CREATE TABLE save_sqlarea
        (
            hid             NUMBER,
            run             NUMBER,
            sql_text        VARCHAR2(1000),
            executions      NUMBER,
            buffer_gets     NUMBER,
            disk_reads      NUMBER,
            serializable_aborts      NUMBER
        );

rem
rem  save_time records duration of each run
rem
        CREATE TABLE save_time
        (
            hid             NUMBER,
            run             NUMBER,
            rtime           NUMBER
        );

rem
rem  save_dfile maps oracle datafile to physical disks and nodes
rem
        CREATE TABLE save_dfile
        (
            file#           NUMBER,
            group#          NUMBER,
            gname           VARCHAR2(20),
            node#           NUMBER,
            nname           VARCHAR2(20),
            disk#           NUMBER,
            dname           VARCHAR2(20)
        );

rem
rem  save_rsrc corresponds to v$rsrc_consumer_group
rem
        CREATE TABLE save_rsrc
        (
            hid             NUMBER,
            run             NUMBER,
            NAME                VARCHAR2(32),
            ACTIVE_SESSIONS     NUMBER,
            EXECUTION_WAITERS   NUMBER,
            REQUESTS            NUMBER,
            CPU_WAIT_TIME       NUMBER,
            CPU_WAITS           NUMBER,
            CONSUMED_CPU_TIME   NUMBER,
            YIELDS              NUMBER,
            SESSIONS_QUEUED     NUMBER
        );

          CREATE TABLE save_circuit
          (
                hid                 NUMBER,
                run                 NUMBER,
                circuit             raw(4),
                msg0                NUMBER,
                msg1                NUMBER,
                msgs                NUMBER,
                bytes               NUMBER,
                breaks              NUMBER
          );

          CREATE TABLE save_dispatcher
          (
                hid                 NUMBER,
                run                 NUMBER,
                paddr               raw(4),
                msgs                NUMBER,
                bytes               NUMBER,
                breaks              NUMBER,
                idle                NUMBER,
                busy                NUMBER
          );

          CREATE TABLE save_server
          (
                hid                 NUMBER,
                run                 NUMBER,
                name                VARCHAR2(20),
                msgs                NUMBER,
                bytes               NUMBER,
                breaks              NUMBER,
                idle                NUMBER,
                busy                NUMBER,
                requests  NUMBER
          );

          CREATE TABLE save_queue
          (
                hid                 NUMBER,
                run                 NUMBER,
                paddr               raw(4),
                wait                NUMBER,
                totalq              NUMBER
          );

rem
rem  tmp_sysstat corresponds to v$sysstat
rem
          CREATE TABLE tmp_sysstat
        (
                hid                 NUMBER,
                state               VARCHAR2(10),
                statistic#          NUMBER,
                value               NUMBER
          );

rem
rem  tmp_latch corresponds to v$latch
rem

          CREATE TABLE tmp_latch
        (
                hid                 NUMBER,
                state                VARCHAR2(10),
                latch#               NUMBER,
                gets                 NUMBER,
```

```
                misses     NUMBER,
                sleeps              NUMBER,
                immediate_gets      NUMBER,
                immediate_misses NUMBER
          );

rem
rem  tmp_filestat corresponds to v$filestat
rem
        CREATE TABLE tmp_filestat
        (
                hid                 NUMBER,
                state               VARCHAR2(10),
            FILE#           NUMBER,
            PHYRDS          NUMBER,
            PHYWRTS         NUMBER,
            PHYBLKRD        NUMBER,
            PHYBLKWRT       NUMBER,
            READTIM         NUMBER,
            WRITETIM        NUMBER
        );

rem
rem  tmp_rollstat corresponds to v$rollstat
rem
        CREATE TABLE tmp_rollstat
        (
                hid                 NUMBER,
                state              VARCHAR2(10),
            USN             NUMBER,
            EXTENTS         NUMBER,
            RSSIZE          NUMBER,
            WRITES          NUMBER,
            XACTS           NUMBER,
            GETS            NUMBER,
            WAITS           NUMBER,
            OPTSIZE         NUMBER,
            HWMSIZE         NUMBER,
            SHRINKS         NUMBER,
            WRAPS           NUMBER,
            EXTENDS         NUMBER,
            AVESHRINK       NUMBER,
            AVEACTIVE       NUMBER
        );

rem
rem  tmp_rowcache corresponds to v$rowcache
rem
        CREATE TABLE tmp_rowcache
        (
                hid                 NUMBER,
            state           VARCHAR2(10),
            cache#          NUMBER,
            type            VARCHAR2(11),
            subordinate#    NUMBER,
            parameter       VARCHAR2(32),
            count           NUMBER,
            usage           NUMBER,
            fixed           NUMBER,
            gets            NUMBER,
            getmisses       NUMBER,
            scans           NUMBER,
            scanmisses      NUMBER,
            scancompletes   NUMBER,
            modifications   NUMBER,
            flushes         NUMBER
        );

rem
rem  tmp_wait corresponds to v$wait_stat
rem
        CREATE TABLE tmp_wait
        (
            hid             NUMBER,
            state           VARCHAR2(10),
            class           VARCHAR2(18),
            count           NUMBER,
            time            NUMBER
        );

rem
rem  tmp_fwait corresponds to X$KCBFWAIT
rem
        CREATE TABLE tmp_fwait
        (
            hid             NUMBER,
            state           VARCHAR2(10),
            addr            VARCHAR2(20),
            indx            NUMBER,
            count           NUMBER,
            time            NUMBER
        );

rem
rem  tmp_event corresponds to v$system_event
rem
        CREATE TABLE tmp_event
        (
            hid             NUMBER,
            state           VARCHAR2(10),
            event           VARCHAR2(64),
            total_waits     NUMBER,
            time_waited     NUMBER,
            average_wait    NUMBER
        );

rem
rem  tmp_fping corresponds to file_ping
rem
        CREATE TABLE tmp_fping
        (
            hid             NUMBER,
            state           VARCHAR2(10),
            file_id         NUMBER,
            file_name       VARCHAR2(257),
            ts_name         VARCHAR2(30),
            x_to_n          NUMBER
        );

rem
rem  tmp_fping2 corresponds to file_ping with extended ping stats
rem
        CREATE TABLE tmp_fping2
        (
            hid             NUMBER,
            state           VARCHAR2(10),
            file_id         NUMBER,
            file_name       VARCHAR2(257),
            ts_name         VARCHAR2(30),
            x2n             NUMBER,
            x2s             NUMBER,
            x2ssx           NUMBER,
            s2n             NUMBER,
            cic             NUMBER,
            crt             NUMBER,
            hping           NUMBER,
            sping           NUMBER
        );

rem
rem  tmp_kclwait corresponds to v$kclwait
rem
        CREATE TABLE tmp_kclwait
        (
            hid             NUMBER,
            state           VARCHAR2(10),
            indx            NUMBER,
            pings           NUMBER,
            hpings          NUMBER,
            spings          NUMBER,
            wpings          NUMBER
        );

rem
rem  blockclass contains mapping from KCBC index to text
rem
          CREATE TABLE blockclass
        (
            indx            NUMBER,
            name            VARCHAR2(24)
        );

  INSERT INTO blockclass VALUES (0, 'NONE');
  INSERT INTO blockclass VALUES (1, 'DATA');
  INSERT INTO blockclass VALUES (2, 'SORT');
  INSERT INTO blockclass VALUES (3, 'SAVE UNDO');
  INSERT INTO blockclass VALUES (4, 'SEG HDR');
  INSERT INTO blockclass VALUES (5, 'SAVE UNDO SEG HDR');
  INSERT INTO blockclass VALUES (6, 'FREE LIST|EXTENT MAP');
  INSERT INTO blockclass VALUES (7, 'UNDO HDR');
  INSERT INTO blockclass VALUES (8, 'UNDO');
  INSERT INTO blockclass VALUES (9, 'UNDO HDR');
  INSERT INTO blockclass VALUES (10, 'UNDO');

rem Are there more...???

rem
rem  tmp_lockact corresponds to v$lock_activity
rem
        CREATE TABLE tmp_lockact
        (
            hid             NUMBER,
            state           VARCHAR2(10),
            from_val        VARCHAR2(4),
            to_val          VARCHAR2(4),
            action_val      VARCHAR2(51),
            counter         NUMBER
        );

rem
rem  zero_lockact corresponds to v$lock_activity with no activity
rem
        CREATE TABLE zero_lockact
        (
            from_val        VARCHAR2(4),
            to_val          VARCHAR2(4),
            action_val      VARCHAR2(51),
            counter         NUMBER
        );

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
```

```
    ('NULL', 'S',    'Lock buffers for read',
0);

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
    ('NULL', 'X',    'Lock buffers for write',
0);

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
    ('S',    'NULL', 'Make buffers CR (no write)',
0);

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
    ('S',    'X',    'Upgrade read lock to write',
0);

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
    ('X',    'NULL', 'Make buffers CR (write dirty buffers)',
0);

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
    ('X',    'S',    'Downgrade write lock to read (write dirty
buffers)',  0);

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
    ('X',    'SSX',  'Write transaction table/undo blocks',
0);

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
    ('SSX',  'NULL', 'Transaction table/undo blocks (write dirty
buffers)', 0);

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
    ('SSX',  'S',    'Make transaction table/undo block available
share',   0);

  INSERT INTO zero_lockact (from_val, to_val, action_val, counter)
VALUES
    ('SSX',  'X',    'Rearm transaction table write mechanism',
0);

rem
rem  tmp_sqlarea corresponds to v$sqlarea
rem
            CREATE TABLE tmp_sqlarea
            (
                hid             NUMBER,
                state           VARCHAR2(10),
                sql_text        VARCHAR2(1000),
                executions      NUMBER,
                buffer_gets     NUMBER,
                disk_reads      NUMBER,
                serializable_aborts      NUMBER
            );

rem
rem  tmp_time records begin and end time
rem
            CREATE TABLE tmp_time
            (
                hid             NUMBER,
                state           VARCHAR2(10),
                timestamp       DATE
            );

              CREATE TABLE tmp_circuit
              (
                    hid                 NUMBER,
                    state               VARCHAR2(10),
                    circuit             raw(4),
                    msg0                NUMBER,
                    msg1                NUMBER,
                    msgs                NUMBER,
                    bytes               NUMBER,
                    breaks              NUMBER
              );

              CREATE TABLE tmp_dispatcher
              (
                    hid                 NUMBER,
                    state               VARCHAR2(10),
                   paddr                raw(4),
                    msgs                NUMBER,
                    bytes               NUMBER,
                    breaks              NUMBER,
                    idle                NUMBER,
                    busy                NUMBER
              );

              CREATE TABLE tmp_server
              (
                    hid                 NUMBER,
                    state               VARCHAR2(10),
                    name                VARCHAR2(20),
                    msgs                NUMBER,
                    bytes               NUMBER,
                    breaks              NUMBER,
                    idle                NUMBER,
                    busy                NUMBER,
                    requests  NUMBER
              );

              CREATE TABLE tmp_queue
              (
                    hid                 NUMBER,
                    state               VARCHAR2(10),
                    paddr               raw(4),
                    wait            NUMBER,
                    totalq            NUMBER
              );
rem
rem  tmp_rsrc corresponds to v$rsrc_consumer_group
rem
            CREATE TABLE tmp_rsrc
            (
                hid             NUMBER,
                state           VARCHAR2(10),
                NAME                VARCHAR2(32),
                ACTIVE_SESSIONS     NUMBER,
                EXECUTION_WAITERS   NUMBER,
                REQUESTS            NUMBER,
                CPU_WAIT_TIME       NUMBER,
                CPU_WAITS           NUMBER,
                CONSUMED_CPU_TIME   NUMBER,
                YIELDS              NUMBER,
                SESSIONS_QUEUED     NUMBER
            );

  COMMIT;
  SET ECHO OFF;


*************************
p_recover.ora
*************************

instance_number     =1
thread    =1
rollback_segments =  (
t_1_1,t_1_2,t_1_3,t_1_4,t_1_5,t_1_6,t_1_7,t_1_8,t_1_9,t_1_10,t_1_11
,t_1_12,t_1_13,t_1_14,t_1_15,t_1_16,t_1_17,t_1_18,t_1_19,t_1_20,
t_1_21,t_1_22,t_1_23,t_1_24,t_1_25,t_1_26,t_1_27,t_1_28,t_1_29,t_1_
30,t_1_31,t_1_32,t_1_33,t_1_34,t_1_35,t_1_36,t_1_37,t_1_38,t_1_39,t
_1_40,
t_1_41,t_1_42,t_1_43,t_1_44,t_1_45,t_1_46,t_1_47,t_1_48,t_1_49,t_1_
50,t_1_51,t_1_52,t_1_53,t_1_54,t_1_55,t_1_56,t_1_57,t_1_58,t_1_59,t
_1_60,t_1_61,t_1_62,t_1_63,t_1_64,t_1_65,t_1_66,t_1_67,t_1_68,t_1_6
9,t_1_70,t_1_71,t_1_72,t_1_73,t_1_74,t_1_75)

compatible = 9.2.0.0.0
db_name = tpcc
control_files = /home/oracle/dev/raw/control-001
sort_area_size = 10485760
recovery_parallelism = 4
db_files = 250
use_indirect_data_buffers = TRUE
db_block_buffers    = 3235840
dml_locks = 2000
log_buffer = 1048576
shared_pool_size = 160M
cursor_space_for_time = TRUE
db_block_size = 4096
_allocate_creation_order = TRUE
cluster_database              = FALSE
processes                     = 64

log_parallelism = 2

parallel_max_servers = 10


*************************
p_run.ora
*************************

#
# 9i RAC 4K
#
#

_db_block_lru_latches = 64
_db_writer_max_writes                     = 1024
_db_writer_chunk_writes                   = 200
db_writer_processes = 4
db_cache_advice = off
compatible = 9.2.0.0.0
db_name = tpcc
control_files = /home/oracle/dev/raw/control-001
sort_area_size = 10485760
parallel_max_servers = 0
parallel_min_servers = 0
recovery_parallelism = 0
log_buffer = 10485760
db_block_size = 4096
#_allocate_creation_order     =TRUE
```

```
db_files=250
cursor_space_for_time             = TRUE
shared_pool_size = 160M
java_pool_size = 15728640
use_indirect_data_buffers       = TRUE   #pse36
db_block_buffers    = 3235840
_log_simultaneous_copies        = 16
dml_locks                         = 60
enqueue_resources                 = 200
hash_join_enabled                 = FALSE
log_archive_start                 = FALSE
log_checkpoint_interval           = 0
log_checkpoint_timeout                    = 0
log_checkpoints_to_alert          = TRUE
max_rollback_segments             = 80
pre_page_sga                      = TRUE
processes                         = 100
sessions                        = 150
open_cursors                      = 180
replication_dependency_tracking   = FALSE
transactions_per_rollback_segment = 1
timed_statistics                  = FALSE
transaction_auditing              = FALSE
db_block_checking               = FALSE
cluster_database              = TRUE
cluster_database_instances      = 8
_kcl_name_table_latches = 64
_lm_lms=1
statistics_level = basic
log_parallelism = 2
_lm_dd_interval                 = 30
gc_files_to_locks              = "1-8=1000EACH:\
9=1:\
10-12=100000:\
13-15=100000:\
16-18=100000:\
19-21=100000:\
22-24=100000:\
25-27=100000:\
28-30=100000:\
31-33=100000:\
34-39=350000:\
40-45=350000:\
46-51=350000:\
52-57=350000:\
58-63=350000:\
64-69=350000:\
70-75=350000:\
76-81=350000:\
82-195=1EACH:\
197-199=1EACH"
_lm_file_affinity="9,10-12,34-39,82,90,99-
101,123,131,139,172,180=1:\
13-15,40-45,83,91,102-104,124,132,140,173,181,188=2:\
16-18,46-51,84,92,105-107,125,133,141,174,182,189=3:\
19-21,52-57,85,93,108-110,126,134,142,175,183,190=4:\
22-24,58-63,86,94,111-113,127,135,143,176,184,191=5:\
25-27,64-69,87,95,114-116,128,136,144,177,185,192=6:\
28-30,70-75,88,96,117-119,129,137,145,178,186,193=7:\
31-33,76-81,89,97,120-122,130,138,146,179,187,184=8"
_gcs_resources=400000
_pcm_shadow_locks=400000
_interconnect_checksum = FALSE
db_block_checksum  = FALSE



*************************
plsql_mon.sql
*************************

rem
rem
================================================================+
rem         Copyright (c) 1995  Oracle Corp, Redwood Shores, CA
|
rem                   OPEN SYSTEMS PERFORMANCE GROUP
|
rem                        All Rights Reserved
|
rem
================================================================+
rem  FILENAME
rem       plsql_mon.sql
rem  DESCRIPTION
rem       SQL script to create a stored package for PL/SQL stored
rem       procedures to dump messages.
rem
================================================================
rem
rem Usage:   sqlplus tpcc/tpcc @plsql_mon
rem

connect tpcc/tpcc;
set echo on;
CREATE OR REPLACE PACKAGE plsql_mon_pack
IS
   PROCEDURE print
   (
      info         VARCHAR2
   );
END;
/
show errors;

