NEC

TPC Benchmark™ C
Full Disclosure Report

NEC Express5800/140Hb (4 SMP)

Using Microsoft SQL Server 2000, Enterprise Edition
and Microsoft Windows 2000 Adanced Server

First Edition
Submitted for Review
June , 2000

NEC, the Sponsors of this benchmark test, believe that the information in this document is accurate as of the publication date. The information in this document is subject to change without notice. The Sponsor assumes no respon sibility for any errors that may appear in this document. The pricing information in this document is believed to accurately reflect the current prices as of the publication date. However, The Sponsor provides no warranty of the pricing information in thi s document.

Benchmark results are highly dependent upon workload, specific application requirements, and system design and implementation. Relative system performance will vary as a result of these and other factors. Therefore, TPC Benchmark ™ 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.

All performance data contained in this report were obtained in a rigorously controlled environment. Results obtained in other operating environments may vary significantly. NEC do 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 USA, 2000

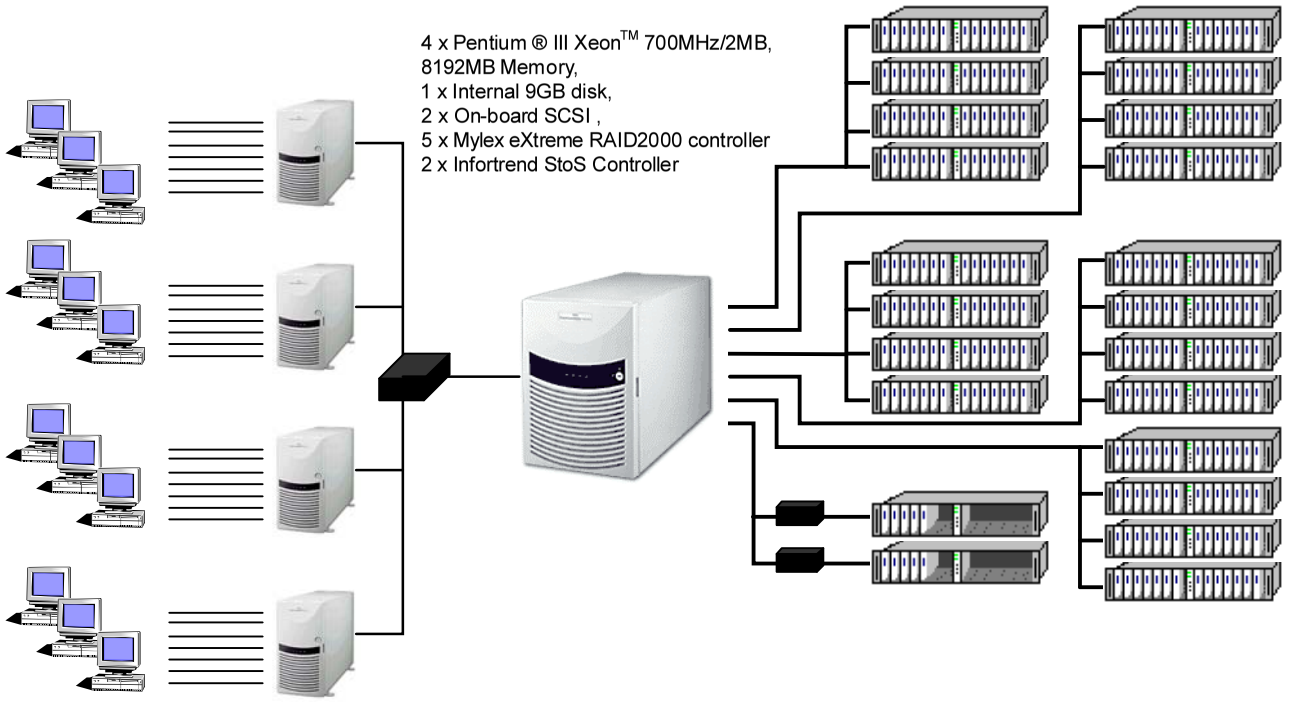
NEC	Express5800/140Hb C/S		TPC-C Rev. 3.5 Reported Date June 19 ,2000
Total System Cost	**TPC-C Throughput**	**Price/Performance**	**Availability Date**
$ 591,383	**31,764.37 tpmC**	**$18.61 per tpmC**	**September 29,2000**

Processors	Database Manager	Operating System	Other Software	Number of Users
4 x Pentium®III Xeon™ 700MHz 2MB L2 cache	Microsoft SQL Server 2000 Enterprise Edition	Microsoft Windows 2000 Advanced Server	Windows2000 Server w/ COM+, IIS5.0 Microsoft VC++	**25,200**

Total of 25,200 PCs

Server : Express5800/140Hb

4 x Pentium ® III Xeon™ 700MHz/2MB,
8192MB Memory,
1 x Internal 9GB disk,
2 x On-board SCSI ,
5 x Mylex eXtreme RAID2000 controller
2 x Infortrend StoS Controller



4 x Express5800/120Ld

2 x Adaptec 4-port NIC

Storage: Disk Expansion Box
280 x 9GB disks
10 x 18GB disks

System Component	Server		Each Clien	
Processors **Cache**	4	Pentium ® III Xeon™ 700MHz 2MB L2 Cache	2	Pentium ® III 866MHz 256KB L2 Cache
Memory	1	8192MB	1	512MB
Disk Controllers	6 2 2	Mylex eXtreme RAID 2000 On-board SCSI Infortrend S2S controller	1	On-board SCSI
Disk Drives	281 10	9GB (8.47GB usable) 18GB (16.95 GB usable)	1	9GB
Total Storage		2473 GB		9GB
Others	1 1	CD-ROM Drive On-board Ether controller	2 1 1	Adaptec 4port Ether NIC CD-ROM Drive On-board Ether controller

NEC

NEC Express5800/140Hb
C/S

TPC-C REV 3.5

Report Date:
June 19 ,2000

Description	Part Number	Third Party Brand	Pricing	Unit Price	Qty	Extended Price	5-yr Mnt. Price
Server Hardware							
Express5800/140Hb system							
Base system with 1 x Pentium III Xeon 700MHz/2MB	NS08000155	NEC	1	8,602	1	8,602	2,064
Pentium III Xeon 700MHz/2MB BTO Option	UBP-2643-1C-IN	NEC	1	3,899	3	11,697	2,807
2GB (4 x 512MB) memory,	AMS-7020-IN-00	NEC	1	8,599	4	34,396	8,255
9GB 10K rpm HDD,	BDH-1960-IN-00	NEC	1	419	1	419	101
DDS-3 DAT Drive	ADT-2410-IN-00	NEC	1	749	1	749	180
CD-ROM, On-board LAN, KB/MS,	Included	NEC	1	0	1	0	0
Windows2000 Advanced Server Hot Loaded	NUT-A200-IN-US	Microsoft	1	3,459	1	3,459	0
NEC MultiSync A500+	011145	NEC	1	179	1	179	43
					Subtotal	59,501	13,450
Disk Subsystem							
eXtreme RAID2000 4channel controller (+2spares)	E2000-4-64NB	Mylex	3	2,050	8	16,400	0
3U Disk Expansion Unit(14 slots)	ADR-0802-IN-00	NEC	1	2,000	22	44,000	10,560
9GB 10k rpm HDD	BDH-1960-IN-00	NEC	1	419	280	117,320	28,157
18GB 10k rpm HDD	BDH-1860-IN-00	NEC	1	599	10	5,990	1,438
42U Rackframe	AZA-4200-00-00	NEC	1	1,879	2	3,758	902
Infortrend S2S RAID Controller (+2spares)	IFT-3102U2G	Infortrend	4	2,092	4	8,368	
64MB EDO SIMM							
Battery back-up module w/ battery (+2spares)	IFT-9070B	Infortrend	4	170	4	680	0
APC Smart UPS (+2 spares)	SU2200NET	APC	5	878	4	3,512	0
					Subtotal	200,028	41,056
Server Software							
SQL Server2000 Ent. Edition, per processor licensing		Microsoft	2	19,999	4	79,996	10,475
Windows2000 Advanced Server, 25 Client Licenses		Microsoft	(included in svr.)		1	0	0
					Subtotal	79,996	10,475
Client Hardware							
NEC Express5800/120Ld							
Base System with 1 x Pentium III 866MHz/256KB	NS020001855	NEC	1	2,909	4	11,636	2,793
1 x Pentium III 866MHz/256 BTO Option	UBP-2718-IN-00	NEC	1	1,599	4	6,396	1,535
1 x 128MB memory,	AMS-5128-IN-00	NEC	1	399	16	6,384	1,532
1 x 9GB 10K rpm HDD,	CDH-1942-00-00	NEC	1	419	4	1,676	402
CD-ROM, On-board LAN, KB/MS	Included	NEC	1	0	4	0	0
Adaptec ANA-62044 NIC (+2spares)	ANA-62044-SGL	Adaptec	5	528	10	5,280	0
NEC MultiSync A500+	011145	NEC	1	179	4	716	172
					Subtotal	32,088	6,434
Client Software							
Microsoft Windows 2000 Server, w/5 Client Licneses		Microsoft	2	999	4	3,996	0
Visual C++ Professional 6.0		Microsoft	2	549	1	549	0
					Subtotal	4,545	0
User Connectivity							
Cisco Catalyst2912-XL-A (+2spares)	WS-C2912-XL-A	Cisco	5	1,110	3	3,330	0
Compex 16-prt 10Mbps HUB (+10% Spare)	TP1016C	Compex	6	80	1756	140,480	0
					Subtotal	143,810	0
					TOTAL	519,968	71,415

Notes:
All Microsoft maintenance is covered by the maintenance costs of Microsoft SQL Server
Pricing: 1-NEC 2-Microsoft 3-Mylex 4-ADS 5-CDW 6-SDD
3,4,5,6 : with 5-year warranty

Audited by Francois Raab, InfoSizing, Inc

5-Yr. Cost of Ownership: **$591,383**
tpmC Rating: **31764.37**
$ / tpmC: 18.61

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 reflects standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark specifications.If you find that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

Numerical Quantities Summary

MQTh, Computed Maximum Qualified Throughput			31764.37 tpmC
%throughput difference ,reported & reproducibility runs			0.13 %
Response Times(in seconds)	**90%**	**Average**	**Maximum**
New-Order	0.30	0.23	5.17
Payment	0.19	0.15	4.73
Stock-Level	1.49	0.95	5.43
Delivery(interactive portion)	0.11	0.10	0.72
Delivery(deferred portion)	0.52	0.31	3.56
Order-status	0.23	0.18	3.77
Menu	0.11	0.10	1.17
Response time delay added for emulated components			0.1
Transaction Mix , in percent of total transaction			
New-Order			44.86%
Payment			43.05%
Order-status			4.02%
Delivery			4.05%
Stock-level			4.02%

Keying/Think Times (in seconds)	**Min.**		**Average**		**Max**	
New-Order	18.00	0.00	18.01	12.04	18.04	120.51
Payment	3.00	0.00	3.02	12.05	3.05	120.50
Stock-Level	2.00	0.00	2.02	5.01	2.05	50.50
Delivery	2.00	0.00	2.02	5.06	2.04	50.50
Order-status	2.00	0.00	2.02	10.11	2.05	100.50

Test Duration	
Ramp-up time	58 minutes
Measurement interval	30 minutes
Number of checkpoints	1
Checkpoint interval	30 minutes
Number of transactions (all types) completed in measurement interval	2,210,511

Abstract

This report documents the compliance of NEC Corporation's TPC Benchmark ™ C tests on the NEC Express 5800/140Hb client/server system with version 3.5 of the TPC Benchmark C Standard Specification. 4 Clients (NEC Express 5800/120Ld) were used as the front-end clients.

The operating system and the DBMS used on the server were Microsoft Windows 2000 Advanced Server and Microsoft SQL Server 2000, Enterprise Edition. The operating system on the clients was Microsoft Windows 2000 Server. Those clients ran Microsoft's IIS server 5.0 and COM+.

Two standard metrics, transaction-per-minute-C(tpmC) and price per tpmC($/tpmC) are reported, in accordance with the TPC Benchmark™ C Standard. The independent auditor's report by Francois Raab appears at the end of this report.

TPC Benchmark™ C Metrics

The standard TPC Benchmark™ C metrics, tpmC (transactions per minute), price per tpmC (five year capital cost per measured tpmC) are reported.

System	SW	Total System Cost	tpmC	$ per tpmC	Availability Date
NEC Express5800/140Hb	Microsoft Windows 2000 Advanced Server Microsoft SQL Server 2000, Enterprise Edition	$591,383	31764.37	$18.61	September 29, 2000

Standard and Executive Summary Statements

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

Auditor

The benchmark configuration, environment and methodology were audited by Francois Raab of Information Paradigm,Inc. to verify compliance with the relevant TPC specifications.

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. T his full disclosure report is based on the TPC Benchmark™ C Standard Specifications Version 3.5.

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 complexi ty
- 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 prim ary 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 p rocessed 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.

Benchmark results are highly dependent upon workload, specifi c 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.

Document Structure

This TPC Benchmark™ C Full Disclosure Report is organized as follows:

- The main body of the document lists each item in Clause 8 of the TPC-C Standard and explains how each requirement is satisfied.
- Appendix A contains the source code of the TPC-C application code used to implement the TPC-C transactions.
- Appendix B contains the database definition and population code used in the tests.
- Appendix C contains the tunable parameters used in the TPC-C tests.
- Appendix D contains space calculation table.
- Appendix E contains third-party price quotations.

TPC Benchmark™ C Full Disclosure

The TPC Benchmark™ C Standard Specification requires test sponsors to publish, and make available to the public, a full disclosure report for the results to be considered compliant with the Standard. The required contents of the full disclosure report are specified in Clause 8. This report is intended to satisfy the Standard's requirement for full disclosure. It documents the compliance of the benchmark tests with each item listed in Clause 8 of the TPC Benchmark ™ C Standard Specification.

In the Standard Specification, the main headings in Clause 8 are keyed to the other clauses. The headings in this report use the same sequence, so that they correspond to the titles or subjects referred to in Clause 8.

Each section in this report begins with the text of the corresponding item from Clause 8 of the Standard Specification, printed in italic type. The plain text that follows explains how the tests comply with the TPC Benchmark™ C requirement. In sections where Clause 8 requires extensive listings, the section refers to the appropriate appendix at the end of this report.

General Items

Order and titles

The order and titles of sections in the Test Sponsors' Full Disclosure Report must correspond with the order and titles of for TPC-C standard specification. The intent is to make it as easy as possible for readers to compare and contrast material in different Full Disclosure reports.

The order and titles of sections in this report correspond with that of the TPC -C standard specification.

Summary Statement

The TPC Executive Summary Statement must be included near the beginning of the Full Disclosure.

The TPC Executive Summary Statement is included at the beginning of this report.

Numerical Quantities Summary

The numerical quantities listed below must be summarized near the beginning of the Full Disclosure Report.

- *measurement interval in minutes,*
- *number of checkpoints in the measurement interval,*
- *computed maximum Qualified Throughput in tpmC,*
- *percentage difference between reported throughput and throughput obtained in reproducibility run,*
- *ninetieth percentile, average and maximum response times for the New-Order, Payment, Order-Status, Stock-Level, Delivery(deferred and interactive) and Menu transactions,*
- *time in seconds added to response time to compensate for delays associated with emulated components, and percentage of transaction mix for each transaction type.*

These numerical quantities are summarized at the beginning of this report.

Application Program

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

Appendix A contains the application source codes used in the TPC -C benchmark.

Sponsor

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

This benchmark test was sponsored by NEC Corporation . NEC has authorized NEC Corp. to publish TPC -C performance and price/performance results for the NEC Epress5800/140Hb. Price quotations contained in Appendix E correspond to the NEC Express5800/140Hb server.

Parameters and Options

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

- *Database tuning options*
- *Recovery/locking options*
- *Operating system and application configuration parameters*

Appendix C contains the tunable parameters used in the TPC -C tests.

Configuration Diagrams

Provide diagrams of both the measured and priced configurations, accompanied by a description of the differences. This includes, but not limited to:

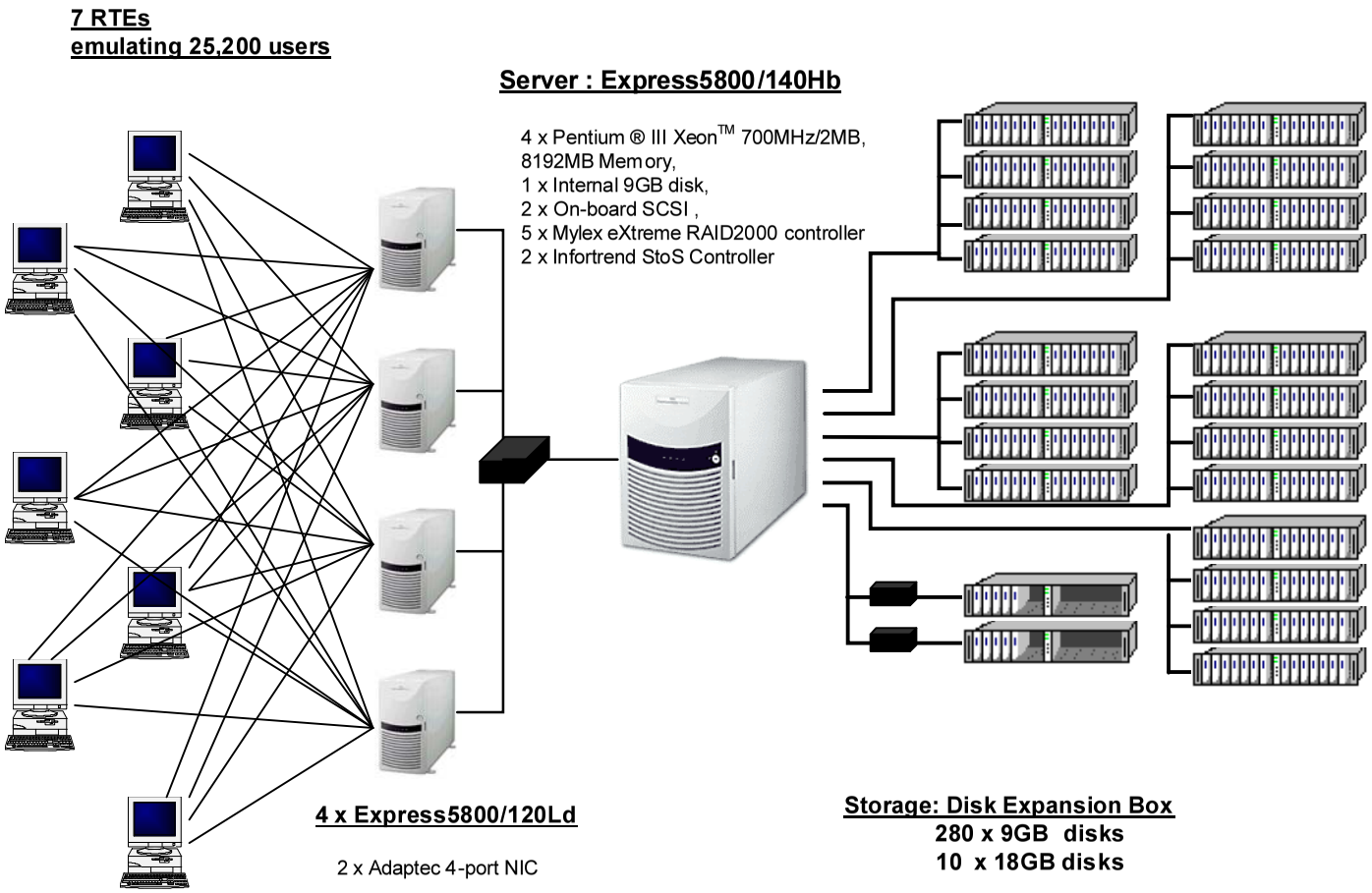
- *Number and type of processors*
- *Size of allocated memory, and any specific mapping/partitioning or memory unique to the test*
- *Number and type of disk drive units (and controllers, if applicable)*
- *Number of channels or bus connections to disk units, including their protocol type*
- *Number of LAN(e.g. Ethernet) connections, including routers, workstations, terminals, etc., that were physically used in the test or are incorporated into the pricing structure.*
- *Type and the run-time execution location of software components(e.g., DBMS, client processes, transaction monitors, software drivers, etc.)*

Figure 1.1 shows the measured configuration diagram.
Figure 1.2 shows the priced configuration diagram.

Measured Configuration

The following figure represents the measured configuration. The benchmark system used a remote terminal emulator(RTE) to initiate transactions and measure response times of transactions, as well as record various data for each transaction.

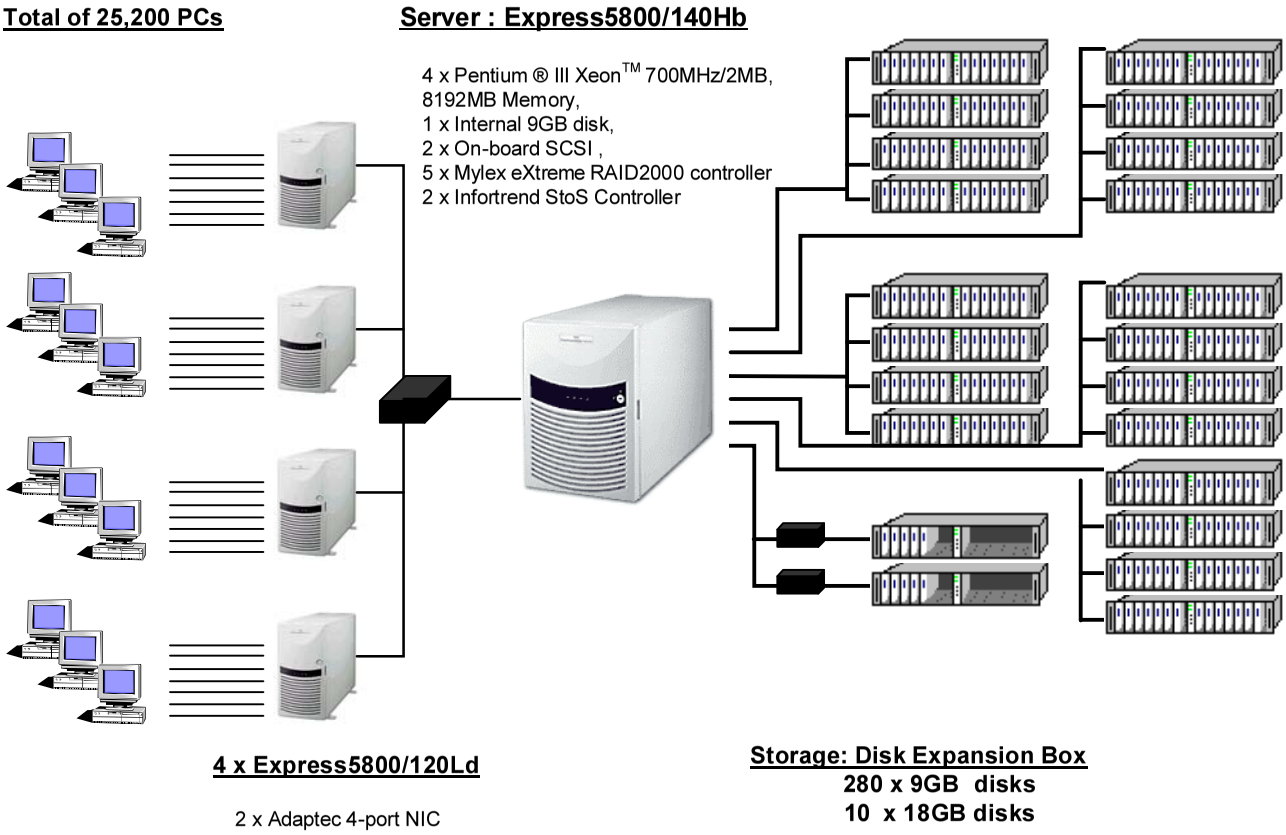
Figure 1.1 Express5800/140Hb, Measured Configuration Diagram



Priced System Configuration

The following figure depicts the priced system, whose cost determines th e normalized price per tpmC reported for the test.

Figure1.2: Express5800/140Hb , Priced Configuration Diagram



Clause 1 : Logical Database Design and 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..

Table Organization

The physical organization of tables and indices within the database must be disclosed.

Appendix B contains the code used to define the physical organization of tables and indices

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 fully operational during the entire benchmark.

Disclosure of Partitioning

While there are a few restrictions placed upon horizontal or vertical partitioning of tables and rows in the TPC-C benchmark(see Clause 1.6), any such partitioning must be disclosed.

Partitioning was not used on any table in this benchmark.

Replication of Tables

Replication of tables, if used, must be disclosed.

No tables were replicated in this benchmark test.

Additional and/or Duplicated Attributes in any Table

Additional and/or duplicated attributes in any table must be disclosed along with a statement on the impact on performance.

No duplications or additional attributes were used in this benchmark.

Clause 2 : Transaction and Terminal profiles Related Items

Random Number Generation

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

Random numbers were generated internaly by the Microsoft BenchCraft RTE program which was already audited independently.

Terminal Input/Output Screen Layout

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

All screen layouts followed the specifications exactly.

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 8.1.3.3.3 must be disclosed and commercially available (including supporting software and maintenance).

Each of five transaction types was tested by the auditor. The auditor verified that all the features specified in Clause 2.2.2.4 were provided.

Presentation Manager or Intelligent Terminal

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

Comment1: *The intent of this clause is to describe any special manipulations performed by a local terminal or workstation to off-load work from the SUT. This includes, but is not limited to : screen presentations, message bundling, and local storage of TPC-C rows.*
Comment2: *This disclosure also requires that all data manipulation functions also be described. Within this disclosure, the purpose of such additional function(s) 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 applications is listed in Appendix A.

Transaction Profiles

The percentage of home and remote order-lines in the New-Order transactions must be disclosed.
The percentage of New-Order transactions that were rolled back as a result of an unused item number must be disclosed.
The number of items per orders entered by New-Order transaction s must be disclosed.
The percentage of home and remote Payment transaction s must be disclosed.
The percentage of Payment and Order-Status transaction s that used non-primary key (C_LAST) access to the database must be disclosed.
The percentage of Delivery transactions that were skipped as a result of an insufficient number of rows in the NEW-ORDER table must be disclosed.

Table 1 shows the numerical quantities required by Clause 8.1.3.5 through 8.1.3.10.

Transaction Mix

The Mix (i.e. , percentages) of transaction types seen by the SUT must be disclosed.

Table 1 shows the mix of transaction types seen by the SUT during the reported measurement interval.

Following table summarizes the data required for disclosure in section 3.5 through 3. 11.

Table 1 Transaction Statistics

	Statistic	Value
New Order	Home warehouse order lines	**99.00%**
	Remote warehouse order lines	**1.00%**
	Rolled back transactions	**0.98%**
	Average items per order	**10.01**
Payment	Home warehouse payments	**85.01%**
	Remote warehouse payments	**14.99%**
	Accessed by last name	**60.01%**
Order Status	Accessed by last name	**60.34%**
Delivery	Skipped deliveries	**0**
Transaction Mix	New Order	**44.86%**
	Payment	**43.05%**
	Stock Level	**4.02%**
	Delivery	**4.05%**
	Order Status	**4.02%**

Queuing Mechanism

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

The client application processes submitted delivery transactions to named pipe delivery server software running on the client machines. There was a single delivery server with multiple execution threads running on each client machine. These delivery servers were responsible for processing deliveries queued to the named pipe and submitting them to the database server. The source code is listed in Appendix A.