CREATE OR REPLACE PACKAGE BODY plsql_mon_pack
IS
   PROCEDURE print
   (
      info         VARCHAR2
   )
   IS
      s            NUMBER;
   BEGIN
      dbms_pipe.pack_message (info);
      s := dbms_pipe.send_message ('plsql_mon');
      IF (s <> 0) THEN
         raise_application_error (-20000, 'Error:' || to_char(s) ||
                                  ' sending on pipe');
      END IF;
   END;
END;
/
show errors;

set echo off;


*************************
pst_c.sql
*************************

rem
rem
rem
================================================================+
rem            Copyright (c) 1992  Oracle Corp, Belmont, CA
|
rem                   OPEN SYSTEMS PERFORMANCE GROUP
|
rem                        All Rights Reserved
|
rem
================================================================+
rem  FILENAME
rem       pst_c.sql
rem  DESCRIPTION
rem       Create Table for OS Specific Process Stats
rem
================================================================*
/
rem
rem  Tables for Unix-specific process statistics
rem
rem  Usage: sqlplus internal/internal @pst_c
rem

        connect tpcc/tpcc;
        set echo on;
        DROP TABLE proc_resource;
        DROP TABLE os_stat;

rem
rem  Resource usage for a process.
rem

        CREATE TABLE proc_resource
        (
            config        VARCHAR2(10),
            run           NUMBER,
            proc          NUMBER,
            child         NUMBER,
            user_cpu_ms   NUMBER,
            system_cpu_ms NUMBER,
            maxrss        NUMBER,
            pagein        NUMBER,
            reclaim       NUMBER,
            zerofill      NUMBER,
            pffincr       NUMBER,
            pffdecr       NUMBER,
            swap          NUMBER,
            syscall       NUMBER,
            volcsw        NUMBER,
            involcsw      NUMBER,
            signal        NUMBER,
            lread         NUMBER,
            lwrite        NUMBER,
            bread         NUMBER,
            bwrite        NUMBER,
            phread        NUMBER,
            phwrite       NUMBER
        );

rem
rem  OS statistics.
rem  These results are from the measurement interval only.
rem

        CREATE TABLE os_stat
        (
            config          VARCHAR2(10),
            run             NUMBER,
```

```
            hid             NUMBER,
            syscall         NUMBER,
            intr            NUMBER,
            cswitch         NUMBER,
            pagefault       NUMBER,
            usr             NUMBER,
            sys             NUMBER,
            idl             NUMBER,
            wio             NUMBER
        );

        set echo off;


*************************
roll1.sql
*************************

spool createrollts_1.log

drop tablespace undo_1 including contents;

create tablespace undo_1 datafile '/home/oracle/dev/raw/roll-1'
size 498M reuse
extent management local uniform size 120K nologging;

create rollback segment t_1_1 tablespace undo_1;
alter rollback segment t_1_1 online;
create rollback segment t_1_2 tablespace undo_1;
alter rollback segment t_1_2 online;
create rollback segment t_1_3 tablespace undo_1;
alter rollback segment t_1_3 online;
create rollback segment t_1_4 tablespace undo_1;
alter rollback segment t_1_4 online;
create rollback segment t_1_5 tablespace undo_1;
alter rollback segment t_1_5 online;
create rollback segment t_1_6 tablespace undo_1;
alter rollback segment t_1_6 online;
create rollback segment t_1_7 tablespace undo_1;
alter rollback segment t_1_7 online;
create rollback segment t_1_8 tablespace undo_1;
alter rollback segment t_1_8 online;
create rollback segment t_1_9 tablespace undo_1;
alter rollback segment t_1_9 online;
create rollback segment t_1_10 tablespace undo_1;
alter rollback segment t_1_10 online;
create rollback segment t_1_11 tablespace undo_1;
alter rollback segment t_1_11 online;
create rollback segment t_1_12 tablespace undo_1;
alter rollback segment t_1_12 online;
create rollback segment t_1_13 tablespace undo_1;

alter rollback segment t_1_13 online;
create rollback segment t_1_14 tablespace undo_1;
alter rollback segment t_1_14 online;
create rollback segment t_1_15 tablespace undo_1;
alter rollback segment t_1_15 online;
create rollback segment t_1_16 tablespace undo_1;
alter rollback segment t_1_16 online;
create rollback segment t_1_17 tablespace undo_1;
alter rollback segment t_1_17 online;
create rollback segment t_1_18 tablespace undo_1;
alter rollback segment t_1_18 online;
create rollback segment t_1_19 tablespace undo_1;
alter rollback segment t_1_19 online;
create rollback segment t_1_20 tablespace undo_1;
alter rollback segment t_1_20 online;
create rollback segment t_1_21 tablespace undo_1;
alter rollback segment t_1_21 online;
create rollback segment t_1_22 tablespace undo_1;
alter rollback segment t_1_22 online;
create rollback segment t_1_23 tablespace undo_1;
alter rollback segment t_1_23 online;
create rollback segment t_1_24 tablespace undo_1;
alter rollback segment t_1_24 online;
create rollback segment t_1_25 tablespace undo_1;
alter rollback segment t_1_25 online;
create rollback segment t_1_26 tablespace undo_1;
alter rollback segment t_1_26 online;
create rollback segment t_1_27 tablespace undo_1;
alter rollback segment t_1_27 online;
create rollback segment t_1_28 tablespace undo_1;
alter rollback segment t_1_28 online;
create rollback segment t_1_29 tablespace undo_1;
alter rollback segment t_1_29 online;
create rollback segment t_1_30 tablespace undo_1;
alter rollback segment t_1_30 online;
create rollback segment t_1_31 tablespace undo_1;
alter rollback segment t_1_31 online;
create rollback segment t_1_32 tablespace undo_1;
alter rollback segment t_1_32 online;
create rollback segment t_1_33 tablespace undo_1;
alter rollback segment t_1_33 online;
create rollback segment t_1_34 tablespace undo_1;
alter rollback segment t_1_34 online;
create rollback segment t_1_35 tablespace undo_1;
alter rollback segment t_1_35 online;
create rollback segment t_1_36 tablespace undo_1;
alter rollback segment t_1_36 online;
create rollback segment t_1_37 tablespace undo_1;
alter rollback segment t_1_37 online;
create rollback segment t_1_38 tablespace undo_1;
alter rollback segment t_1_38 online;
create rollback segment t_1_39 tablespace undo_1;
alter rollback segment t_1_39 online;
create rollback segment t_1_40 tablespace undo_1;
alter rollback segment t_1_40 online;
create rollback segment t_1_41 tablespace undo_1;
alter rollback segment t_1_41 online;
create rollback segment t_1_42 tablespace undo_1;
alter rollback segment t_1_42 online;
create rollback segment t_1_43 tablespace undo_1;
alter rollback segment t_1_43 online;
create rollback segment t_1_44 tablespace undo_1;
alter rollback segment t_1_44 online;
create rollback segment t_1_45 tablespace undo_1;
alter rollback segment t_1_45 online;
create rollback segment t_1_46 tablespace undo_1;
alter rollback segment t_1_46 online;
create rollback segment t_1_47 tablespace undo_1;
alter rollback segment t_1_47 online;
create rollback segment t_1_48 tablespace undo_1;
alter rollback segment t_1_48 online;
create rollback segment t_1_49 tablespace undo_1;
alter rollback segment t_1_49 online;
create rollback segment t_1_50 tablespace undo_1;
alter rollback segment t_1_50 online;
create rollback segment t_1_51 tablespace undo_1;
alter rollback segment t_1_51 online;
create rollback segment t_1_52 tablespace undo_1;
alter rollback segment t_1_52 online;
create rollback segment t_1_53 tablespace undo_1;
alter rollback segment t_1_53 online;
create rollback segment t_1_54 tablespace undo_1;
alter rollback segment t_1_54 online;
create rollback segment t_1_55 tablespace undo_1;
alter rollback segment t_1_55 online;
create rollback segment t_1_56 tablespace undo_1;
alter rollback segment t_1_56 online;
create rollback segment t_1_57 tablespace undo_1;
alter rollback segment t_1_57 online;
create rollback segment t_1_58 tablespace undo_1;
alter rollback segment t_1_58 online;
create rollback segment t_1_59 tablespace undo_1;
alter rollback segment t_1_59 online;
create rollback segment t_1_60 tablespace undo_1;
alter rollback segment t_1_60 online;
create rollback segment t_1_61 tablespace undo_1;
alter rollback segment t_1_61 online;
create rollback segment t_1_62 tablespace undo_1;
alter rollback segment t_1_62 online;
create rollback segment t_1_63 tablespace undo_1;
alter rollback segment t_1_63 online;
create rollback segment t_1_64 tablespace undo_1;
alter rollback segment t_1_64 online;
create rollback segment t_1_65 tablespace undo_1;
alter rollback segment t_1_65 online;
create rollback segment t_1_66 tablespace undo_1;
alter rollback segment t_1_66 online;
create rollback segment t_1_67 tablespace undo_1;
alter rollback segment t_1_67 online;
create rollback segment t_1_68 tablespace undo_1;
alter rollback segment t_1_68 online;
create rollback segment t_1_69 tablespace undo_1;
alter rollback segment t_1_69 online;
create rollback segment t_1_70 tablespace undo_1;
alter rollback segment t_1_70 online;
create rollback segment t_1_71 tablespace undo_1;
alter rollback segment t_1_71 online;
create rollback segment t_1_72 tablespace undo_1;
alter rollback segment t_1_72 online;
create rollback segment t_1_73 tablespace undo_1;
alter rollback segment t_1_73 online;
create rollback segment t_1_74 tablespace undo_1;
alter rollback segment t_1_74 online;
create rollback segment t_1_75 tablespace undo_1;
alter rollback segment t_1_75 online;

spool off



*************************
roll2.sql
*************************

spool createrollts_2.log

drop tablespace undo_2 including contents;

create tablespace undo_2 datafile '/home/oracle/dev/raw/roll-2'
size 498M reuse
extent management local uniform size 120K nologging;

create rollback segment t_2_1 tablespace undo_2;
alter rollback segment t_2_1 online;
create rollback segment t_2_2 tablespace undo_2;
alter rollback segment t_2_2 online;
create rollback segment t_2_3 tablespace undo_2;
alter rollback segment t_2_3 online;
create rollback segment t_2_4 tablespace undo_2;
alter rollback segment t_2_4 online;
```

```
create rollback segment t_2_5 tablespace undo_2;
alter rollback segment t_2_5 online;
create rollback segment t_2_6 tablespace undo_2;
alter rollback segment t_2_6 online;
create rollback segment t_2_7 tablespace undo_2;
alter rollback segment t_2_7 online;
create rollback segment t_2_8 tablespace undo_2;
alter rollback segment t_2_8 online;
create rollback segment t_2_9 tablespace undo_2;
alter rollback segment t_2_9 online;
create rollback segment t_2_10 tablespace undo_2;
alter rollback segment t_2_10 online;
create rollback segment t_2_11 tablespace undo_2;
alter rollback segment t_2_11 online;
create rollback segment t_2_12 tablespace undo_2;
alter rollback segment t_2_12 online;
create rollback segment t_2_13 tablespace undo_2;
alter rollback segment t_2_13 online;
create rollback segment t_2_14 tablespace undo_2;
alter rollback segment t_2_14 online;
create rollback segment t_2_15 tablespace undo_2;
alter rollback segment t_2_15 online;
create rollback segment t_2_16 tablespace undo_2;
alter rollback segment t_2_16 online;
create rollback segment t_2_17 tablespace undo_2;
alter rollback segment t_2_17 online;
create rollback segment t_2_18 tablespace undo_2;
alter rollback segment t_2_18 online;
create rollback segment t_2_19 tablespace undo_2;
alter rollback segment t_2_19 online;
create rollback segment t_2_20 tablespace undo_2;
alter rollback segment t_2_20 online;
create rollback segment t_2_21 tablespace undo_2;
alter rollback segment t_2_21 online;
create rollback segment t_2_22 tablespace undo_2;
alter rollback segment t_2_22 online;
create rollback segment t_2_23 tablespace undo_2;
alter rollback segment t_2_23 online;
create rollback segment t_2_24 tablespace undo_2;
alter rollback segment t_2_24 online;
create rollback segment t_2_25 tablespace undo_2;
alter rollback segment t_2_25 online;
create rollback segment t_2_26 tablespace undo_2;
alter rollback segment t_2_26 online;
create rollback segment t_2_27 tablespace undo_2;
alter rollback segment t_2_27 online;
create rollback segment t_2_28 tablespace undo_2;
alter rollback segment t_2_28 online;
create rollback segment t_2_29 tablespace undo_2;
alter rollback segment t_2_29 online;
create rollback segment t_2_30 tablespace undo_2;
alter rollback segment t_2_30 online;
create rollback segment t_2_31 tablespace undo_2;
alter rollback segment t_2_31 online;
create rollback segment t_2_32 tablespace undo_2;
alter rollback segment t_2_32 online;
create rollback segment t_2_33 tablespace undo_2;
alter rollback segment t_2_33 online;
create rollback segment t_2_34 tablespace undo_2;
alter rollback segment t_2_34 online;
create rollback segment t_2_35 tablespace undo_2;
alter rollback segment t_2_35 online;
create rollback segment t_2_36 tablespace undo_2;
alter rollback segment t_2_36 online;
create rollback segment t_2_37 tablespace undo_2;
alter rollback segment t_2_37 online;
create rollback segment t_2_38 tablespace undo_2;
alter rollback segment t_2_38 online;
create rollback segment t_2_39 tablespace undo_2;
alter rollback segment t_2_39 online;
create rollback segment t_2_40 tablespace undo_2;
alter rollback segment t_2_40 online;
create rollback segment t_2_41 tablespace undo_2;
alter rollback segment t_2_41 online;
create rollback segment t_2_42 tablespace undo_2;
alter rollback segment t_2_42 online;
create rollback segment t_2_43 tablespace undo_2;
alter rollback segment t_2_43 online;
create rollback segment t_2_44 tablespace undo_2;
alter rollback segment t_2_44 online;
create rollback segment t_2_45 tablespace undo_2;
alter rollback segment t_2_45 online;
create rollback segment t_2_46 tablespace undo_2;
alter rollback segment t_2_46 online;
create rollback segment t_2_47 tablespace undo_2;
alter rollback segment t_2_47 online;
create rollback segment t_2_48 tablespace undo_2;
alter rollback segment t_2_48 online;
create rollback segment t_2_49 tablespace undo_2;
alter rollback segment t_2_49 online;
create rollback segment t_2_50 tablespace undo_2;
alter rollback segment t_2_50 online;
create rollback segment t_2_51 tablespace undo_2;
alter rollback segment t_2_51 online;
create rollback segment t_2_52 tablespace undo_2;
alter rollback segment t_2_52 online;
create rollback segment t_2_53 tablespace undo_2;
alter rollback segment t_2_53 online;
create rollback segment t_2_54 tablespace undo_2;
alter rollback segment t_2_54 online;
create rollback segment t_2_55 tablespace undo_2;
alter rollback segment t_2_55 online;
create rollback segment t_2_56 tablespace undo_2;
alter rollback segment t_2_56 online;
create rollback segment t_2_57 tablespace undo_2;
alter rollback segment t_2_57 online;
create rollback segment t_2_58 tablespace undo_2;
alter rollback segment t_2_58 online;
create rollback segment t_2_59 tablespace undo_2;
alter rollback segment t_2_59 online;
create rollback segment t_2_60 tablespace undo_2;
alter rollback segment t_2_60 online;
create rollback segment t_2_61 tablespace undo_2;
alter rollback segment t_2_61 online;
create rollback segment t_2_62 tablespace undo_2;
alter rollback segment t_2_62 online;
create rollback segment t_2_63 tablespace undo_2;
alter rollback segment t_2_63 online;
create rollback segment t_2_64 tablespace undo_2;
alter rollback segment t_2_64 online;
create rollback segment t_2_65 tablespace undo_2;
alter rollback segment t_2_65 online;
create rollback segment t_2_66 tablespace undo_2;
alter rollback segment t_2_66 online;
create rollback segment t_2_67 tablespace undo_2;
alter rollback segment t_2_67 online;
create rollback segment t_2_68 tablespace undo_2;
alter rollback segment t_2_68 online;
create rollback segment t_2_69 tablespace undo_2;
alter rollback segment t_2_69 online;
create rollback segment t_2_70 tablespace undo_2;
alter rollback segment t_2_70 online;
create rollback segment t_2_71 tablespace undo_2;
alter rollback segment t_2_71 online;

create rollback segment t_2_72 tablespace undo_2;
alter rollback segment t_2_72 online;
create rollback segment t_2_73 tablespace undo_2;
alter rollback segment t_2_73 online;
create rollback segment t_2_74 tablespace undo_2;
alter rollback segment t_2_74 online;
create rollback segment t_2_75 tablespace undo_2;
alter rollback segment t_2_75 online;

spool off


*************************
roll3.sql
*************************

spool createrollts_3.log

drop tablespace undo_3 including contents;

create tablespace undo_3 datafile '/home/oracle/dev/raw/roll-3'
size 498M reuse
extent management local uniform size 120K nologging;

create rollback segment t_3_1 tablespace undo_3;
alter rollback segment t_3_1 online;
create rollback segment t_3_2 tablespace undo_3;
alter rollback segment t_3_2 online;
create rollback segment t_3_3 tablespace undo_3;
alter rollback segment t_3_3 online;
create rollback segment t_3_4 tablespace undo_3;
alter rollback segment t_3_4 online;
create rollback segment t_3_5 tablespace undo_3;
alter rollback segment t_3_5 online;
create rollback segment t_3_6 tablespace undo_3;
alter rollback segment t_3_6 online;
create rollback segment t_3_7 tablespace undo_3;
alter rollback segment t_3_7 online;
create rollback segment t_3_8 tablespace undo_3;
alter rollback segment t_3_8 online;
create rollback segment t_3_9 tablespace undo_3;
alter rollback segment t_3_9 online;
create rollback segment t_3_10 tablespace undo_3;
alter rollback segment t_3_10 online;
create rollback segment t_3_11 tablespace undo_3;
alter rollback segment t_3_11 online;
create rollback segment t_3_12 tablespace undo_3;
alter rollback segment t_3_12 online;
create rollback segment t_3_13 tablespace undo_3;
alter rollback segment t_3_13 online;
create rollback segment t_3_14 tablespace undo_3;
alter rollback segment t_3_14 online;
create rollback segment t_3_15 tablespace undo_3;
alter rollback segment t_3_15 online;
create rollback segment t_3_16 tablespace undo_3;
alter rollback segment t_3_16 online;
create rollback segment t_3_17 tablespace undo_3;
alter rollback segment t_3_17 online;
create rollback segment t_3_18 tablespace undo_3;
alter rollback segment t_3_18 online;
create rollback segment t_3_19 tablespace undo_3;
alter rollback segment t_3_19 online;
create rollback segment t_3_20 tablespace undo_3;
alter rollback segment t_3_20 online;
create rollback segment t_3_21 tablespace undo_3;
alter rollback segment t_3_21 online;
create rollback segment t_3_22 tablespace undo_3;
```

```
alter rollback segment t_3_22 online;
create rollback segment t_3_23 tablespace undo_3;
alter rollback segment t_3_23 online;
create rollback segment t_3_24 tablespace undo_3;
alter rollback segment t_3_24 online;
create rollback segment t_3_25 tablespace undo_3;
alter rollback segment t_3_25 online;
create rollback segment t_3_26 tablespace undo_3;
alter rollback segment t_3_26 online;
create rollback segment t_3_27 tablespace undo_3;
alter rollback segment t_3_27 online;
create rollback segment t_3_28 tablespace undo_3;
alter rollback segment t_3_28 online;
create rollback segment t_3_29 tablespace undo_3;
alter rollback segment t_3_29 online;
create rollback segment t_3_30 tablespace undo_3;
alter rollback segment t_3_30 online;
create rollback segment t_3_31 tablespace undo_3;
alter rollback segment t_3_31 online;
create rollback segment t_3_32 tablespace undo_3;
alter rollback segment t_3_32 online;
create rollback segment t_3_33 tablespace undo_3;
alter rollback segment t_3_33 online;
create rollback segment t_3_34 tablespace undo_3;
alter rollback segment t_3_34 online;
create rollback segment t_3_35 tablespace undo_3;
alter rollback segment t_3_35 online;
create rollback segment t_3_36 tablespace undo_3;

alter rollback segment t_3_36 online;
create rollback segment t_3_37 tablespace undo_3;
alter rollback segment t_3_37 online;
create rollback segment t_3_38 tablespace undo_3;
alter rollback segment t_3_38 online;
create rollback segment t_3_39 tablespace undo_3;
alter rollback segment t_3_39 online;
create rollback segment t_3_40 tablespace undo_3;
alter rollback segment t_3_40 online;
create rollback segment t_3_41 tablespace undo_3;
alter rollback segment t_3_41 online;
create rollback segment t_3_42 tablespace undo_3;
alter rollback segment t_3_42 online;
create rollback segment t_3_43 tablespace undo_3;
alter rollback segment t_3_43 online;
create rollback segment t_3_44 tablespace undo_3;
alter rollback segment t_3_44 online;
create rollback segment t_3_45 tablespace undo_3;
alter rollback segment t_3_45 online;
create rollback segment t_3_46 tablespace undo_3;
alter rollback segment t_3_46 online;
create rollback segment t_3_47 tablespace undo_3;
alter rollback segment t_3_47 online;
create rollback segment t_3_48 tablespace undo_3;
alter rollback segment t_3_48 online;
create rollback segment t_3_49 tablespace undo_3;
alter rollback segment t_3_49 online;
create rollback segment t_3_50 tablespace undo_3;
alter rollback segment t_3_50 online;
create rollback segment t_3_51 tablespace undo_3;
alter rollback segment t_3_51 online;
create rollback segment t_3_52 tablespace undo_3;
alter rollback segment t_3_52 online;
create rollback segment t_3_53 tablespace undo_3;
alter rollback segment t_3_53 online;
create rollback segment t_3_54 tablespace undo_3;
alter rollback segment t_3_54 online;
create rollback segment t_3_55 tablespace undo_3;
alter rollback segment t_3_55 online;
create rollback segment t_3_56 tablespace undo_3;
alter rollback segment t_3_56 online;
create rollback segment t_3_57 tablespace undo_3;
alter rollback segment t_3_57 online;
create rollback segment t_3_58 tablespace undo_3;
alter rollback segment t_3_58 online;
create rollback segment t_3_59 tablespace undo_3;
alter rollback segment t_3_59 online;
create rollback segment t_3_60 tablespace undo_3;
alter rollback segment t_3_60 online;
create rollback segment t_3_61 tablespace undo_3;
alter rollback segment t_3_61 online;
create rollback segment t_3_62 tablespace undo_3;
alter rollback segment t_3_62 online;
create rollback segment t_3_63 tablespace undo_3;
alter rollback segment t_3_63 online;
create rollback segment t_3_64 tablespace undo_3;
alter rollback segment t_3_64 online;
create rollback segment t_3_65 tablespace undo_3;
alter rollback segment t_3_65 online;
create rollback segment t_3_66 tablespace undo_3;
alter rollback segment t_3_66 online;
create rollback segment t_3_67 tablespace undo_3;
alter rollback segment t_3_67 online;
create rollback segment t_3_68 tablespace undo_3;
alter rollback segment t_3_68 online;
create rollback segment t_3_69 tablespace undo_3;
alter rollback segment t_3_69 online;
create rollback segment t_3_70 tablespace undo_3;
alter rollback segment t_3_70 online;
create rollback segment t_3_71 tablespace undo_3;
alter rollback segment t_3_71 online;
create rollback segment t_3_72 tablespace undo_3;
alter rollback segment t_3_72 online;
create rollback segment t_3_73 tablespace undo_3;
alter rollback segment t_3_73 online;
create rollback segment t_3_74 tablespace undo_3;
alter rollback segment t_3_74 online;
create rollback segment t_3_75 tablespace undo_3;
alter rollback segment t_3_75 online;

spool off


*************************
roll4.sql
*************************

spool createrollts_4.log

drop tablespace undo_4 including contents;

create tablespace undo_4 datafile '/home/oracle/dev/raw/roll-4'
size 498M reuse
extent management local uniform size 120K nologging;

create rollback segment t_4_1 tablespace undo_4;
alter rollback segment t_4_1 online;
create rollback segment t_4_2 tablespace undo_4;
alter rollback segment t_4_2 online;
create rollback segment t_4_3 tablespace undo_4;
alter rollback segment t_4_3 online;
create rollback segment t_4_4 tablespace undo_4;
alter rollback segment t_4_4 online;
create rollback segment t_4_5 tablespace undo_4;
alter rollback segment t_4_5 online;
create rollback segment t_4_6 tablespace undo_4;
alter rollback segment t_4_6 online;
create rollback segment t_4_7 tablespace undo_4;
alter rollback segment t_4_7 online;
create rollback segment t_4_8 tablespace undo_4;
alter rollback segment t_4_8 online;
create rollback segment t_4_9 tablespace undo_4;
alter rollback segment t_4_9 online;
create rollback segment t_4_10 tablespace undo_4;
alter rollback segment t_4_10 online;
create rollback segment t_4_11 tablespace undo_4;
alter rollback segment t_4_11 online;
create rollback segment t_4_12 tablespace undo_4;
alter rollback segment t_4_12 online;
create rollback segment t_4_13 tablespace undo_4;
alter rollback segment t_4_13 online;
create rollback segment t_4_14 tablespace undo_4;
alter rollback segment t_4_14 online;
create rollback segment t_4_15 tablespace undo_4;
alter rollback segment t_4_15 online;
create rollback segment t_4_16 tablespace undo_4;
alter rollback segment t_4_16 online;
create rollback segment t_4_17 tablespace undo_4;
alter rollback segment t_4_17 online;
create rollback segment t_4_18 tablespace undo_4;
alter rollback segment t_4_18 online;
create rollback segment t_4_19 tablespace undo_4;
alter rollback segment t_4_19 online;
create rollback segment t_4_20 tablespace undo_4;
alter rollback segment t_4_20 online;
create rollback segment t_4_21 tablespace undo_4;
alter rollback segment t_4_21 online;
create rollback segment t_4_22 tablespace undo_4;
alter rollback segment t_4_22 online;
create rollback segment t_4_23 tablespace undo_4;
alter rollback segment t_4_23 online;
create rollback segment t_4_24 tablespace undo_4;
alter rollback segment t_4_24 online;
create rollback segment t_4_25 tablespace undo_4;
alter rollback segment t_4_25 online;
create rollback segment t_4_26 tablespace undo_4;
alter rollback segment t_4_26 online;
create rollback segment t_4_27 tablespace undo_4;
alter rollback segment t_4_27 online;
create rollback segment t_4_28 tablespace undo_4;
alter rollback segment t_4_28 online;
create rollback segment t_4_29 tablespace undo_4;
alter rollback segment t_4_29 online;
create rollback segment t_4_30 tablespace undo_4;
alter rollback segment t_4_30 online;
create rollback segment t_4_31 tablespace undo_4;
alter rollback segment t_4_31 online;
create rollback segment t_4_32 tablespace undo_4;
alter rollback segment t_4_32 online;
create rollback segment t_4_33 tablespace undo_4;
alter rollback segment t_4_33 online;
create rollback segment t_4_34 tablespace undo_4;
alter rollback segment t_4_34 online;
create rollback segment t_4_35 tablespace undo_4;
alter rollback segment t_4_35 online;
create rollback segment t_4_36 tablespace undo_4;
alter rollback segment t_4_36 online;
create rollback segment t_4_37 tablespace undo_4;
alter rollback segment t_4_37 online;
create rollback segment t_4_38 tablespace undo_4;
alter rollback segment t_4_38 online;
create rollback segment t_4_39 tablespace undo_4;
alter rollback segment t_4_39 online;
```

```
create rollback segment t_4_40 tablespace undo_4;
alter rollback segment t_4_40 online;
create rollback segment t_4_41 tablespace undo_4;
alter rollback segment t_4_41 online;
create rollback segment t_4_42 tablespace undo_4;
alter rollback segment t_4_42 online;
create rollback segment t_4_43 tablespace undo_4;
alter rollback segment t_4_43 online;
create rollback segment t_4_44 tablespace undo_4;
alter rollback segment t_4_44 online;
create rollback segment t_4_45 tablespace undo_4;
alter rollback segment t_4_45 online;
create rollback segment t_4_46 tablespace undo_4;
alter rollback segment t_4_46 online;
create rollback segment t_4_47 tablespace undo_4;
alter rollback segment t_4_47 online;
create rollback segment t_4_48 tablespace undo_4;
alter rollback segment t_4_48 online;
create rollback segment t_4_49 tablespace undo_4;
alter rollback segment t_4_49 online;
create rollback segment t_4_50 tablespace undo_4;
alter rollback segment t_4_50 online;
create rollback segment t_4_51 tablespace undo_4;
alter rollback segment t_4_51 online;
create rollback segment t_4_52 tablespace undo_4;
alter rollback segment t_4_52 online;
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alter rollback segment t_4_53 online;
create rollback segment t_4_54 tablespace undo_4;
alter rollback segment t_4_54 online;
create rollback segment t_4_55 tablespace undo_4;
alter rollback segment t_4_55 online;
create rollback segment t_4_56 tablespace undo_4;
alter rollback segment t_4_56 online;
create rollback segment t_4_57 tablespace undo_4;
alter rollback segment t_4_57 online;
create rollback segment t_4_58 tablespace undo_4;
alter rollback segment t_4_58 online;
create rollback segment t_4_59 tablespace undo_4;
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create rollback segment t_4_61 tablespace undo_4;
alter rollback segment t_4_61 online;
create rollback segment t_4_62 tablespace undo_4;
alter rollback segment t_4_62 online;
create rollback segment t_4_63 tablespace undo_4;
alter rollback segment t_4_63 online;
create rollback segment t_4_64 tablespace undo_4;
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alter rollback segment t_4_65 online;
create rollback segment t_4_66 tablespace undo_4;
alter rollback segment t_4_66 online;
create rollback segment t_4_67 tablespace undo_4;
alter rollback segment t_4_67 online;
create rollback segment t_4_68 tablespace undo_4;
alter rollback segment t_4_68 online;
create rollback segment t_4_69 tablespace undo_4;
alter rollback segment t_4_69 online;
create rollback segment t_4_70 tablespace undo_4;
alter rollback segment t_4_70 online;
create rollback segment t_4_71 tablespace undo_4;
alter rollback segment t_4_71 online;
create rollback segment t_4_72 tablespace undo_4;
alter rollback segment t_4_72 online;
create rollback segment t_4_73 tablespace undo_4;
alter rollback segment t_4_73 online;
create rollback segment t_4_74 tablespace undo_4;
alter rollback segment t_4_74 online;
create rollback segment t_4_75 tablespace undo_4;
alter rollback segment t_4_75 online;

spool off


*************************
roll5.sql
*************************

spool createrollts_5.log

drop tablespace undo_5 including contents;

create tablespace undo_5 datafile '/home/oracle/dev/raw/roll-5'
size 498M reuse
extent management local uniform size 120K nologging;

create rollback segment t_5_1 tablespace undo_5;
alter rollback segment t_5_1 online;
create rollback segment t_5_2 tablespace undo_5;
alter rollback segment t_5_2 online;
create rollback segment t_5_3 tablespace undo_5;
alter rollback segment t_5_3 online;
create rollback segment t_5_4 tablespace undo_5;
alter rollback segment t_5_4 online;
create rollback segment t_5_5 tablespace undo_5;
alter rollback segment t_5_5 online;
create rollback segment t_5_6 tablespace undo_5;
alter rollback segment t_5_6 online;
create rollback segment t_5_7 tablespace undo_5;
alter rollback segment t_5_7 online;
create rollback segment t_5_8 tablespace undo_5;
alter rollback segment t_5_8 online;
create rollback segment t_5_9 tablespace undo_5;
alter rollback segment t_5_9 online;
create rollback segment t_5_10 tablespace undo_5;
alter rollback segment t_5_10 online;
create rollback segment t_5_11 tablespace undo_5;
alter rollback segment t_5_11 online;
create rollback segment t_5_12 tablespace undo_5;
alter rollback segment t_5_12 online;
create rollback segment t_5_13 tablespace undo_5;
alter rollback segment t_5_13 online;
create rollback segment t_5_14 tablespace undo_5;
alter rollback segment t_5_14 online;
create rollback segment t_5_15 tablespace undo_5;
alter rollback segment t_5_15 online;
create rollback segment t_5_16 tablespace undo_5;
alter rollback segment t_5_16 online;
create rollback segment t_5_17 tablespace undo_5;
alter rollback segment t_5_17 online;
create rollback segment t_5_18 tablespace undo_5;
alter rollback segment t_5_18 online;
create rollback segment t_5_19 tablespace undo_5;
alter rollback segment t_5_19 online;
create rollback segment t_5_20 tablespace undo_5;
alter rollback segment t_5_20 online;
create rollback segment t_5_21 tablespace undo_5;
alter rollback segment t_5_21 online;
create rollback segment t_5_22 tablespace undo_5;
alter rollback segment t_5_22 online;
create rollback segment t_5_23 tablespace undo_5;
alter rollback segment t_5_23 online;
create rollback segment t_5_24 tablespace undo_5;
alter rollback segment t_5_24 online;
create rollback segment t_5_25 tablespace undo_5;
alter rollback segment t_5_25 online;
create rollback segment t_5_26 tablespace undo_5;
alter rollback segment t_5_26 online;
create rollback segment t_5_27 tablespace undo_5;
alter rollback segment t_5_27 online;
create rollback segment t_5_28 tablespace undo_5;
alter rollback segment t_5_28 online;
create rollback segment t_5_29 tablespace undo_5;
alter rollback segment t_5_29 online;
create rollback segment t_5_30 tablespace undo_5;
alter rollback segment t_5_30 online;
create rollback segment t_5_31 tablespace undo_5;
alter rollback segment t_5_31 online;
create rollback segment t_5_32 tablespace undo_5;
alter rollback segment t_5_32 online;
create rollback segment t_5_33 tablespace undo_5;
alter rollback segment t_5_33 online;
create rollback segment t_5_34 tablespace undo_5;
alter rollback segment t_5_34 online;
create rollback segment t_5_35 tablespace undo_5;
alter rollback segment t_5_35 online;
create rollback segment t_5_36 tablespace undo_5;
alter rollback segment t_5_36 online;
create rollback segment t_5_37 tablespace undo_5;
alter rollback segment t_5_37 online;
create rollback segment t_5_38 tablespace undo_5;
alter rollback segment t_5_38 online;
create rollback segment t_5_39 tablespace undo_5;
alter rollback segment t_5_39 online;
create rollback segment t_5_40 tablespace undo_5;
alter rollback segment t_5_40 online;
create rollback segment t_5_41 tablespace undo_5;
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create rollback segment t_5_42 tablespace undo_5;
alter rollback segment t_5_42 online;
create rollback segment t_5_43 tablespace undo_5;
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create rollback segment t_5_44 tablespace undo_5;
alter rollback segment t_5_44 online;
create rollback segment t_5_45 tablespace undo_5;
alter rollback segment t_5_45 online;
create rollback segment t_5_46 tablespace undo_5;
alter rollback segment t_5_46 online;
create rollback segment t_5_47 tablespace undo_5;
alter rollback segment t_5_47 online;
create rollback segment t_5_48 tablespace undo_5;
alter rollback segment t_5_48 online;
create rollback segment t_5_49 tablespace undo_5;
alter rollback segment t_5_49 online;
create rollback segment t_5_50 tablespace undo_5;
alter rollback segment t_5_50 online;
create rollback segment t_5_51 tablespace undo_5;
alter rollback segment t_5_51 online;
create rollback segment t_5_52 tablespace undo_5;
alter rollback segment t_5_52 online;
create rollback segment t_5_53 tablespace undo_5;
alter rollback segment t_5_53 online;
create rollback segment t_5_54 tablespace undo_5;
alter rollback segment t_5_54 online;
create rollback segment t_5_55 tablespace undo_5;
alter rollback segment t_5_55 online;
create rollback segment t_5_56 tablespace undo_5;
alter rollback segment t_5_56 online;
create rollback segment t_5_57 tablespace undo_5;
alter rollback segment t_5_57 online;
```