Clause 3 : Transaction and System Properties 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.

The TPC Benchmark™ C Standard Specification defines a set of transaction processing system properties that a system under test (SUT) must support during the execution of the benchmark. Those properties are At omicity, Consistency, Isolation and Durability (ACID). This section quotes the specification definition of each of those properties and describes the tests done as specified and monitored by the auditor , to demonstrate compliance.

Atomicity Tests

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

Perform the Payment for randomly selected warehouse, district and customer(by customer number as specified in Clause 2.5.1.2) and verify that the records in the CUSTOMER,DISTRICT and WAREHOUSE tables have been changed appropriately.

The value of w_ytd, d_ytd, c_balance, c_ytd_payment and c_payment_cnt of a randomly selected warehouse, district, and customer were retrieved. The Payment transaction was executed on the same warehouse, district, and customer. The transaction was committed. The values w_ytd, d_ytd, c_balance, c_ytd_payment, and c_payment_cnt were retrieved again. It was verified that all values had been changed appropriately.

Aborted Transactions

Perform the Payment transaction for randomly selected warehouse, district and customer(by customer number as specified in Clause 2.5.1.2) and substitute a ROLLBACK of the transaction for the COMMIT of the transaction. Verify that records in CUSTOMER, DISTRICT and WAREHOUSE tables have Not been changed.

The value of w_ytd, d_ytd, c_balance, c_ytd_payment and c_payment_cnt of randomly selected warehouse , district, and customer were retrieved. The Payment transaction was executed on the same warehouse, district, and customer. The transaction was rolled back. The values of w_ytd, d_ytd, c_balance, c_ytd_payment, c_payment_cnt were retrieved again. It was verified that none of the values had changed.

Consistency Tests

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 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 over 10 minutes and included a checkpoint under 3500 users (350 active warehouse) condition . The shell script was executed before and after the run. 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 level is obtained.

Isolation tests one through nine were executed using shell scripts to issue queries to the database. Each script included timestamps to demonstrate the concurrency of operations. The results of the queries were captured to files. The captured files were verified to demonstrate the required isolation had been met.
Case A was followed for Isolation Test 7.

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.

- *Permanent irrecoverable failure of any single durable medium containing database, ABTH files/tables, or recovery log data.*
- *Instantaneous interruption(system crash/system hang) in processing which requires system reboot to recover.*
- *Failure of all or part of memory(loss of contents)*

Loss of Memory and Loss of Log

Because the loss of power erases the contents of memory, both of instantaneous interruption and loss of memory were combined into a single test. Also loss of log was combined into the test.

The following steps were performed on a database of 2520 warehouses under the full load of users.

1. A sum of D_NEXT_O_ID of all rows in the district table was taken.
2. Full load of users were logged in to the database and running transactions for 5 minutes.
3. A checkpoint was initiated.
4. One disk drive of mirror paired drives holding the transaction log was removed.
   An NT alert message was displayed and logged in the NT event log.
   The benchmark run continued without interruption.
5. The running continued 2 minutes.
6. the system was powered off.
7. The RTE was shutted down.
8. The system was powered back up. SQL Server was restarted and automatically recovered.
9. A new count of D_NEXT_O_ID was taken.
10. This number was compared with the number of new orders reported by the RTE.

Loss of Data

Loss of data was demonstrated on a 10 Warehouse database for convenience. The standard driving mechanism was used to generate the transaction load of 100 users for the test. To demonstrate recovery from a permanent failure of durable media containing TPC-C tables, the following steps were performed. A fully scaled database would also pass this test.

1. A 10 Warehouse database was built having similar characteristics to the large database.
2. The database was backed up using SQL Server backup facilities.
3. A sum of D_NEXT_O_ID was taken.
4. 100 users were logged in to the database and running transactions.
5. One disk drive in the array was removed causing SQL Server error. SQL Server was shutted down.
6. SQL Server was restarted and a dump of the transaction log was taken.
7. The 10 Warehouse database was restored from backup.
8. The transaction log was restored and transactions rolled forward.
9. A new count of D_NEXT_O_ID was taken.
10. This number was compared with the number of new orders reported by the RTE.

Clause 4 : Scaling and Database Population 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.

The TPC-C database was originally built with 2520 warehouses.

Table 2 Number of Rows for Server

Table	Cardinality as benchmarked
Warehouse	2,520
Distinct	25,200
Customer	75,600,000
History	75,600,000
Orders	75,600,000
New Order	22,680,000
Order Line	756,002,500
Stock	252,000,000
Item	100,000
Deleted Warehouse Rows	0

Constant Value for the NURand function

The following values were used as constant value inputs to the NURand function for this benchmark.

C_LAST (Build) 123
C_LAST (RUN) 233

Distribution of Tables and Logs

The distribution of tables and logs across all media must be explicitly depicted for tested and priced systems.

Table 3 depicts the distribution of the database over the disks of the tested system.

Figure 1.1, 1.2 shows the disk configuration for measured and priced system.

Table 3 : Data Distribution

Disk Administrator Configuration						
Disk	Partition 1	Partition 2	Unused Space	HA#	LD#	Usage
0 8.46GB	C: NTFS 8.46GB		(None)	1	1	System SQL Server
1 84.56GB	E: (RAW) 39.06GB		45.50GB	2	1	Log (Mirrored)
2 458.93GB	F: (RAW) 21.00GB	K: (RAW) 37.11GB	400.83GB	3	1	Data MSSQL70_misc1 MSSQL70_cs1
3 458.93GB	G: (RAW) 21.00GB	L: (RAW) 37.11GB	400.83GB	4	1	Data MSSQL70_misc2 MSSQL70_cs2
4 458.93GB	H: (RAW) 21.00GB	M: (RAW) 37.11GB	400.83GB	5	1	Data MSSQL70_misc3 MSSQL70_cs3
5 458.93GB	I: (RAW) 21.00GB	N: (RAW) 37.11GB	400.83GB	6	1	Data MSSQL70_misc4 MSSQL70_cs4
6 458.93GB	J: (RAW) 21.00GB	O: (RAW) 37.11GB	400.83GB	7	1	Data MSSQL70_misc5 MSSQL70_cs5

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, PL/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.

Microsoft SQL Server, 2000, a relational database, was used in this benchmark. SQL Server stored procedures were used and invoked through DB-Library function calls embedded in C code.

Database Mapping

The mapping of database partitions/replications must be explicitly described.
No partitioning or replication was used.

180-Days Space

Details of the 180 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.

The detail of 180-day space calculation is shown in Appendix D.
To calculate the space required to sustain the database log for 8 hours of growth at steady state, the following steps were followed:

1. The free space on the log file was queried using *DBCC sqlperf(logspace).*
2. Transactions were run against the database with a full load of users.
3. The free space was again queried using *DBCC sqlperf(logspace)*.
4. The space used was calculated as the difference between the first and second query.
5. The number of NEW-ORDERS was verified from an RTE report covering the entire run.
6. The space used was divided by the number of NEW-ORDERS giving a spaceused per NEW-ORDER transaction.
7. The space used per transaction was multiplied by the measured tpmC rate times 480 minutes.

The results of the above steps yielded a requirement of 74.45 GB to sustain the log for 8 hours.
Space available on the transaction log volume was 84.56 GB (including mirror), indicating that enough storage was configured to sustain 8 hours of growth.

The same methodology was used to compute growth requirements for dynamic tables Order,Order-Line and History.

Clause 5 : Performance Metrics and Response Time Related Items

Throughput

Measured tpmC must be reported

Table 4 : Measured tpmC

31,764.37 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 : Response Times (in seconds)

Type	Average	Maximum	90th %
New-Order	0.23	5.17	0.30
Payment	0.15	4.73	0.19
Stock Level	0.95	5.43	1.49
Interactive Delivery	0.10	0.72	0.11
Deferred Delivery	0.31	3.56	0.52
Order Status	0.18	3.77	0.23
Menu	0.10	1.17	0.11

Keying and Think Times

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

Table 6 : Keying Times

Type	Minimum	Average	Maximum
New-Order	18.00	18.01	18.04
Payment	3.00	3.02	3.05
Stock Level	2.00	2.02	2.05
Interactive Delivery	2.00	2.02	2.04
Order Status	2.00	2.02	2.05

Table 7 : Think Times

Type	Minimum	Average	Maximum
New-Order	0.00	12.04	120.51
Payment	0.00	12.05	120.50
Stock Level	0.00	5.01	50.50
Interactive Delivery	0.00	5.06	50.50
Order Status	0.00	10.11	100.50

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.

Figure 2.1 : New Order Response Time Distribution

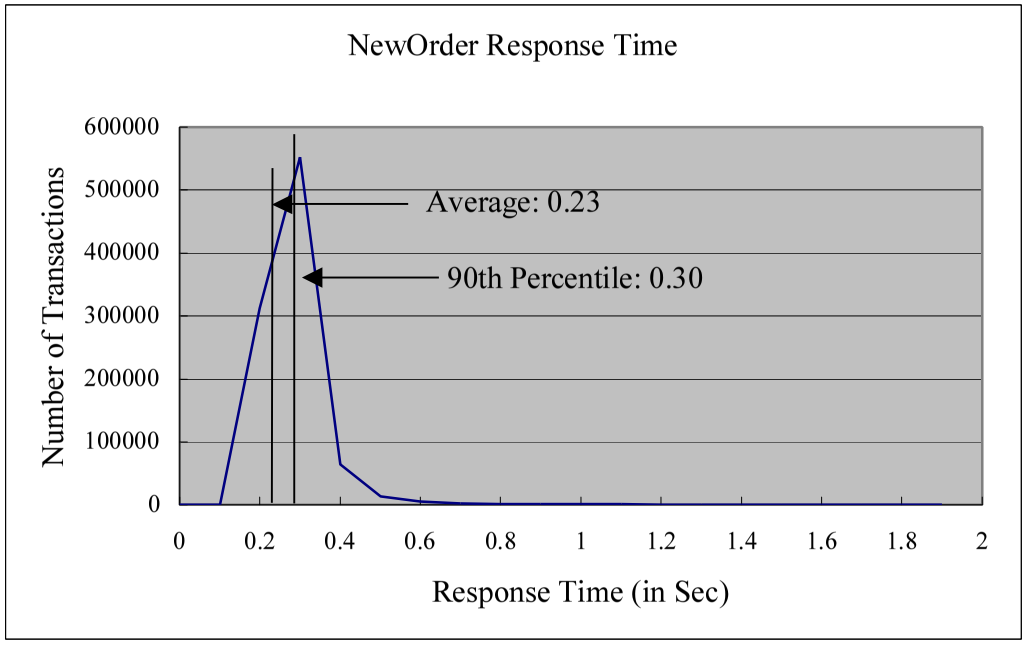


Figure 2.2 : Payment Response Time Distribution

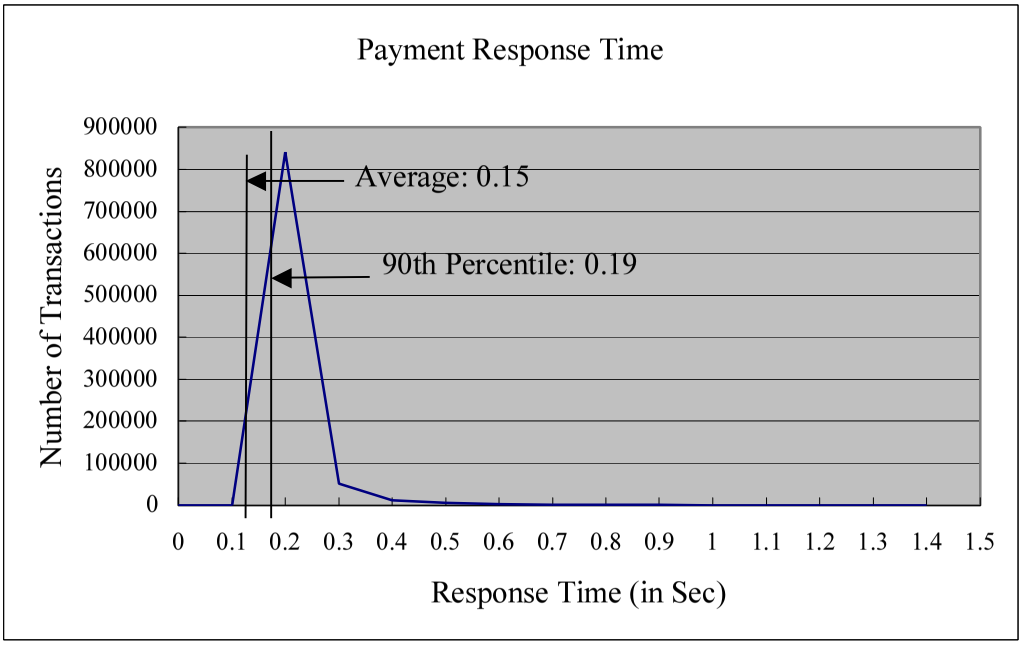


Figure 2.3 : Order Status Response Time Distribution

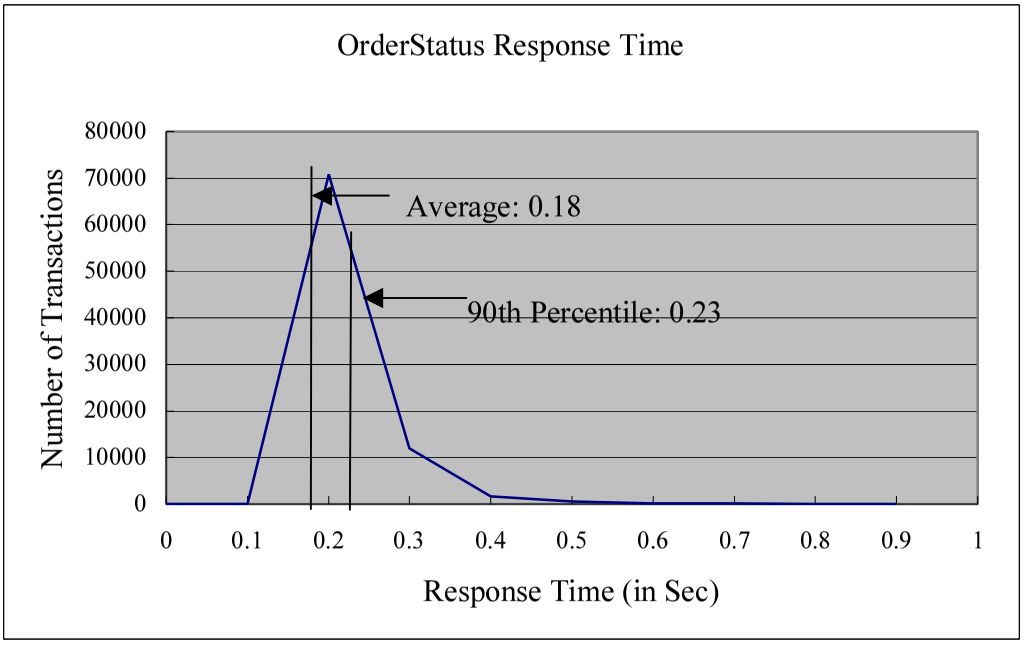


Figure 2.4 : Delivery Response Time Distribution

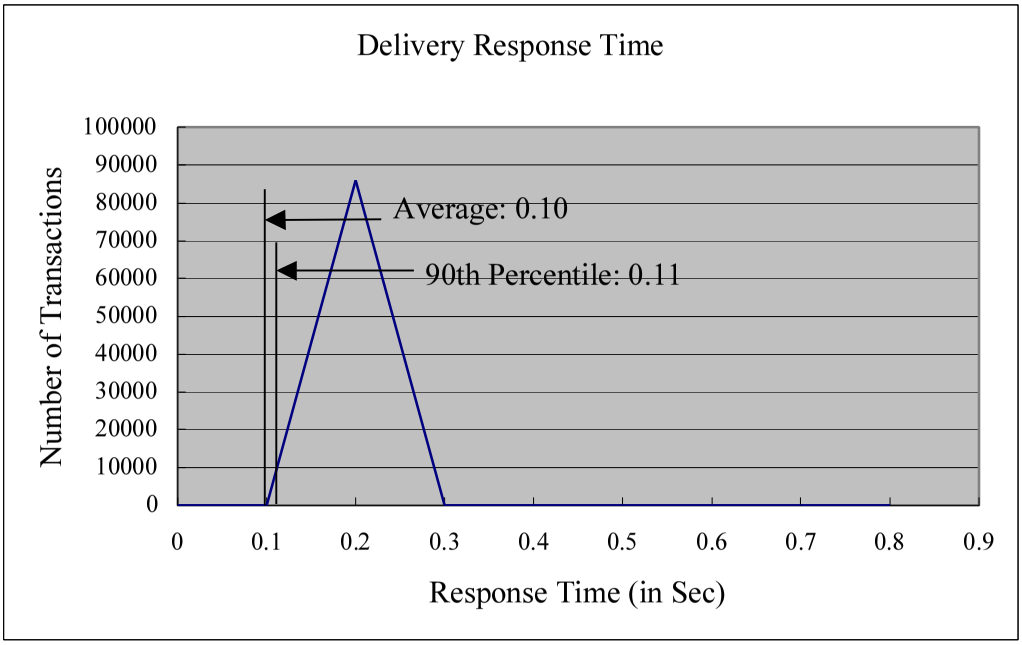
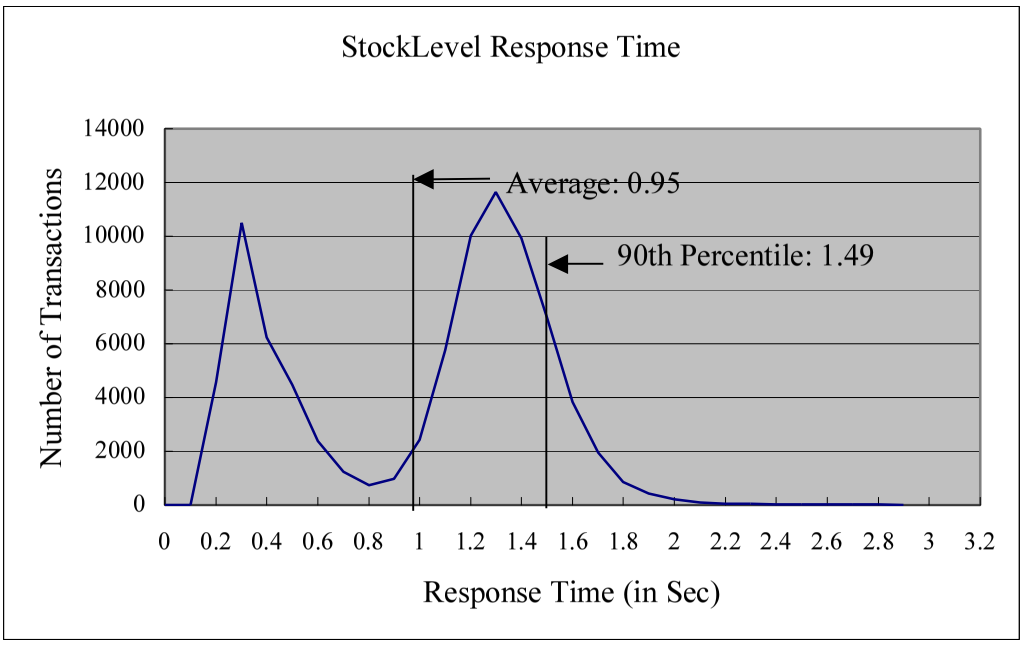


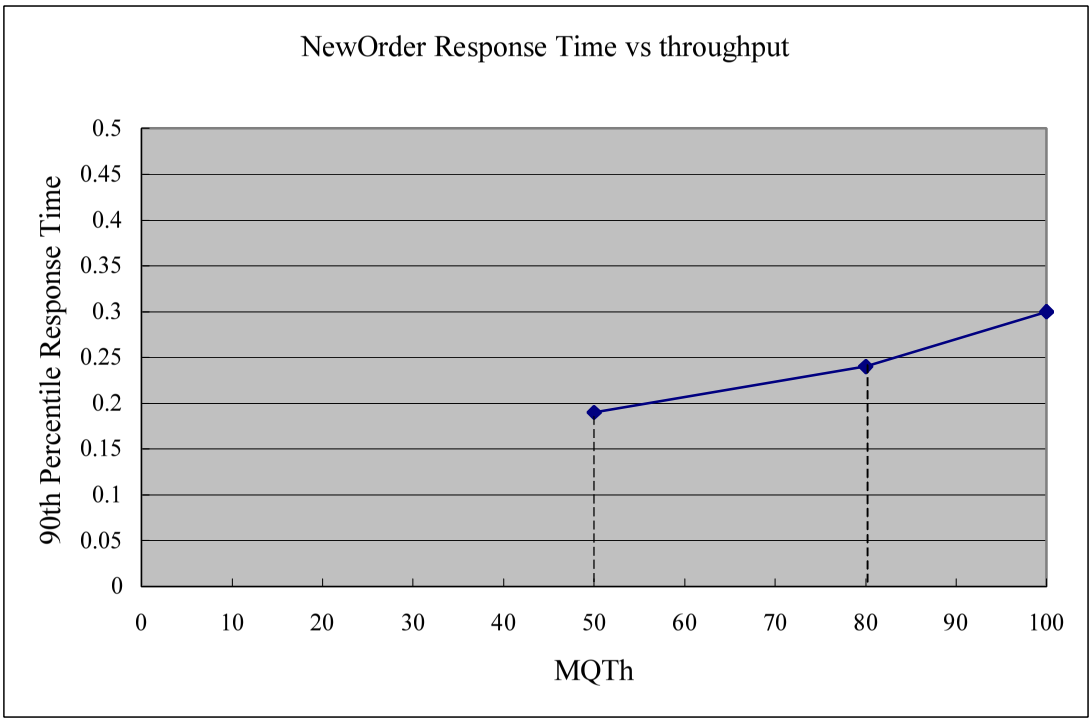
Figure 2.5 : Stock Level Response Time Distribution



Response time versus Throughput Performance Curve

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

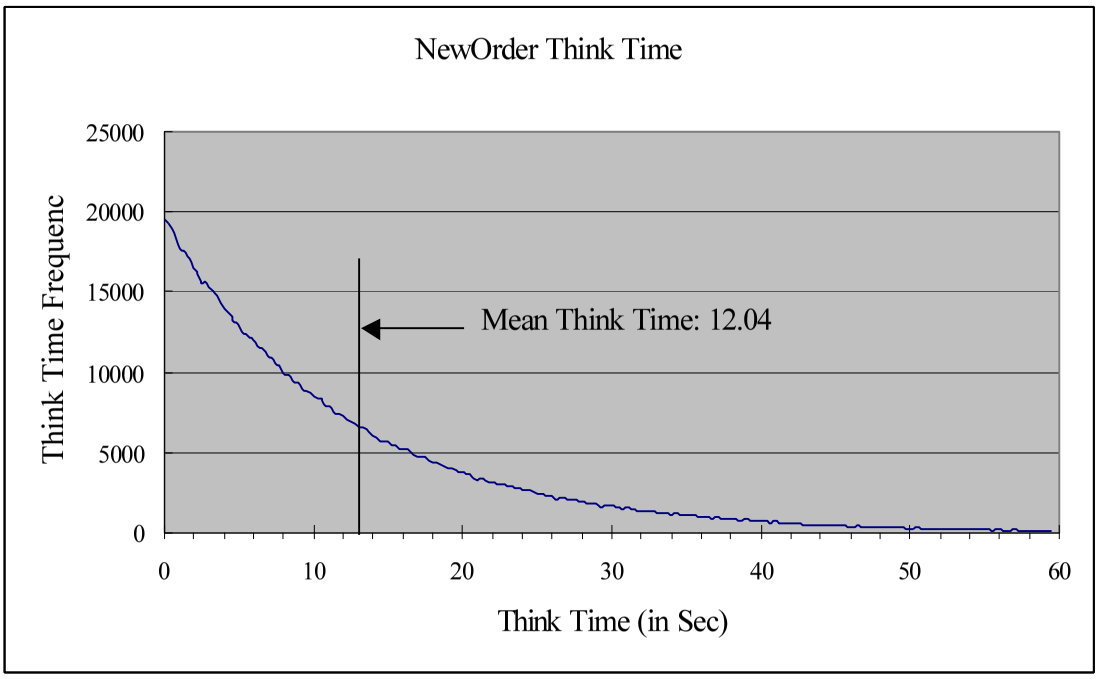
Figure 2.6 Response Time Performance vs. Throughput Curve



NEW-Order Think Time

Think Time frequency distribution curves (see Clause 5.6.3) must be reported for the New-Order transaction.

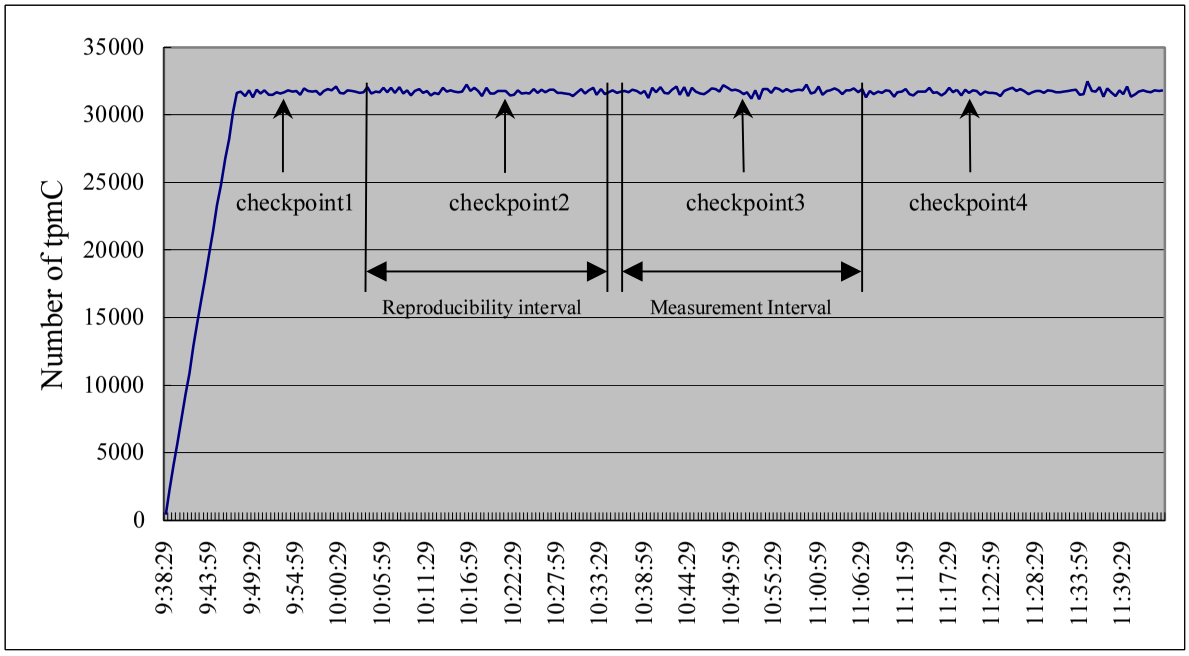
Figure 2.7 New-Order Think Time



New-Order Throughput vs. Elapsed Time

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

Figure 2.8 New Order Throughput vs. Time



Steady State

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 confirmed by the throughput data collected during the run and graphed in Figure 2.8.