```
create rollback segment t_5_58 tablespace undo_5;
alter rollback segment t_5_58 online;
create rollback segment t_5_59 tablespace undo_5;

alter rollback segment t_5_59 online;
create rollback segment t_5_60 tablespace undo_5;
alter rollback segment t_5_60 online;
create rollback segment t_5_61 tablespace undo_5;
alter rollback segment t_5_61 online;
create rollback segment t_5_62 tablespace undo_5;
alter rollback segment t_5_62 online;
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alter rollback segment t_5_63 online;
create rollback segment t_5_64 tablespace undo_5;
alter rollback segment t_5_64 online;
create rollback segment t_5_65 tablespace undo_5;
alter rollback segment t_5_65 online;
create rollback segment t_5_66 tablespace undo_5;
alter rollback segment t_5_66 online;
create rollback segment t_5_67 tablespace undo_5;
alter rollback segment t_5_67 online;
create rollback segment t_5_68 tablespace undo_5;
alter rollback segment t_5_68 online;
create rollback segment t_5_69 tablespace undo_5;
alter rollback segment t_5_69 online;
create rollback segment t_5_70 tablespace undo_5;
alter rollback segment t_5_70 online;
create rollback segment t_5_71 tablespace undo_5;
alter rollback segment t_5_71 online;
create rollback segment t_5_72 tablespace undo_5;
alter rollback segment t_5_72 online;
create rollback segment t_5_73 tablespace undo_5;
alter rollback segment t_5_73 online;
create rollback segment t_5_74 tablespace undo_5;
alter rollback segment t_5_74 online;
create rollback segment t_5_75 tablespace undo_5;
alter rollback segment t_5_75 online;

spool off


**************************
roll6.sql
**************************

spool createrollts_6.log

drop tablespace undo_6 including contents;

create tablespace undo_6 datafile '/home/oracle/dev/raw/roll-6'
size 498M reuse
extent management local uniform size 120K nologging;

create rollback segment t_6_1 tablespace undo_6;
alter rollback segment t_6_1 online;
create rollback segment t_6_2 tablespace undo_6;
alter rollback segment t_6_2 online;
create rollback segment t_6_3 tablespace undo_6;
alter rollback segment t_6_3 online;
create rollback segment t_6_4 tablespace undo_6;
alter rollback segment t_6_4 online;
create rollback segment t_6_5 tablespace undo_6;
alter rollback segment t_6_5 online;
create rollback segment t_6_6 tablespace undo_6;
alter rollback segment t_6_6 online;

create rollback segment t_6_7 tablespace undo_6;
alter rollback segment t_6_7 online;
create rollback segment t_6_8 tablespace undo_6;
alter rollback segment t_6_8 online;
create rollback segment t_6_9 tablespace undo_6;
alter rollback segment t_6_9 online;
create rollback segment t_6_10 tablespace undo_6;
alter rollback segment t_6_10 online;
create rollback segment t_6_11 tablespace undo_6;
alter rollback segment t_6_11 online;
create rollback segment t_6_12 tablespace undo_6;
alter rollback segment t_6_12 online;
create rollback segment t_6_13 tablespace undo_6;
alter rollback segment t_6_13 online;
create rollback segment t_6_14 tablespace undo_6;
alter rollback segment t_6_14 online;
create rollback segment t_6_15 tablespace undo_6;
alter rollback segment t_6_15 online;
create rollback segment t_6_16 tablespace undo_6;
alter rollback segment t_6_16 online;
create rollback segment t_6_17 tablespace undo_6;
alter rollback segment t_6_17 online;
create rollback segment t_6_18 tablespace undo_6;
alter rollback segment t_6_18 online;
create rollback segment t_6_19 tablespace undo_6;
alter rollback segment t_6_19 online;
create rollback segment t_6_20 tablespace undo_6;
alter rollback segment t_6_20 online;
create rollback segment t_6_21 tablespace undo_6;
alter rollback segment t_6_21 online;
create rollback segment t_6_22 tablespace undo_6;
alter rollback segment t_6_22 online;
create rollback segment t_6_23 tablespace undo_6;
alter rollback segment t_6_23 online;
create rollback segment t_6_24 tablespace undo_6;
alter rollback segment t_6_24 online;
create rollback segment t_6_25 tablespace undo_6;
alter rollback segment t_6_25 online;
create rollback segment t_6_26 tablespace undo_6;
alter rollback segment t_6_26 online;
create rollback segment t_6_27 tablespace undo_6;
alter rollback segment t_6_27 online;
create rollback segment t_6_28 tablespace undo_6;
alter rollback segment t_6_28 online;
create rollback segment t_6_29 tablespace undo_6;
alter rollback segment t_6_29 online;
create rollback segment t_6_30 tablespace undo_6;
alter rollback segment t_6_30 online;
create rollback segment t_6_31 tablespace undo_6;
alter rollback segment t_6_31 online;
create rollback segment t_6_32 tablespace undo_6;
alter rollback segment t_6_32 online;
create rollback segment t_6_33 tablespace undo_6;
alter rollback segment t_6_33 online;
create rollback segment t_6_34 tablespace undo_6;
alter rollback segment t_6_34 online;
create rollback segment t_6_35 tablespace undo_6;
alter rollback segment t_6_35 online;
create rollback segment t_6_36 tablespace undo_6;
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create rollback segment t_6_37 tablespace undo_6;
alter rollback segment t_6_37 online;
create rollback segment t_6_38 tablespace undo_6;
alter rollback segment t_6_38 online;
create rollback segment t_6_39 tablespace undo_6;
alter rollback segment t_6_39 online;
create rollback segment t_6_40 tablespace undo_6;
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create rollback segment t_6_41 tablespace undo_6;
alter rollback segment t_6_41 online;
create rollback segment t_6_42 tablespace undo_6;
alter rollback segment t_6_42 online;
create rollback segment t_6_43 tablespace undo_6;
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create rollback segment t_6_46 tablespace undo_6;
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create rollback segment t_6_48 tablespace undo_6;
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create rollback segment t_6_49 tablespace undo_6;
alter rollback segment t_6_49 online;
create rollback segment t_6_50 tablespace undo_6;
alter rollback segment t_6_50 online;
create rollback segment t_6_51 tablespace undo_6;
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create rollback segment t_6_57 tablespace undo_6;
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create rollback segment t_6_59 tablespace undo_6;
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create rollback segment t_6_61 tablespace undo_6;
alter rollback segment t_6_61 online;
create rollback segment t_6_62 tablespace undo_6;
alter rollback segment t_6_62 online;
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create rollback segment t_6_64 tablespace undo_6;
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alter rollback segment t_6_65 online;
create rollback segment t_6_66 tablespace undo_6;
alter rollback segment t_6_66 online;
create rollback segment t_6_67 tablespace undo_6;
alter rollback segment t_6_67 online;
create rollback segment t_6_68 tablespace undo_6;
alter rollback segment t_6_68 online;
create rollback segment t_6_69 tablespace undo_6;
alter rollback segment t_6_69 online;
create rollback segment t_6_70 tablespace undo_6;
alter rollback segment t_6_70 online;
create rollback segment t_6_71 tablespace undo_6;
alter rollback segment t_6_71 online;
create rollback segment t_6_72 tablespace undo_6;
alter rollback segment t_6_72 online;
create rollback segment t_6_73 tablespace undo_6;
alter rollback segment t_6_73 online;
create rollback segment t_6_74 tablespace undo_6;
alter rollback segment t_6_74 online;
```

```
create rollback segment t_6_75 tablespace undo_6;
alter rollback segment t_6_75 online;

spool off


*************************
roll7.sql
*************************

spool createrollts_7.log

drop tablespace undo_7 including contents;

create tablespace undo_7 datafile '/home/oracle/dev/raw/roll-7'
size 498M reuse
extent management local uniform size 120K nologging;

create rollback segment t_7_1 tablespace undo_7;
alter rollback segment t_7_1 online;
create rollback segment t_7_2 tablespace undo_7;
alter rollback segment t_7_2 online;
create rollback segment t_7_3 tablespace undo_7;
alter rollback segment t_7_3 online;
create rollback segment t_7_4 tablespace undo_7;
alter rollback segment t_7_4 online;
create rollback segment t_7_5 tablespace undo_7;
alter rollback segment t_7_5 online;
create rollback segment t_7_6 tablespace undo_7;
alter rollback segment t_7_6 online;
create rollback segment t_7_7 tablespace undo_7;
alter rollback segment t_7_7 online;
create rollback segment t_7_8 tablespace undo_7;
alter rollback segment t_7_8 online;
create rollback segment t_7_9 tablespace undo_7;
alter rollback segment t_7_9 online;
create rollback segment t_7_10 tablespace undo_7;
alter rollback segment t_7_10 online;
create rollback segment t_7_11 tablespace undo_7;
alter rollback segment t_7_11 online;
create rollback segment t_7_12 tablespace undo_7;
alter rollback segment t_7_12 online;
create rollback segment t_7_13 tablespace undo_7;
alter rollback segment t_7_13 online;
create rollback segment t_7_14 tablespace undo_7;
alter rollback segment t_7_14 online;
create rollback segment t_7_15 tablespace undo_7;
alter rollback segment t_7_15 online;
create rollback segment t_7_16 tablespace undo_7;
alter rollback segment t_7_16 online;
create rollback segment t_7_17 tablespace undo_7;
alter rollback segment t_7_17 online;
create rollback segment t_7_18 tablespace undo_7;
alter rollback segment t_7_18 online;
create rollback segment t_7_19 tablespace undo_7;
alter rollback segment t_7_19 online;
create rollback segment t_7_20 tablespace undo_7;
alter rollback segment t_7_20 online;
create rollback segment t_7_21 tablespace undo_7;
alter rollback segment t_7_21 online;
create rollback segment t_7_22 tablespace undo_7;
alter rollback segment t_7_22 online;
create rollback segment t_7_23 tablespace undo_7;
alter rollback segment t_7_23 online;
create rollback segment t_7_24 tablespace undo_7;
alter rollback segment t_7_24 online;
create rollback segment t_7_25 tablespace undo_7;
alter rollback segment t_7_25 online;
create rollback segment t_7_26 tablespace undo_7;
alter rollback segment t_7_26 online;
create rollback segment t_7_27 tablespace undo_7;
alter rollback segment t_7_27 online;
create rollback segment t_7_28 tablespace undo_7;
alter rollback segment t_7_28 online;
create rollback segment t_7_29 tablespace undo_7;
alter rollback segment t_7_29 online;
create rollback segment t_7_30 tablespace undo_7;
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create rollback segment t_7_32 tablespace undo_7;
alter rollback segment t_7_32 online;
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create rollback segment t_7_34 tablespace undo_7;
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alter rollback segment t_7_36 online;
create rollback segment t_7_37 tablespace undo_7;
alter rollback segment t_7_37 online;
create rollback segment t_7_38 tablespace undo_7;
alter rollback segment t_7_38 online;
create rollback segment t_7_39 tablespace undo_7;
alter rollback segment t_7_39 online;
create rollback segment t_7_40 tablespace undo_7;
alter rollback segment t_7_40 online;
create rollback segment t_7_41 tablespace undo_7;
alter rollback segment t_7_41 online;
create rollback segment t_7_42 tablespace undo_7;
alter rollback segment t_7_42 online;
create rollback segment t_7_43 tablespace undo_7;
alter rollback segment t_7_43 online;
create rollback segment t_7_44 tablespace undo_7;
alter rollback segment t_7_44 online;
create rollback segment t_7_45 tablespace undo_7;
alter rollback segment t_7_45 online;
create rollback segment t_7_46 tablespace undo_7;
alter rollback segment t_7_46 online;
create rollback segment t_7_47 tablespace undo_7;
alter rollback segment t_7_47 online;
create rollback segment t_7_48 tablespace undo_7;
alter rollback segment t_7_48 online;
create rollback segment t_7_49 tablespace undo_7;
alter rollback segment t_7_49 online;
create rollback segment t_7_50 tablespace undo_7;
alter rollback segment t_7_50 online;
create rollback segment t_7_51 tablespace undo_7;
alter rollback segment t_7_51 online;
create rollback segment t_7_52 tablespace undo_7;
alter rollback segment t_7_52 online;
create rollback segment t_7_53 tablespace undo_7;
alter rollback segment t_7_53 online;
create rollback segment t_7_54 tablespace undo_7;
alter rollback segment t_7_54 online;
create rollback segment t_7_55 tablespace undo_7;
alter rollback segment t_7_55 online;
create rollback segment t_7_56 tablespace undo_7;
alter rollback segment t_7_56 online;
create rollback segment t_7_57 tablespace undo_7;
alter rollback segment t_7_57 online;
create rollback segment t_7_58 tablespace undo_7;
alter rollback segment t_7_58 online;
create rollback segment t_7_59 tablespace undo_7;
alter rollback segment t_7_59 online;
create rollback segment t_7_60 tablespace undo_7;
alter rollback segment t_7_60 online;
create rollback segment t_7_61 tablespace undo_7;
alter rollback segment t_7_61 online;
create rollback segment t_7_62 tablespace undo_7;
alter rollback segment t_7_62 online;
create rollback segment t_7_63 tablespace undo_7;
alter rollback segment t_7_63 online;
create rollback segment t_7_64 tablespace undo_7;
alter rollback segment t_7_64 online;
create rollback segment t_7_65 tablespace undo_7;
alter rollback segment t_7_65 online;
create rollback segment t_7_66 tablespace undo_7;
alter rollback segment t_7_66 online;
create rollback segment t_7_67 tablespace undo_7;
alter rollback segment t_7_67 online;
create rollback segment t_7_68 tablespace undo_7;
alter rollback segment t_7_68 online;
create rollback segment t_7_69 tablespace undo_7;
alter rollback segment t_7_69 online;
create rollback segment t_7_70 tablespace undo_7;
alter rollback segment t_7_70 online;
create rollback segment t_7_71 tablespace undo_7;
alter rollback segment t_7_71 online;
create rollback segment t_7_72 tablespace undo_7;
alter rollback segment t_7_72 online;
create rollback segment t_7_73 tablespace undo_7;
alter rollback segment t_7_73 online;
create rollback segment t_7_74 tablespace undo_7;
alter rollback segment t_7_74 online;
create rollback segment t_7_75 tablespace undo_7;
alter rollback segment t_7_75 online;

spool off


*************************
roll8.sql
*************************

spool createrollts_8.log

drop tablespace undo_8 including contents;

create tablespace undo_8 datafile '/home/oracle/dev/raw/roll-8'
size 498M reuse
extent management local uniform size 120K nologging;

create rollback segment t_8_1 tablespace undo_8;
alter rollback segment t_8_1 online;
create rollback segment t_8_2 tablespace undo_8;
alter rollback segment t_8_2 online;
create rollback segment t_8_3 tablespace undo_8;
alter rollback segment t_8_3 online;
create rollback segment t_8_4 tablespace undo_8;
alter rollback segment t_8_4 online;
create rollback segment t_8_5 tablespace undo_8;
alter rollback segment t_8_5 online;
create rollback segment t_8_6 tablespace undo_8;
alter rollback segment t_8_6 online;
create rollback segment t_8_7 tablespace undo_8;
alter rollback segment t_8_7 online;
create rollback segment t_8_8 tablespace undo_8;
alter rollback segment t_8_8 online;
create rollback segment t_8_9 tablespace undo_8;
alter rollback segment t_8_9 online;
```

```
create rollback segment t_8_10 tablespace undo_8;
alter rollback segment t_8_10 online;
create rollback segment t_8_11 tablespace undo_8;
alter rollback segment t_8_11 online;
create rollback segment t_8_12 tablespace undo_8;
alter rollback segment t_8_12 online;

create rollback segment t_8_13 tablespace undo_8;
alter rollback segment t_8_13 online;
create rollback segment t_8_14 tablespace undo_8;
alter rollback segment t_8_14 online;
create rollback segment t_8_15 tablespace undo_8;
alter rollback segment t_8_15 online;
create rollback segment t_8_16 tablespace undo_8;
alter rollback segment t_8_16 online;
create rollback segment t_8_17 tablespace undo_8;
alter rollback segment t_8_17 online;
create rollback segment t_8_18 tablespace undo_8;
alter rollback segment t_8_18 online;
create rollback segment t_8_19 tablespace undo_8;
alter rollback segment t_8_19 online;
create rollback segment t_8_20 tablespace undo_8;
alter rollback segment t_8_20 online;
create rollback segment t_8_21 tablespace undo_8;
alter rollback segment t_8_21 online;
create rollback segment t_8_22 tablespace undo_8;
alter rollback segment t_8_22 online;
create rollback segment t_8_23 tablespace undo_8;
alter rollback segment t_8_23 online;
create rollback segment t_8_24 tablespace undo_8;
alter rollback segment t_8_24 online;
create rollback segment t_8_25 tablespace undo_8;
alter rollback segment t_8_25 online;
create rollback segment t_8_26 tablespace undo_8;
alter rollback segment t_8_26 online;
create rollback segment t_8_27 tablespace undo_8;
alter rollback segment t_8_27 online;
create rollback segment t_8_28 tablespace undo_8;
alter rollback segment t_8_28 online;
create rollback segment t_8_29 tablespace undo_8;
alter rollback segment t_8_29 online;
create rollback segment t_8_30 tablespace undo_8;
alter rollback segment t_8_30 online;
create rollback segment t_8_31 tablespace undo_8;
alter rollback segment t_8_31 online;
create rollback segment t_8_32 tablespace undo_8;
alter rollback segment t_8_32 online;
create rollback segment t_8_33 tablespace undo_8;
alter rollback segment t_8_33 online;
create rollback segment t_8_34 tablespace undo_8;
alter rollback segment t_8_34 online;
create rollback segment t_8_35 tablespace undo_8;
alter rollback segment t_8_35 online;
create rollback segment t_8_36 tablespace undo_8;
alter rollback segment t_8_36 online;
create rollback segment t_8_37 tablespace undo_8;
alter rollback segment t_8_37 online;
create rollback segment t_8_38 tablespace undo_8;
alter rollback segment t_8_38 online;
create rollback segment t_8_39 tablespace undo_8;
alter rollback segment t_8_39 online;
create rollback segment t_8_40 tablespace undo_8;
alter rollback segment t_8_40 online;
create rollback segment t_8_41 tablespace undo_8;
alter rollback segment t_8_41 online;
create rollback segment t_8_42 tablespace undo_8;
alter rollback segment t_8_42 online;
create rollback segment t_8_43 tablespace undo_8;
alter rollback segment t_8_43 online;
create rollback segment t_8_44 tablespace undo_8;
alter rollback segment t_8_44 online;
create rollback segment t_8_45 tablespace undo_8;
alter rollback segment t_8_45 online;
create rollback segment t_8_46 tablespace undo_8;
alter rollback segment t_8_46 online;
create rollback segment t_8_47 tablespace undo_8;
alter rollback segment t_8_47 online;
create rollback segment t_8_48 tablespace undo_8;
alter rollback segment t_8_48 online;
create rollback segment t_8_49 tablespace undo_8;
alter rollback segment t_8_49 online;
create rollback segment t_8_50 tablespace undo_8;
alter rollback segment t_8_50 online;
create rollback segment t_8_51 tablespace undo_8;
alter rollback segment t_8_51 online;
create rollback segment t_8_52 tablespace undo_8;
alter rollback segment t_8_52 online;
create rollback segment t_8_53 tablespace undo_8;
alter rollback segment t_8_53 online;
create rollback segment t_8_54 tablespace undo_8;
alter rollback segment t_8_54 online;
create rollback segment t_8_55 tablespace undo_8;
alter rollback segment t_8_55 online;
create rollback segment t_8_56 tablespace undo_8;
alter rollback segment t_8_56 online;
create rollback segment t_8_57 tablespace undo_8;
alter rollback segment t_8_57 online;
create rollback segment t_8_58 tablespace undo_8;
alter rollback segment t_8_58 online;
create rollback segment t_8_59 tablespace undo_8;
alter rollback segment t_8_59 online;
create rollback segment t_8_60 tablespace undo_8;
alter rollback segment t_8_60 online;
create rollback segment t_8_61 tablespace undo_8;
alter rollback segment t_8_61 online;
create rollback segment t_8_62 tablespace undo_8;
alter rollback segment t_8_62 online;
create rollback segment t_8_63 tablespace undo_8;
alter rollback segment t_8_63 online;
create rollback segment t_8_64 tablespace undo_8;
alter rollback segment t_8_64 online;
create rollback segment t_8_65 tablespace undo_8;
alter rollback segment t_8_65 online;
create rollback segment t_8_66 tablespace undo_8;
alter rollback segment t_8_66 online;
create rollback segment t_8_67 tablespace undo_8;
alter rollback segment t_8_67 online;
create rollback segment t_8_68 tablespace undo_8;
alter rollback segment t_8_68 online;
create rollback segment t_8_69 tablespace undo_8;
alter rollback segment t_8_69 online;
create rollback segment t_8_70 tablespace undo_8;
alter rollback segment t_8_70 online;
create rollback segment t_8_71 tablespace undo_8;
alter rollback segment t_8_71 online;
create rollback segment t_8_72 tablespace undo_8;
alter rollback segment t_8_72 online;
create rollback segment t_8_73 tablespace undo_8;
alter rollback segment t_8_73 online;
create rollback segment t_8_74 tablespace undo_8;
alter rollback segment t_8_74 online;
create rollback segment t_8_75 tablespace undo_8;
alter rollback segment t_8_75 online;

spool off


*************************
rollts.sql
*************************

spool createrollts.log

drop tablespace undo_1 including contents;
drop tablespace undo_2 including contents;
drop tablespace undo_3 including contents;
drop tablespace undo_4 including contents;
drop tablespace undo_5 including contents;
drop tablespace undo_6 including contents;
drop tablespace undo_7 including contents;
drop tablespace undo_8 including contents;

create tablespace undo_1 datafile '/home/oracle/dev/raw/roll-1'
size 498M reuse
extent management local uniform size 120K nologging;
create tablespace undo_2 datafile '/home/oracle/dev/raw/roll-2'
size 498M reuse
extent management local uniform size 120K nologging;
create tablespace undo_3 datafile '/home/oracle/dev/raw/roll-3'
size 498M reuse
extent management local uniform size 120K nologging;
create tablespace undo_4 datafile '/home/oracle/dev/raw/roll-4'
size 498M reuse
extent management local uniform size 120K nologging;
create tablespace undo_5 datafile '/home/oracle/dev/raw/roll-5'
size 498M reuse
extent management local uniform size 120K nologging;
create tablespace undo_6 datafile '/home/oracle/dev/raw/roll-6'
size 498M reuse
extent management local uniform size 120K nologging;
create tablespace undo_7 datafile '/home/oracle/dev/raw/roll-7'
size 498M reuse
extent management local uniform size 120K nologging;
create tablespace undo_8 datafile '/home/oracle/dev/raw/roll-8'
size 498M reuse
extent management local uniform size 120K nologging;


spool off


*************************
step17createitem.sh
*************************

#!sh
$SEQLPLUS tpcc/tpcc @step17createitem > junk 2>&1

if test $? -ne 0
then
  exit 1;
else
  exit 0;
fi


*************************
step17createitem.sql
*************************

spool log/step17createitem.log;
set echo on;
```

```
drop table item;
drop cluster itemcluster including tables;

set timing on;

create cluster itemcluster (
i_id    number(6,0)
  )
  single    table
  hashkeys    100000
  hash is    (i_id + 1)
  size    120
  initrans    3
  pctfree    0
  storage ( buffer_pool keep freelists 22 freelist groups 43 )
  tablespace    item_0;

create table item (
        i_id            number(6,0),
        i_name          varchar2(24),
        i_price         number,
        i_data          varchar2(50),
        i_im_id         number
)
cluster itemcluster (i_id
);
spool off;
set echo off;
exit sql.sqlcode;



*************************
step20loadware.sh
*************************

#!sh
$TPCCLOAD -M 11520 -w > step20loadware.log 2>&1

if test $? -ne 0
then
  exit 1;
else
  exit 0;
fi


*************************
step21loaddist.sh
*************************

#!sh
$TPCCLOAD -M 11520 -d > step21loaddist.log 2>&1

if test $? -ne 0
then
  exit 1;
else
  exit 0;
fi


*************************
step22loaditem.sh
*************************

#!sh
p
$TPCCLOAD -M 11520 -i > step22loaditem.log 2>&1

if test $? -ne 0
then
  exit 1;
else
  exit 0;
fi


*************************
step2createdb.sql
*************************

spool log/step2createdb.log

set echo on

startup pfile=p_create.ora nomount
create database tpcc
  controlfile reuse
  maxdatafiles 731
  maxinstances 8
  datafile '/home/oracle/dev/raw/system-1' size 96M reuse,
           '/home/oracle/dev/raw/system-2' size 96M reuse,
           '/home/oracle/dev/raw/system-3' size 96M reuse,
           '/home/oracle/dev/raw/system-4' size 96M reuse,
           '/home/oracle/dev/raw/system-5' size 96M reuse,
           '/home/oracle/dev/raw/system-6' size 96M reuse,
           '/home/oracle/dev/raw/system-7' size 96M reuse,
           '/home/oracle/dev/raw/system-8' size 96M reuse
  logfile group 1 ('/home/oracle/dev/raw/log-1-1') size 5717M
reuse,
          group 2 ('/home/oracle/dev/raw/log-1-2') size 5717M reuse
  undo tablespace undo_1 datafile '/home/oracle/dev/raw/roll-1'
size 500M reuse;

alter database add logfile thread 2
          group 3 ('/home/oracle/dev/raw/log-2-1') size 5717M
reuse,
          group 4 ('/home/oracle/dev/raw/log-2-2') size 5717M
reuse;
alter database enable public thread 2;

alter database add logfile thread 3
          group 5 ('/home/oracle/dev/raw/log-3-1') size 5717M
reuse,
          group 6 ('/home/oracle/dev/raw/log-3-2') size 5717M
reuse;
alter database enable public thread 3;

alter database add logfile thread 4
          group 7 ('/home/oracle/dev/raw/log-4-1') size 5717M
reuse,
          group 8 ('/home/oracle/dev/raw/log-4-2') size 5717M
reuse;
alter database enable public thread 4;

alter database add logfile thread 5
          group 9 ('/home/oracle/dev/raw/log-5-1') size 5717M
reuse,
          group 10 ('/home/oracle/dev/raw/log-5-2') size 5717M
reuse;
alter database enable public thread 5;

alter database add logfile thread 6
          group 11 ('/home/oracle/dev/raw/log-6-1') size 5717M
reuse,
          group 12 ('/home/oracle/dev/raw/log-6-2') size 5717M
reuse;
alter database enable public thread 6;

alter database add logfile thread 7
          group 13 ('/home/oracle/dev/raw/log-7-1') size 5717M
reuse,
          group 14 ('/home/oracle/dev/raw/log-7-2') size 5717M
reuse;
alter database enable public thread 7;

alter database add logfile thread 8
          group 15 ('/home/oracle/dev/raw/log-8-1') size 5717M
reuse,
          group 16 ('/home/oracle/dev/raw/log-8-2') size 5717M
reuse;
alter database enable public thread 8;

spool off
set echo off
exit sql.sqlcode


*************************
step40createstats.sql
*************************

spool log/step40createstats.log
@orst_cre
@c_stat
@pst_c
spool off
exit sql.sqlcode;


*************************
step41createstoredprocs.sql
*************************

spool log/step41createstoredprocs.log
@initpay
@initnew
spool off
exit sql.sqlcode;


*************************
step43createmisc.sql
*************************

spool log/step43createmisc.log
set echo on;
alter user tpcc temporary tablespace system;
grant execute on dbms_lock to public;
grant execute on dbms_pipe to public;
grant select on v_$parameter to public;
@plsql_mon
@cre_tab
@create_cache_views
@views
@dml
@extent 2048
@freeext 2048
spool off
exit sql.sqlcode;
```

```
*************************
step6createddviews.sql
*************************

spool log/step6createddviews.log
@$ORACLE_HOME/rdbms/admin/catalog
@$ORACLE_HOME/rdbms/admin/catproc
@$ORACLE_HOME/rdbms/admin/catparr
spool off
exit sql.sqlcode;


*************************
stepcreateuser.sql
*************************

spool log/stepcreateuser.log;

set echo on;

create user tpcc identified by tpcc;

grant dba to tpcc;

set echo off;
spool off;

exit sql.sqlcode;


*************************
views.sql
*************************

connect tpcc/tpcc;
set echo on;

create or replace view wh_cust
(w_id, w_tax, c_id, c_d_id, c_w_id, c_discount, c_last, c_credit)
as select w.w_id, w.w_tax,
          c.c_id, c.c_d_id, c.c_w_id, c.c_discount, c.c_last,
c.c_credit
   from cust c, ware w
   where w.w_id = c.c_w_id;

create or replace view wh_dist
(w_id, d_id, d_tax, d_next_o_id, w_tax )
as select w.w_id, d.d_id, d.d_tax, d.d_next_o_id, w.w_tax
   from dist d, ware w
   where w.w_id = d.d_w_id;

create  or replace view stock_item
(i_id, s_w_id, i_price, i_name, i_data, s_data, s_quantity,
 s_order_cnt, s_ytd, s_remote_cnt,
 s_dist_01, s_dist_02, s_dist_03, s_dist_04, s_dist_05,
 s_dist_06, s_dist_07, s_dist_08, s_dist_09, s_dist_10)
as
 select i.i_id, s_w_id, i.i_price, i.i_name, i.i_data, s_data,
s_quantity,
 s_order_cnt, s_ytd, s_remote_cnt,
 s_dist_01, s_dist_02, s_dist_03, s_dist_04, s_dist_05,
 s_dist_06, s_dist_07, s_dist_08, s_dist_09, s_dist_10
  from stok s, item i
 where i.i_id = s.s_i_id;

set echo off;
```

Appendix C: Tunable Parameters

SEQUENCE OF EVENTS FOR PERFORMANCE RUN

1. Boot up computers (clients, servers, & RTEs)
2. Run tcp_tune.sh on clients and database servers
3. Run tune_elv.sh on database servers.
4. Startup the database on all nodes.
5. Start apache on the clients.
6. Start tuxedo on the clients.
7. Run realtime.sh on the databases.
8. Start the RTE.

DATABASE SERVERS OS TUNABLES