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.

A checkpoint in Microsoft SQL Server writes to disk all updated memory pages that have not been yet actually written to disk. SQL Server recovery interval parameter was set to the maximum allowable value to perform checkpoint at specific intervals. A checkpoint script, which issues specified number of checkpoint at specified (30 minutes) intervals, was started after all users logged in and sending transactions.

Reproducibility

A description of the method used to determine the reproducibility of the measurement results must be reported.

The reproducibility test result is taken from another, non-overlapping, measurement interval of the same duration as the reported interval. The throughput difference measured over that interval was within 0.13% of reported interval result.

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 30 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.

The above statistics are disclosed in Table 1.

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.

Initial checkpoint was started 13 minutes after the start of ramp-up. Second checkpoint was started 30 minutes after the 1st checkpoint. And Third checkpoint was started 30 minutes after the 2nd checkpoint. The time from the start of the Measurement interval was 15.0 minutes after. In accord with Clause 5.5.22, there is no checkpoint within the "guard zones" 1800/4=450 seconds from the beginning and end of the measurement interval.

Clause 6 : SUT, Driver, and Communication Definition Related Items

Descriptions of RTE

The RTE input parameters, code fragments, functions, etc. used to generate each transaction input field must be disclosed.

The RTE used was the Microsoft BenchCraft RTE System. The RTE input parameters are listed in Appendix C.

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..

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. One tenth of a second (100 mil li seconds) was added to each transaction time to compensate for the overhead of the Web browser.

Functional Diagrams and Detail of Driver System

A complete functional diagram of both the benchmark configuration and the configuration of the proposed (targe t) 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 diagrams in figure 1.1 and 1.2 show the tested and priced benchmark configurati ons.

Network configurations and Driver system

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 replace d with the Driver System must be disclosed.

Figure 1.1 and 1.2 in this report has the network configurations of both the tested system and the priced system.

The front-end clients were connected over one 100Mbps 100Base-T Ethernet segments to the back-end. Each front-end client were connected to the RTE over seven 10Mbps 10Base-T Ethernet segments.

The priced PCs are also connected using 10Mbps Ethernet to the front-end clients.

Network Bandwidth

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

The Ethernet used in the local area network (LAN) between the emulated terminals and the front-end system compiles with the IEEE 802.3 standard and has a bandwidth of 10Mbps.

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 : Pricing Related Items

Hardware and Software Components

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 data. 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 5 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 detailed list of all hardware and software for the priced configuration is listed in the system pricing summary.

Availability

The committed delivery date for general availability (availability date) of products used in the price calculation must be reported. When the priced system included 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. The single date must be reported on the first page of the Executive Summary. All availability dates,whether for individual components or for the SUT as a whole, must be disclosed to a precision of one day.

All the components used in the priced system are currently available with the exception of:

NEC Express5800 140Hb will be available by July 30, 2000.
NEC 3U Disk Expansion Unit(14 slots) ADR-0802-IN-00 will be available by September 29, 2000.
Microsoft SQL Server 2000, Enterprise Edition will be available by Augast 1, 2000.

Throughput, and Price Performance

A statement of the measured tpmC as well as the respective calculations for the 5-year pricing, price/performance (price/tpmC), and the availability date must be included.

Maximum Qualified Throughput 31764.37 tpmC
Price per tpmC : $18.61 per tpmC
Total 5-yesr cost of ownership

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.

None

Clause 9 : Audit 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.

Next page contains the complete independent auditor's report by Francois Raab of Information Paradigm Inc. for the test described in this report.

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
c/o Shanley Public Relations
777 North First Street, Suite 6000
San Jose, CA 95112-6311
or your local NEC office.

Auditor's letter

INFO SIZING

TPC TRANSACTION PROCESSING PERFORMANCE COUNCIL CERTIFIED AUDITOR

Benchmark Sponsor: Eiichi Kenai
NEC Corporation
3rd Development Dept
3rd Computers Software Dept
Fuchu City Tokyo 183, Japan

June 15, 2000

I verified the TPC Benchmark™ C performance of the following Client Server configuration:

Platform:	**NEC Express5800/140Hb c/s**
Operating system:	**Microsoft Windows 2000 Advanced Server**
Database Manager:	**Microsoft SQL Server 2000 Enterprise Edition**
Transaction Manager:	**Microsoft COM+**

The results were:

CPU's Speed	Memory	Disks	NewOrder 90% Response Time	**tpmC**
Server: NEC Express5800/140Hb				
4 x Pentium III Xeon (700 MHz)	8 GB Main 2 MB L2-cache/cpu	281 x 9 GB 10 x 18 GB	0.30 Seconds	**31,764.37**
Four (4) Clients: NEC Express5800/120Ld (Specification for each)				
2 x Pentium III Xeon (866 MHz)	512 MB Main 256 KB L2-cache/cpu	1 x 9 GB	n/a	n/a

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

- The database records were the proper size
- The database was properly scaled and populated

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- The required ACID properties were met
- The transactions were correctly implemented
- Input data was generated according to the specified percentages
- The transaction cycle times included the required keying and think times
- The reported response times were correctly measured.
- All 90% response times were under the specified maximums
- At least 90% of all delivery transactions met the 80 Second completion time limit
- The reported measurement interval was 30 minutes (1800 seconds)
- The reported measurement interval was representative of steady state conditions
- One checkpoint was taken during the reported measurement interval
- The repeatability of the measured performance was verified
- The 180 day storage requirement was correctly computed
- The system pricing was verified for major components and maintenance

Additional Audit Notes:

None.

Respectfully Yours,

François Raab
President

1373 North Franklin Street •Colorado Springs, CO 80903 -2527 •Office: 719/473 -7555 •Fax: 719/473 -7554

Appendix A : Application Source Code

WEBCLNT.DSP

```
# Microsoft Developer Studio Project File- Name="webclnt" - Package
Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 5.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Application" 0x0101

CFG=webclnt - Win32 Release
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "Webclnt.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "Webclnt.mak" CFG="webclnt - Win32 Release"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "webclnt - Win32 Release" (based on "Win32 (x86) Application")
!MESSAGE "webclnt - Win32 Debug" (based on "Win32 (x86) Application")
!MESSAGE

# Begin Project
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "webclnt - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir ".\Release"
# PROP BASE Intermediate_Dir "\Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\Release"
# PROP Intermediate_Dir "\Release"
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /c
# ADD CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS"
/YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspoollib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /machine:I386

!ELSEIF  "$(CFG)" == "webclnt - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir ".\Debug"
# PROP BASE Intermediate_Dir "\Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\Debug"
# PROP Intermediate_Dir "\Debug"
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
"_WINDOWS" /YX /c
# ADD CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /debug /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /debug /machine:I386

!ENDIF

# Begin Target

# Name "webclnt - Win32 Release"
# Name "webclnt - Win32 Debug"
# End Target
# End Project
```

WEBCLNT.DSW

```
Microsoft Developer Studio Workspace File, Format Version 6.00
# WARNING: DO NOT EDIT OR DELETE THIS WORKSPACE FILE!

###############################################################################

Project: "db_dblib_dll"=.\db_dblib_dll\db_dblib_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "db_odbc_dll"=.\db_odbc_dll\db_odbc_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "install"=.\install\install.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name isapi_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tuxapp
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_dblib_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_odbc_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_com_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_tuxedo_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tpcc_com_all
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tpcc_com_ps
    End Project Dependency
}}}

###############################################################################

Project: "isapi_dll"=.\isapi_dll\isapi_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name db_dblib_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_odbc_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_tuxedo_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_com_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_encina_dll
    End Project Dependency
}}}

###############################################################################
```

```
Project: "tm_com_dll"=.\tm_com_dll\tm_com_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
   Begin Project Dependency
   Project_Dep_Name tpcc_com_ps
   End Project Dependency
   Begin Project Dependency
   Project_Dep_Name tpcc_com_all
   End Project Dependency
}}}

###############################################################################

Project: "tm_encina_dll"=.\tm_encina_dll\tm_encina_dll.dsp - Package
Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "tm_tuxedo_dll"=.\tm_tuxedo_dll\tm_tuxedo_dll.dsp - Package
Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "tpcc_com_all"=.\tpcc_com_all\tpcc_com_all.dsp - Package
Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
   Begin Project Dependency
   Project_Dep_Name tpcc_com_ps
   End Project Dependency
}}}

###############################################################################

Project: "tpcc_com_ps"=.\tpcc_com_ps\tpcc_com_ps.dsp - Package
Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "tuxapp"=.\tuxapp\tuxapp.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
   Begin Project Dependency
   Project_Dep_Name db_dblib_dll
   End Project Dependency
   Begin Project Dependency
   Project_Dep_Name db_odbc_dll
   End Project Dependency
}}}

###############################################################################

Global:

Package=<5>
{{{
}}}

Package=<3>
{{{
}}}

###############################################################################
```

INSTALL.DSP

```
# Microsoft Developer Studio Project File- Name="install" - Package
Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Application" 0x0101

CFG=install - Win32 Release
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "install.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "install.mak" CFG="install - Win32 Release"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "install - Win32 Release" (based on "Win32 (x86) Application")
!MESSAGE "install - Win32 Debug" (based on "Win32 (x86) Application")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "install - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir ".\Release"
# PROP BASE Intermediate_Dir ".\Release"
# PROP BASE Target_Dir "."
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir "."
# ADD BASE CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /c
# ADD CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS"
/YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /machine:I386
# ADD LINK32 version.lib comctl32.lib kernel32.lib user32.lib gdi32.lib
winspool.lib comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib
odbc32.lib odbccp32.lib /nologo /subsystem:windows /machine:I386
/out:"..\bin\install.exe"

!ELSEIF  "$(CFG)" == "install - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir ".\Debug"
# PROP BASE Intermediate_Dir ".\Debug"
# PROP BASE Target_Dir "."
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir "."
# ADD BASE CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
"_WINDOWS" /YX /c
# ADD CPP /nologo /W3 /Gm /GX /ZI /Od /D "WIN32" /D "_DEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /debug /machine:I386
# ADD LINK32 version.lib comctl32.lib kernel32.lib user32.lib gdi32.lib
winspool.lib comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib
odbc32.lib odbccp32.lib /nologo /subsystem:windows /debug /machine:I386
/out:"..\bin\install.exe"

!ENDIF

# Begin Target
```

```
# Name "install - Win32 Release"
# Name "install - Win32 Debug"
# Begin Group "Source Files"

# PROP Default_Filter "cpp;c;cxx;rc;def;r;odl;hpj;bat;for;f90"
# Begin Source File

SOURCE=.\src\install.c
# End Source File
# Begin Source File

SOURCE=.\src\install.rc
# ADD BASE RSC /l 0x409 /i "src"
# ADD RSC /l 0x409 /i "src" /i "..\src"
# End Source File
# Begin Source File

SOURCE=.\src\install_com.cpp
# End Source File
# End Group
# Begin Group "Header Files"

# PROP Default_Filter "h;hpp;hxx;hm;inl;fi;fd"
# End Group
# Begin Group "Resource Files"

# PROP Default_Filter "ico;cur;bmp;dlg;rc2;rct;bin;cnt;rtf;gif;jpg;jpeg;jpe"
# Begin Source File

SOURCE=.\SRC\ICON1.ICO
# End Source File
# Begin Source File

SOURCE=.\SRC\ICON2.ICO
# End Source File
# End Group
# Begin Source File

SOURCE=.\SRC\LICENSE.TXT
# End Source File
# Begin Source File

SOURCE=..\isapi_dll\bin\tpcc.dll
# End Source File
# Begin Source File

SOURCE=..\tm_com_dll\bin\tpcc_com.dll
# End Source File
# Begin Source File

SOURCE=..\tpcc_com_all\bin\tpcc_com_all.dll
# End Source File
# Begin Source File

SOURCE=..\tpcc_com_ps\bin\tpcc_com_ps.dll
# End Source File
# Begin Source File

SOURCE=..\db_dblib_dll\bin\tpcc_dblib.dll
# End Source File
# Begin Source File

SOURCE=..\db_odbc_dll\bin\tpcc_odbc.dll
# End Source File
# Begin Source File

SOURCE=..\tm_tuxedo_dll\bin\tpcc_tuxedo.dll
# End Source File
# Begin Source File

SOURCE=..\tuxapp\bin\tuxapp.exe
# End Source File
# End Target
# End Project
```

ISAPI_DLL.DSP

```
# Microsoft Developer Studio Project File- Name="isapi_dll" - Package
Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

CFG=isapi_dll - Win32 IceCAP
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "isapi_dll.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "isapi_dll.mak" CFG="isapi_dll - Win32 IceCAP"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "isapi_dll - Win32 Release" (based on "Win32 (x86) Dynamic-Link
Library")
!MESSAGE "isapi_dll - Win32 Debug" (based on "Win32 (x86) Dynamic-Link
Library")
!MESSAGE "isapi_dll - Win32 IceCAP" (based on "Win32 (x86) Dynamic-Link
Library")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "isapi_dll - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD CPP /nologo /MD /W3 /GX /O2 /D "NDEBUG" /D "WIN32" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386
# ADD
LINK32 ..\common\txnlog\lib\release\rtetime.lib ..\common\txnlog\lib\release\spi
nlock.lib ..\common\txnlog\lib\release\error.lib ..\common\txnlog\lib\release\txnlo
g.lib wsock32.lib kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386 /out:".\bin/tpcc.dll"

!ELSEIF  "$(CFG)" == "isapi_dll - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG"
/D "_WINDOWS" /YX /FD /c
# ADD CPP /nologo /MDd /W3 /GX /ZI /Od /D "_DEBUG" /D "WIN32" /D
"_WINDOWS" /FR /YX /FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /pdbtype:sept
# ADD
LINK32 ..\common\txnlog\lib\debug\rtetime.lib ..\common\txnlog\lib\debug\spinlo
ck.lib ..\common\txnlog\lib\debug\error.lib ..\common\txnlog\lib\debug\txnlog.lib
wsock32.lib kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc.dll"
/pdbtype:sept
# SUBTRACT LINK32 /profile /pdb:none

!ELSEIF  "$(CFG)" == "isapi_dll - Win32 IceCAP"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "isapi_dll"
# PROP BASE Intermediate_Dir "isapi_dll"
# PROP BASE Ignore_Export_Lib 0
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MDd /W3 /GX /Zi /Od /D "_DEBUG" /D "WIN32" /D
"_WINDOWS" /FR /YX /FD /Gh /c
# ADD CPP /nologo /MD /W3 /GX /Zi /O2 /D "NDEBUG" /D "ICECAP" /D
"WIN32" /D "_WINDOWS" /FR /YX /FD /Gh /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc.dll"
```

```
/pdbtype:sept
# SUBTRACT BASE LINK32 /profile /pdb:none
# ADD LINK32
icap.lib ..\common\txnlog\lib\release\rtetime.lib ..\common\txnlog\lib\release\spin
lock.lib ..\common\txnlog\lib\release\error.lib ..\common\txnlog\lib\release\txnlog.
lib wsock32.lib kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc.dll"
/pdbtype:sept
# SUBTRACT LINK32 /profile /pdb:none /map

!ENDIF

# Begin Target

# Name "isapi_dll - Win32 Release"
# Name "isapi_dll - Win32 Debug"
# Name "isapi_dll - Win32 IceCAP"
# Begin Group "Source"

# PROP Default_Filter "*.cpp, *.def, *.rc"
# Begin Source File

SOURCE=.\src\tpcc.cpp
# End Source File
# Begin Source File

SOURCE=.\src\tpcc.def
# End Source File
# Begin Source File

SOURCE=.\src\tpcc.rc
# End Source File
# End Group
# Begin Group "Header Files"

# PROP Default_Filter "*.h, *.hpp"
# Begin Source File

SOURCE=..\common\src\error.h
# End Source File
# Begin Source File

SOURCE=..\common\src\ReadRegistry.h
# End Source File
# Begin Source File

SOURCE=.\src\tpcc.h
# End Source File
# Begin Source File

SOURCE=..\db_dblib_dll\src\tpcc_dblib.h
# End Source File
# Begin Source File

SOURCE=..\db_odbc_dll\src\tpcc_odbc.h
# End Source File
# Begin Source File

SOURCE=..\tm_tuxedo_dll\src\tpcc_tux.h
# End Source File
# Begin Source File

SOURCE=..\common\src\trans.h
# End Source File
# Begin Source File

SOURCE=..\common\src\txn_base.h
# End Source File
# End Group
# End Target
# End Project
```

DB_DBLIB_DLL.DSP

```
# Microsoft Developer Studio Project File - Name="db_dblib_dll" - Package
Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

CFG=db_dblib_dll - Win32 IceCAP
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "db_dblib_dll.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "db_dblib_dll.mak" CFG="db_dblib_dll - Win32 IceCAP"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "db_dblib_dll - Win32 Release" (based on "Win32 (x86) Dynamic-
Link Library")
!MESSAGE "db_dblib_dll - Win32 Debug" (based on "Win32 (x86) Dynamic-
Link Library")
!MESSAGE "db_dblib_dll - Win32 IceCAP" (based on "Win32 (x86) Dynamic-
Link Library")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "db_dblib_dll - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD CPP /nologo /MD /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386
# ADD LINK32 ntwdblib.lib kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib /nologo
/subsystem:windows /dll /machine:I386 /out:".\bin/tpcc_dblib.dll"

!ELSEIF  "$(CFG)" == "db_dblib_dll - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG"
/D "_WINDOWS" /YX /FD /c
# ADD CPP /nologo /MDd /W3 /Gm /GX /ZI /Od /D "WIN32"/D "_DEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine :I386 /pdbtype:sept
# ADD LINK32 ntwdblib.lib kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib /nologo
/subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_dblib.dll"
/pdbtype:sept

!ELSEIF  "$(CFG)" == "db_dblib_dll - Win32 IceCAP"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "db_dblib"
# PROP BASE Intermediate_Dir "db_dblib"
# PROP BASE Ignore_Export_Lib 0
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MDd /W3 /Gm /GX /Zi /Od /D "WIN32" /D
"_DEBUG" /D "_WINDOWS" /YX /FD /Gh /c
# ADD CPP /nologo /MD /W3 /Gm /GX /Zi /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /D "ICECAP" /YX /FD /Gh /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 ntwdblib.lib kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib /nologo
/subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_dblib.dll"
/pdbtype:sept
# ADD LINK32 icap.lib ntwdblib.lib kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib /nologo
/subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_dblib.dll"
/pdbtype:sept

!ENDIF

# Begin Target
```

```
# Name "db_dblib_dll - Win32 Release"
# Name "db_dblib_dll - Win32 Debug"
# Name "db_dblib_dll - Win32 IceCAP"
# Begin Group "Source"

# PROP Default_Filter "*.cpp"
# Begin Source File

SOURCE=.\src\tpcc_dblib.cpp
# End Source File
# End Group
# Begin Group "Header"

# PROP Default_Filter "*.h"
# Begin Source File

SOURCE=..\common\src\error.h
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_dblib.h
# End Source File
# Begin Source File

SOURCE=..\common\src\trans.h
# End Source File
# Begin Source File

SOURCE=..\common\src\txn_base.h
# End Source File
# End Group
# End Target
# End Project
```

TM_COM_DLL.DSP

```
# Microsoft Developer Studio Project File - Name="tm_com_dll" - Package
Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

CFG=tm_com_dll - Win32 Debug
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "tm_com_dll.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "tm_com_dll.mak" CFG="tm_com_dll - Win32 Debug"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "tm_com_dll - Win32 Release" (based on "Win32 (x86) Dynamic-
Link Library")
!MESSAGE "tm_com_dll - Win32 Debug" (based on "Win32 (x86) Dynamic-Link
Library")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "tm_com_dll - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD CPP /nologo /MD /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386 /out:".\bin/tpcc_com.dll"

!ELSEIF  "$(CFG)" == "tm_com_dll - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG"
/D "_WINDOWS" /YX /FD /c
# ADD CPP /nologo /MDd /W3 /Gm /GX /ZI /Od /D "WIN32" /D "_DEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /pdbtype:sept
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_com.dll"
/pdbtype:sept

!ENDIF

# Begin Target

# Name "tm_com_dll - Win32 Release"
# Name "tm_com_dll - Win32 Debug"
# Begin Source File

SOURCE=.\src\tpcc_com.cpp
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com.h
# End Source File
# End Target
# End Project
```

TPCC_COM_ALL.DSP

```
# Microsoft Developer Studio Project File- Name="tpcc_com_all" - Package
Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

CFG=tpcc_com_all - Win32 Debug
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "tpcc_com_all.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "tpcc_com_all.mak" CFG="tpcc_com_all - Win32
Debug"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "tpcc_com_all - Win32 Release" (based on "Win32 (x86) Dynamic-
Link Library")
!MESSAGE "tpcc_com_all - Win32 Debug" (based on "Win32 (x86) Dynamic-
Link Library")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "tpcc_com_all - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
```

```
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386
# ADD LINK32 ..\db_dblib_dll\bin\tpcc_dblib.lib ..\db_odbc_dll\bin\tpcc_odbc.lib
kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib advapi32.lib
shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib /nologo
/subsystem:windows /dll /machine:I386

!ELSEIF  "$(CFG)" == "tpcc_com_all - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG"
/D "_WINDOWS" /YX /FD /c
# ADD CPP /nologo /MTd /W3 /Gm /GX /ZI /Od /D "WIN32" /D "_DEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL"/win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /pdbtype:sept
# ADD LINK32 ..\db_dblib_dll\bin\tpcc_dblib.lib ..\db_odbc_dll\bin\tpcc_odbc.lib
kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib advapi32.lib
shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib /nologo
/subsystem:windows /dll /debug /machine:I386 /pdbtype:sept

!ENDIF

# Begin Target

# Name "tpcc_com_all - Win32 Release"
# Name "tpcc_com_all - Win32 Debug"
# Begin Group "Source"

# PROP Default_Filter "*.cpp, *.c"
# Begin Source File

SOURCE=.\src\tpcc_com_all.cpp
# SUBTRACT CPP /YX
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_all.def
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_all.idl

!IF  "$(CFG)" == "tpcc_com_all - Win32 Release"

# PROP Ignore_Default_Tool 1
# Begin Custom Build - Performing MIDL step
InputPath=.\src\tpcc_com_all.idl

BuildCmds= \
        midl /Oicf /h "tpcc_com_all.h" /iid "tpcc_com_all_i.c"
".\src\tpcc_com_all.idl"   /out ".\src"

".\src\tpcc_com_all.tlb" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\tpcc_com_all.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\tpcc_com_all_i.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)
# End Custom Build

!ELSEIF  "$(CFG)" == "tpcc_com_all - Win32 Debug"

# PROP Ignore_Default_Tool 1
# Begin Custom Build - Performing MIDL step
InputPath=.\src\tpcc_com_all.idl

BuildCmds= \
        midl /Oicf /h "tpcc_com_all.h" /iid "tpcc_com_all_i.c"
".\src\tpcc_com_all.idl"   /out ".\src"

".\src\tpcc_com_all.tlb" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\tpcc_com_all.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\tpcc_com_all_i.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)
# End Custom Build

!ENDIF

# End Source File
# End Group
# Begin Group "Header"

# PROP Default_Filter "*.h"
# Begin Source File

SOURCE=.\src\Methods.h
# End Source File
# Begin Source File

SOURCE=.\src\resource.h
# End Source File
# End Group
# Begin Source File

SOURCE=.\src\tpcc_com_all.rc
# End Source File
# End Target
# End Project
```