```
**************************
mkraw.sh
**************************

raw /home/oracle/dev/raw/log-1-1         /dev/sda1

raw /home/oracle/dev/raw/log-1-2         /dev/sda2
raw /home/oracle/dev/raw/stock-1         /dev/sdc1
raw /home/oracle/dev/raw/stock-2         /dev/sdc2
raw /home/oracle/dev/raw/stock-3         /dev/sde1
raw /home/oracle/dev/raw/stock-4         /dev/sde2
raw /home/oracle/dev/raw/stock-5         /dev/sdg1
raw /home/oracle/dev/raw/stock-6         /dev/sdg2
raw /home/oracle/dev/raw/ordl-1-1        /dev/sdc3
raw /home/oracle/dev/raw/ordl-1-2        /dev/sde3
raw /home/oracle/dev/raw/ordl-1-3        /dev/sdg3
raw /home/oracle/dev/raw/cust-1          /dev/sdc10
raw /home/oracle/dev/raw/cust-2          /dev/sde10
raw /home/oracle/dev/raw/cust-3          /dev/sdg10
raw /home/oracle/dev/raw/nord-1          /dev/sdc5
raw /home/oracle/dev/raw/hist-1          /dev/sde5
raw /home/oracle/dev/raw/ordr-1          /dev/sdg5
raw /home/oracle/dev/raw/icust2-1        /dev/sdc6
raw /home/oracle/dev/raw/icust2-2        /dev/sde6
raw /home/oracle/dev/raw/icust2-3        /dev/sdg6
raw /home/oracle/dev/raw/ware-1          /dev/sdc7
raw /home/oracle/dev/raw/dist-1          /dev/sde7
raw /home/oracle/dev/raw/system-1        /dev/sdg7
raw /home/oracle/dev/raw/roll-1          /dev/sdc8
raw /home/oracle/dev/raw/iordr1-1        /dev/sde8
raw /home/oracle/dev/raw/iordr2-1        /dev/sdg8
raw /home/oracle/dev/raw/control-001     /dev/sdc9
raw /home/oracle/dev/raw/temp-1          /dev/sde9
raw /home/oracle/dev/raw/temp-2          /dev/sdg9

raw /home/oracle/dev/raw/log-2-1         /dev/sdi1
raw /home/oracle/dev/raw/log-2-2         /dev/sdi2
raw /home/oracle/dev/raw/stock-7         /dev/sdk1
raw /home/oracle/dev/raw/stock-8         /dev/sdk2
raw /home/oracle/dev/raw/stock-9         /dev/sdm1
raw /home/oracle/dev/raw/stock-10        /dev/sdm2
raw /home/oracle/dev/raw/stock-11        /dev/sdo1
raw /home/oracle/dev/raw/stock-12        /dev/sdo2
raw /home/oracle/dev/raw/ordl-2-1        /dev/sdk3
raw /home/oracle/dev/raw/ordl-2-2        /dev/sdm3
raw /home/oracle/dev/raw/ordl-2-3        /dev/sdo3
raw /home/oracle/dev/raw/cust-4          /dev/sdk10
raw /home/oracle/dev/raw/cust-5          /dev/sdm10
raw /home/oracle/dev/raw/cust-6          /dev/sdo10
raw /home/oracle/dev/raw/nord-2          /dev/sdk5
raw /home/oracle/dev/raw/hist-2          /dev/sdm5
raw /home/oracle/dev/raw/ordr-2          /dev/sdo5
raw /home/oracle/dev/raw/icust2-4        /dev/sdk6
raw /home/oracle/dev/raw/icust2-5        /dev/sdm6
raw /home/oracle/dev/raw/icust2-6        /dev/sdo6
raw /home/oracle/dev/raw/ware-2          /dev/sdk7
raw /home/oracle/dev/raw/dist-2          /dev/sdm7
raw /home/oracle/dev/raw/system-2        /dev/sdo7
raw /home/oracle/dev/raw/roll-2         /dev/sdk8
raw /home/oracle/dev/raw/iordr1-2        /dev/sdm8
raw /home/oracle/dev/raw/iordr2-2        /dev/sdo8
raw /home/oracle/dev/raw/oracmd          /dev/sdk9
raw /home/oracle/dev/raw/temp-3          /dev/sdm9
raw /home/oracle/dev/raw/temp-4          /dev/sdo9

raw /home/oracle/dev/raw/log-3-1         /dev/sdq1
raw /home/oracle/dev/raw/log-3-2         /dev/sdq2
raw /home/oracle/dev/raw/stock-13        /dev/sds1
raw /home/oracle/dev/raw/stock-14        /dev/sds2
raw /home/oracle/dev/raw/stock-15        /dev/sdu1
raw /home/oracle/dev/raw/stock-16        /dev/sdu2
raw /home/oracle/dev/raw/stock-17        /dev/sdw1
raw /home/oracle/dev/raw/stock-18        /dev/sdw2
raw /home/oracle/dev/raw/ordl-3-1        /dev/sds3
raw /home/oracle/dev/raw/ordl-3-2        /dev/sdu3
raw /home/oracle/dev/raw/ordl-3-3        /dev/sdw3
raw /home/oracle/dev/raw/cust-7          /dev/sds10
raw /home/oracle/dev/raw/cust-8          /dev/sdu10
raw /home/oracle/dev/raw/cust-9          /dev/sdw10
raw /home/oracle/dev/raw/nord-3          /dev/sds5
raw /home/oracle/dev/raw/hist-3          /dev/sdu5
raw /home/oracle/dev/raw/ordr-3          /dev/sdw5
raw /home/oracle/dev/raw/icust2-7        /dev/sds6
raw /home/oracle/dev/raw/icust2-8        /dev/sdu6
raw /home/oracle/dev/raw/icust2-9        /dev/sdw6
raw /home/oracle/dev/raw/ware-3          /dev/sds7
raw /home/oracle/dev/raw/dist-3          /dev/sdu7
raw /home/oracle/dev/raw/system-3        /dev/sdw7
raw /home/oracle/dev/raw/roll-3         /dev/sds8
raw /home/oracle/dev/raw/iordr1-3        /dev/sdu8
raw /home/oracle/dev/raw/iordr2-3        /dev/sdw8
raw /home/oracle/dev/raw/indexes-1       /dev/sds9
raw /home/oracle/dev/raw/temp-5          /dev/sdu9
raw /home/oracle/dev/raw/temp-6          /dev/sdw9

raw /home/oracle/dev/raw/log-4-1         /dev/sdy1
raw /home/oracle/dev/raw/log-4-2         /dev/sdy2
raw /home/oracle/dev/raw/stock-19        /dev/sdaa1
raw /home/oracle/dev/raw/stock-20        /dev/sdaa2
raw /home/oracle/dev/raw/stock-21        /dev/sdac1
raw /home/oracle/dev/raw/stock-22        /dev/sdac2
raw /home/oracle/dev/raw/stock-23        /dev/sdae1
raw /home/oracle/dev/raw/stock-24        /dev/sdae2
raw /home/oracle/dev/raw/ordl-4-1        /dev/sdaa3
raw /home/oracle/dev/raw/ordl-4-2        /dev/sdac3
raw /home/oracle/dev/raw/ordl-4-3        /dev/sdae3
raw /home/oracle/dev/raw/cust-10         /dev/sdaa10
raw /home/oracle/dev/raw/cust-11         /dev/sdac10
raw /home/oracle/dev/raw/cust-12         /dev/sdae10
raw /home/oracle/dev/raw/nord-4          /dev/sdaa5
raw /home/oracle/dev/raw/hist-4          /dev/sdac5
raw /home/oracle/dev/raw/ordr-4          /dev/sdae5
raw /home/oracle/dev/raw/icust2-10       /dev/sdaa6
raw /home/oracle/dev/raw/icust2-11       /dev/sdac6
raw /home/oracle/dev/raw/icust2-12       /dev/sdae6
raw /home/oracle/dev/raw/ware-4          /dev/sdaa7
raw /home/oracle/dev/raw/dist-4          /dev/sdac7
raw /home/oracle/dev/raw/system-4        /dev/sdae7
raw /home/oracle/dev/raw/roll-4         /dev/sdaa8
raw /home/oracle/dev/raw/iordr1-4        /dev/sdac8
raw /home/oracle/dev/raw/iordr2-4        /dev/sdae8
raw /home/oracle/dev/raw/indexes-2       /dev/sdaa9
raw /home/oracle/dev/raw/temp-7          /dev/sdac9
raw /home/oracle/dev/raw/temp-8          /dev/sdae9

raw /home/oracle/dev/raw/log-5-1         /dev/sdag1
raw /home/oracle/dev/raw/log-5-2         /dev/sdag2
raw /home/oracle/dev/raw/stock-25        /dev/sdai1
raw /home/oracle/dev/raw/stock-26        /dev/sdai2
raw /home/oracle/dev/raw/stock-27        /dev/sdak1
raw /home/oracle/dev/raw/stock-28        /dev/sdak2
raw /home/oracle/dev/raw/stock-29        /dev/sdam1
raw /home/oracle/dev/raw/stock-30        /dev/sdam2
raw /home/oracle/dev/raw/ordl-5-1        /dev/sdai3
raw /home/oracle/dev/raw/ordl-5-2        /dev/sdak3
raw /home/oracle/dev/raw/ordl-5-3        /dev/sdam3
raw /home/oracle/dev/raw/cust-13         /dev/sdai10
raw /home/oracle/dev/raw/cust-14         /dev/sdak10
raw /home/oracle/dev/raw/cust-15         /dev/sdam10
raw /home/oracle/dev/raw/nord-5          /dev/sdai5
raw /home/oracle/dev/raw/hist-5          /dev/sdak5
raw /home/oracle/dev/raw/ordr-5          /dev/sdam5
raw /home/oracle/dev/raw/icust2-13       /dev/sdai6
raw /home/oracle/dev/raw/icust2-14       /dev/sdak6
raw /home/oracle/dev/raw/icust2-15       /dev/sdam6
raw /home/oracle/dev/raw/ware-5          /dev/sdai7
raw /home/oracle/dev/raw/dist-5          /dev/sdak7
raw /home/oracle/dev/raw/system-5        /dev/sdam7
raw /home/oracle/dev/raw/roll-5         /dev/sdai8
raw /home/oracle/dev/raw/iordr1-5        /dev/sdak8
raw /home/oracle/dev/raw/iordr2-5        /dev/sdam8
raw /home/oracle/dev/raw/statspack-1     /dev/sdai9
raw /home/oracle/dev/raw/temp-9          /dev/sdak9
raw /home/oracle/dev/raw/temp-10         /dev/sdam9

raw /home/oracle/dev/raw/log-6-1         /dev/sdao1
raw /home/oracle/dev/raw/log-6-2         /dev/sdao2
raw /home/oracle/dev/raw/stock-31        /dev/sdaq1
raw /home/oracle/dev/raw/stock-32        /dev/sdaq2
raw /home/oracle/dev/raw/stock-33        /dev/sdas1
raw /home/oracle/dev/raw/stock-34        /dev/sdas2
raw /home/oracle/dev/raw/stock-35        /dev/sdau1
raw /home/oracle/dev/raw/stock-36        /dev/sdau2
raw /home/oracle/dev/raw/ordl-6-1        /dev/sdaq3
raw /home/oracle/dev/raw/ordl-6-2        /dev/sdas3
raw /home/oracle/dev/raw/ordl-6-3        /dev/sdau3
raw /home/oracle/dev/raw/cust-16         /dev/sdaq10
raw /home/oracle/dev/raw/cust-17         /dev/sdas10
raw /home/oracle/dev/raw/cust-18         /dev/sdau10
raw /home/oracle/dev/raw/nord-6          /dev/sdaq5
raw /home/oracle/dev/raw/hist-6          /dev/sdas5
raw /home/oracle/dev/raw/ordr-6          /dev/sdau5
raw /home/oracle/dev/raw/icust2-16       /dev/sdaq6
```

```
raw /home/oracle/dev/raw/icust2-17       /dev/sdas6
raw /home/oracle/dev/raw/icust2-18       /dev/sdau6
raw /home/oracle/dev/raw/ware-6          /dev/sdaq7
raw /home/oracle/dev/raw/dist-6          /dev/sdas7
raw /home/oracle/dev/raw/system-6        /dev/sdau7
raw /home/oracle/dev/raw/roll-6         /dev/sdaq8
raw /home/oracle/dev/raw/iordr1-6        /dev/sdas8
raw /home/oracle/dev/raw/iordr2-6        /dev/sdau8
raw /home/oracle/dev/raw/item-1          /dev/sdaq9
raw /home/oracle/dev/raw/temp-11         /dev/sdas9
raw /home/oracle/dev/raw/temp-12         /dev/sdau9

raw /home/oracle/dev/raw/log-7-1         /dev/sdaw1
raw /home/oracle/dev/raw/log-7-2         /dev/sdaw2
raw /home/oracle/dev/raw/stock-37        /dev/sday1
raw /home/oracle/dev/raw/stock-38        /dev/sday2
raw /home/oracle/dev/raw/stock-39        /dev/sdba1
raw /home/oracle/dev/raw/stock-40        /dev/sdba2
raw /home/oracle/dev/raw/stock-41        /dev/sdbc1
raw /home/oracle/dev/raw/stock-42        /dev/sdbc2
raw /home/oracle/dev/raw/ordl-7-1        /dev/sday3
raw /home/oracle/dev/raw/ordl-7-2        /dev/sdba3
raw /home/oracle/dev/raw/ordl-7-3        /dev/sdbc3
raw /home/oracle/dev/raw/cust-19         /dev/sday10
raw /home/oracle/dev/raw/cust-20         /dev/sdba10
raw /home/oracle/dev/raw/cust-21         /dev/sdbc10
raw /home/oracle/dev/raw/nord-7          /dev/sday5
raw /home/oracle/dev/raw/hist-7          /dev/sdba5
raw /home/oracle/dev/raw/ordr-7          /dev/sdbc5
raw /home/oracle/dev/raw/icust2-19       /dev/sday6
raw /home/oracle/dev/raw/icust2-20       /dev/sdba6
raw /home/oracle/dev/raw/icust2-21       /dev/sdbc6
raw /home/oracle/dev/raw/ware-7          /dev/sday7
raw /home/oracle/dev/raw/dist-7          /dev/sdba7
raw /home/oracle/dev/raw/system-7        /dev/sdbc7
raw /home/oracle/dev/raw/roll-7         /dev/sday8
raw /home/oracle/dev/raw/iordr1-7        /dev/sdba8
raw /home/oracle/dev/raw/iordr2-7        /dev/sdbc8
raw /home/oracle/dev/raw/cust-25         /dev/sday9
raw /home/oracle/dev/raw/temp-13         /dev/sdba9
raw /home/oracle/dev/raw/temp-14         /dev/sdbc9

raw /home/oracle/dev/raw/log-8-1         /dev/sdbe1
raw /home/oracle/dev/raw/log-8-2         /dev/sdbe2
raw /home/oracle/dev/raw/stock-43        /dev/sdbg1
raw /home/oracle/dev/raw/stock-44        /dev/sdbg2
raw /home/oracle/dev/raw/stock-45        /dev/sdbi1
raw /home/oracle/dev/raw/stock-46        /dev/sdbi2
raw /home/oracle/dev/raw/stock-47        /dev/sdbk1
raw /home/oracle/dev/raw/stock-48        /dev/sdbk2
raw /home/oracle/dev/raw/ordl-8-1        /dev/sdbg3
raw /home/oracle/dev/raw/ordl-8-2        /dev/sdbi3
raw /home/oracle/dev/raw/ordl-8-3        /dev/sdbk3
raw /home/oracle/dev/raw/cust-22         /dev/sdbg10
raw /home/oracle/dev/raw/cust-23         /dev/sdbi10
raw /home/oracle/dev/raw/cust-24         /dev/sdbk10
raw /home/oracle/dev/raw/nord-8          /dev/sdbg5
raw /home/oracle/dev/raw/hist-8          /dev/sdbi5
raw /home/oracle/dev/raw/ordr-8          /dev/sdbk5
raw /home/oracle/dev/raw/icust2-22       /dev/sdbg6
raw /home/oracle/dev/raw/icust2-23       /dev/sdbi6
raw /home/oracle/dev/raw/icust2-24       /dev/sdbk6
raw /home/oracle/dev/raw/ware-8          /dev/sdbg7
raw /home/oracle/dev/raw/dist-8          /dev/sdbi7
raw /home/oracle/dev/raw/system-8        /dev/sdbk7
raw /home/oracle/dev/raw/roll-8         /dev/sdbg8
raw /home/oracle/dev/raw/iordr1-8        /dev/sdbi8
raw /home/oracle/dev/raw/iordr2-8        /dev/sdbk8
raw /home/oracle/dev/raw/stok-49         /dev/sdbg9
raw /home/oracle/dev/raw/temp-15         /dev/sdbi9
raw /home/oracle/dev/raw/stok-50         /dev/sdbk9


****************************

bash_profile
****************************
# This file sets options when remaking Apache
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
         . ~/.bashrc
fi

export inst=`echo $HOSTNAME| awk '{print substr($0,length($0))}'`

export DB_NAME=tpcc
export ORACLE_SERVICE=tpcc
export ORACLE_SID=tpcc${inst}
export ORACLE_HOME=/home/oracle/OraHome1
export VLM_WINDOW_SIZE=973078528
PATH=$PATH:$HOME/bin:$ORACLE_HOME/bin:./
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$ORACLE_HOME/lib

export PATH
/usr/local/bin/lowermap
unset USERNAME


****************************

rc.local
****************************

#!/bin/sh
#
# This script will be executed *after* all the other init scripts.
# You can put your own initialization stuff in here if you don't
# want to do the full Sys V style init stuff.

touch /var/lock/subsys/local

/sbin/insmod qla2300

/sbin/insmod softdog nowayout=1 soft_noboot=1

/root/mkraw.sh

echo 2 > /proc/sys/kernel/shm-use-bigpages
echo 98304 > /proc/sys/fs/aio-max-nr


****************************
realtime.sh
****************************

renice -20 -p `ps -ef | grep oracm | grep -v grep |  cut -b 10-15`
renice -20 -p `ps -ef | grep tpcc | grep -v grep | cut -b 10-15`


****************************
sysctl.conf
****************************

# Disables packet forwarding
net.ipv4.ip_forward = 0
# Enables source route verification
net.ipv4.conf.default.rp_filter = 1
# Disables the magic-sysrq key
kernel.sysrq = 1
kernel.shmmax=3000000000
kernel.sem = 250        32000   100     128
fs.file-max=204800
#kernel.shm-use-bigpages=2


****************************
grub.conf
****************************
default=0
timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz

title Red Hat Linux (2.4.9-e.8enterprise)
        root (hd0,0)
        kernel /vmlinuz-2.4.9-e.8enterprise ro root=/dev/ida/c0d0p2
bigpages=14200MB
        initrd /initrd-2.4.9-e.8enterprise.img
title Red Hat Linux Advanced Server-smp (2.4.9-e.3smp)
        root (hd0,0)
        kernel /vmlinuz-2.4.9-e.3smp ro root=/dev/ida/c0d0p2
        initrd /initrd-2.4.9-e.3smp.img
title Red Hat Linux Advanced Server-up (2.4.9-e.3)
        root (hd0,0)
        kernel /vmlinuz-2.4.9-e.3 ro root=/dev/ida/c0d0p2
        initrd /initrd-2.4.9-e.3.img


****************************
fstab
****************************
LABEL=/                 /                       ext3    defaults
1 1
LABEL=/boot             /boot                   ext3    defaults
1 2
none                    /dev/pts                devpts
gid=5,mode=620  0 0
none                    /proc                   proc    defaults
0 0
none                    /dev/shm                tmpfs
nr_inodes=32000,nr_block
s=4194304       0 0
/dev/ida/c0d0p4         /home2                  ext2    defaults
1 2
/dev/ida/c0d0p3         swap                    swap    defaults
0 0
/dev/cdrom              /mnt/cdrom              iso9660
noauto,owner,kudzu,ro 0
0
/dev/fd0                /mnt/floppy             auto
noauto,owner,kudzu 0 0


****************************
tcp_tune.sh
****************************

echo 0 > /proc/sys/net/ipv4/tcp_sack
echo 0 > /proc/sys/net/ipv4/tcp_timestamps
echo 0 > /proc/sys/net/ipv4/tcp_window_scaling
/etc/rc.d/init.d/network restart
```

```
****************************
tune_elv.sh
****************************

/sbin/elvtune -r 512 -w 8192 /dev/sda
/sbin/elvtune -r 512 -w 8192 /dev/sdb
/sbin/elvtune -r 512 -w 8192 /dev/sdc
/sbin/elvtune -r 512 -w 8192 /dev/sdd
/sbin/elvtune -r 512 -w 8192 /dev/sde
/sbin/elvtune -r 512 -w 8192 /dev/sdf
/sbin/elvtune -r 512 -w 8192 /dev/sdg
/sbin/elvtune -r 512 -w 8192 /dev/sdh
/sbin/elvtune -r 512 -w 8192 /dev/sdi
/sbin/elvtune -r 512 -w 8192 /dev/sdj
/sbin/elvtune -r 512 -w 8192 /dev/sdk
/sbin/elvtune -r 512 -w 8192 /dev/sdl
/sbin/elvtune -r 512 -w 8192 /dev/sdm
/sbin/elvtune -r 512 -w 8192 /dev/sdn
/sbin/elvtune -r 512 -w 8192 /dev/sdo
/sbin/elvtune -r 512 -w 8192 /dev/sdp
/sbin/elvtune -r 512 -w 8192 /dev/sdq
/sbin/elvtune -r 512 -w 8192 /dev/sdr
/sbin/elvtune -r 512 -w 8192 /dev/sds
/sbin/elvtune -r 512 -w 8192 /dev/sdt
/sbin/elvtune -r 512 -w 8192 /dev/sdu
/sbin/elvtune -r 512 -w 8192 /dev/sdv
/sbin/elvtune -r 512 -w 8192 /dev/sdw
/sbin/elvtune -r 512 -w 8192 /dev/sdx
/sbin/elvtune -r 512 -w 8192 /dev/sdy
/sbin/elvtune -r 512 -w 8192 /dev/sdz
/sbin/elvtune -r 512 -w 8192 /dev/sdaa
/sbin/elvtune -r 512 -w 8192 /dev/sdab
/sbin/elvtune -r 512 -w 8192 /dev/sdac
/sbin/elvtune -r 512 -w 8192 /dev/sdad
/sbin/elvtune -r 512 -w 8192 /dev/sdae
/sbin/elvtune -r 512 -w 8192 /dev/sdaf
/sbin/elvtune -r 512 -w 8192 /dev/sdag
/sbin/elvtune -r 512 -w 8192 /dev/sdah
/sbin/elvtune -r 512 -w 8192 /dev/sdai
/sbin/elvtune -r 512 -w 8192 /dev/sdaj
/sbin/elvtune -r 512 -w 8192 /dev/sdak
/sbin/elvtune -r 512 -w 8192 /dev/sdal
/sbin/elvtune -r 512 -w 8192 /dev/sdam
/sbin/elvtune -r 512 -w 8192 /dev/sdan
/sbin/elvtune -r 512 -w 8192 /dev/sdao
/sbin/elvtune -r 512 -w 8192 /dev/sdap
/sbin/elvtune -r 512 -w 8192 /dev/sdaq
/sbin/elvtune -r 512 -w 8192 /dev/sdar
/sbin/elvtune -r 512 -w 8192 /dev/sdas
/sbin/elvtune -r 512 -w 8192 /dev/sdat
/sbin/elvtune -r 512 -w 8192 /dev/sdau
/sbin/elvtune -r 512 -w 8192 /dev/sdav
/sbin/elvtune -r 512 -w 8192 /dev/sdaw
/sbin/elvtune -r 512 -w 8192 /dev/sdax
/sbin/elvtune -r 512 -w 8192 /dev/sday
/sbin/elvtune -r 512 -w 8192 /dev/sdaz
/sbin/elvtune -r 512 -w 8192 /dev/sdba
/sbin/elvtune -r 512 -w 8192 /dev/sdbb
/sbin/elvtune -r 512 -w 8192 /dev/sdbc
/sbin/elvtune -r 512 -w 8192 /dev/sdbd
/sbin/elvtune -r 512 -w 8192 /dev/sdbe
/sbin/elvtune -r 512 -w 8192 /dev/sdbf
/sbin/elvtune -r 512 -w 8192 /dev/sdbg
/sbin/elvtune -r 512 -w 8192 /dev/sdbh
/sbin/elvtune -r 512 -w 8192 /dev/sdbi
/sbin/elvtune -r 512 -w 8192 /dev/sdbj
/sbin/elvtune -r 512 -w 8192 /dev/sdbk
/sbin/elvtune -r 512 -w 8192 /dev/sdbl


****************************
lowermap.c
****************************


#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <unistd.h>
#include <string.h>

#define DEFAULT_MAPPED_BASE 0x10000000

int main(int argc, char *argv[])
{
  pid_t ppid;
  char  buf[256];
  unsigned long  mapped_base;
  int ret;

  ppid = getppid();
  mapped_base = DEFAULT_MAPPED_BASE;

  if (argc == 2)
  {
    mapped_base = strtoul(argv[1], 0, 0);
  }

  sprintf(buf, "echo %lu >/proc/%u/mapped_base", mapped_base,
ppid);
  setuid(0);
  ret = system(buf);
  if (ret == 0)
    printf("Lowering mapped base of pid=%u to 0x%X\n", ppid,
mapped_base);
  else
    printf("unable to lower mapped base.  You might need to:\n"
           "  chmod 4711 lowermap\n  chown root.root lowermap\n");
  exit(-ret);
}
```

DATBASE TUNABLES

```
****************************

init_1.ora
****************************

instance_number     =1
thread    =1
rollback_segments =  (
t_1_1,t_1_2,t_1_3,t_1_4,t_1_5,t_1_6,t_1_7,t_1_8,t_1_9,t_1_10,t_1_11
,t_1_12,t_1_13,t_1_14,t_1_15,t_1_16,t_1_17,t_1_18,t_1_19,t_1_20,
t_1_21,t_1_22,t_1_23,t_1_24,t_1_25,t_1_26,t_1_27,t_1_28,t_1_29,t_1_
30,t_1_31,t_1_32,t_1_33,t_1_34,t_1_35,t_1_36,t_1_37,t_1_38,t_1_39,t
_1_40,
t_1_41,t_1_42,t_1_43,t_1_44,t_1_45,t_1_46,t_1_47,t_1_48,t_1_49,t_1_
50,t_1_51,t_1_52,t_1_53,t_1_54,t_1_55,t_1_56,t_1_57,t_1_58,t_1_59,t
_1_60,t_1_61,t_1_62,t_1_63,t_1_64,t_1_65,t_1_66,t_1_67,t_1_68,t_1_6
9,t_1_70,t_1_71,t_1_72,t_1_73,t_1_74,t_1_75)
ifile=$HOME/p_run.ora


****************************
init_2.ora
****************************

instance_number     =2

thread    =2
rollback_segments =  (
t_2_1,t_2_2,t_2_3,t_2_4,t_2_5,t_2_6,t_2_7,t_2_8,t_2_9,t_2_10,t_2_11
,t_2_12,t_2_13,t_2_14,t_2_15,t_2_16,t_2_17,t_2_18,t_2_19,t_2_20,
t_2_21,t_2_22,t_2_23,t_2_24,t_2_25,t_2_26,t_2_27,t_2_28,t_2_29,t_2_
30,t_2_31,t_2_32,t_2_33,t_2_34,t_2_35,t_2_36,t_2_37,t_2_38,t_2_39,t
_2_40,
t_2_41,t_2_42,t_2_43,t_2_44,t_2_45,t_2_46,t_2_47,t_2_48,t_2_49,t_2_
50,t_2_51,t_2_52,t_2_53,t_2_54,t_2_55,t_2_56,t_2_57,t_2_58,t_2_59,t
_2_60,t_2_61,t_2_62,t_2_63,t_2_64,t_2_65,t_2_66,t_2_67,t_2_68,t_2_6
9,t_2_70,t_2_71,t_2_72,t_2_73,t_2_74,t_2_75)
ifile=$HOME/p_run.ora


****************************
init_3.ora
****************************

instance_number     =3
thread    =3
rollback_segments =  (
t_3_1,t_3_2,t_3_3,t_3_4,t_3_5,t_3_6,t_3_7,t_3_8,t_3_9,t_3_10,t_3_11
,t_3_12,t_3_13,t_3_14,t_3_15,t_3_16,t_3_17,t_3_18,t_3_19,t_3_20,
t_3_21,t_3_22,t_3_23,t_3_24,t_3_25,t_3_26,t_3_27,t_3_28,t_3_29,t_3_
30,t_3_31,t_3_32,t_3_33,t_3_34,t_3_35,t_3_36,t_3_37,t_3_38,t_3_39,t
_3_40,
t_3_41,t_3_42,t_3_43,t_3_44,t_3_45,t_3_46,t_3_47,t_3_48,t_3_49,t_3_
50,t_3_51,t_3_52,t_3_53,t_3_54,t_3_55,t_3_56,t_3_57,t_3_58,t_3_59,t
_3_60,t_3_61,t_3_62,t_3_63,t_3_64,t_3_65,t_3_66,t_3_67,t_3_68,t_3_6
9,t_3_70,t_3_71,t_3_72,t_3_73,t_3_74,t_3_75)
ifile=$HOME/p_run.ora


****************************
init_4.ora
****************************

instance_number     =4
thread    =4
rollback_segments =  (
t_4_1,t_4_2,t_4_3,t_4_4,t_4_5,t_4_6,t_4_7,t_4_8,t_4_9,t_4_10,t_4_11
,t_4_12,t_4_13,t_4_14,t_4_15,t_4_16,t_4_17,t_4_18,t_4_19,t_4_20,
t_4_21,t_4_22,t_4_23,t_4_24,t_4_25,t_4_26,t_4_27,t_4_28,t_4_29,t_4_
30,t_4_31,t_4_32,t_4_33,t_4_34,t_4_35,t_4_36,t_4_37,t_4_38,t_4_39,t
_4_40,
t_4_41,t_4_42,t_4_43,t_4_44,t_4_45,t_4_46,t_4_47,t_4_48,t_4_49,t_4_
50,t_4_51,t_4_52,t_4_53,t_4_54,t_4_55,t_4_56,t_4_57,t_4_58,t_4_59,t
_4_60,t_4_61,t_4_62,t_4_63,t_4_64,t_4_65,t_4_66,t_4_67,t_4_68,t_4_6
9,t_4_70,t_4_71,t_4_72,t_4_73,t_4_74,t_4_75)
ifile=$HOME/p_run.ora


****************************
init_5.ora
****************************

instance_number     =5
thread    =5
```

```
rollback_segments =  (
t_5_1,t_5_2,t_5_3,t_5_4,t_5_5,t_5_6,t_5_7,t_5_8,t_5_9,t_5_10,t_5_11
,t_5_12,t_5_13,t_5_14,t_5_15,t_5_16,t_5_17,t_5_18,t_5_19,t_5_20,
t_5_21,t_5_22,t_5_23,t_5_24,t_5_25,t_5_26,t_5_27,t_5_28,t_5_29,t_5_
30,t_5_31,t_5_32,t_5_33,t_5_34,t_5_35,t_5_36,t_5_37,t_5_38,t_5_39,t
_5_40,
t_5_41,t_5_42,t_5_43,t_5_44,t_5_45,t_5_46,t_5_47,t_5_48,t_5_49,t_5_
50,t_5_51,t_5_52,t_5_53,t_5_54,t_5_55,t_5_56,t_5_57,t_5_58,t_5_59,t
_5_60,t_5_61,t_5_62,t_5_63,t_5_64,t_5_65,t_5_66,t_5_67,t_5_68,t_5_6
9,t_5_70,t_5_71,t_5_72,t_5_73,t_5_74,t_5_75)
ifile=$HOME/p_run.ora


****************************
init_6.ora
****************************

instance_number     =6
thread    =6
rollback_segments =  (
t_6_1,t_6_2,t_6_3,t_6_4,t_6_5,t_6_6,t_6_7,t_6_8,t_6_9,t_6_10,t_6_11
,t_6_12,t_6_13,t_6_14,t_6_15,t_6_16,t_6_17,t_6_18,t_6_19,t_6_20,
t_6_21,t_6_22,t_6_23,t_6_24,t_6_25,t_6_26,t_6_27,t_6_28,t_6_29,t_6_
30,t_6_31,t_6_32,t_6_33,t_6_34,t_6_35,t_6_36,t_6_37,t_6_38,t_6_39,t
_6_40,
t_6_41,t_6_42,t_6_43,t_6_44,t_6_45,t_6_46,t_6_47,t_6_48,t_6_49,t_6_
50,t_6_51,t_6_52,t_6_53,t_6_54,t_6_55,t_6_56,t_6_57,t_6_58,t_6_59,t
_6_60,t_6_61,t_6_62,t_6_63,t_6_64,t_6_65,t_6_66,t_6_67,t_6_68,t_6_6
9,t_6_70,t_6_71,t_6_72,t_6_73,t_6_74,t_6_75)
ifile=$HOME/p_run.ora


****************************
init_7.ora
****************************

instance_number     =7
thread    =7
rollback_segments =  (
t_7_1,t_7_2,t_7_3,t_7_4,t_7_5,t_7_6,t_7_7,t_7_8,t_7_9,t_7_10,t_7_11
,t_7_12,t_7_13,t_7_14,t_7_15,t_7_16,t_7_17,t_7_18,t_7_19,t_7_20,
t_7_21,t_7_22,t_7_23,t_7_24,t_7_25,t_7_26,t_7_27,t_7_28,t_7_29,t_7_
30,t_7_31,t_7_32,t_7_33,t_7_34,t_7_35,t_7_36,t_7_37,t_7_38,t_7_39,t
_7_40,
t_7_41,t_7_42,t_7_43,t_7_44,t_7_45,t_7_46,t_7_47,t_7_48,t_7_49,t_7_
50,t_7_51,t_7_52,t_7_53,t_7_54,t_7_55,t_7_56,t_7_57,t_7_58,t_7_59,t
_7_60,t_7_61,t_7_62,t_7_63,t_7_64,t_7_65,t_7_66,t_7_67,t_7_68,t_7_6
9,t_7_70,t_7_71,t_7_72,t_7_73,t_7_74,t_7_75)
ifile=$HOME/p_run.ora


****************************
init_8.ora
****************************

instance_number     =8
thread    =8
rollback_segments =  (
t_8_1,t_8_2,t_8_3,t_8_4,t_8_5,t_8_6,t_8_7,t_8_8,t_8_9,t_8_10,t_8_11
,t_8_12,t_8_13,t_8_14,t_8_15,t_8_16,t_8_17,t_8_18,t_8_19,t_8_20,
t_8_21,t_8_22,t_8_23,t_8_24,t_8_25,t_8_26,t_8_27,t_8_28,t_8_29,t_8_
30,t_8_31,t_8_32,t_8_33,t_8_34,t_8_35,t_8_36,t_8_37,t_8_38,t_8_39,t
_8_40,
t_8_41,t_8_42,t_8_43,t_8_44,t_8_45,t_8_46,t_8_47,t_8_48,t_8_49,t_8_
50,t_8_51,t_8_52,t_8_53,t_8_54,t_8_55,t_8_56,t_8_57,t_8_58,t_8_59,t
_8_60,t_8_61,t_8_62,t_8_63,t_8_64,t_8_65,t_8_66,t_8_67,t_8_68,t_8_6
9,t_8_70,t_8_71,t_8_72,t_8_73,t_8_74,t_8_75)
ifile=$HOME/p_run.ora