TPCC_COM_PS.DSP

```
# Microsoft Developer Studio Project File- Name="tpcc_com_ps" - Package
Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Application" 0x0101

CFG=tpcc_com_ps - Win32 Debug
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "tpcc_com_ps.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "tpcc_com_ps.mak" CFG="tpcc_com_ps - Win32
Debug"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "tpcc_com_ps - Win32 Release" (based on "Win32 (x86)
Application")
!MESSAGE "tpcc_com_ps - Win32 Debug" (based on "Win32 (x86)
Application")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "tpcc_com_ps - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
_WIN32_WINNT=0x0400 /D "REGISTER_PROXY_DLL" /FD /c
# SUBTRACT CPP /YX
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 ó "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /machine:I386
# ADD LINK32 kernel32.lib rpcndr.lib rpcns4.lib rpcrt4.lib oleaut32.lib uuid.lib
/nologo /entry:"DllMain" /subsystem:windows /dll /pdb:none /machine:I386
/def:".\src\tpcc_com_ps.def"
# Begin Custom Build - Copying tpcc_com_ps.h
InputPath=.\bin\tpcc_com_ps.dll
SOURCE="$(InputPath)"

"..\tpcc_com_all\src\tpcc_com_ps.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
        copy    .\src\tpcc_com_ps.h    ..\tpcc_com_all\src\

# End Custom Build

!ELSEIF  "$(CFG)" == "tpcc_com_ps - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
```

```
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD CPP /nologo /ZI /Od /D "WIN32" /D "_DEBUG" /D
_WIN32_WINNT=0x0400 /D "REGISTER_PROXY_DLL" /FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /debug /machine:I386 /pdbtype:sept
# ADD LINK32 kernel32.lib rpcndr.lib rpcns4.lib rpcrt4.lib oleaut32.lib uuid.lib
/nologo /entry:"DllMain" /dll /debug /machine:IX86 /def:". \src\tpcc_com_ps.def"
/pdbtype:sept
# SUBTRACT LINK32 /pdb:none
# Begin Custom Build - Copying tpcc_com_ps.h
InputPath=.\bin\tpcc_com_ps.dll
SOURCE="$(InputPath)"

"..\tpcc_com_all\src\tpcc_com_ps.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
                copy    .\src\tpcc_com_ps.h    ..\tpcc_com_all\src\

# End Custom Build

!ENDIF

# Begin Target

# Name "tpcc_com_ps - Win32 Release"
# Name "tpcc_com_ps - Win32 Debug"
# Begin Group "Source"

# PROP Default_Filter ""
# Begin Source File

SOURCE=.\src\dlldata.c
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_ps.def
# PROP Exclude_From_Build 1
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_ps.idl

!IF  "$(CFG)" == "tpcc_com_ps - Win32 Release"

# PROP Ignore_Default_Tool 1
# Begin Custom Build
InputPath=.\src\tpcc_com_ps.idl

BuildCmds= \
                midl /Oicf /h "tpcc_com_ps.h" /iid "tpcc_com_ps_i.c"
".\src\tpcc_com_ps.idl"    /out ".\src"

".\src\tpcc_com_ps.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\tpcc_com_ps_i.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\dlldata.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\tpcc_com_ps_p.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)
# End Custom Build

!ELSEIF  "$(CFG)" == "tpcc_com_ps - Win32 Debug"

# PROP Ignore_Default_Tool 1
# Begin Custom Build
InputPath=.\src\tpcc_com_ps.idl

BuildCmds= \
                midl /Oicf /h "tpcc_com_ps.h" /iid "tpcc_com_ps_i.c"
".\src\tpcc_com_ps.idl"    /out ".\src"

".\src\tpcc_com_ps.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\tpcc_com_ps_i.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\dlldata.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)

".\src\tpcc_com_ps_p.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
  $(BuildCmds)
# End Custom Build

!ENDIF

# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_ps_i.c
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_ps_p.c
# End Source File
# End Group
# End Target
# End Project
```

install\src\install.c

```
/*              FILE:                   INSTALL.C
 *                                                      Microsoft TPC-C Kit Ver.
4.20.000
 *                                                      Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                                      not audited
 *
 *              PURPOSE:  Automated installation application for TPC-C Web Kit
 *              Contact:      Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                          4.20.000 - added COM installation steps
 */

#include <windows.h>
#include <direct.h>
#include <io.h>
#include <stdlib.h>
#include <stdio.h>
#include <commctrl.h>
#include "..\..\common\src\ReadRegistry.h"

#include "resource.h"

#define         WM_INITTEXT                     WM_USER+100
HICON                   hIcon;
HINSTANCEhInst;

DWORD                           versionExeMS;
DWORD                           versionExeLS;
DWORD                           versionExeMM;
DWORD                           versionDllMS;
DWORD                           versionDllLS;

// TPC-C registry settings
TPCCREGISTRYDATA    Reg;

static          int                     iPoolThreadLimit;
static          int                     iThreadTimeout;
static          int                     iListenBackLog;
static          int                     iAcceptExOutstanding;

static          int                     iMaxPhysicalMemory;
                //max physical memory in MB
static          char            szLastFileName[64];             // last file we
worked on (for error reporting)


BOOL            CALLBACK  LicenseDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam);
BOOL            CALLBACK  UpdatedDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam);
BOOL            CALLBACK  MainDlgProc(HWND hwnd, UINT uMsg, WPARAM
wParam, LPARAM lParam);
BOOL            CALLBACK  CopyDlgProc(HWND hwnd, UINT uMsg, WPARAM
wParam, LPARAM lParam);
static          void                    ProcessOK(HWND hwnd, char
*szDllPath);
static          void                    ReadRegistrySettings(void);
static          void                    WriteRegistrySettings(char *szDllPath);
static          BOOL                    RegisterDLL(char *szFileName);
static          int                             CopyFiles(HWND hDlg,
char *szDllPath);
static          BOOL                    GetInstallPath(char *szDllPath);
static          void                    GetVersionInfo(char *szDLLPath, char
*szExePath);
static          BOOL                    CheckWWWebService(void);
static          BOOL                    StartWWWebService(void);
static          BOOL                    StopWWWebService(void);
static          void                    UpdateDialog(HWND hDlg);

BOOL install_com(char *szDllPath);

#include "..\..\common\src\ReadRegistry.cpp"

int WINAPI WinMain( HINSTANCE hInstance, HINSTANCE hPrevInstance,
LPSTR lpCmdLine, int nCmdShow )
{
                int iRc;

                hInst = hInstance;

                InitCommonControls();

                hIcon = LoadIcon(hInstance,MAKEINTRESOURCE(IDI_ICON1));

                iRc = DialogBox(hInstance, MAKEINTRESOURCE(IDD_DIALOG4),
GetDesktopWindow(), LicenseDlgProc);
                if ( iRc )
                {
                                iRc = DialogBox(hInstance,
MAKEINTRESOURCE(IDD_DIALOG1), GetDesktopWindow(), MainDlgProc);
                                if ( iRc )
                                {
                                                DialogBoxParam(hInstance,
MAKEINTRESOURCE(IDD_DIALOG2), GetDesktopWindow(), UpdatedDlgProc,
(LPARAM)iRc);
```

```
                }
        }

        DestroyIcon(hIcon);
        return 0;
}

BOOL CALLBACK LicenseDlgProc(HWND hwnd, UINT uMsg, WPARAM
wParam, LPARAM lParam)
{
        HGLOBAL                 hRes;
        HRSRC                   hResInfo;
        BYTE                    *pSrc, *pDst;
        DWORD                   dwSize;
        static HFONT            hFont;

        switch(uMsg)
        {
                case WM_INITDIALOG:
                        hFont = CreateFont(-12, 0, 0, 0, 400, 0,
0, 0, 0, 0, 0, 0, 0, "Arial");
                        SendMessage( GetDlgItem(hwnd,
IDR_LICENSE1), WM_SETFONT, (WPARAM)hFont, MAKELPARAM(0, 0) );
                        PostMessage(hwnd, WM_INITTEXT,
(WPARAM)0, (LPARAM)0);
                        return TRUE;
                case WM_INITTEXT:
                        hResInfo = FindResource(hInst,
MAKEINTRESOURCE(IDR_LICENSE1), "LICENSE");
                        dwSize = SizeofResource(hInst,
hResInfo);
                        hRes = LoadResource(hInst, hResInfo );
                        pSrc = (BYTE *)LockResource(hRes);
                        pDst = (unsigned char
*)malloc(dwSize+1);
                        if ( pDst )
                        {
                                memcpy(pDst, pSrc,
dwSize);
                                pDst[dwSize] = 0;
                                SetDlgItemText(hwnd,
IDC_LICENSE, (const char *)pDst);
                                free(pDst);
                        }
                        else
                                SetDlgItemText(hwnd,
IDC_LICENSE, (const char *)pSrc);
                        return TRUE;
                case WM_DESTROY:
                        DeleteObject(hFont);
                        return TRUE;
                case WM_COMMAND:
                        if ( wParam == IDOK )
                                EndDialog(hwnd, TRUE);
                        if ( wParam == IDCANCEL )
                                EndDialog(hwnd, FALSE);
                default:
                        break;
        }
        return FALSE;
}

BOOL CALLBACK UpdatedDlgProc(HWND hwnd, UINT uMsg, WPARAM
wParam, LPARAM lParam)
{
        switch(uMsg)
        {
                case WM_INITDIALOG:
                        switch(lParam)
                        {
                                case 1:
                                case 2:
                                        SetDlgItemText(hwnd, IDC_RESULTS, "TPC-C Web Client
Installed");
                                        break;
                        }
                        return TRUE;
                case WM_COMMAND:
                        if ( wParam == IDOK )
                                EndDialog(hwnd, TRUE);
                        break;
                default:
                        break;
        }
        return FALSE;
}

BOOL CALLBACK MainDlgProc(HWND hwnd, UINT uMsg, WPARAM wParam,
LPARAM lParam)
{
        PAINTSTRUCT             ps;
        MEMORYSTATUS            memoryStatus;
        OSVERSIONINFO           VI;
        char                    szTmp[256];
        static char             szDllPath[256];
        static char             szExePath[256];

        switch(uMsg)
        {
                case WM_INITDIALOG:
                        GlobalMemoryStatus(&memoryStatus);
                        iMaxPhysicalMemory      =
(memoryStatus.dwTotalPhys/ 1048576);

                        if ( GetInstallPath(szDllPath) )
                        {
                                MessageBox(hwnd, "Error
internet service inetsrv is not installed.", NULL, MB_ICONSTOP | MB_OK);
                                EndDialog(hwnd, FALSE);
                                return TRUE;
                        }

                        // set default values
                        ZeroMemory( &Reg, sizeof(Reg) );
                        Reg.dwNumberOfDeliveryThreads = 4;
                        Reg.dwMaxConnections = 100;
                        Reg.dwMaxPendingDeliveries
        = 100;
                        Reg.eDB_Protocol = DBLIB;
                        Reg.eTxnMon = None;
                        strcpy(Reg.szDbServer,
        "");
                        strcpy(Reg.szDbName,
        "tpcc");
                        strcpy(Reg.szDbUser,
        "sa");
                        strcpy(Reg.szDbPassword,
        "");

                        iPoolThreadLimit =
iMaxPhysicalMemory * 2;
                        iThreadTimeout = 86400;
                        iListenBackLog = 15;
                        iAcceptExOutstanding = 40;

                        ReadTPCCRegistrySettings( &Reg );
                        ReadRegistrySettings();

                        GetModuleFileName(hInst, szExePath,
sizeof(szExePath));
                        GetVersionInfo(szDllPath, szExePath);

                        wsprintf(szTmp,
"Version %d.%2.2d.%3.3d", versionExeMS, versionExeMM, versionExeLS);
                        SetDlgItemText(hwnd, IDC_VERSION,
szTmp);

                        SetDlgItemText(hwnd, IDC_PATH,
szDllPath);

                        SetDlgItemText(hwnd,
ED_DB_SERVER, Reg.szDbServer);
                        SetDlgItemText(hwnd,
ED_DB_USER_ID, Reg.szDbUser);
                        SetDlgItemText(hwnd,
ED_DB_PASSWORD, Reg.szDbPassword);
                        SetDlgItemText(hwnd, ED_DB_NAME,
Reg.szDbName);

                        SetDlgItemInt(hwnd, ED_THREADS,
Reg.dwNumberOfDeliveryThreads, FALSE);
                        SetDlgItemInt(hwnd,
ED_MAXCONNECTION, Reg.dwMaxConnections, FALSE);
                        SetDlgItemInt(hwnd,
ED_MAXDELIVERIES, Reg.dwMaxPendingDeliveries, FALSE);
                        SetDlgItemInt(hwnd,
ED_IIS_MAX_THEAD_POOL_LIMIT, iPoolThreadLimit, FALSE);
                        SetDlgItemInt(hwnd,
ED_IIS_THREAD_TIMEOUT, iThreadTimeout, FALSE);
                        SetDlgItemInt(hwnd,
ED_IIS_LISTEN_BACKLOG, iListenBackLog, FALSE);
                        SetDlgItemInt(hwnd,
ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE, iAcceptExOutstanding,
FALSE);

                        CheckDlgButton(hwnd, IDC_DBLIB, 0);
                        CheckDlgButton(hwnd, IDC_ODBC,  0);
                        if ( Reg.eDB_Protocol == DBLIB )
                                CheckDlgButton(hwnd,
IDC_DBLIB, 1);
                        else
                                CheckDlgButton(hwnd,
IDC_ODBC,  1);

                        // check OS version level for COM.
Must be at least Windows 2000
                        VI.dwOSVersionInfoSize = sizeof(VI);
                        GetVersionEx( &VI );
                        if (VI.dwMajorVersion < 5)
                        {
                                HWND hDlg =
GetDlgItem( hwnd, IDC_TM_MTS );
                                EnableWindow( hDlg, 0 );
                // disable COM option
                                if (Reg.eTxnMon == COM)
                Reg.eTxnMon = None;
                        }

                        CheckDlgButton(hwnd, IDC_TM_NONE,
0);
                        CheckDlgButton(hwnd,
IDC_TM_TUXEDO, 0);
                        CheckDlgButton(hwnd, IDC_TM_MTS,
0);
                        CheckDlgButton(hwnd,
IDC_TM_ENCINA,          0);
                        switch (Reg.eTxnMon)
                        {
                        case None:
                                CheckDlgButton(hwnd,
IDC_TM_NONE,   1);
                                break;
                        case TUXEDO:
                                CheckDlgButton(hwnd,
```

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IDC_TM_TUXEDO, 1);
                                        break;
                                case ENCINA:
                                        CheckDlgButton(hwnd,
IDC_TM_ENCINA, 1);
                                        break;
                                case COM:
                                        CheckDlgButton(hwnd,
IDC_TM_MTS,             1);
                                        break;
                                }

                                return TRUE;
                        case WM_PAINT:
                                if ( IsIconic(hwnd) )
                                {
                                        BeginPaint(hwnd, &ps);
                                        DrawIcon(ps.hdc, 0, 0,
hIcon);
                                        EndPaint(hwnd, &ps);
                                        return TRUE;
                                }
                                break;
                        case WM_COMMAND:
                                if ( HIWORD(wParam) ==
BN_CLICKED )
                                {

                switch( LOWORD(wParam) )
                                        {
                                                case
IDC_DBLIB:

                return TRUE;
                                                case
IDC_ODBC:

                return TRUE;
                                                case IDOK:

                ProcessOK(hwnd, szDllPath);

                return TRUE;
                                                case
IDCANCEL:

                EndDialog(hwnd, FALSE);

                return TRUE;
                                                default:

                return FALSE;
                                        }
                                }
                                break;
                        default:
                                break;
                }
                return FALSE;
}

static void ProcessOK(HWND hwnd, char *szDllPath)
{
                int                     d;
                HWND    hDlg;
                int                     rc;

                char    szFullName[256];
                char    szErrTxt[128];

                // read settings from dialog
                Reg.dwNumberOfDeliveryThreads  = GetDlgItemInt(hwnd,
ED_THREADS, &d, FALSE);
                Reg.dwMaxConnections = GetDlgItemInt(hwnd,
ED_MAXCONNECTION, &d, FALSE);
                Reg.dwMaxPendingDeliveries = GetDlgItemInt(hwnd,
ED_MAXDELIVERIES, &d, FALSE);

                GetDlgItemText(hwnd, ED_DB_SERVER, Reg.szDbServer,
sizeof(Reg.szDbServer));
                GetDlgItemText(hwnd, ED_DB_USER_ID, Reg.szDbUser,
sizeof(Reg.szDbUser));
                GetDlgItemText(hwnd, ED_DB_PASSWORD, Reg.szDbPassword,
sizeof(Reg.szDbPassword));
                GetDlgItemText(hwnd, ED_DB_NAME, Reg.szDbName,
sizeof(Reg.szDbName));

                if ( IsDlgButtonChecked(hwnd, IDC_DBLIB) )
                {
                        Reg.eDB_Protocol = DBLIB;
                        rc = 1;
                }
                else if ( IsDlgButtonChecked(hwnd, IDC_ODBC) )
                {
                        Reg.eDB_Protocol = ODBC;
                        rc = 2;
                }

                if ( IsDlgButtonChecked(hwnd, IDC_TM_NONE) )
                        Reg.eTxnMon = None;
                else if ( IsDlgButtonChecked(hwnd, IDC_TM_TUXEDO) )
                        Reg.eTxnMon = TUXEDO;
                else if ( IsDlgButtonChecked(hwnd, IDC_TM_MTS) )
                        Reg.eTxnMon = COM;
                else if ( IsDlgButtonChecked(hwnd, IDC_TM_ENCINA) )
                        Reg.eTxnMon = ENCINA;

                iPoolThreadLimit = GetDlgItemInt(hwnd,
ED_IIS_MAX_THEAD_POOL_LIMIT, &d, FALSE);
                iThreadTimeout = GetDlgItemInt(hwnd,
ED_IIS_THREAD_TIMEOUT,          &d, FALSE);
                iListenBackLog = GetDlgItemInt(hwnd,
ED_IIS_LISTEN_BACKLOG, &d, FALSE);
                iAcceptExOutstanding = GetDlgItemInt(hwnd,
ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE, &d, FALSE);


                ShowWindow(hwnd, SW_HIDE);
                hDlg = CreateDialog(hInst, MAKEINTRESOURCE(IDD_DIALOG3),
hwnd, CopyDlgProc);
                ShowWindow(hDlg, SW_SHOWNA);
                UpdateDialog(hDlg);


                // write binaries to inetpub\wwwroot
                rc = CopyFiles(hDlg, szDllPath);
                if ( !rc )
                {
                        ShowWindow(hwnd, SW_SHOWNA);
                        DestroyWindow(hDlg);
                        strcpy( szErrTxt, "Error(s) occured when creating " );
                        strcat( szErrTxt, szLastFileName );
                        MessageBox(hwnd, szErrTxt, NULL, MB_ICONSTOP
| MB_OK);
                        EndDialog(hwnd, 0);
                        return;
                }

                // update registry
                SetDlgItemText(hDlg, IDC_STATUS, "Updating Registry.");
                SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
                UpdateDialog(hDlg);
                WriteRegistrySettings(szDllPath);

                // register com proxy stub
                strcpy(szFullName, szDllPath);
                strcat(szFullName, "tpcc_com_ps.dll");
                if (!RegisterDLL(szFullName))
                {
                        ShowWindow(hwnd, SW_SHOWNA);
                        DestroyWindow(hDlg);
                        strcpy( szErrTxt, "Error occured when registering " );
                        strcat( szErrTxt, szFullName );
                        MessageBox(hwnd, szErrTxt, NULL, MB_ICONSTOP
| MB_OK);
                        EndDialog(hwnd, 0);
                        return;
                }

                // if using COM
                if (Reg.eTxnMon == COM)
                {
                        SetDlgItemText(hDlg, IDC_STATUS, "Configuring
COM.");
                        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
                        UpdateDialog(hDlg);

                        if (install_com(szDllPath))
                        {
                                ShowWindow(hwnd, SW_SHOWNA);
                                DestroyWindow(hDlg);
                                strcpy( szErrTxt, "Error occured when
configuring COM settings." );
                                MessageBox(hwnd, szErrTxt, NULL,
MB_ICONSTOP | MB_OK);
                                EndDialog(hwnd, 0);
                                return;
                        }
                }

                Sleep(100);

                ShowWindow(hwnd, SW_SHOWNA);
                DestroyWindow(hDlg);

                EndDialog(hwnd, rc);
                return;
}

static void ReadRegistrySettings(void)
{
                HKEY    hKey;
                DWORD   size;
                DWORD   type;

                if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\Inetinfo\\Parameters", 0, KEY_READ,
&hKey) == ERROR_SUCCESS )
                {
                        size = sizeof(iPoolThreadLimit);
                        if ( RegQueryValueEx(hKey, "PoolThreadLimit", 0,
&type, (char *)&iPoolThreadLimit, &size) == ERROR_SUCCESS )
                                if ( !iPoolThreadLimit )
                                        iPoolThreadLimit =
iMaxPhysicalMemory * 2;

                        size = sizeof(iThreadTimeout);
                        if ( RegQueryValueEx(hKey, "ThreadTimeout", 0,
&type, (char *)&iThreadTimeout, &size) == ERROR_SUCCESS )
                                if ( !iThreadTimeout )
                                        iThreadTimeout = 86400;

                        size = sizeof(iListenBackLog);
                        if ( RegQueryValueEx(hKey, "ListenBackLog", 0,
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&type, (char *)&iListenBackLog, &size) == ERROR_SUCCESS )
                                        if ( !iListenBackLog )
                                                iListenBackLog = 15;

                        RegCloseKey(hKey);
                }

                if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\W3SVC\\Parameters", 0, KEY_READ,
&hKey) == ERROR_SUCCESS )
                {
                        size = sizeof(iAcceptExOutstanding);
                        if ( RegQueryValueEx(hKey, "AcceptExOutstanding",
0, &type, (char *)&iAcceptExOutstanding, &size) == ERROR_SUCCESS )
                                        if ( !iAcceptExOutstanding )
                                                iAcceptExOutstanding =
40;

                        RegCloseKey(hKey);
                }
}

static void WriteRegistrySettings(char *szDllPath)
{
                HKEY            hKey;
                DWORD           dwDisposition;
                char            szTmp[256];
                char            *ptr;
                int                             iRc;

                if ( RegCreateKeyEx(HKEY_LOCAL_MACHINE,
"SOFTWARE\\Microsoft\\TPCC", 0, NULL, REG_OPTION_NON_VOLATILE,
KEY_ALL_ACCESS, NULL, &hKey, &dwDisposition) == ERROR_SUCCESS )
                {
                        strcpy(szTmp, szDllPath);
                        ptr = strstr(szTmp, "tpcc");
                        if ( ptr )
                                        *ptr = 0;

                        RegSetValueEx(hKey, "Path", 0, REG_SZ, szTmp,
strlen(szTmp)+1);

                       RegSetValueEx(hKey, "NumberOfDeliveryThreads", 0,
REG_DWORD, (char *)&Reg.dwNumberOfDeliveryThreads,
sizeof(Reg.dwNumberOfDeliveryThreads));
                        RegSetValueEx(hKey, "MaxConnections", 0,
REG_DWORD, (char *)&Reg.dwMaxConnections,
sizeof(Reg.dwMaxConnections));
                        RegSetValueEx(hKey, "MaxPendingDeliveries", 0,
REG_DWORD, (char *)&Reg.dwMaxPendingDeliveries,
sizeof(Reg.dwMaxPendingDeliveries));

                        RegSetValueEx(hKey, "DB_Protocol", 0, REG_SZ,
szDBNames[Reg.eDB_Protocol], strlen(szDBNames[Reg.eDB_Protocol])+1);
                        RegSetValueEx(hKey, "TxnMonitor", 0, REG_SZ,
szTxnMonNames[Reg.eTxnMon], strlen(szTxnMonNames[Reg.eTxnMon])+1);

                        RegSetValueEx(hKey, "DbServer", 0, REG_SZ,
Reg.szDbServer, strlen(Reg.szDbServer)+1);
                        RegSetValueEx(hKey, "DbName", 0, REG_SZ,
Reg.szDbName, strlen(Reg.szDbName)+1);
                        RegSetValueEx(hKey, "DbUser", 0, REG_SZ,
Reg.szDbUser, strlen(Reg.szDbUser)+1);
                        RegSetValueEx(hKey, "DbPassword", 0, REG_SZ,
Reg.szDbPassword, strlen(Reg.szDbPassword)+1);

                        strcpy(szTmp, "YES");
                        RegSetValueEx(hKey, "COM_SinglePool", 0,
REG_SZ, szTmp, strlen(szTmp)+1);

                        RegFlushKey(hKey);
                        RegCloseKey(hKey);
                }

                if ( (iRc=RegCreateKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\Inetinfo\\Parameters", 0, NULL,
REG_OPTION_NON_VOLATILE, KEY_ALL_ACCESS, NULL, &hKey,
&dwDisposition)) == ERROR_SUCCESS )
                {
                        RegSetValueEx(hKey, "PoolThreadLimit", 0,
REG_DWORD, (char *)&iPoolThreadLimit, sizeof(iPoolThreadLimit));
                        RegSetValueEx(hKey, "ThreadTimeout", 0,
REG_DWORD, (char *)&iThreadTimeout, sizeof(iThreadTimeout));
                        RegSetValueEx(hKey, "ListenBackLog", 0,
REG_DWORD, (char *)&iListenBackLog, sizeof(iListenBackLog));

                        RegFlushKey(hKey);
                        RegCloseKey(hKey);
                }

                if ( (iRc=RegCreateKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\W3SVC\\Parameters", 0, NULL,
REG_OPTION_NON_VOLATILE, KEY_ALL_ACCESS, NULL, &hKey,
&dwDisposition)) == ERROR_SUCCESS )
                {
                        RegSetValueEx(hKey, "AcceptExOutstanding", 0,
REG_DWORD, (char *)&iAcceptExOutstanding, sizeof(iAcceptExOutstanding));

                        RegFlushKey(hKey);
                        RegCloseKey(hKey);
                }

                return;
}

BOOL CALLBACK CopyDlgProc(HWND hwnd, UINT uMsg, WPARAM wParam,
LPARAM lParam)
{
                if ( uMsg == WM_INITDIALOG )
                {
                        SendDlgItemMessage(hwnd, IDC_PROGRESS1,
PBM_SETRANGE, 0, MAKELPARAM(0, 15));
                        SendDlgItemMessage(hwnd, IDC_PROGRESS1,
PBM_SETSTEP, (WPARAM)1, 0);
                        return TRUE;
                }
                return FALSE;
}

BOOL RegisterDLL(char *szFileName)
{
                HINSTANCE       hLib;
                FARPROC                 lpDllEntryPoint;

                hLib = LoadLibrary(szFileName);
                if ( hLib == NULL )
                        return FALSE;
                // Find the entry point.
                lpDllEntryPoint = GetProcAddress(hLib, "DllRegisterServer");
                if (lpDllEntryPoint != NULL)
                {
                        return ((*lpDllEntryPoint)() == S_OK);
                }
                else
                        return FALSE;           //unable to locate entry
point
}

BOOL FileFromResource( char *szResourceName, int iResourceId, char
*szDllPath, char *szFileName )
{
                HGLOBAL                         hDLL;
                HRSRC                           hResInfo;
                HANDLE                          hFile;
                DWORD                           dwSize;
                BYTE                            *pSrc;
                DWORD                           d;
                char                            szFullName[256];

                hResInfo = FindResource(hInst,
MAKEINTRESOURCE(iResourceId), szResourceName);

                strcpy(szFullName, szDllPath);
                strcat(szFullName, szFileName);

                dwSize = SizeofResource(hInst, hResInfo);
                hDLL = LoadResource(hInst, hResInfo );
                pSrc = (BYTE *)LockResource(hDLL);
                remove(szFullName);

                if ( !(hFile = CreateFile(szFullName, GENERIC_WRITE, 0, NULL,
CREATE_ALWAYS, FILE_ATTRIBUTE_NORMAL, NULL)) )
                        return FALSE;

                if ( !WriteFile(hFile, pSrc, dwSize, &d, NULL) )
                        return FALSE;

                CloseHandle(hFile);

                UnlockResource(hDLL);
                FreeResource(hDLL);
                return TRUE;
}

static int CopyFiles(HWND hDlg, char *szDllPath)
{
                BOOL                    bSvcRunning;

                bSvcRunning = CheckWWWebService();
                if ( bSvcRunning )
                {
                        SetDlgItemText(hDlg, IDC_STATUS, "Stopping Web
Service.");
                        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
                        UpdateDialog(hDlg);

                        StopWWWebService();
                        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
                        UpdateDialog(hDlg);
                }

                SetDlgItemText(hDlg, IDC_STATUS, "Copying Files...");
                SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
                UpdateDialog(hDlg);

                // install TPCC.DLL
                strcpy( szLastFileName, "tpcc.dll" );
                if (!FileFromResource( "TPCCDLL", IDR_TPCCDLL, szDllPath,
szLastFileName ))
                        return 0;
                SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
                UpdateDialog(hDlg);

                // install tpcc_dblib.dll
                strcpy( szLastFileName, "tpcc_dblib.dll" );
                if (!FileFromResource( "DBLIB_DLL", IDR_DBLIB_DLL, szDllPath,
szLastFileName ))
                        return 0;
                SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
                UpdateDialog(hDlg);
```

```
		// install tpcc_odbc.dll
		strcpy( szLastFileName, "tpcc_odbc.dll" );
		if (!FileFromResource( "ODBC_DLL", IDR_ODBC_DLL, szDllPath,
szLastFileName ))
			return 0;
		SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
		UpdateDialog(hDlg);

		// install tuxapp.exe
		strcpy( szLastFileName, "tuxapp.exe" );
		if (!FileFromResource( "TUXEDO_APP", IDR_TUXEDO_APP,
szDllPath, szLastFileName ))
			return 0;
		SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
		UpdateDialog(hDlg);

		// install tpcc_tuxedo.dll
		strcpy( szLastFileName, "tpcc_tuxedo.dll" );
		if (!FileFromResource( "TUXEDO_DLL", IDR_TUXEDO_DLL,
szDllPath, szLastFileName ))
			return 0;
		SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
		UpdateDialog(hDlg);

		// install tpcc_com.dll
		strcpy( szLastFileName, "tpcc_com.dll" );
		if (!FileFromResource( "COM_DLL", IDR_COM_DLL, szDllPath,
szLastFileName ))
			return 0;
		SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
		UpdateDialog(hDlg);

		// install tpcc_com_ps.dll
		strcpy( szLastFileName, "tpcc_com_ps.dll" );
		if (!FileFromResource( "COM_PS_DLL", IDR_COMPS_DLL,
szDllPath, szLastFileName ))
			return 0;
		SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
		UpdateDialog(hDlg);

		// install tpcc_com_all.dll
		strcpy( szLastFileName, "tpcc_com_all.dll" );
		if (!File FromResource( "COM_ALL_DLL", IDR_COMALL_DLL,
szDllPath, szLastFileName ))
			return 0;
		SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
		UpdateDialog(hDlg);

		//if we stopped service restart it.
		if ( bSvcRunning )
		{
			SetDlgItemText(hDlg, IDC_STATUS, "Starting Web
Service.");
			SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
			UpdateDialog(hDlg);
			StartWWWebService();
		}

		SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0,
0);
		UpdateDialog(hDlg);

		return 1;
}
```

```
static BOOL GetInstallPath(char *szDllPath)
{
   HKEY	hKey;
		BYTE	szData[256];
		DWORD	sv;
		BOOL	bRc;
		int			len;
		char	*ptr;
		int			iRc;

		szDllPath[0] =  0;
		bRc = TRUE;
		if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\W3SVC\\Parameters\\Virtual Roots", 0,
KEY_ALL_ACCESS, &hKey) == ERROR_SUCCESS )
		{
			sv = sizeof(szData);
			iRc = RegQueryValueEx( hKey, "/,", NULL, NULL,
szData, &sv );  // used by IIS 3.0
			if (iRc == ERROR_FILE_NOT_FOUND)
				iRc = RegQueryValueEx( hKey, "/",
NULL, NULL, szData, &sv );   // used by IIS 4.0
			if (iRc == ERROR_SUCCESS)
			{
				bRc = FALSE;
				strcpy(szDllPath, szData);
				if ( (ptr = strchr(szDllPath, ',')) )
					*ptr = 0;

				len = strlen(szDllPath);
				if ( szDllPath[len-1] != '\\' )
				{
					szDllPath[len] = '\\';
					szDllPath[len+1] = 0;
				}
			}

			RegCloseKey(hKey);
		}

		return bRc;
}

static void GetVersionInfo(char *szDLLPath, char *szExePath)
{
		DWORD					d;
		DWORD					dwSize;
		DWORD					dwBytes;
		char					*ptr;
		VS_FIXEDFILEINFO	*vs;

		versionDllMS = 0;
		versionDllLS = 0;
		if ( _access(szDLLPath, 00) == 0 )
		{
			dwSize = GetFileVersionInfoSize(szDLLPath, &d);
			if ( dwSize )
			{
				ptr = (char *)malloc(dwSize);
				GetFileVersionInfo(szDLLPath, 0,
dwSize, ptr);
				VerQueryValue(ptr, "\\",&vs, &dwBytes);
				versionDllMS = vs-
>dwProductVersionMS;
				versionDllLS = vs-
>dwProductVersionLS;
				free(ptr);
			}
		}

		versionExeMS = 0x7FFF;
		versionExeLS = 0x7FFF;
		dwSize = GetFileVersionInfoSize(szExePath, &d);
		if ( dwSize )
		{
			ptr = (char *)malloc(dwSize);
			GetFileVersionInfo(szExePath, 0, dwSize, ptr);
			VerQueryValue(ptr, "\\",&vs, &dwBytes);

			versionExeMS = vs>dwProductVersionMS;
			versionExeLS = LOWORD(vs
>dwProductVersionLS);
			versionExeMM = HIWORD(vs
>dwProductVersionLS);
			free(ptr);
		}
		return;
}

static BOOL CheckWWWebService(void)
{
		SC_HANDLE			schSCManager;
		SC_HANDLE			schService;
		SERVICE_STATUS	ssStatus;

		schSCManager = OpenSCManager(NULL, NULL,
SC_MANAGER_ALL_ACCESS);
		schService = OpenService(schSCManager, TEXT("W3SVC"),
SERVICE_ALL_ACCESS);
		if (schService == NULL)
			return FALSE;

		if (! QueryServiceStatus(schService, &ssStatus) )
			goto ServiceNotRunning;

		if ( !ControlService(schService, SERVICE_CONTROL_STOP,
&ssStatus) )
			goto ServiceNotRunning;
		//start Service pending, Check the status until the service is
running.
		if (! QueryServiceStatus(schService, &ssStatus) )
			goto ServiceNotRunning;

		CloseServiceHandle(schService);
		return TRUE;

ServiceNotRunning:

		CloseServiceHandle(schService);
		return FALSE;
}

static BOOL StartWWWebService(void)
{
		SC_HANDLE			schSCManager;
		SC_HANDLE			schService;
		SERVICE_STATUS	ssStatus;
		DWORD					dwOldCheckPoint;

		schSCManager = OpenSCManager(NULL, NULL,
SC_MANAGER_ALL_ACCESS);
		schService = OpenService(schSCManager, TEXT("W3SVC"),
SERVICE_ALL_ACCESS);
		if (schService == NULL)
			return FALSE;

		if (! StartService(schService, 0, NULL) )
			goto StartWWWebErr;
		//start Service pending, Check the status until the service is
running.
		if (! QueryServiceStatus(schService, &ssStatus) )
			goto StartWWWebErr;
		while( ssStatus.dwCurrentState != SERVICE_RUNNING)
		{
```

```
                        dwOldCheckPoint = ssStatus.dwCheckPoint;
                        //Save the current checkpoint.
                        Sleep(ssStatus.dwWaitHint);
                                                        //Wait for the
specified interval.
                        if ( !QueryServiceStatus(schService, &ssStatus) )
        //Check the status again.
                                break;
                        if (dwOldCheckPoint >= ssStatus.dwCheckPoint)
        //Break if the checkpoint has not been incremented.
                                break;
        }

        if (ssStatus.dwCurrentState == SERVICE_RUNNING)
                goto StartWWWebErr;

        CloseServiceHandle(schService);
        return TRUE;

StartWWWebErr:
        CloseServiceHandle(schService);
        return FALSE;
}

static BOOL StopWWWebService(void)
{
        SC_HANDLE                       schSCManager;
        SC_HANDLE                       schService;
        SERVICE_STATUS          ssStatus;
        DWORD                           dwOldCheckPoint;

        schSCManager = OpenSCManager(NULL, NULL,
SC_MANAGER_ALL_ACCESS);
        schService = OpenService(schSCManager, TEXT("W3SVC"),
SERVICE_ALL_ACCESS);
        if (schService == NULL)
                return FALSE;

        if (! QueryServiceStatus(schService, &ssStatus) )
                goto StopWWWebErr;

        if ( !ControlService(schService, SERVICE_CONTROL_STOP,
&ssStatus) )
                goto StopWWWebErr;
        //start Service pending, Check the status until the service is
running.
        if (! QueryServiceStatus(schService, &ssStatus) )
                goto StopWWWebErr;
        while( ssStatus.dwCurrentState == SERVICE_RUNNING)
        {

                dwOldCheckPoint = ssStatus.dwCheckPoint;
                //Save the current checkpoint.
                Sleep(ssStatus.dwWaitHint);
                                                        //Wait for the
specified interval.
                if ( !QueryServiceStatus(schService, &ssStatus) )
        //Check the status again.
                        break;
                if (dwOldCheckPoint >= ssStatus.dwCheckPoint)
        //Break if the checkpoint has not been incremented.
                        break;
        }

        if (ssStatus.dwCurrentState == SERVICE_RUNNING)
                goto StopWWWebErr;

        CloseServiceHandle(schService);
        return TRUE;

StopWWWebErr:
        CloseServiceHandle(schService);
        return FALSE;
}

static void UpdateDialog(HWND hDlg)
{
        MSG msg;

        UpdateWindow(hDlg);
        while( PeekMessage(&msg, hDlg, 0, 0, PM_REMOVE) )
        {
                TranslateMessage(&msg);
                DispatchMessage(&msg);
        }
        Sleep(250);
        return;
}
```

install\src\install.h

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by install.rc
//

#define IDD_DIALOG1                     101
#define IDI_ICON1                       102
#define IDR_TPCCDLL                     103
#define IDD_DIALOG2                     105
#define IDI_ICON2                       106
#define IDR_DELIVERY                    107
#define IDD_DIALOG3                     108

#define BN_LOG                          1001
#define ED_KEEP                         1002
#define ED_THREADS                      1003
#define ED_THREADS2                     1004
#define IDC_PATH                        1007
#define IDC_VERSION                     1009
#define IDC_RESULTS                     1010
#define IDC_PROGRESS1                   1011
#define IDC_STATUS                      1012
#define IDC_BUTTON1                     1013
#define ED_MAXCONNECTION                        1014
#define ED_IIS_MAX_THEAD_POOL_LIMIT             1015
#define ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE               1017
#define ED_IIS_THREAD_TIMEOUT                   1018
#define ED_IIS_LISTEN_BACKLOG                   1019
#define IDC_DBLIB                       1021
#define IDC_ODBC                        1022
#define IDC_CONNECT_POOL
                1023
#define ED_USER_CONNECT_DELAY_TIME
                1024

// Next default values for new objects
//
```

install\src\install.rc

```
//Microsoft Developer Studio generated resource script.
//
#include "resource.h"

#define APSTUDIO_READONLY_SYMBOLS
////////////////////////////////////////////////////////////////////// //
//
// Generated from the TEXTINCLUDE 2 resource.
//
#include "afxres.h"

////////////////////////////////////////////////////////////////////////
#undef APSTUDIO_READONLY_SYMBOLS

////////////////////////////////////////////////////////////////////// ////////
// English (U.S.) resources

#if !defined(AFX_RESOURCE_DLL) || defined(AFX_TARG_ENU)
#ifdef _WIN32
LANGUAGE LANG_ENGLISH, SUBLANG_ENGLISH_US
#pragma code_page(1252)
#endif //_WIN32

////////////////////////////////////////////////////////////// ////////////
//
// Dialog
//

IDD_DIALOG1 DIALOGEX 0, 0, 219, 351
STYLE DS_MODALFRAME | DS_CENTER | WS_MINIMIZEBOX | WS_POPUP |
WS_CAPTION |
    WS_SYSMENU
CAPTION "TPCC Web Client Installation Utility"
FONT 8, "MS Sans Serif"
BEGIN
    EDITTEXT        ED_THREADS,164,45,34,12,ES_RIGHT | ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT        ED_MAXDELIVERIES,164,59,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT        ED_MAXCONNECTION,164,73,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
    CONTROL         "None",IDC_TM_NONE,"Button",BS_AUTORADIOBUTTON |
                    WS_GROUP | WS_TABSTOP,43,100,33,10
    CONTROL         "COM",IDC_TM_MTS,"Button",BS_AUTORADIOBUTTON |
                    WS_TABSTOP,43,113,32,10
    CONTROL
"TUXEDO",IDC_TM_TUXEDO,"Button",BS_AUTORADIOBUTTON |
                    WS_TABSTOP,106,100,46,10
    CONTROL
"ENCINA",IDC_TM_ENCINA,"Button",BS_AUTORADIOBUTTON |
                    WS_DISABLED | WS_TABSTOP,106,113,43,10
    EDITTEXT        ED_DB_SERVER,131,152,67,12,ES_AUTOHSCROLL
    EDITTEXT        ED_DB_USER_ID,131,165,67,12,ES_AUTOHSCROLL
    EDITTEXT        ED_DB_PASSWORD,131,178,67,12,ES_AUTOHSCROLL
    EDITTEXT        ED_DB_NAME,131,191,67,12,ES_AUTOHSCROLL
    CONTROL         "DBLIB",IDC_DBLIB,"Button",BS_AUTORADIOBUTTON |
WS_GROUP |
                    WS_TABSTOP,45,219,39,12
    CONTROL         "ODBC",IDC_ODBC,"Button",BS_AUTORADIOBUTTON |
WS_TABSTOP,
                    91,219,39,12
    EDITTEXT
ED_IIS_MAX_THEAD_POOL_LIMIT,164,263,34,12,ES_RIGHT |
                    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT
ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE,164,277,34,12,ES_RIGHT |
                    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT        ED_IIS_THREAD_TIMEOUT,164,291,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT        ED_IIS_LISTEN_BACKLOG,164,305,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
    DEFPUSHBUTTON   "OK",IDOK,53,331,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,119,331,50,14
    EDITTEXT        IDC_PATH,106,26,91,13,ES_AUTOHSCROLL |
```

```
ES_READONLY
    LTEXT           "Number of Delivery Threads:",IDC_STATIC,35,45,115,12
    LTEXT           "Max Number of Connections:",IDC_STATIC,35,73,115,12
    RTEXT           "Version 4.11",IDC_VERSION,120,4,89,9
    LTEXT           "IIS Max Thread Pool Limit:",IDC_STATIC,36,263,115,12
    LTEXT           "Web Service Backlog Queue Size:",IDC_STATIC,36,277,115,
                    12
    LTEXT           "IIS Thread Timeout (seconds):",IDC_STATIC,36,291,115,12
    LTEXT           "IIS Listen Backlog:",IDC_STATIC,36,307,115,10
    GROUPBOX        "Database
Interface",IDC_STATIC,35,208,163,27,WS_GROUP
    LTEXT           "Installation directory:",IDC_STATIC,35,29,71,10
    GROUPBOX        "Transaction Monitor",IDC_STATIC,33,90,165,37
    LTEXT           "Server Name:",IDC_STATIC,35,155,56,8
    LTEXT           "User ID:",IDC_STATIC,35,168,60,8
    LTEXT           "User Password:",IDC_STATIC,35,181,83,8
    LTEXT           "Database Name:",IDC_STATIC,35,194,54,8
    GROUPBOX        "SQL Server Connection
Properties",IDC_STATIC,22,139,187,
                    102
    GROUPBOX        "Web Client Properties",IDC_STATIC,22,15,187,118
    GROUPBOX        "IIS Settings",IDC_STATIC,22,247,187,79
    LTEXT           "Max Pending Deliveries:",IDC_STATIC,35,59,115,12
END

IDD_DIALOG2 DIALOGEX 0, 0, 117, 62
STYLE DS_SETFOREGROUND | DS_3DLOOK | DS_CENTER | WS_POPUP |
WS_BORDER
EXSTYLE WS_EX_STATICEDGE
FONT 12, "MS Sans Serif", 0, 0, 0x1
BEGIN
    DEFPUSHBUTTON   "OK",IDOK,33,45,50,9
    CTEXT           "HTML TPC-C Installation Successfull",IDC_RESULTS,7,22,
                    102,18,0,WS_EX_CLIENTEDGE
    ICON            IDI_ICON2,IDC_STATIC,50,7,18,20,SS_REALSIZEIMAGE,
                    WS_EX_TRANSPARENT
END

IDD_DIALOG3 DIALOG DISCARDABLE  0, 0, 91, 40
STYLE DS_SYSMODAL | DS_MODALFRAME | DS_3DLOOK | DS_CENTER |
WS_CAPTION
CAPTION "Installing TPC-C Web Client"
FONT 12, "Arial Black"
BEGIN
    CONTROL
"Progress1",IDC_PROGRESS1,"msctls_progress32",WS_BORDER,
                    7,20,77,13
    CTEXT           "Static",IDC_STATUS,7,7,77,12,SS_SUNKEN
END

IDD_DIALOG4 DIALOG DISCARDABLE  0, 0, 291, 202
STYLE DS_MODALFRAME | DS_CENTER | WS_POPUP | WS_CAPTION |
WS_SYSMENU
CAPTION "Client End User License"
FONT 8, "MS Sans Serif"
BEGIN
    EDITTEXT        IDC_LICENSE,7,7,271,167,ES_MULTILINE |
ES_AUTOVSCROLL |
                    ES_AUTOHSCROLL | ES_READONLY | WS_VSCROLL |
WS_HSCROLL
    DEFPUSHBUTTON   "I &Agree",IDOK,87,181,50,14
    PUSHBUTTON      "&Cancel",IDCANCEL,153,181,50,14
END


/////////////////////////////////////////////////////////////////////////////
//
// DESIGNINFO
//

#ifdef APSTUDIO_INVOKED
GUIDELINES DESIGNINFO DISCARDABLE
BEGIN
    IDD_DIALOG1, DIALOG
    BEGIN
        LEFTMARGIN, 22
        RIGHTMARGIN, 209
        VERTGUIDE, 35
        VERTGUIDE, 198
        TOPMARGIN, 4
        BOTTOMMARGIN, 345
    END

    IDD_DIALOG2, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 109
        TOPMARGIN, 7
        BOTTOMMARGIN, 54
    END

    IDD_DIALOG3, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 84
        TOPMARGIN, 7
        BOTTOMMARGIN, 33
    END

    IDD_DIALOG4, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 278
        TOPMARGIN, 7
        BOTTOMMARGIN, 195
    END
END
#endif    // APSTUDIO_INVOKED


#ifdef APSTUDIO_INVOKED
/////////////////////////////////////////////////////////////////////////////
//
// TEXTINCLUDE
//

1 TEXTINCLUDE DISCARDABLE
BEGIN
    "resource.h\0"
END

2 TEXTINCLUDE DISCARDABLE
BEGIN
    "#include ""afxres.h""\r\n"
    "\0"
END

3 TEXTINCLUDE DISCARDABLE
BEGIN
    "\r\n"
    "\0"
END

#endif    // APSTUDIO_INVOKED


/////////////////////////////////////////////////////////////////////////////
//
// Icon
//

// Icon with lowest ID value placed first to ensure application icon
// remains consistent on all systems.
IDI_ICON1               ICON    DISCARDABLE     "icon1.ico"
IDI_ICON2               ICON    DISCARDABLE     "icon2.ico"

/////////////////////////////////////////////////////////////////////////////
//
// TPCCDLL
//

IDR_TPCCDLL             TPCCDLL DISCARDABLE
"..\\..\\isapi_dll\\bin\\tpcc.dll"

#ifndef _MAC
/////////////////////////////////////////////////////////////////////////////
//
// Version
//

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 0,4,20,0
 PRODUCTVERSION 0,4,20,0
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x40004L
 FILETYPE 0x1L
 FILESUBTYPE 0x0L
BEGIN
    BLOCK "StringFileInfo"
    BEGIN
        BLOCK "040904b0"
        BEGIN
            VALUE "Comments", "TPC-C Web Client Installer\0"
            VALUE "CompanyName", "Microsoft\0"
            VALUE "FileDescription", "install\0"
            VALUE "FileVersion", "0, 4, 20, 0\0"
            VALUE "InternalName", "install\0"
            VALUE "LegalCopyright", "Copyright © 1999\0"
            VALUE "OriginalFilename", "install.exe\0"
            VALUE "ProductName", "Microsoft install\0"
            VALUE "ProductVersion", "0, 4, 20, 0\0"
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END

#endif    // !_MAC


/////////////////////////////////////////////////////////////////////////////
//
// LICENSE
//

IDR_LICENSE1            LICENSE DISCARDABLE     "license.txt"

/////////////////////////////////////////////////////////////////////////////
//
// DBLIB_DLL
//

IDR_DBLIB_DLL           DBLIB_DLL DISCARDABLE
"..\\..\\db_dblib_dll\\bin\\tpcc_dblib.dll"

/////////////////////////////////////////////////////////////////////////////
//
// ODBC_DLL
//
```

```
IDR_ODBC_DLL            ODBC_DLL DISCARDABLE
"..\\..\\db_odbc_dll\\bin\\tpcc_odbc.dll"

////////////////////////////////////////////////////////////////////// ////
//
// TUXEDO_APP
//

IDR_TUXEDO_APP          TUXEDO_APP DISCARDABLE
"..\\..\\tuxapp\\bin\\tuxapp.exe"

//////////////////////////////////////////////////////////////////////
//
// TUXEDO_DLL
//

IDR_TUXEDO_DLL          TUXEDO_DLL DISCARDABLE
"..\\..\\tm_tuxedo_dll\\bin\\tpcc_tuxedo.dll"

//////////////////////////////////////////////////////////////////////
//
// COM_DLL
//

IDR_COM_DLL             COM_DLL DISCARDABLE
"..\\..\\tm_com_dll\\bin\\tpcc_com.dll"

//////////////////////////////////////////////////////////////////////
//
// COM_PS_DLL
//

IDR_COMPS_DLL           COM_PS_DLL DISCARDABLE
"..\\..\\tpcc_com_ps\\bin\\tpcc_com_ps.dll"

//////////////////////////////////////////////////////////////////////
//
// COM_ALL_DLL
//

IDR_COMALL_DLL          COM_ALL_DLL DISCARDABLE
"..\\..\\tpcc_com_all\\bin\\tpcc_com_all.dll"
#endif    // English (U.S.) resources
//////////////////////////////////////////////////////////////////////



#ifndef APSTUDIO_INVOKED
//////////////////////////////////////////////////////////////////////
//
// Generated from the TEXTINCLUDE 3 resource.
//


//////////////////////////////////////////////////////////////////////
#endif    // not APSTUDIO_INVOKED
```

install\src\install_com.cpp

```
/*              FILE:                   INSTALL_COM.CPP
 *                                              Microsoft TPC-C Kit Ver.
4.20.000
 *                                              Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                              not audited
 *
 *              PURPOSE:  installation code for COM application for TPC-C Web
Kit
 *              Contact:        Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                          4.20.000 - first version
 */

#define _WIN32_WINNT 0x0500

#include <comdef.h>
#include <comadmin.h>
#include <stdio.h>
#include <tchar.h>

extern "C"
{
        BOOL install_com(char *szDllPath);
}

BOOL install_com(char *szDllPath)
{
        ICOMAdminCatalog*       pCOMAdminCat = NULL;
        ICatalogCollection*     pCatalogCollectionApp    = NULL;
        ICatalogCollection*     pCatalogCollectionCo     = NULL;
        ICatalogCollection*     pCatalogCollectionItf    = NULL;
        ICatalogCollection*     pCatalogCollectionMethod = NULL;

        ICatalogObject*                 pCatalogObjectApp    =
NULL;
        ICatalogObject*                 pCatalogObjectCo     =
NULL;
        ICatalogObject*                 pCatalogObjectItf    =
NULL;
        ICatalogObject*                 pCatalogObjectMethod =
NULL;

        _bstr_t                                 bstrTemp,
bstrTemp2, bstrTemp3, bstrTemp4;
        _bstr_t                                 bstrDllPath =
szDllPath;
        _variant_t                      vTmp, vKey;
        long                                    lActProp,
lCount, lCountCo, lCountItf, lCountMethod;
        bool                                    bTmp;


        CoInitializeEx(NULL, COINIT_MULTITHREADED);

        HRESULT hr = CoCreateInstance(CLSID_COMAdminCatalog,

                                NULL,

                                CLSCTX_INPROC_SERVER,

                                IID_ICOMAdminCatalog,

                                (void**) &pCOMAdminCat);

        if (!SUCCEEDED(hr)) goto Error;

        bstrTemp = "Applications";

        // Attempt to connect to "Applications" in the Catalog
        hr = pCOMAdminCat->GetCollection(bstrTemp,

                                (IDispatch**) &pCatalogCollectionApp);
        if (!SUCCEEDED(hr)) goto Error;

        // Attempt to load the "Applications" collection
        hr = pCatalogCollectionApp->Populate();
        if (!SUCCEEDED(hr)) goto Error;

        hr = pCatalogCollectionApp->get_Count(&lCount);
        if (!SUCCEEDED(hr)) goto Error;

        // iterate through applications to delete existing "TPC-C" application
(if any)
        while (lCount > 0)
        {
                hr = pCatalogCollectionApp->get_Item(lCount - 1,
(IDispatch**) &pCatalogObjectApp);
                if (!SUCCEEDED(hr)) goto Error;

                hr = pCatalogObjectApp->get_Name(&vTmp);
                if (!SUCCEEDED(hr)) goto Error;

                if (wcscmp(vTmp.bstrVal, L"TPC-C"))
                {
                        lCount--;
                        continue;
                }
                else
                {
                        hr = pCatalogCollectionApp-
>Remove(lCount - 1);
                        if (!SUCCEEDED(hr)) goto Error;
                        break;
                }
        }

        hr = pCatalogCollectionApp->SaveChanges(&lActProp);
        if (!SUCCEEDED(hr)) goto Error;

        // add the new application
        hr = pCatalogCollectionApp->Add((IDispatch**)
&pCatalogObjectApp);
        if (!SUCCEEDED(hr)) goto Error;

        // set properties
        bstrTemp = "Name";
        vTmp = "TPC-C";
        hr = pCatalogObjectApp->put_Value(bstrTemp, vTmp);
        if (!SUCCEEDED(hr)) goto Error;

        // set as a library (in process) application
        bstrTemp = "Activation";
        lActProp = COMAdminActivationInproc;
        vTmp = lActProp;
        hr = pCatalogObjectApp->put_Value(bstrTemp, vTmp);
        if (!SUCCEEDED(hr)) goto Error;

        // set security level to process
        bstrTemp = "AccessChecksLevel";
        lActProp = COMAdminAccessChecksApplicationLevel;
        vTmp = lActProp;
        hr = pCatalogObjectApp->put_Value(bstrTemp, vTmp);
        if (!SUCCEEDED(hr)) goto Error;

        // save key to get the Components collection later
        hr = pCatalogObjectApp->get_Key(&vKey);
        if (!SUCCEEDED(hr)) goto Error;

        // save changes (app creation) so component installation will work
        hr = pCatalogCollectionApp->SaveChanges(&lActProp);
        if (!SUCCEEDED(hr)) goto Error;

        pCatalogObjectApp->Release();
        pCatalogObjectApp = NULL;

        bstrTemp  = "TPC-C";
        // app name
        bstrTemp2 = bstrDllPath + "tpcc_com_all.dll";
        // DLL
        bstrTemp3 = "";
```

```
                // type library (TLB)
        bstrTemp4 = bstrDllPath + "tpcc_com_ps.dll";
        // proxy/stub dll

        hr = pCOMAdminCat->InstallComponent(bstrTemp,
                                                bstrTemp2,
                                                bstrTemp3,
                                                bstrTemp4);
        if (!SUCCEEDED(hr)) goto Error;


        bstrTemp = "Components";
        hr = pCatalogCollectionApp->GetCollection(bstrTemp, vKey,
(IDispatch**) &pCatalogCollectionCo);
        if (!SUCCEEDED(hr)) goto Error;

        hr = pCatalogCollectionCo->Populate();
        if (!SUCCEEDED(hr)) goto Error;

        hr = pCatalogCollectionCo->get_Count(&lCountCo);
        if (!SUCCEEDED(hr)) goto Error;

        // iterate through components in application and set the properties
        while (lCountCo > 0)
        {
                hr = pCatalogCollectionCo->get_Item(lCountCo - 1,
(IDispatch**) &pCatalogObjectCo);
                if (!SUCCEEDED(hr)) goto Error;

                // used for debugging (view the name)
                hr = pCatalogObjectCo->get_Name(&vTmp);
                if (!SUCCEEDED(hr)) goto Error;

                bstrTemp = "ConstructionEnabled";
                bTmp = TRUE;
                vTmp = bTmp;
                hr = pCatalogObjectCo->put_Value(bstrTemp, vTmp);
                if (!SUCCEEDED(hr)) goto Error;

                bstrTemp = "ConstructorString";
                bstrTemp2 = "dummy string (do not remove)";
                vTmp = bstrTemp2;
                hr = pCatalogObjectCo->put_Value(bstrTemp, vTmp);
                if (!SUCCEEDED(hr)) goto Error;

                bstrTemp = "JustInTimeActivation";
                bTmp = TRUE;
                vTmp = bTmp;
                hr = pCatalogObjectCo->put_Value(bstrTemp, vTmp);
                if (!SUCCEEDED(hr)) goto Error;

                bstrTemp = "MaxPoolSize";
                vTmp.Clear();           // clear variant so it isn't
stored as a bool (_variant_t feature)
                vTmp = (long)30;
                hr = pCatalogObjectCo->put_Value(bstrTemp, vTmp);
                if (!SUCCEEDED(hr)) goto Error;

                bstrTemp = "ObjectPoolingEnabled";
                bTmp = TRUE;
                vTmp = bTmp;
                hr = pCatalogObjectCo->put_Value(bstrTemp, vTmp);
                if (!SUCCEEDED(hr)) goto Error;



                // save key to get the InterfacesForComponent
collection
                hr = pCatalogObjectCo->get_Key(&vKey);
                if (!SUCCEEDED(hr)) goto Error;

                bstrTemp = "InterfacesForComponent";
                hr = pCatalogCollectionCo->GetCollection(bstrTemp,
vKey, (IDispatch**) &pCatalogCollectionItf);
                if (!SUCCEEDED(hr)) goto Error;

                hr = pCatalogCollectionItf->Populate();
                if (!SUCCEEDED(hr)) goto Error;

                hr = pCatalogCollectionItf->get_Count(&lCountItf);
                if (!SUCCEEDED(hr)) goto Error;

                // iterate through interfaces in component
                while (lCountItf > 0)
                {
                        hr = pCatalogCollectionItf-
>get_Item(lCountItf - 1, (IDispatch**) &pCatalogObjectItf);
                        if (!SUCCEEDED(hr)) goto Error;

                        // save key to get the
MethodsForInterface collection
                        hr = pCatalogObjectItf-
>get_Key(&vKey);
                        if (!SUCCEEDED(hr)) goto Error;

                        bstrTemp = "MethodsForInterface";
                        hr = pCatalogCollectionItf-
>GetCollection(bstrTemp, vKey, (IDispatch**) &pCatalogCollectionMethod);
                        if (!SUCCEEDED(hr)) goto Error;

                        hr = pCatalogCollectionMethod-
>Populate();
                        if (!SUCCEEDED(hr)) goto Error;

                        hr = pCatalogCollectionMethod-
>get_Count(&lCountMethod);
                        if (!SUCCEEDED(hr)) goto Error;

                        // iterate through methods of interface
                        while (lCountMethod > 0)
                        {
                                hr =
pCatalogCollectionMethod->get_Item(lCountMethod - 1, (IDispatch**)
&pCatalogObjectMethod);
                                if (!SUCCEEDED(hr)) goto
Error;

                                bstrTemp =
"AutoComplete";
                                bTmp = TRUE;
                                vTmp = bTmp;
                                hr =
pCatalogObjectMethod->put_Value(bstrTemp, vTmp);
                                if (!SUCCEEDED(hr)) goto
Error;

                                pCatalogObjectMethod-
>Release();
                                pCatalogObjectMethod =
NULL;

                                lCountMethod--;
                        }

                        // save changes
                        hr = pCatalogCollectionMethod-
>SaveChanges(&lActProp);
                        if (!SUCCEEDED(hr)) goto Error;

                        pCatalogObjectItf->Release();
                        pCatalogObjectItf = NULL;

                        lCountItf--;

                }


                pCatalogObjectCo->Release();
                pCatalogObjectCo = NULL;

                lCountCo--;
        }


        // save changes
        hr = pCatalogCollectionCo->SaveChanges(&lActProp);
        if (!SUCCEEDED(hr)) goto Error;

        pCatalogCollectionApp->Release();
        pCatalogCollectionApp = NULL;

        pCatalogCollectionCo->Release();
        pCatalogCollectionCo = NULL;

        pCatalogCollectionItf->Release();
        pCatalogCollectionItf = NULL;

        pCatalogCollectionMethod->Release();
        pCatalogCollectionMethod = NULL;


Error:
        CoUninitialize();

        if (!SUCCEEDED(hr))
        {
                LPTSTR lpBuf;
                DWORD dwRes =
FormatMessage(FORMAT_MESSAGE_ALLOCATE_BUFFER |
FORMAT_MESSAGE_FROM_SYSTEM,
                        NULL,
                        hr,
                        MAKELANGID(LANG_NEUTRAL,
SUBLANG_DEFAULT),
                        (LPTSTR) &lpBuf,
                        0,
                        NULL);
//              _tprintf(__T("Error adding components.  HRESULT:
0x%x\n%s"), hr, lpBuf);
                return TRUE;
        }
        else
                return FALSE;
}
```

install\src\RESOURCE.H

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by install.rc
//
#define IDD_DIALOG1             101
#define IDI_ICON1               102
#define IDR_TPCCDLL             103
```

```
#define IDD_DIALOG2                 105
#define IDI_ICON2                   106
#define IDR_DELIVERY                107
#define IDD_DIALOG3                 108
#define IDR_LICENSE1                112
#define IDD_DIALOG4                 113
#define IDR_TPCCOBJ1                117
#define IDR_TPCCSTUB1               118
#define IDR_DBLIB_DLL               122
#define IDR_ODBC_DLL                123
#define IDR_TUXEDO_APP              124
#define IDR_TUXEDO_DLL              125
#define IDR_COM_DLL                 126
#define IDR_COMPS_DLL               127
#define IDR_COMALL_DLL              128
#define BN_LOG                      1001
#define ED_KEEP                     1002
#define ED_THREADS                  1003
#define ED_THREADS2                 1004
#define IDC_PATH                    1007
#define IDC_VERSION                 1009
#define IDC_RESULTS                 1010
#define IDC_PROGRESS1               1011
#define IDC_STATUS                  1012
#define IDC_BUTTON1                 1013
#define ED_MAXCONNECTION            1014
#define ED_IIS_MAX_THEAD_POOL_LIMIT 1015
#define ED_MAXDELIVERIES            1016
#define ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE 1017
#define ED_IIS_THREAD_TIMEOUT       1018
#define ED_IIS_LISTEN_BACKLOG       1019
#define IDC_DBLIB                   1021
#define IDC_LICENSE                 1022
#define IDC_ODBC                    1022
#define IDC_CONNECT_POOL            1023
#define ED_DB_SERVER                1023
#define ED_USER_CONNECT_DELAY_TIME  1024
#define ED_DB_USER_ID               1024
#define IDC_MTS                     1025
#define IDC_TM_MTS                  1025
#define IDC_TM_TUXEDO               1026
#define IDC_TM_NONE                 1027
#define ED_DB_PASSWORD              1028
#define ED_DB_NAME                  1029
#define IDC_TM_ENCINA               1030

// Next default values for new objects
//
#ifdef APSTUDIO_INVOKED
#ifndef APSTUDIO_READONLY_SYMBOLS
#define _APS_NEXT_RESOURCE_VALUE    129
#define _APS_NEXT_COMMAND_VALUE     40001
#define _APS_NEXT_CONTROL_VALUE     1024
#define _APS_NEXT_SYMED_VALUE       101
#endif
#endif
```

isapi_dll\src\tpcc.def

```
LIBRARY TPCC.DLL

EXPORTS

        GetExtensionVersion     @1
        HttpExtensionProc       @2
        TerminateExtension      @3
```

isapi_dll\src\tpcc.rc

```
//Microsoft Developer Studio generated resource script.
//
#include "resource.h"

#define APSTUDIO_READONLY_SYMBOLS
//////////////////////////////////////////////////////////////////////
//
// Generated from the TEXTINCLUDE 2 resource.
//
#include "afxres.h"

//////////////////////////////////////////////////////////////////////
#undef APSTUDIO_READONLY_SYMBOLS

//////////////////////////////////////////////////////////////////////
// English (U.S.) resources

#if !defined(AFX_RESOURCE_DLL) || defined(AFX_TARG_ENU)
#ifdef _WIN32
LANGUAGE LANG_ENGLISH, SUBLANG_ENGLISH_US
#pragma code_page(1252)
#endif //_WIN32

#ifndef _MAC
//////////////////////////////////////////////////////////////////////
//
// Version
//

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 0,4,0,0
 PRODUCTVERSION 0,4,0,0
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x40004L
 FILETYPE 0x2L
 FILESUBTYPE 0x0L
BEGIN
    BLOCK "StringFileInfo"
    BEGIN
        BLOCK "040904b0"
        BEGIN
            VALUE "Comments", "TPC-C HTML DLL Server (DBLIB)\0"
            VALUE "CompanyName", "Microsoft\0"
            VALUE "FileDescription", "TPC-C HTML DLL Server (DBLIB)\0"
            VALUE "FileVersion", "0, 4, 0, 0\0"
            VALUE "InternalName", "tpcc\0"
            VALUE "LegalCopyright", "Copyright © 1997\0"
            VALUE "OriginalFilename", "tpcc.dll\0"
            VALUE "ProductName", "Microsoft tpcc\0"
            VALUE "ProductVersion", "0, 4, 0, 0\0"
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END

#endif    // !_MAC


#ifdef APSTUDIO_INVOKED
//////////////////////////////////////////////////////////////////////
//
// TEXTINCLUDE
//

1 TEXTINCLUDE DISCARDABLE
BEGIN
    "resource.h\0"
END

2 TEXTINCLUDE DISCARDABLE
BEGIN
    "#include ""afxres.h""\r\n"
    "\0"
END

3 TEXTINCLUDE DISCARDABLE
BEGIN
    "\r\n"
    "\0"
END

#endif    // APSTUDIO_INVOKED


//////////////////////////////////////////////////////////////////////
//
// Dialog
//

IDD_DIALOG1 DIALOG DISCARDABLE  0, 0, 186, 95
STYLE DS_MODALFRAME | WS_POPUP | WS_CAPTION | WS_SYSMENU
CAPTION "Dialog"
FONT 8, "MS Sans Serif"
BEGIN
    DEFPUSHBUTTON   "OK",IDOK,129,7,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,129,24,50,14
END


//////////////////////////////////////////////////////////////////////
//
// DESIGNINFO
//

#ifdef APSTUDIO_INVOKED
GUIDELINES DESIGNINFO DISCARDABLE
BEGIN
    IDD_DIALOG1, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 179
        TOPMARGIN, 7
        BOTTOMMARGIN, 88
    END
END
#endif    // APSTUDIO_INVOKED

#endif    // English (U.S.) resources
//////////////////////////////////////////////////////////////////////



#ifndef APSTUDIO_INVOKED
//////////////////////////////////////////////////////////////////////
//
// Generated from the TEXTINCLUDE 3 resource.
//


//////////////////////////////////////////////////////////////////////
#endif    // not APSTUDIO_INVOKED
```

isapi_dll\src\tpcc.h

```
/*              FILE:                   TPCC.H
 *                                              Microsoft TPC-C Kit Ver.
4.20.000
 *                                              Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                              Version 4.10.000 audited
by Richard Gimarc, Performance Metrics, 3/17/99
 *
 *              PURPOSE:  Header file for ISAPI TPCC.DLL, defines structures
and functions used in the isapi tpcc.dll.
 *
 */

//VERSION RESOURCE DEFINES
#define _APS_NEXT_RESOURCE_VALUE
        101
#define _APS_NEXT_COMMAND_VALUE
                40001
#define _APS_NEXT_CONTROL_VALUE
                1000
#define _APS_NEXT_SYMED_VALUE
        101

#define TP_MAX_RETRIES
                                50


//note that the welcome form must be processed first as terminal ids assigned
here, once the
//terminal id is assigned then the forms can be processed in any order.
#define WELCOME_FORM
                1                       //beginning form no term
id assigned, form id
#define MAIN_MENU_FORM
                2                       //term id assigned main
menu form id
#define NEW_ORDER_FORM
                3                       //new order form id
#define PAYMENT_FORM
        4               //payment form id
#define DELIVERY_FORM
                5                       //delivery form id
#define ORDER_STATUS_FORM
        6               //order status id
#define STOCK_LEVEL_FORM
        7               //stock level form id

//This macro is used to prevent the compiler error unused formal parameter
#define UNUSEDPARAM(x) (x = x)


//This structure defines the data necessary to keep distinct for each terminal or
client connection.
typedef struct _CLIENTDATA
{
        int                                     iNextFree;
                //index of next free element or -1 if this entry in use.
        int                                     w_id;
                //warehouse id assigned at welcome
form
        int                                     d_id;
                //district id assigned at welcome form

        int                                     iSyncId;
                //syncronization id
        int                                     iTickCount;
                //time of last access;

        CTPCC_BASE              *pTxn;

} CLIENTDATA, *PCLIENTDATA;


//This structure is used to define the operational interface for terminal id support
typedef struct _TERM
{
        int                                     iNumEntries;
                                //total allocated terminal array entries
        int                                     iFreeList;
                                //next available terminal
array element or -1 if none
        int                                     iMasterSyncId;
                                //syncronization id
        CLIENTDATA              *pClientData;
                                //pointer to allocated client data
} TERM;

typedef TERM *PTERM;
                //pointer to terminal structure type


        enum WEBERROR
        {
                NO_ERR,
                ERR_COMMAND_UNDEFINED,
                ERR_D_ID_INVALID,
                ERR_DELIVERY_CARRIER_ID_RANGE,
                ERR_DELIVERY_CARRIER_INVALID,
                ERR_DELIVERY_MISSING_OCD_KEY,
                ERR_DELIVERY_THREAD_FAILED,
                ERR_GETPROCADDR_FAILED,
                ERR_HTML_ILL_FORMED,
                ERR_INVALID_SYNC_CONNECTION,
                ERR_INVALID_TERMID,
                ERR_LOADDLL_FAILED,
                ERR_MAX_CONNECTIONS_EXCEEDED,
                ERR_MEM_ALLOC_FAILED,
                ERR_MISSING_REGISTRY_ENTRIES,
                ERR_NEWORDER_CUSTOMER_INVALID,
                ERR_NEWORDER_CUSTOMER_KEY,
                ERR_NEWORDER_DISTRICT_INVALID,
                ERR_NEWORDER_FORM_MISSING_DID,
                ERR_NEWORDER_ITEMID_INVALID,
                ERR_NEWORDER_ITEMID_RANGE,
                ERR_NEWORDER_ITEMID_WITHOUT_SUPPW,
                ERR_NEWORDER_MISSING_IID_KEY,
                ERR_NEWORDER_MISSING_QTY_KEY,
                ERR_NEWORDER_MISSING_SUPPW_KEY,
                ERR_NEWORDER_NOITEMS_ENTERED,
                ERR_NEWORDER_QTY_INVALID,
                ERR_NEWORDER_QTY_RANGE,
                ERR_NEWORDER_QTY_WITHOUT_SUPPW,
                ERR_NEWORDER_SUPPW_INVALID,
                ERR_NO_SERVER_SPECIFIED,
                ERR_ORDERSTATUS_CID_AND_CLT,
                ERR_ORDERSTATUS_CID_INVALID,
                ERR_ORDERSTATUS_CLT_RANGE,
                ERR_ORDERSTATUS_DID_INVALID,
                ERR_ORDERSTATUS_MISSING_CID_CLT,
                ERR_ORDERSTATUS_MISSING_CID_KEY,
                ERR_ORDERSTATUS_MISSING_CLT_KEY,
                ERR_ORDERSTATUS_MISSING_DID_KEY,
                ERR_PAYMENT_CDI_INVALID,
                ERR_PAYMENT_CID_AND_CLT,
                ERR_PAYMENT_CUSTOMER_INVALID,
                ERR_PAYMENT_CWI_INVALID,
                ERR_PAYMENT_DISTRICT_INVALID,
                ERR_PAYMENT_HAM_INVALID,
                ERR_PAYMENT_HAM_RANGE,
                ERR_PAYMENT_LAST_NAME_TO_LONG,
                ERR_PAYMENT_MISSING_CDI_KEY,
                ERR_PAYMENT_MISSING_CID_CLT,
                ERR_PAYMENT_MISSING_CID_KEY,
                ERR_PAYMENT_MISSING_CLT,
                ERR_PAYMENT_MISSING_CLT_KEY,
                ERR_PAYMENT_MISSING_CWI_KEY,
                ERR_PAYMENT_MISSING_DID_KEY,
                ERR_PAYMENT_MISSING_HAM_KEY,
                ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,
                ERR_STOCKLEVEL_THRESHOLD_INVALID,
                ERR_STOCKLEVEL_THRESHOLD_RANGE,
                ERR_VERSION_MISMATCH,
                ERR_W_ID_INVALID
        };

class CWEBCLNT_ERR : public CBaseErr
{
        public:

                CWEBCLNT_ERR(WEBERROR Err)
                {
                        m_Error = Err;
                        m_szTextDetail = NULL;
                        m_SystemErr = 0;
                        m_szErrorText = NULL;
                };

                CWEBCLNT_ERR(WEBERROR Err, char
*szTextDetail, DWORD dwSystemErr)
                {
                        m_Error = Err;
                        m_szTextDetail = new
char[strlen(szTextDetail)+1];
                        strcpy( m_szTextDetail, szTextDetail );
                        m_SystemErr = dwSystemErr;
                        m_szErrorText = NULL;
                };

                ~CWEBCLNT_ERR()
                {
                        if (m_szTextDetail != NULL)
                                delete [] m_szTextDetail;
                        if (m_szErrorText != NULL)
                                delete [] m_szErrorText;
                };

                WEBERROR                m_Error;
                char                    *m_szTextDetail;
        //
                char                    *m_szErrorText;
                DWORD                   m_SystemErr;

                int ErrorType() {return ERR_TYPE_WEBDLL;};
                int ErrorNum() {return m_Error;};
                char *ErrorText();

};

//These constants have already been defined in engstut.h, but since we do
//not want to include it in the delisrv executable
#define     TXN_EVENT_START             2
#define     TXN_EVENT_STOP              4
#define TXN_EVENT_WARNING       6                       //used to
record a warning into the log

//function prototypes

BOOL APIENTRY DllMain(HANDLE hModule, DWORD ul_reason_for_call,
LPVOID lpReserved);
```

```
void WriteMessageToEventLog(LPTSTR lpszMsg);
void ProcessQueryString(EXTENSION_CONTROL_BLOCK *pECB, int *pCmd,
int *pFormId, int *pTermId, int *pSyncId);
void WelcomeForm(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer);
void SubmitCmd(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer);
void BeginCmd(EXTENSION_CONTROL_BLOCK *pECB, int iFormId, int
iTermId);
void ProcessCmd(EXTENSION_CONTROL_BLOCK *pECB, int iFormId, int
iTermId);
void StatsCmd(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer);
void ErrorMessage(EXTENSION_CONTROL_BLOCK *pECB, int iError, int
iErrorType, char *szMsg, int iTermId);
void GetKeyValue(char **pQueryString, char *pKey, char *pValue, int iMax,
WEBERROR err);
int  GetIntKeyValue(char **pQueryString, char *pKey, WEBERROR NoKeyErr,
WEBERROR NotIntErr);
void TermInit(void);
void TermDeleteAll(void);
int  TermAdd(void);
void TermDelete(int id);
void ErrorForm(EXTENSION_CONTROL_BLOCK *pECB, int iType, int
iErrorNum, int iTermId, int iSyncId, char *szErrorText, char *szBuffer );
void MakeMainMenuForm(int iTermId, int iSyncId, char *szForm);
void MakeStockLevelForm(int iTermId, STOCK_LEVEL_DATA
*pStockLevelData, BOOL bInput, char *szForm);
void MakeNewOrderForm(int iTermId, NEW_ORDER_DATA *pNewOrderData,
BOOL bInput, char *szForm);
void MakePaymentForm(int iTermId, PAYMENT_DATA *pPaymentData, BOOL
bInput, char *szForm);
void MakeOrderStatusForm(int iTermId, ORDER_STATUS_DATA
*pOrderStatusData, BOOL bInput, char *szForm);
void MakeDeliveryForm(int iTermId, DELIVERY_DATA *pDeliveryData, BOOL
bInput, char *szForm);
void ProcessNewOrderForm(EXTENSION_CONTROL_BLOCK    *pECB, int
iTermId, char *szBuffer);
void ProcessPaymentForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer);
void ProcessOrderStatusForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer);
void ProcessDeliveryForm(EXTENSION_CONTROL_BLOCK *pECB, int iTermId,
char *szBuffer);
void ProcessStockLevelForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer);
void GetNewOrderData(LPSTR lpszQueryString, NEW_ORDER_DATA
*pNewOrderData);
void GetPaymentData(LPSTR lpszQueryString, PAYMENT_DATA
*pPaymentData);
void GetOrderStatusData(LPSTR lpszQueryString, ORDER_STATUS_DATA
*pOrderStatusData);
BOOL PostDeliveryInfo(short w_id, short o_carrier_id);
BOOL IsNumeric(char *ptr);
BOOL IsDecimal(char *ptr);
void DeliveryWorkerThread(void *ptr);
```

isapi_dll\src\tpcc.cpp

```
/*      FILE:                   TPCC.C
 *                                              Microsoft TPC-C Kit Ver.
4.20.000
 *                                              Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                                              Version 4.10.000 audited
by Richard Gimarc, Performance Metrics, 3/17/99
 *
 *      PURPOSE:  Main module for TPCC.DLL which is an ISAPI service
dll.
 *      Contact:  Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                          4.20.000 - reworked error handling; added options for
COM and Encina txn monitors
 */

#include <windows.h>
#include <process.h>
#include <tchar.h>
#include <stdio.h>
#include <stdarg.h>
#include <malloc.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <io.h>
#include <assert.h>

#include <sqltypes.h>

#ifdef ICECAP
#include <icapexp.h>
#endif

#include "..\..\common\src\trans.h"             //tpckit transaction header
contains definations of structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "..\..\common\src\ReadRegistry.h"

#include "..\..\common\txnlog\include\rtetime.h"
#include "..\..\common\txnlog\include\spinlock.h"
#include "..\..\common\txnlog\include\txnlog.h"

// Database layer includes
#include "..\..\db_dblib_dll\src\tpcc_dblib.h"          // DBLIB
implementation of TPC-C txns
#include "..\..\db_odbc_dll\src\tpcc_odbc.h"            // ODBC
implementation of TPC-C txns

// Txn monitor layer includes
#include "..\..\tm_com_dll\src\tpcc_com.h"
        // COM Services implementation on TPC-C txns
#include "..\..\tm_tuxedo_dll\src\tpcc_tux.h"           // interface to
Tuxedo libraries
#include "..\..\tm_encina_dll\src\tpcc_enc.h"           // interface to
Encina libraries

#include "httpext.h"                                    //ISAPI DLL
information header
#include "tpcc.h"
        //this dlls specific structure, value e.t. header.


#define     LEN_ERR_STRING      256

// defines for Make<Txn>Form calls to distinguish input and output flavors
#define     OUTPUT_FORM         0
#define INPUT_FORM      1

char
        szMyComputerName[MAX_COMPUTERNAME_LENGTH+1];

//Terminal client id structure
TERM        Term = { 0, 0, 0, NULL };

// The WEBCLIENT_VERSION string specifies the version level of this web
client interface.
// The RTE must be synchronized with the interface level on login, otherwise the
login
// will fail.  This is a sanity check to catch problems resulting from mismatched
versions
// of the RTE and web client.
#define WEBCLIENT_VERSION "410"

static      CRITICAL_SECTION                TermCriticalSection;

static  HINSTANCE hLibInstanceTm = NULL;
static  HINSTANCE hLibInstanceDb = NULL;

TYPE_CTPCC_DBLIB    *pCTPCC_DBLIB_new;
TYPE_CTPCC_ODBC             *pCTPCC_ODBC_new;
TYPE_CTPCC_TUXEDO  *pCTPCC_TUXEDO_new;
TYPE_CTPCC_ENCINA   *pCTPCC_ENCINA_new
TYPE_CTPCC_ENCINA   *pCTPCC_ENCINA_post_init;
TYPE_CTPCC_COM              *pCTPCC_COM_new;

// For deferred Delivery txns:

CTxnLog                                                 *txnDelilog =
NULL;                               //used to log delivery transaction
information

HANDLE
        hWorkerSemaphore    = INVALID_HANDLE_VALUE;
HANDLE                                                  hDoneEvent
                = INVALID_HANDLE_VALUE;
HANDLE
        *pDeliHandles                   = NULL;

// configuration settings from registry
TPCCREGISTRYDATA            Reg;


DWORD
        dwNumDeliveryThreads = 4;
CRITICAL_SECTION            DelBuffCriticalSection;
        //critical section for delivery transactions cache
DELIVERY_TRANSACTION        *pDelBuff
        = NULL;
DWORD
        dwDelBuffSize                   = 100;
        // size of circular buffer for delivery txns
DWORD
        dwDelBuffFreeCount;
        // number of buffers free
DWORD
        dwDelBuffBusyIndex  = 0;                // index
position of entry waiting to be delivered
DWORD
        dwDelBuffFreeIndex  = 0;                // index
position of unused entry

#include "..\..\common\src\ReadRegistry.cpp"

/* FUNCTION: DllMain
 *
 * PURPOSE:         This function is the entry point for the DLL.  This
implementation is based on the
 *                          fact that DLL_PROCESS_ATTACH is
only called from the inet service once.
 *
 * ARGUMENTS:       HANDLE     hModule
        module handle
 *                                          DWORD
        ul_reason_for_call      reason for call
 *                                          LPVOID     lpReserved
                reserved for future use
 *
 * RETURNS:                         BOOL       FALSE
                errors occured in initialization
 *
        TRUE                                            DLL
successfully initialized
```

```
 */

BOOL APIENTRY DllMain(HANDLE hModule, DWORD ul_reason_for_call,
LPVOID lpReserved)
{
	DWORD  i;
	char szEvent[LEN_ERR_STRING] = '\0';
	char szLogFile[128];
	char szDllName[128];

	try
	{
		switch( ul_reason_for_call )
		{
			case DLL_PROCESS_ATTACH:
				{
					DWORD
dwSize = MAX_COMPUTERNAME_LENGTH+1;

	GetComputerName(szMyComputerName, &dwSize);

	szMyComputerName[dwSize] = 0;
				}


	DisableThreadLibraryCalls((HMODULE)hModule);

	InitializeCriticalSection(&TermCriticalSection);

				if
( ReadTPCCRegistrySettings( &Reg ) )
					throw new
CWEBCLNT_ERR( ERR_MISSING_REGISTRY_ENTRIES );

				dwDelBuffSize =
min( Reg.dwMaxPendingDeliveries, 10000 );  // min with 10000 as a sanity
constraint
				dwNumDeliveryThreads =
min( Reg.dwNumberOfDeliveryThreads, 100 );  // min with 100 as a sanity
constraint

				TermInit();

				// load DLL for txn monitor
				if (Reg.eTxnMon ==
TUXEDO)
				{

	strcpy( szDllName, Reg.szPath );

	strcat( szDllName, "tpcc_tuxedo.dll");

	hLibInstanceTm = LoadLibrary( szDllName );
					if
(hLibInstanceTm == NULL)

	throw new CWEBCLNT_ERR( ERR_LOADDLL_FAILED,
szDllName, GetLastError() );

					// get
function pointer to wrapper for class constructor

	pCTPCC_TUXEDO_new = (TYPE_CTPCC_TUXEDO*)
GetProcAddress(hLibInstanceTm,"CTPCC_TUXEDO_new");
					if
(pCTPCC_TUXEDO_new == NULL)

	throw new CWEBCLNT_ERR( ERR_GETPROCADDR_FAILED,
szDllName, GetLastError() );
				}
				else if (Reg.eTxnMon ==
ENCINA)
```

```
				{

	strcpy( szDllName, Reg.szPath );

	strcat( szDllName, "tpcc_encina.dll");

	hLibInstanceTm = LoadLibrary( szDllName );
					if
(hLibInstanceTm == NULL)

	throw new CWEBCLNT_ERR( ERR_LOADDLL_FAILED,
szDllName, GetLastError() );
					// get
function pointer to wrapper for class constructor

	pCTPCC_ENCINA_new = (TYPE_CTPCC_ENCINA*)
GetProcAddress(hLibInstanceTm,"CTPCC_ENCINA_new");

	pCTPCC_ENCINA_post_init = (TYPE_CTPCC_ENCINA*)
GetProcAddress(hLibInstanceTm,"CTPCC_ENCINA_post_init");
					if
(pCTPCC_ENCINA_new == NULL)

	throw new CWEBCLNT_ERR( ERR_GETPROCADDR_FAILED,
szDllName, GetLastError() );
				}
				else if (Reg.eTxnMon ==
COM)
				{

	strcpy( szDllName, Reg.szPath );

	strcat( szDllName, "tpcc_com.dll");

	hLibInstanceTm = LoadLibrary( szDllName );
					if
(hLibInstanceTm == NULL)

	throw new CWEBCLNT_ERR( ERR_LOADDLL_FAILED,
szDllName, GetLastError() );