****************************
p_run.ora
****************************

#
# 9i RAC 4K
#
#

_db_block_lru_latches = 64
_db_writer_max_writes                    = 1024
_db_writer_chunk_writes                  = 200
db_writer_processes = 4
db_cache_advice = off
compatible = 9.2.0.0.0
db_name = tpcc
control_files = /home/oracle/dev/raw/control-001
sort_area_size = 10485760
parallel_max_servers = 0
parallel_min_servers = 0
recovery_parallelism = 0
log_buffer = 10485760
db_block_size = 4096
db_files=250
cursor_space_for_time             = TRUE
shared_pool_size = 160M
java_pool_size = 15728640
use_indirect_data_buffers       = TRUE   #pse36
db_block_buffers    = 3235840
_log_simultaneous_copies        = 16
dml_locks                         = 60
enqueue_resources                 = 200
hash_join_enabled                 = FALSE
log_archive_start                 = FALSE
log_checkpoint_interval           = 0
log_checkpoint_timeout                     = 0
log_checkpoints_to_alert          = TRUE
max_rollback_segments             = 80
pre_page_sga                      = TRUE
processes                         = 100
sessions                        = 150
open_cursors                      = 180
replication_dependency_tracking   = FALSE
transactions_per_rollback_segment = 1
timed_statistics                  = FALSE
transaction_auditing              = FALSE
db_block_checking               = FALSE
cluster_database              = TRUE
cluster_database_instances      = 8
_kcl_name_table_latches = 64
_lm_lms=1
statistics_level = basic
log_parallelism = 2
_lm_dd_interval                 = 30
gc_files_to_locks             = "1-8=1000EACH:\
9=1:\
10-12=100000:\
13-15=100000:\
16-18=100000:\
19-21=100000:\
22-24=100000:\
25-27=100000:\
28-30=100000:\
31-33=100000:\
34-39=350000:\
40-45=350000:\
46-51=350000:\
52-57=350000:\
58-63=350000:\
64-69=350000:\
70-75=350000:\
76-81=350000:\
82-195=1EACH:\
197-199=1EACH"
_lm_file_affinity="9,10-12,34-39,82,90,99-
101,123,131,139,172,180=1:\
13-15,40-45,83,91,102-104,124,132,140,173,181,188=2:\
16-18,46-51,84,92,105-107,125,133,141,174,182,189=3:\
19-21,52-57,85,93,108-110,126,134,142,175,183,190=4:\
22-24,58-63,86,94,111-113,127,135,143,176,184,191=5:\
25-27,64-69,87,95,114-116,128,136,144,177,185,192=6:\
28-30,70-75,88,96,117-119,129,137,145,178,186,193=7:\
31-33,76-81,89,97,120-122,130,138,146,179,187,184=8"
_gcs_resources=400000
_pcm_shadow_locks=400000
_interconnect_checksum = FALSE
db_block_checksum  = FALSE
```

CLIENT O/S AND TUXEDO CONFIGURATION

```
****************************

config.nice
****************************

#! /bin/sh
#
# Created by configure

"./configure" \
"--with-mpm=worker" \
"--enable-auth=shared" \
"--enable-env=shared" \
"--enable-negotiation=shared" \
"--enable-userdir=shared" \
"--enable-include=shared" \
"--enable-status=shared" \
"--disable-cgid" \
"--enable-setenvif=shared" \
"--enable-dir=shared" \
"--enable-imap=shared" \
"--enable-actions=shared" \
"--enable-alias=shared" \
"--enable-autoindex=shared" \
"--enable-asis=shared" \
"--enable-cgi=shared" \
"--prefix=/usr/local/ap2w" \
"$@"


****************************
grub.conf
****************************

# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to
this file
# NOTICE:  You have a /boot partition.  This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
```

```
#          kernel /vmlinuz-version ro root=/dev/cciss/c0d0p3
#          initrd /initrd-version.img
#boot=/dev/cciss/c0d0
default=0
timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
title Red Hat Linux (2.4.18-7.80custom)
          root (hd0,0)
          kernel /vmlinuz-2.4.18-7.80custom ro root=LABEL=/
root=LABEL=/ ide=nodma
          initrd /initrd-2.4.18-7.80custom.img
title Red Hat Linux (2.4.18-7.80smp)
          root (hd0,0)
          kernel /vmlinuz-2.4.18-7.80smp ro root=LABEL=/
root=LABEL=/ ide=nodma
          initrd /initrd-2.4.18-7.80smp.img
title Red Hat Linux-up (2.4.18-7.80)
          root (hd0,0)
          kernel /vmlinuz-2.4.18-7.80 ro root=LABEL=/ root=LABEL=/
          initrd /initrd-2.4.18-7.80.img


****************************
httpd.conf
****************************


ServerTokens OS

ServerRoot "/usr/local/ap2"

PidFile run/httpd.pid

Timeout 300

KeepAlive On

MaxKeepAliveRequests 0

KeepAliveTimeout 999

CoreDumpDirectory /usr/local/ap2

##
## Server-Pool Size Regulation (MPM specific)
##

# prefork MPM
# StartServers: number of server processes to start
# MinSpareServers: minimum number of server processes which are
kept spare
# MaxSpareServers: maximum number of server processes which are
kept spare
# MaxClients: maximum number of server processes allowed to start
# MaxRequestsPerChild: maximum number of requests a server process
serves
<IfModule prefork.c>
StartServers     1000
MinSpareServers    5
MaxSpareServers  1000
MaxClients       7300
MaxRequestsPerChild  0
</IfModule>

# worker MPM
# StartServers: initial number of server processes to start
# MaxClients: maximum number of simultaneous client connections
# MinSpareThreads: minimum number of worker threads which are kept
spare
# MaxSpareThreads: maximum number of worker threads which are kept
spare
# ThreadsPerChild: constant number of worker threads in each server
process
# MaxRequestsPerChild: maximum number of requests a server process
serves
<IfModule worker.c>
ServerLimit 16
ThreadLimit 500
### max processes
StartServers        16
MaxClients          7216
MinSpareThreads     10
MaxSpareThreads     7300
ThreadsPerChild     451
MaxRequestsPerChild  0
</IfModule>


Listen 80

LoadModule tpcc_module /usr/local/ap2/lib/apache/mod_tpcc.so

User apache
Group apache

#
# ServerAdmin: Your address, where problems with the server should
be
# e-mailed.  This address appears on some server-generated pages,
such
# as error documents.  e.g. admin@your-domain.com
#
ServerAdmin you@your.address

ServerName lcli1

UseCanonicalName Off

DocumentRoot "/var/www/html"

<Directory />
    Options FollowSymLinks
    AllowOverride None
</Directory>

TypesConfig /etc/mime.types

#
# DefaultType is the default MIME type the server will use for a
document
# if it cannot otherwise determine one, such as from filename
extensions.
# If your server contains mostly text or HTML documents,
"text/plain" is
# a good value.  If most of your content is binary, such as
applications
# or images, you may want to use "application/octet-stream" instead
to
# keep browsers from trying to display binary files as though they
are
# text.
#
DefaultType text/plain

#
# The mod_mime_magic module allows the server to use various hints
from the
# contents of the file itself to determine its type.  The
MIMEMagicFile
# directive tells the module where the hint definitions are
located.
#
<IfModule mod_mime_magic.c>
#   MIMEMagicFile /usr/share/magic.mime
    MIMEMagicFile conf/magic
</IfModule>

#
# HostnameLookups: Log the names of clients or just their IP
addresses
# e.g., www.apache.org (on) or 204.62.129.132 (off).
# The default is off because it'd be overall better for the net if
people
# had to knowingly turn this feature on, since enabling it means
that
# each client request will result in AT LEAST one lookup request to
the
# nameserver.
#
HostnameLookups Off

#
# ErrorLog: The location of the error log file.
# If you do not specify an ErrorLog directive within a
<VirtualHost>
# container, error messages relating to that virtual host will be
# logged here.  If you *do* define an error logfile for a
<VirtualHost>
# container, that host's errors will be logged there and not here.
#
ErrorLog logs/error_log

#
# LogLevel: Control the number of messages logged to the error_log.
# Possible values include: debug, info, notice, warn, error, crit,
# alert, emerg.
#
LogLevel warn

#
# The following directives define some format nicknames for use
with
# a CustomLog directive (see below).
#
LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-
Agent}i\"" combined
LogFormat "%h %l %u %t \"%r\" %>s %b" common
LogFormat "%{Referer}i -> %U" referer
LogFormat "%{User-agent}i" agent

#CustomLog logs/access_log combined


<Location /tpcc>
    SetHandler tpcc
</Location>


****************************
httpd_modules
****************************
```

```
[root@cl93 tmp]# /usr/local/ap2/sbin/httpd -l
Compiled in modules:
  core.c
  mod_access.c
  mod_log_config.c
  worker.c
  http_core.c
  mod_mime.c
  mod_so.c


****************************
ubb
****************************

#
# 9i RAC UBBconfig file for 24 clients configuration
#
# Clients systems have indentical configuration except:
# IPCKEY 4000[1-24] on client[1-24]
# MASTER OC[1-24] on Client[1-24]
# LMID OC[1=24] on Client[1-24]
#
#------------------------------------------------------------------
-----------
*RESOURCES
#------------------------------------------------------------------
-----------
IPCKEY              40001
MASTER              cl93
MAXACCESSERS        9800      # 1024 or more
MAXGTT 8000
MAXSERVERS          80
MAXSERVICES         410       #MAXSERVERS * #-of-services-each-
server + 10 (for BBL)
MODEL               SHM
LDBAL               Y
*MACHINES
DEFAULT:
                            TUXDIR="/home/bea/tuxedo8.0"
                            APPDIR="/home/bea/tuxedo8.0"

          TUXCONFIG="/home/bea/tuxedo8.0/tuxconfig"
                            UID=0
                            GID=0
                            TYPE="LINUX"
cl93      LMID=cl93

*GROUPS
TPCC
          LMID=cl93 GRPNO=1 OPENINFO=NONE
DELI
          LMID=cl93 GRPNO=2 OPENINFO=NONE

*SERVERS
DEFAULT: CLOPT="-A"
tpccora   SRVGRP=TPCC SRVID=1 RQADDR=txnque1 REPLYQ=Y MIN=30 MAX=40
deliora  SRVGRP=DELI SRVID=2 RQADDR=txnque2 REPLYQ=N MIN=2 MAX=20

*SERVICES

DEFAULT:
                    LOAD=1
                    PRIO=1
                    BUFTYPE="CARRAY"
                    TRANTIME=900
                    AUTOTRAN=N
no_transaction
os_transaction
pt_transaction
sl_transaction
dy_transaction
```

Appendix D:
Third Party Letters

RESOURCES
- Order Status
- My Company
- My Account
- Account Team
- New Accounts
- Rebates
- Special Events
- CDW Outlet
- CDW Leasing
- Technical Support
- E-Newsletters

ONLINEHELP CDW eSupport

Printable version

Netgear GS516T 16 port Rack Mountable Switch

Product Information

16-port 10/100/1000Mbps Gigabit Ethernet unmanaged stackable rackmountable switch

Usually Ships:	Same Day
CDW Part No.:	392502
Mfg. Part No.:	GS516TNA

Price: **$1,399.58**

ADD TO CART

Manufacturer

NETGEAR

Product Links

> Similar Products
> Send to Associate

OVERVIEW

Your office network gets gigabit speed to burn with NETGEAR's GS516T 10/100/1000Mbps Gigabit Switch

Your office network gets gigabit speed to burn with NETGEAR's GS516T 10/100/1000Mbps Gigabit Switch! Its 16 ports send data at scorching speeds – up to 2000Mbps per port in full-duplex mode, and every port also features 10/100/1000 automatic speed and full/half-duplex sensing plus Auto Uplink™, making this unmanaged, rack-mountable switch ideal for combining 10, 100, and 1000Mbps devices. Users can take advantage of the GS516's ability to deliver large amounts of multimedia, image, and video information in no time at all. It's invaluable as a robust and reliable network backbone for your 50- to 250-employee company.

Accessible:
Plenty of bandwidth for all users, with 16 switched 10/100/1000 ports for PCs, servers,or switches.

Smart:
All 16 ports provide automatic speed and duplex sensing, plus Auto Uplink™ to adjust for straight-through or crossover cables and make the right link.

Efficient:
Each port delivers network speeds of up to 2000Mbps per port.

Straightforward:
Easy to set up and easy to use. All ports feature integrated LEDs, so network monitoring couldn't be easier.

Features:
16 10/100/1000 ports

RESOURCES
- Order Status
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- Special Events
- CDW Outlet
- CDW Leasing
- Technical Support
- E-Newsletters

ONLINEHELP CDW eSupport

Printable version

NetGear 8-port Copper Gigabit Switch, GS508TNA

Product Information

8-port 1000BASE-T Gigabit Copper unmanaged Layer 2 Switch

Usually Ships:	Same Day
CDW Part No.:	287841
Mfg. Part No.:	GS508TNA

Price: **$719.16**

ADD TO CART

Manufacturer

NETGEAR

Product Links

> Accessories
> Similar Products
> Send to Associate

OVERVIEW

Delivers up to 11.8 million packets per second

Copper Gigabit ports in this Ethernet switch give you high-speed connectivity without the cost and hassle of fiber cables. Providing backbone for power workgroups, data centers, and server farms with convenient Plug and Play installation NETGEAR's high-performance GS508T Copper Gigabit Switch delivers the power of Copper Gigabit Ethernet to optimize your small to medium-sized business network.

Key Features:
Eight, 10/100/1000 auto-negotiating ports
Auto-detects optimum network speed
Delivers up to 11.8 million packets per second
Supports 8,000 network users or devices
Conveniently rack-mountable

SPECIFICATIONS

Dimensions
Weight: 5.3 lbs.
Dimensions: 13" (W) x 8.2" (D) x 1.7" (H)

LEDs
LEDs: Link Activity, Power, Link Status

Network ports
Port Type: 1000BASE-T

August 6, 2002

Hewlett-Packard
Mike Nikolaiev
MS150402
20555 SH 249
Houston, TX 77070

Dear Mike:

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

Part number	Description	Unit Price	Quantity	Price
RHF0090US	Red Hat Linux Advanced Server 2.1 (Basic)	$800	8	$6,400
RHF0090US	2 additional years maintenance & support	$800	16	$12,800
RHF099US	Red Hat Linux Personal	$60	1	$60
MCT0172US	Red Hat Linux Personal 8 x 3 Bundle (8 systems, 3 years support & maintenance)	$4800	2	$9,600

Products orderable through www.redhat.com or Red Hat Sales 1-888-REDHAT-1

Quote is valid for the next 90 days.

If we can be of any further assistance, please contact Nick Carr at ncarr@redhat.com

*Support and maintenance for software includes 30 day configuration and installation support proactive update support via Red Hat Network and product upgrades.

August 13, 2002

Raghunath K. Othayoth
ISS - Solutions and Strategy
Hewlett Packard Company
281-518-2748 tel
281-514-8375 fax

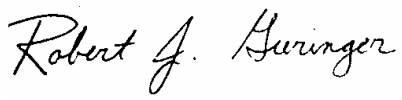
Per your request I am enclosing the pricing information regarding TUXEDO 6.5 that you requested. This pricing applies to Tuxedo 6.4, 6.5, 7.1, and 8.0. Please note that Tuxedo 8.0 is our most recent version of Tuxedo. Core functionality services pricing is appropriate for your activities. As per the table below HP/Compaq systems are classified as either a Tier 1, 2, 3, 4 or 5 systems depending on the performance and CPU capacity of the system. The Compaq DL 360 or Intel 2P machines are Tier 1 machines – price is $3,000 per server (License) + $630 per server (7x24) for support. This quote is valid for 60 days from the date of this letter.

Tuxedo Core Functionality Services (CFS) Program Product Pricing and Description

TUX-CFS provides a basic level of middleware support for distributed computing, and is b used by organizations with substantial resources and knowledge for advanced distributed computing implementations.

TUX-CFS prices are server only and are based on the overall performance characteristic the server and uses the same five tier computer classification as TUXEDO 6.4, 6.5, 7.1, a 8.0. Prices range from $3,000 for Tier 1 to $250,000 for Tier 5. Under this pricing option EVERY system running TUX-CFS at the user site must have a TUXEDO license installed pay the appropriate per server license fees.

Very Truly Yours,



Rob Gieringer,
Worldwide Pricing Manager

Appendix G:

Product Description	Price	Quantity	Extended Price
Oracle9i Database Enterprise Edition Release 2, per processor for 3 years	$20,000	32	$640,000
Real Application Clusters, per processor for 3 years	$10,000	32	$320,000
Partitioning, per processor for 3 years	$5,000	32	$160,000
Oracle Database Server Support Package for 3 years	2,000 per yr.	8	48,000
Oracle Mandatory E-Business Discount	-$292,000	1	-$292,000

Oracle pricing contact: MaryBeth Pierantoni
mary.beth.pierantoni@oracle.com
650-506-2118