					// get
function pointer to wrapper for class constructor

	pCTPCC_COM_new = (TYPE_CTPCC_COM*)
GetProcAddress(hLibInstanceTm,"CTPCC_COM_new");
					if
(pCTPCC_COM_new == NULL)

	throw new CWEBCLNT_ERR( ERR_GETPROCADDR_FAILED,
szDllName, GetLastError() );
				}

				// load DLL for database
connection
				if ((Reg.eTxnMon ==
None) || (dwNumDeliveryThreads > 0))
				{
					if
(Reg.eDB_Protocol == DBLIB)
					{

	strcpy( szDllName, Reg.szPath );

	strcat( szDllName, "tpcc_dblib.dll");

	hLibInstanceDb = LoadLibrary( szDllName );

	if (hLibInstanceDb == NULL)

	throw new CWEBCLNT_ERR( ERR_LOADDLL_FAILED,
szDllName, GetLastError() );
```

```
	// get function pointer to wrapper for class constructor

	pCTPCC_DBLIB_new = (TYPE_CTPCC_DBLIB*)
GetProcAddress(hLibInstanceDb,"CTPCC_DBLIB_new");

	if (pCTPCC_DBLIB_new ==NULL)

	throw new CWEBCLNT_ERR( ERR_GETPROCADDR_FAILED,
szDllName, GetLastError() );
					}
					else if
(Reg.eDB_Protocol == ODBC)
					{

	strcpy( szDllName, Reg.szPath );

	strcat( szDllName, "tpcc_odbc.dll");

	hLibInstanceDb = LoadLibrary( szDllName );

	if (hLibInstanceDb == NULL)

	throw new CWEBCLNT_ERR( ERR_LOADDLL_FAILED,
szDllName, GetLastError() );


	// get function pointer to wrapper for class constructor

	pCTPCC_ODBC_new = (TYPE_CTPCC_ODBC*)
GetProcAddress(hLibInstanceDb,"CTPCC_ODBC_new");

	if (pCTPCC_ODBC_new == NULL)

	throw new CWEBCLNT_ERR( ERR_GETPROCADDR_FAILED,
szDllName, GetLastError() );
					}
				}

				if
(dwNumDeliveryThreads)
				{
					// for deferred
delivery txns:
					hDoneEvent
= CreateEvent( NULL, TRUE /* manual reset */, FALSE /* initially not signalled */,
NULL );

	InitializeCriticalSection(&DelBuffCriticalSection);

	hWorkerSemaphore = CreateSemaphore( NULL, 0, dwDelBuffSize,
NULL );

	dwDelBuffFreeCount = dwDelBuffSize;


	InitJulianTime(NULL);

					// create
unique log file name based on delilog-yymmdd-hhmm.log

	SYSTEMTIME Time;

	GetLocalTime( &Time );

	wsprintf( szLogFile, "%sdelivery-%2.2d%2.2d%2.2d-
%2.2d%2.2d.log",

	  Reg.szPath, Time.wYear % 100, Time.wMonth, Time.wDay,
Time.wHour, Time.wMinute );
					txnDelilog =
```

```
new CTxnLog(szLogFile, TXN_LOG_WRITE);

                                                //write event
into txn log for START
                                                txnDelilog-
>WriteCtrlRecToLog(TXN_EVENT_START, szMyComputerName,
sizeof(szMyComputerName));

                                                // allocate
structures for delivery buffers and thread mgmt
        pDeliHandles = new HANDLE[dwNumDeliveryThreads];
                                                pDelBuff =
new DELIVERY_TRANSACTION[dwDelBuffSize];
                                                // launch
DeliveryWorkerThread to perform actual delivery txns
                                                for(i=0;
i<dwNumDeliveryThreads; i++)
                                                {

        pDeliHandles[i] = (HANDLE) _beginthread( DeliveryWorkerThread,
0, NULL );

        if (pDeliHandles[i] == INVALID_HANDLE_VALUE)

        throw new
CWEBCLNT_ERR( ERR_DELIVERY_THREAD_FAILED );
                                                }
                                        }

                                        break;

                                case DLL_PROCESS_DETACH:
                                        if
(dwNumDeliveryThreads)
                                        {
                                                if
(txnDelilog != NULL)
                                                {

        //write event into txn log for STOP

        txnDelilog->WriteCtrlRecToLog(TXN_EVENT_STOP,
szMyComputerName, sizeof(szMyComputerName));


        // This will do a clean shutdown of the delivery log file

        CTxnLog      *txnDelilogLocal = txnDelilog;

        txnDelilog= NULL;

        delete txnDelilogLocal;
                                                }

                                                delete []
pDeliHandles;
                                                delete []
pDelBuff;


        CloseHandle( hWorkerSemaphore );

        CloseHandle( hDoneEvent );

        DeleteCriticalSection(&DelBuffCriticalSection);
                                        }


        DeleteCriticalSection(&TermCriticalSection);

                                        if (hLibInstanceTm !=
NULL)

        FreeLibrary( hLibInstanceTm );
                                                hLibInstanceTm = NULL;

                                                if (hLibInstanceDb !=
NULL)

        FreeLibrary( hLibInstanceDb );
                                                hLibInstanceDb = NULL;

                                                Sleep(500);
                                                break;

                                        default:
                                                /* nothing */;
                        }
                }
                catch (CBaseErr *e)
                {
                        WriteMessageToEventLog( e->ErrorText() );
                        delete e;
                        TerminateExtension(0);
                        return FALSE;
                }
                catch (...)
                {
                        WriteMessageToEventLog(TEXT("Unhandled
exception.  DLL could not load."));
                        TerminateExtension(0);
                        return FALSE;
                }

                return TRUE;
}


/* FUNCTION: GetExtensionVersion
 *
 * PURPOSE:             This function is called by the inet service when the
DLL is first loaded.
 *
 * ARGUMENTS:           HSE_VERSION_INFO    *pVer           passed in
structure in which to place expected version number.
 *
 * RETURNS:                             TRUE        inet service expected
return value.
 */

BOOL WINAPI GetExtensionVersion(HSE_VERSION_INFO *pVer)
{
        pVer->dwExtensionVersion =
MAKELONG(HSE_VERSION_MINOR, HSE_VERSION_MAJOR);
        lstrcpyn(pVer->lpszExtensionDesc, "TPC-C Server.",
HSE_MAX_EXT_DLL_NAME_LEN);

        // TODO: why do we need this here instead of in the DLL attach?
        if (Reg.eTxnMon == ENCINA)
                pCTPCC_ENCINA_post_init();

        return TRUE;
}

/* FUNCTION: TerminateExtension
 *
 * PURPOSE:             This function is called by the inet service when the
DLL is about to be unloaded.
 *                                      Release all resources in anticipation of
being unloaded.
 *
 * RETURNS:                             TRUE        inet service expected
return value.
 */

BOOL WINAPI TerminateExtension( DWORD dwFlags )
{
        if (pDeliHandles)
        {
                SetEvent( hDoneEvent );
                for(DWORD i=0; i<dwNumDeliveryThreads; i++)
                        WaitForSingleObject( pDeliHandles[i],
INFINITE );
        }

        TermDeleteAll();
        return TRUE;
}


/* FUNCTION: HttpExtensionProc
 *
 * PURPOSE:             This function is the main entry point for the TPCC
DLL. The internet service
 *                                      calls this function passing in the http
string.
 *
 * ARGUMENTS:           EXTENSION_CONTROL_BLOCK     *pECB
        structure pointer to passed in internet
 *
        service information.
 *
 * RETURNS:                             DWORD       HSE_STATUS_SUCCESS
                                                        connection
can be dropped if error
 *
        HSE_STATUS_SUCCESS_AND_KEEP_CONN        keep
connect valid comment sent
 *
 * COMMENTS:            None
 *
 */

DWORD WINAPI HttpExtensionProc(EXTENSION_CONTROL_BLOCK *pECB)
{
        int                                     iCmd, FormId, TermId,
iSyncId;
        char                    szBuffer[4096];

        int                                     lpbSize;
        static char     szHeader[] = "200 Ok";
        DWORD                   dwSize = 6;             // initial value
is strlen(szHeader)
        char                    szHeader1[4096];


#ifdef ICECAP
        StartCAP();
#endif

        try
        {
                //process http query
                ProcessQueryString(pECB, &iCmd, &FormId,
&TermId, &iSyncId);

                if (TermId != 0)
                {
                        if ( TermId < 0 || TermId >=
Term.iNumEntries || Term.pClientData[TermId].iNextFree !=-1 )
                        {
                                // debuggi ng...
                                char szTmp[128];
                                wsprintf( szTmp, "Invalid
```

```
term ID; TermId = %d", TermId );

                WriteMessageToEventLog( szTmp );

                                                throw new
CWEBCLNT_ERR( ERR_INVALID_TERMID );
                                        }

                                        //must have a valid syncid here since
termid is valid
                                        if (iSyncId !=
Term.pClientData[TermId].iSyncId)
                                                throw new
CWEBCLNT_ERR( ERR_INVALID_SYNC_CONNECTION );

                                        //set use time
                                        Term.pClientData[TermId].iTickCount =
GetTickCount();
                        }


                        switch(iCmd)
                        {
                        case 0:
                                WelcomeForm(pECB, szBuffer);
                                break;
                        case 1:
                                switch( FormId )
                                {
                                        case WELCOME_FORM:
                                        case
MAIN_MENU_FORM:
                                                break;
                                        case
NEW_ORDER_FORM:

                ProcessNewOrderForm(pECB, TermId, szBuffer);
                                                break;
                                        case PAYMENT_FORM:

                ProcessPaymentForm(pECB, TermId, szBuffer);
                                                break;
                                        case DELIVERY_FORM:

                ProcessDeliveryForm(pECB, TermId, szBuffer);
                                                break;
                                        case
ORDER_STATUS_FORM:

                ProcessOrderStatusForm(pECB, TermId, szBuffer);
                                                break;
                                        case
STOCK_LEVEL_FORM:

                ProcessStockLevelForm(pECB, TermId, szBuffer);
                                                break;
                                        }
                                        break;
                        case 2:
                                        // new-order selected from menu;
display new-order input form
                                        MakeNewOrderForm(TermId, NULL,
INPUT_FORM, szBuffer);
                                        break;
                        case 3:
                                        // payment selected from menu; display
payment input form
                                        MakePaymentForm(TermId, NULL,
INPUT_FORM, szBuffer);
                                        break;
                        case 4:
                                        // delivery selected from menu; display
delivery input form
                                        MakeDeliveryForm(TermId, NULL,
INPUT_FORM, szBuffer);
                                        break;
                        case 5:
                                        // order-status selected from menu;
display order-status input form
                                        MakeOrderStatusForm(TermId, NULL,
INPUT_FORM, szBuffer);
                                        break;
                        case 6:
                                        // stock-level selected from menu;
display stock-level input form
                                        MakeStockLevelForm(TermId, NULL,
INPUT_FORM, szBuffer);
                                        break;
                        case 7:
                                        // ExitCmd
                                        TermDelete(TermId);
                                        WelcomeForm(pECB, szBuffer);
                                        break;
                        case 8:
                                        SubmitCmd(pECB, szBuffer);
                                        break;
                        case 9:
                                        // menu
                                        MakeMainMenuForm(TermId,
Term.pClientData[TermId].iSyncId, szBuffer);
                                        break;
                        case 10:
                                        // CMD=Clear
                                        // resets all connections; should only be
used when no other connections are active
                                        TermDeleteAll();
                                        TermInit();
                                        WelcomeForm(pECB, szBuffer);
                                        break;
                        case 11:        // CMD=Stats
                                        StatsCmd(pECB, szBuffer);
                                        break;
                        }
                }
                catch (CBaseErr *e)
                {
                        ErrorForm( pECB, e->ErrorType(), e->ErrorNum(),
TermId, iSyncId, e->ErrorText(), szBuffer );
                        delete e;
                }
                catch (...)
                {
                        ErrorForm( pECB, ERR_TYPE_WEBDLL, 0, TermId,
iSyncId, "Error: Unhandled exception in Web Client.", szBuffer );
                }

#ifdef ICECAP
                StopCAP();
#endif


                lpbSize = strlen(szBuffer);
                wsprintf(szHeader1,
                                        "Content-Type: text/html\r\n"
                                        "Content-Length: %d\r\n"
                                        "Connection: Keep-Alive\r\n\r\n" ,
lpbSize);
                strcat( szHeader1, szBuffer );

                (*pECB->ServerSupportFunction)(pECB->ConnID,
HSE_REQ_SEND_RESPONSE_HEADER, szHeader, (LPDWORD) &dwSize,
(LPDWORD)szHeader1);

                //finish up and keep connection
                pECB->dwHttpStatusCode = 200;
                return HSE_STATUS_SUCCESS_AND_KEEP_CONN;
}


void WriteMessageToEventLog(LPTSTR lpszMsg)
{
   TCHAR  szMsg[256];
   HANDLE  hEventSource;
   LPTSTR  lpszStrings[2];

   // Use event logging to log the error.
   //
   hEventSource = RegisterEventSource(NULL, TEXT("TPCC.DLL"));

   _stprintf(szMsg, TEXT("Error in TPCC.DLL: "));
   lpszStrings[0] = szMsg;
   lpszStrings[1] = lpszMsg;

   if (hEventSource != NULL)
           {
      ReportEvent(hEventSource, // handle of event source
        EVENTLOG_ERROR_TYPE,  // event type
        0,                    // event category
        0,                    // event ID
        NULL,                 // current user's SID
        2,                    // strings in lpszStrings
        0,                    // no bytes of raw data
        (LPCTSTR *)lpszStrings,    // array of error strings
        NULL);                // no raw data

      (VOID) DeregisterEventSource(hEventSource);
   }
}


/* FUNCTION: DeliveryWorkerThread
 *
 * PURPOSE:              This function processes deferred delivery txns.  There
are typically several
 *                                      threads running this routine.  The
number of threads is determined by an entry
 *                                      read from the registry.  The thread waits
for work by waiting on semaphore.
 *                                      When a delivery txn is posted, the
semaphore is released.  After processing
 *                                      the delivery txn, information is logged to
record the txn status and execution
 *                                      time.
 */

/*static*/ void DeliveryWorkerThread(void *ptr)
{
        CTPCC_BASE                      *pTxn = NULL;

        DELIVERY_TRANSACTION                    delivery;
        PDELIVERY_DATA
        pDeliveryData;
        TXN_RECORD_TPCC_DELIV_DEF       txnDeliRec;

        DWORD
        index;
        HANDLE
        handles[2];

        SYSTEMTIME                      trans_end;
        //delivery transaction finished time
        SYSTEMTIME                      trans_start;   //delivery
transaction start time

        assert(txnDelilog != NULL);
```

```
	try
	{
		if (Reg.eDB_Protocol == ODBC)
			pTxn =
pCTPCC_ODBC_new( Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword,
szMyComputerName, Reg.szDbName );
		else if (Reg.eDB_Protocol == DBLIB)
			pTxn =
pCTPCC_DBLIB_new( Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword,
szMyComputerName, Reg.szDbName );
		pDeliveryData = pTxn->BuffAddr_Delivery();
	}
	catch (CBaseErr *e)
	{
		char szTmp[1024];
		wsprintf( szTmp, "Error in Delivery Txn thread.  Could
not connect to database.  "
			"%s.  Server=%s,
User=%s, Password=%s, Database=%s",
			e->ErrorText(),
Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword, Reg.szDbName );
		WriteMessageToEventLog( szTmp );
		delete e;
		goto ErrorExit;
	}
	catch (...)
	{
		WriteMessageToEventLog(TEXT("Unhandled
exception caught in DeliveryWorkerThread."));
		goto ErrorExit;
	}

	while (TRUE)
	{
		try
		{
			//while delivery thread running, i.e. user
has not requested termination
			while (TRUE)
			{
				// need to wait for multiple
objects: program exit or worker semaphore;
				handles[0] = hDoneEvent;
				handles[1] =
hWorkerSemaphore;
				index =
WaitForMultipleObjects( 2, &handles[0], FALSE, INFINITE );
				if (index ==
WAIT_OBJECT_0)
					goto
ErrorExit;

				ZeroMemory(&txnDeliRec,
sizeof(txnDeliRec));
				txnDeliRec.TxnType =
TXN_REC_TYPE_TPCC_DELIV_DEF;

				// make a local copy of
current entry from delivery buffer and increment buffer index

	EnterCriticalSection(&DelBuffCriticalSection);
				delivery =
*(pDelBuff+dwDelBuffBusyIndex);
				dwDelBuffFreeCount++;
				dwDelBuffBusyIndex++;
				if (dwDelBuffBusyIndex ==
dwDelBuffSize)	// wrap-around if at end of buffer

	dwDelBuffBusyIndex = 0;


	LeaveCriticalSection(&DelBuffCriticalSection);

				pDeliveryData->w_id =
delivery.w_id;
				pDeliveryData-
>o_carrier_id = delivery.o_carrier_id;

				txnDeliRec.w_id =
pDeliveryData->w_id;
				txnDeliRec.o_carrier_id =
pDeliveryData->o_carrier_id;
				txnDeliRec.TxnStartT0 =
Get64BitTime(&delivery.queue);


	GetLocalTime( &trans_start );
				pTxn->Delivery();

	GetLocalTime( &trans_end );

				//log txn
				txnDeliRec.TxnStatus =
ERR_SUCCESS;
				for (int i=0; i<10; i++)

	txnDeliRec.o_id[i] = pDeliveryData->o_id[i];
				txnDeliRec.DeltaT4 =
(int)(Get64BitTime(&trans_end)- txnDeliRec.TxnStartT0);
				txnDeliRec.DeltaTxnExec
= (int)(Get64BitTime(&trans_end)- Get64BitTime(&trans_start));

				if (txnDelilog != NULL)
					txnDelilog-
>WriteToLog(&txnDeliRec);
			}
		}
		catch (CBaseErr *e)
		{
			char szTmp[1024];
			wsprintf( szTmp, "Error in Delivery Txn
thread.  %s", e->ErrorText() );
			WriteMessageToEventLog( szTmp );

			// log the error txn
			txnDeliRec.TxnStatus = e->ErrorType();
			if (txnDelilog != NULL)
				txnDelilog-
>WriteToLog(&txnDeliRec);

			delete e;
		}
		catch (...)
		{
			// unhandled exception; shouldn't
happen; not much we can do...

	WriteMessageToEventLog(TEXT("Unhandled exception caught in
DeliveryWorkerThread."));
		}
	}

ErrorExit:
	delete pTxn;
	_endthread();
}

/* FUNCTION: PostDeliveryInfo
 *
 * PURPOSE:		This function enters the delivery txn into the deferred
delivery buffer.
 *
 * RETURNS:			BOOL	FALSE	delivery
information posted successfully
 *
		TRUE	error cannot post delivery info
 */

BOOL PostDeliveryInfo(short w_id, short o_carrier_id)
{
	BOOL bError;

	EnterCriticalSection(&DelBuffCriticalSection);
	if (dwDelBuffFreeCount > 0)
	{
		bError = FALSE;
		(pDelBuff+dwDelBuffFreeIndex)->w_id
	= w_id;
		(pDelBuff+dwDelBuffFreeIndex)->o_carrier_id
	= o_carrier_id;
		GetLocalTime(&(pDelBuff+dwDelBuffFreeIndex)
>queue);

		dwDelBuffFreeCount--;
		dwDelBuffFreeIndex++;
		if (dwDelBuffFreeIndex == dwDelBuffSize)
			dwDelBuffFreeIndex = 0;
	// wrap-around if at end of buffer
	}
	else
		// No free buffers.  Return an error, which indicates
that the delivery buffer is full.
		// Most likely, the number of delivery worker threads
needs to be increased to keep up
		// with the txn rate.
		bError = TRUE;
	LeaveCriticalSection(&DelBuffCriticalSection);

	if (!bError)
		// increment worker semaphore to wake up a worker
thread
		ReleaseSemaphore( hWorkerSemaphore, 1, NULL );

	return bError;
}

/* FUNCTION: ProcessQueryString
 *
 * PURPOSE:		This function extracts the relevent information out of
the http command passed in from
 *				the browser.
 *
 * 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.
 */

void ProcessQueryString(EXTENSION_CONTROL_BLOCK *pECB, int *pCmd,
int *pFormId, int *pTermId, int *pSyncId)
{
	char *ptr = pECB->lpszQueryString;
	char szBuffer[25];
	int i;

	//allowable client command strings i.e. CMD=command
	static char *szCmds[] =
	{
		"Process", "..NewOrder..", "..Payment..", "..Delivery..",
"..Order-Status..", "..Stock-Level..",
		"..Exit..", "Submit", "Menu", "Clear", "Stats", ""
	};

	*pCmd	= 0;			// default is the login
```

```
screen
        *pTermId = 0;

        // if no params (i.e., empty query string), then return login screen
        if (strlen(pECB->lpszQueryString) == 0)
                return;

        // parse FORMID, TERMID, and SYNCID
        *pFormId = GetIntKeyValue(&ptr, "FORMID", NO_ERR, NO_ERR);
        *pTermId = GetIntKeyValue(&ptr, "TERMID", NO_ERR, NO_ERR);
        *pSyncId = GetIntKeyValue(&ptr, "SYNCID", NO_ERR, NO_ERR);

        // parse CMD
        GetKeyValue(&ptr, "CMD", szBuffer, sizeof(szBuffer),
ERR_COMMAND_UNDEFINED);

        // see which command it matches
        for(i=0; ; i++)
        {
                if (szCmds[i][0] == 0)
                        // no more; no match; return error
                        throw new
CWEBCLNT_ERR( ERR_COMMAND_UNDEFINED );
                if ( !strcmp(szCmds[i], szBuffer) )
                {
                        *pCmd = i+1;
                        break;
                }
        }
}

/* FUNCTION: void WelcomeForm
 *
 */

void WelcomeForm(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer)
{
        char szTmp[1024];

        //welcome to tpc-c html form buffer, this is first form client sees.
        strcpy( szBuffer,       "<HTML><HEAD><TITLE>TPCC Web
Client</TITLE></HEAD><BODY>"

        "<B><BIG>Microsoft TPCC Web Client (ver 4.20)</BIG></B>
<BR> <BR>"

        "<font face=\"Courier New\"><PRE>"

        "Compiled: "__DATE__", "__TIME__" <BR>"

        "Source:   "__FILE__" ("__TIMESTAMP__") <BR>"

        "</PRE></font>"

        "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"

        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"0\">"

        "<INPUT TYPE=\"hidden\" NAME=\"ERROR\" VALUE=\"0\">"

        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"1\">"

        "<INPUT TYPE=\"hidden\" NAME=\"TERMID\" VALUE=\"0\">"

        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"0\">"

        "<INPUT TYPE=\"hidden\" NAME=\"VERSION\" VALUE=\""
WEBCLIENT_VERSION \"">"
                        );

        sprintf( szTmp,         "Configuration Settings: <BR><font
face=\"Courier New\" color=\"blue\"><PRE>"
                                                        "Txn Monitor
= <B>%s</B><BR>"
                                                        "Database
protocol     = <B>%s</B><BR>"
                                                        "Max
Connections       = <B>%d</B><BR>"
                                                        "# of Delivery
Threads  = <B>%d</B><BR>"
                                                        "Max
Pending Deliveries = <B>%d</B><BR>"
                                        , szTxnMonNames[RegeTxnMon],
szDBNames[Reg.eDB_Protocol],
                                        Reg.dwMaxConnections,
dwNumDeliveryThreads, dwDelBuffSize );
        strcat( szBuffer, szTmp);

        if (Reg.eTxnMon == COM)
        {
                sprintf( szTmp,         "COM Single Pool       =
<B>%s</B><BR>",
                                        Reg.bCOM_SinglePool ? "YES" :
"NO" );
                strcat( szBuffer, szTmp);
        }
        strcat( szBuffer, "</PRE></font>");

        if (Reg.eTxnMon == None)
                // connection options may be specified when not
using a txn monitor
                sprintf( szTmp,         "Please enter your
database options for this connection:<BR>"

        "<font face=\"Courier New\" color=\"blue\"><PRE>"

        "DB Server    = <INPUT NAME=\"db_server\" SIZE=20
VALUE=\"%s\"><BR>"

        "DB User ID   = <INPUT NAME=\"db_user\" SIZE=20
VALUE=\"%s\"><BR>"

        "DB Password  = <INPUT NAME=\"db_passwd\" SIZE=20
VALUE=\"%s\"><BR>"

        "DB Name      = <INPUT NAME=\"db_name\" SIZE=20
VALUE=\"%s\"><BR>"

        "</PRE></font>"
                                        , Reg.szDbServer,
Reg.szDbUser, Reg.szDbPassword, Reg.szDbName );
        else
                // if using a txn monitor, connection options are
determined from registry; can't
                // set per user.  show options fyi
                sprintf( szTmp,         "Database options which
will be used by the transaction monitor:<BR>"

        "<font face=\"Courier New\" color=\"blue\"><PRE>"

        "DB Server            = <B>%s</B><BR>"

        "DB User ID           = <B>%s</B><BR>"

        "DB Password          = <B>%s</B><BR>"

        "DB Name              = <B>%s</B><BR>"

        "</PRE></font>"
                                        , Reg.szDbServer,
Reg.szDbUser, Reg.szDbPassword, Reg.szDbName );
        strcat( szBuffer, szTmp);

        sprintf( szTmp,         "Please enter your Warehouse and
District for this session:<BR>"
                                                        "<font
face=\"Courier New\" color=\"blue\"><PRE>" );
        strcat( szBuffer, szTmp);
        strcat( szBuffer,       "Warehouse ID = <INPUT
NAME=\"w_id\" SIZE=4><BR>"

        "District ID  = <INPUT NAME=\"d_id\" SIZE=2><BR>"

        "</PRE></font><HR>"

        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Submit\">"

        "</FORM></BODY></HTML>");
}

/* FUNCTION: SubmitCmd
 *
 * PURPOSE:             This function allocated a new terminal id in the Term
structure array.
 *
 */

void SubmitCmd(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer)
{
        int             iNewTerm;
        char            *ptr = pECB->lpszQueryString;

        char            szVersion[32]           = { 0 };
        char            szServer[32] = { 0 };
        char            szUser[32]              = "sa";
        char            szPassword[32]          = { 0 };
        char            szDatabase[32]          = "tpcc";

        // validate version field; the version field ensures that the RTE is
synchronized with the web client
        GetKeyValue(&ptr, "VERSION", szVersion, sizeof(szVersion),
ERR_VERSION_MISMATCH);
        if ( strcmp( szVersion, WEBCLIENT_VERSION ) )
                throw new
CWEBCLNT_ERR( ERR_VERSION_MISMATCH );

        if (Reg.eTxnMon == None)
        {
                // parse Server name
                GetKeyValue(&ptr, "db_server", szServer,
sizeof(szServer), ERR_NO_SERVER_SPECIFIED);
                // parse User name
                GetKeyValue(&ptr, "db_user", szUser, sizeof(szUser),
NO_ERR);
                // parse Password
                GetKeyValue(&ptr, "db_passwd", szPassword,
sizeof(szPassword), NO_ERR);
                // parse Database name
                GetKeyValue(&ptr, "db_name", szDatabase,
sizeof(szDatabase), NO_ERR);
        }

        // parse warehouse ID
        int w_id = GetIntKeyValue(&ptr, "w_id", ERR_HTML_ILL_FORMED,
ERR_W_ID_INVALID);
        if ( w_id < 1 )
                throw new
CWEBCLNT_ERR( ERR_W_ID_INVALID );

        // parse district ID
        int d_id = GetIntKeyValue(&ptr, "d_id", ERR_HTML_ILL_FORMED,
ERR_D_ID_INVALID);
        if ( d_id < 1 || d_id > 10 )
                throw new
CWEBCLNT_ERR( ERR_D_ID_INVALID );
```

```
        iNewTerm = TermAdd();

        Term.pClientData[iNewTerm].w_id = w_id;
        Term.pClientData[iNewTerm].d_id = d_id;

        try
        {
                if (Reg.eTxnMon == TUXEDO)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_TUXEDO_new();
                else if (Reg.eTxnMon == ENCINA)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_ENCINA_new();
                else if (Reg.eTxnMon == COM)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_COM_new( Reg.bCOM_SinglePool );
                else if (Reg.eDB_Protocol == ODBC)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_ODBC_new( szServer, szUser, szPassword, szMyComputerName,
szDatabase );
                else if (Reg.eDB_Protocol == DBLIB)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_DBLIB_new( szServer, szUser, szPassword, szMyComputerName,
szDatabase );
        }
        catch (...)
        {
                TermDelete(iNewTerm);
                throw;                  // pass exception upward
        }

        MakeMainMenuForm(iNewTerm,
Term.pClientData[iNewTerm].iSyncId, szBuffer);
}

/* FUNCTION: StatsCmd
 *
 * PURPOSE:             This function returns to the browser the total number
of active terminal ids.
 *                      This routine is for
development/debugging purposes.
 *
 */

void StatsCmd(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer)
{
        int i;
        int     iTotal;

        EnterCriticalSection(&TermCriticalSection);

        iTotal = 0;
        for(i=0; i<Term.iNumEntries; i++)
        {
                if (Term.pClientData[i].iNextFree ==-1)
                        iTotal++;
        }

        LeaveCriticalSection(&TermCriticalSection);

        wsprintf( szBuffer,
                        "<HTML><HEAD><TITLE>TPCC Web
Client Stats</TITLE></HEAD>"
                        "<BODY><B><BIG> Total Active
Connections: %d </BIG></B><BR></BODY></HTML>"
                        , iTotal );
}

char *CWEBCLNT_ERR::ErrorText()
{
        static SERRORMSG errorMsgs[] =
        {
                {       ERR_COMMAND_UNDEFINED,
                                "Command undefined."
                        },
                {       ERR_D_ID_INVALID,
                                "Invalid District ID Must be
1 to 10."
                },
                {
        ERR_DELIVERY_CARRIER_ID_RANGE,
        "Delivery Carrier ID out of range must be 1- 10."
                        },
                {       ERR_DELIVERY_CARRIER_INVALID,
                "Delivery Carrier ID invalid must be numeric 1- 10."
                        },
                {       ERR_DELIVERY_MISSING_OCD_KEY,
                "Delivery missing Carrier ID key\"OCD*\"."

        },
                        {       ERR_DELIVERY_THREAD_FAILED,
                                "Could not start delivery worker thread."

        },
                        {       ERR_GETPROCADDR_FAILED,
                                "Could not map proc in
DLL.  GetProcAddr error.  DLL="
        },
                        {       ERR_HTML_ILL_FORMED,
                                "Required key field is
missing from HTML string."
        },
                        {       ERR_INVALID_SYNC_CONNECTION,
                        "Invalid Terminal Sync ID."

                        },
                        {       ERR_INVALID_TERMID,
                                "Invalid Terminal ID."

                                                },
                        {       ERR_LOADDLL_FAILED,
                                "Load of DLL failed.
DLL="
                                                },
                {
        ERR_MAX_CONNECTIONS_EXCEEDED,
        "No connections available.  Max Connections is probably too
low."  },
                        {       ERR_MISSING_REGISTRY_ENTRIES,
                        "Required registry entries are missing.  Rerun
INSTALL to correct."    },
                        {
        ERR_NEWORDER_CUSTOMER_INVALID,
        "New Order customer id invalid data type, range = 1 to 3000."
        },
                        {       ERR_NEWORDER_CUSTOMER_KEY,
                                "New Order missing Customer key
\"CID*\"."
        },
                        {
        ERR_NEWORDER_DISTRICT_INVALID,
        "New Order District ID Invalid range 1- 10."
                                        },
                        {
        ERR_NEWORDER_FORM_MISSING_DID,
        "New Order missing District key \"DID*\"."
                                        },
                        {       ERR_NEWORDER_ITEMID_INVALID,
                        "New Order Item Id is wrong data type, must be
numeric."               },
                        {       ERR_NEWORDER_ITEMID_RANGE,
                                "New Order Item Id is out of range.
Range = 1 to 999999."                   },
                        {
        ERR_NEWORDER_ITEMID_WITHOUT_SUPPW,
        "New Order Item_Id field entered without a corresponding
Supp_W."        },
                        {       ERR_NEWORDER_MISSING_IID_KEY,
                                "New Order missing Item Id key\"IID*\"."

        },
                        {
        ERR_NEWORDER_MISSING_QTY_KEY,
        "New Order Missing Qty key \"Qty##*\"."
                                                },
                        {
        ERR_NEWORDER_MISSING_SUPPW_KEY,
        "New Order missing Supp_W key \"SP##*\"."
                                                },
                        {
        ERR_NEWORDER_NOITEMS_ENTERED,
        "New Order No order lines entered."

        },
                        {       ERR_NEWORDER_QTY_INVALID,
                                "New Order Qty invalid must be numeric
range 1 - 99."                          },
                        {       ERR_NEWORDER_QTY_RANGE,
                                        "New Order Qty is out of
range. Range = 1 to 99."
        },
                        {
        ERR_NEWORDER_QTY_WITHOUT_SUPPW,
        "New Order Qty field entered without a corresponding Supp_W."
        },
                        {       ERR_NEWORDER_SUPPW_INVALID,
                                "New Order Supp_W invalid data type
must be numeric."                       },
                        {       ERR_NO_SERVER_SPECIFIED,
                        "No Server name specified."

                                                },
                        {       ERR_ORDERSTATUS_CID_AND_CLT,
                        "Order Status Only Customer ID or Last Name may
be entered, not both."  },
                        {       ERR_ORDERSTATUS_CID_INVALID,
                        "Order Status Customer ID invalid, range must be
numeric 1 - 3000."      },
                        {       ERR_ORDERSTATUS_CLT_RANGE,
                                "Order Status Customer last name
longer than 16 characters."             },
                        {       ERR_ORDERSTATUS_DID_INVALID,
                        "Order Status District invalid, value must be numeric
1 - 10."                },
                        {
        ERR_ORDERSTATUS_MISSING_CID_CLT,
        "Order Status Either Customer ID or Last Name must be entered."
        },
                        {
        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_MISSING_DID_KEY,
        "Order Status missing District key \"DID*\"."
                                        },
                        {       ERR_PAYMENT_CDI_INVALID,
                                "Payment Customer district invalid must
be numeric."                            },
                        {       ERR_PAYMENT_CID_AND_CLT,
```

```
                        "Payment Only Customer ID or Last
Name may be entered, not both."         },
                {
        ERR_PAYMENT_CUSTOMER_INVALID,
        "Payment Customer data type invalid, must be numeric."
                        },
                {       ERR_PAYMENT_CWI_INVALID,
                        "Payment Customer Warehouse invalid,
must be numeric."                                       },
                {       ERR_PAYMENT_DISTRICT_INVALID,
                "Payment District ID is invalid, must be 1 - 10."
                                        },
                {       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_PAYMENT_LAST_NAME_TO_LONG,
        "Payment Customer last name longer than 16 characters."
                        },
                {       ERR_PAYMENT_MISSING_CDI_KEY,
                "Payment missing Customer district key \"CDI*\"."
                                        },
                {       ERR_PAYMENT_MISSING_CID_CLT,
                "Payment Either Customer ID or Last Name must be
entered."                               },
                {       ERR_PAYMENT_MISSING_CID_KEY,
                "Payment missing Customer Key \"CID*\"."


        },
                {       ERR_PAYMENT_MISSING_CLT_KEY,
                "Payment missing Customer Last Name key
\"CLT*\"."                                              },
                {       ERR_PAYMENT_MISSING_CWI_KEY,
                "Payment missing Customer Warehouse key
\"CWI*\"."                                              },
                {       ERR_PAYMENT_MISSING_DID_KEY,
                "Payment missing District Key \"DID*\"."
                                        },
                {       ERR_PAYMENT_MISSING_HAM_KEY,
                "Payment missing Amount key \"HAM*\"."


        },
                {
        ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,"Stock Level;
missing Threshold key \"TT*\"."
                },
                {
        ERR_STOCKLEVEL_THRESHOLD_INVALID,
        "Stock Level; Threshold value must be in the range = 1 - 99."
        },
                {
        ERR_STOCKLEVEL_THRESHOLD_RANGE,
        "Stock Level Threshold out of range, range must be 1 - 99."
                },
                {       ERR_VERSION_MISMATCH,
                                "Invalid version field.  RTE
and Web Client are probably out of sync." },
                {       ERR_W_ID_INVALID,
                                "Invalid Warehouse ID."

                                                },
                {       0,

        ""


        }
```

```
        };

        char szTmp[256];
        int i = 0;
        while (TRUE)
        {
                if (errorMsgs[i].szMsg[0] == 0)
                {
                        strcpy( szTmp, "Unknown error
number." );
                        break;
                }
                if (m_Error == errorMsgs[i].iError)
                {
                        strcpy( szTmp, errorMsgs[i].szMsg );
                        break;
                }
                i++;
        }

        if (m_szTextDetail)
                strcat( szTmp, m_szTextDetail );
        if (m_SystemErr)
                wsprintf( szTmp+strlen(szTmp), "  Error=%d",
m_SystemErr );

        m_szErrorText = new char[strlen(szTmp)+1];
        strcpy( m_szErrorText, szTmp );
        return m_szErrorText;


}

/* FUNCTION: GetKeyValue
 *
 * PURPOSE:             This function parses a http formatted string for
specific key values.
 *
 * ARGUMENTS:           char
        *pQueryString           http string from client browser
 *                                              char
        *pKey                                   key value to look for
 *                                              char
        *pValue                                 character array into which
to place key's value
 *                                              int
                        iMax                            maximum
length of key value array.
 *                                              WEBERROR
        err                                             error value to
throw
 *
 * RETURNS:                     nothing.
 *
 * ERROR:               if (the pKey value is not found) then
 *                                                      if (err == 0)
 *
        return (empty string)
 *                                                      else
 *
        throw CWEBCLNT_ERR(err)
 *
 * 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.
 */

void GetKeyValue(char **pQueryString, char *pKey, char *pValue, int iMax,
WEBERROR err)
{
        char *ptr;
```

```
        if ( !(ptr=strstr(*pQueryString, pKey)) )
                goto ErrorExit;
        ptr += strlen(pKey);
        if ( *ptr != '=' )
                goto ErrorExit;
        ptr++;

        iMax--;  // one position is for terminating null
        while( *ptr && *ptr != '&' && iMax)
        {
                *pValue++ = *ptr++;
                iMax--;
        }
        *pValue = 0;  // terminating null

        *pQueryString = ptr;
        return;

ErrorExit:
        if (err != NO_ERR)
                throw new CWEBCLNT_ERR( err );
        *pValue = 0;  // return empty result string
}

/* FUNCTION: GetIntKeyValue
 *
 * PURPOSE:             This function parses a http formatted string for a
specific key value.
 *
 * ARGUMENTS:           char
        *pQueryString           http string from client browser
 *                                              char
        *pKey                                   key value to look for
 *                                              WEBERROR
        NoKeyErr                error value to throw if key not found
 *                                              WEBERROR
        NotIntErr               error value to throw if value not numeric
 *
 * RETURNS:                     integer
 *
 * ERROR:               if (the pKey value is not found) then
 *                                                      if
(NoKeyErr != NO_ERR)
 *
        throw CWEBCLNT_ERR(err)
 *                                                      else
 *
        return 0
 *                                              else if (non-numeric char
found) then
 *                                                      if
(NotIntErr != NO_ERR) then
 *
        throw CWEBCLNT_ERR(err)
 *                                                      else
 *
        return 0
 *
 * 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.
 */

int GetIntKeyValue(char **pQueryString, char *pKey, WEBERROR NoKeyErr,
WEBERROR NotIntErr)
{
        char *ptr0;
        char *ptr;
```

```
		if ( !(ptr=strstr(*pQueryString, pKey)) )
			goto ErrorNoKey;
		ptr += strlen(pKey);
		if ( *ptr != '=' )
			goto ErrorNoKey;
		ptr++;

		ptr0 = ptr;			// remember starting point
		// scan string until a terminator (null or &) or a non-digit
		while( *ptr && *ptr != '&' && isdigit(*ptr) )
			ptr++;

		// make sure we stopped scanning for the right reason
		if ((ptr0 == ptr) || (*ptr && *ptr != '&'))
		{
			if (NotIntErr != NO_ERR)
				throw new
CWEBCLNT_ERR( NoKeyErr );
			return 0;
		}

		*pQueryString = ptr;
		return atoi(ptr0);

ErrorNoKey:
		if (NoKeyErr != NO_ERR)
			throw new CWEBCLNT_ERR( NoKeyErr );
		return 0;
}

/* FUNCTION: TermInit
 *
 * PURPOSE:		This function initializes the client terminal structure; it
is called when the TPCC.DLL
 *				is first loaded by the inet service.
 *
 */

void TermInit(void)
{
		EnterCriticalSection(&TermCriticalSection);

		Term.iMasterSyncId	= 1;
		Term.iNumEntries	= Reg.dwMaxConnections+1;

		Term.pClientData	= NULL;
		Term.pClientData	=
(PCLIENTDATA)malloc(Term.iNumEntries * sizeof(CLIENTDATA));
		if (Term.pClientData == NULL)
		{
			LeaveCriticalSection(&TermCriticalSection);
			throw new
CWEBCLNT_ERR( ERR_MEM_ALLOC_FAILED );
		}

		ZeroMemory( Term.pClientData, Term.iNumEntries *
sizeof(CLIENTDATA) );

		Term.iFreeList				= Term.iNumEntries-1;
		// build free list
		// note: Term.pClientData[0].iNextFree gets set to-1, which marks
it as "in use".
		//	This is intentional, as the zero entry is used as an anchor and
never
		//				allocated as an actual terminal.
		for(int i=0; i<Term.iNumEntries; i++)
			Term.pClientData[i].iNextFree = i-1;

		LeaveCriticalSection(&TermCriticalSection);
}

/* FUNCTION: TermDeleteAll
 *
 * PURPOSE:		This function frees allocated resources associated
with the terminal structure.
 *
 * ARGUMENTS:		none
 *
 * RETURNS:			None
 *
 * COMMENTS:		This function is called only when the inet service
unloads the TPCC.DLL
 *
 */

void TermDeleteAll(void)
{
		EnterCriticalSection(&TermCriticalSection);

		for(int i=1; i<Term.iNumEntries; i++)
		{
			if (Term.pClientData[i].iNextFree ==-1)
				delete Term.pClientData[i].pTxn;
		}

		Term.iFreeList				= 0;
		Term.iNumEntries	= 0;
		if ( Term.pClientData )
			free(Term.pClientData);
		Term.pClientData	= NULL;

		LeaveCriticalSection(&TermCriticalSection);
}

/* FUNCTION: TermAdd
 *
 * PURPOSE:		This function assigns a terminal id which is used to
identify a client browser.
 *
 * RETURNS:			int				assigned
terminal id
 *
 */

int TermAdd(void)
{
		DWORD	i;
		int			iNewTerm, iTickCount;

		if (Term.iNumEntries == 0)
			return -1;

		EnterCriticalSection(&TermCriticalSection);
		if (Term.iFreeList != 0)
		{	// position is available
			iNewTerm = Term.iFreeList;
			Term.iFreeList =
Term.pClientData[iNewTerm].iNextFree;
			Term.pClientData[iNewTerm].iNextFree =-1;  //
indicates this position is in use
		}
		else
		{	// no open slots, so find the slot that hasn't been used
in the longest time and reuse it
			for(iNewTerm=1, i=1, iTickCount=0x7FFFFFFF;
i<Reg.dwMaxConnections; i++)
			{
				if (iTickCount >
Term.pClientData[i].iTickCount)
				{
					iTickCount =
Term.pClientData[i].iTickCount;
					iNewTerm = i;
				}
			}
			// if oldest term is less than one minute old, it
probably means that more connections
			// are being attempted than were specified as "Max
Connections" at install.  In this case,
			// do not bump existing connection; instead, return
error to requestor.
			if ((GetTickCount()- iTickCount) < 60000)
			{
				LeaveCriticalSection(&TermCriticalSection);
				throw new
CWEBCLNT_ERR( ERR_MAX_CONNECTIONS_EXCEEDED );
			}
		}

		Term.pClientData[iNewTerm].iTickCount = GetTickCount();
		Term.pClientData[iNewTerm].iSyncId = Term.iMasterSyncId++;
		Term.pClientData[iNewTerm].pTxn = NULL;

		LeaveCriticalSection(&TermCriticalSection);
		return iNewTerm;
}

/* FUNCTION: TermDelete
 *
 * PURPOSE:		This function makes a terminal entry in the Term
array available for reuse.
 *
 * ARGUMENTS:		int
			id				Terminal id of client exiting
 *
 */

void TermDelete(int id)
{
		if ( id > 0 && id < Term.iNumEntries )
		{
			delete Term.pClientData[id].pTxn;

			// put onto free list
			EnterCriticalSection(&TermCriticalSection);

			Term.pClientData[id].iNextFree = Term.iFreeList;
			Term.iFreeList = id;

			LeaveCriticalSection(&TermCriticalSection);
		}
}


/* FUNCTION: MakeErrorForm
 */

void ErrorForm(EXTENSION_CONTROL_BLOCK *pECB, int iType, int
iErrorNum, int iTermId, int iSyncId, char *szErrorText, char *szBuffer )
{
		wsprintf(szBuffer,
			"<HTML><HEAD><TITLE>TPCC
Error</TITLE></HEAD><BODY>"
			"<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
			"<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"%d\">"
			"<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"%d\">"
			"<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
			"<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
			"<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
			"<BOLD>An Error Occurred</BOLD><BR><BR>"
```

```
                        "%s"
                        "<BR><BR><HR>"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..NewOrder..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Payment..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Delivery..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Order-Status..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Stock-Level..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Exit..\">"
                        "</FORM></BODY></HTML>"
                        , iType, iErrorNum, MAIN_MENU_FORM, iTermId,
iSyncId, szErrorText );
}

/* FUNCTION: MakeMainMenuForm
 */

void MakeMainMenuForm(int iTermId, int iSyncId, char *szForm)
{
        wsprintf(szForm,
                        "<HTML><HEAD><TITLE>TPCC Main
Menu</TITLE></HEAD><BODY>"
                        "Select Desired Transaction.<BR><HR>"
                        "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..NewOrder..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Payment..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Delivery..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Order-Status..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Stock-Level..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Exit..\">"
                        "</FORM></BODY></HTML>"
                        , MAIN_MENU_FORM, iTermId, iSyncId);
}

/* FUNCTION: MakeStockLevelForm
 *
 * PURPOSE:             This function constructs the Stock Level HTML page.
 *
 * COMMENTS:            The internal client buffer is created when the terminal
id is assigned and should not
 *                                                      be freed except when the
client terminal id is no longer needed.
 */

void MakeStockLevelForm(int iTermId, STOCK_LEVEL_DATA
*pStockLevelData, BOOL bInput, char *szForm)
{
        int             c;

        c = wsprintf(szForm,
                        "<HTML><HEAD><TITLE>TPCC Stock
Level</TITLE></HEAD><FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
                        "<PRE><font face=\"Courier\">
Stock-Level<BR>"
                        "Warehouse: %4.4d   District: %2.2d<BR> <BR>",
                        STOCK_LEVEL_FORM, iTermId,
Term.pClientData[iTermId].iSyncId,
                        Term.pClientData[iTermId].w_id,
Term.pClientData[iTermId].d_id);

        if ( bInput )
        {
                strcpy(szForm+c,
                        "Stock Level Threshold: <INPUT
NAME=\"TT*\" SIZE=2><BR> <BR>"
                        "low stock:    </font><BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR>"
                        " <BR> <BR> <BR> <BR> <BR> <BR>
<BR></PRE><HR>"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Menu\">"
                        "</FORM></HTML>" );
        }
        else
        {
                wsprintf(szForm+c,
                        "Stock Level Threshold: %2.2d<BR>
<BR>"
                        "low stock: %3.3d</font> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR>"
                        " <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR></PRE><HR>"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                        "</FORM></HTML>"
                        , pStockLevelData->threshold,
pStockLevelData->low_stock);
        }
}

/* FUNCTION: MakeNewOrderForm
 *
 * COMMENTS:            The internal client buffer is created when the terminal
id is assigned and should not
 *                                                      be freed except when the
client terminal id is no longer needed.
 */

void MakeNewOrderForm(int iTermId, NEW_ORDER_DATA *pNewOrderData,
BOOL bInput, char *szForm)
{
        int             i, c;
        BOOL        bValid;
        static      char szBR[] = " <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>";

        if (!bInput)
                assert( pNewOrderData->exec_status_code == eOK
|| pNewOrderData->exec_status_code == eInvalidItem );

        bValid = (bInput || (pNewOrderData->exec_status_code == eOK));

        c = wsprintf(szForm,
                        "<HTML><HEAD><TITLE>TPCC New
Order</TITLE></HEAD><BODY>"
                        "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
                        "<PRE><font face=\"Courier\">
New Order<BR>"
                        , bValid ? 0 : ERR_BAD_ITEM_ID,
NEW_ORDER_FORM, iTermId, Term.pClientData[iTermId].iSyncId);

        if ( bInput )
        {
                c += wsprintf(szForm+c, "Warehouse: %4.4d   ",
Term.pClientData[iTermId].w_id );

                strcpy( szForm+c,
                        "District: <INPUT NAME=\"DID*\"
SIZE=1>                 Date:<BR>"
                        "Customer:  <INPUT NAME=\"CID*\"
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=\"SP00*\" SIZE=4>
<INPUT NAME=\"IID00*\" SIZE=6>                  <INPUT NAME=\"Qty00*\"
SIZE=1><BR>"
                        "  <INPUT NAME=\"SP01*\" SIZE=4>
<INPUT NAME=\"IID01*\" SIZE=6>                  <INPUT NAME=\"Qty01*\"
SIZE=1><BR>"
                        "  <INPUT NAME=\"SP02*\" SIZE=4>
<INPUT NAME=\"IID02*\" SIZE=6>                  <INPUT NAME=\"Qty02*\"
SIZE=1><BR>"
                        "  <INPUT NAME=\"SP03*\" SIZE=4>
<INPUT NAME=\"IID03*\" SIZE=6>                  <INPUT NAME=\"Qty03*\"
SIZE=1><BR>"
                        "  <INPUT NAME=\"SP04*\" SIZE=4>
<INPUT NAME=\"IID04*\" SIZE=6>                  <INPUT NAME=\"Qty04*\"
SIZE=1><BR>"
                        "  <INPUT NAME=\"SP05*\" SIZE=4>
<INPUT NAME=\"IID05*\" SIZE=6>                  <INPUT NAME=\"Qty05*\"
SIZE=1><BR>"
                        "  <INPUT NAME=\"SP06*\" SIZE=4>
<INPUT NAME=\"IID06*\" SIZE=6>                  <INPUT NAME=\"Qty06*\"
SIZE=1><BR>"
                        "  <INPUT NAME=\"SP07*\" SIZE=4>
<INPUT NAME=\"IID07*\" SIZE=6>                  <INPUT NAME=\"Qty07*\"
SIZE=1><BR>"
                        "  <INPUT NAME=\"SP08*\" SIZE=4>
<INPUT NAME=\"IID08*\" SIZE=6>                  <INPUT NAME=\"Qty08*\"
SIZE=1><BR>"
                        "  <INPUT NAME=\"SP09*\" SIZE=4>
```

```
<INPUT NAME=\"IID09*\" SIZE=6>                    <INPUT NAME=\"Qty09*\"
SIZE=1><BR>"
                                  " <INPUT NAME=\"SP10*\" SIZE=4>
<INPUT NAME=\"IID10*\" SIZE=6>                    <INPUT NAME=\"Qty10*\"
SIZE=1><BR>"
                                  " <INPUT NAME=\"SP11*\" SIZE=4>
<INPUT NAME=\"IID11*\" SIZE=6>                    <INPUT NAME=\"Qty11*\"
SIZE=1><BR>"
                                  " <INPUT NAME=\"SP12*\" SIZE=4>
<INPUT NAME=\"IID12*\" SIZE=6>                    <INPUT NAME=\"Qty12*\"
SIZE=1><BR>"
                                  " <INPUT NAME=\"SP13*\" SIZE=4>
<INPUT NAME=\"IID13*\" SIZE=6>                    <INPUT NAME=\"Qty13*\"
SIZE=1><BR>"
                                  " <INPUT NAME=\"SP14*\" SIZE=4>
<INPUT NAME=\"IID14*\" SIZE=6>                    <INPUT NAME=\"Qty14*\"
SIZE=1><BR>"
                                  "Execution Status:
Total:<BR>"
                                  "</font></PRE><HR>"
                                  "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\">"
                                  "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Menu\">"
                                  );
        }
        else
        {
                c += wsprintf(szForm+c, "Warehouse: %4.4d
District: %2.2d      Date: ",
                                  pNewOrderData->w_id,
                                  pNewOrderData->d_id);

                if ( bValid )
                {
                                  c += wsprintf(szForm+c, "%2.2d-%2.2d-
%4.4d %2.2d:%2.2d:%2.2d",
                                                  pNewOrderData-
>o_entry_d.day,
                                                  pNewOrderData-
>o_entry_d.month,
                                                  pNewOrderData-
>o_entry_d.year,
                                                  pNewOrderData-
>o_entry_d.hour,
                                                  pNewOrderData-
>o_entry_d.minute,
                                                  pNewOrderData-
>o_entry_d.second);
                }

                c += wsprintf(szForm+c, "<BR>Customer:  %4.4d
Name: %-16s   Credit: %-2s  ",
                                  pNewOrderData->c_id,
pNewOrderData->c_last, pNewOrderData->c_credit);

                if ( bValid )
                {
                                  c += sprintf(szForm+c,

        "%%Disc: %5.2f          <BR>"

        "Order Number: %8.8d  Number of Lines: %2.2d       W_tax: %5.2f
D_tax: %5.2f  <BR> <BR>"

        " Supp_W  Item_Id  Item Name              Qty  Stock  B/G  Price
Amount<BR>",
                                                  100.0*pNewOrderData-
>c_discount,
                                                  pNewOrderData->o_id,
                                                  pNewOrderData->o_ol_cnt,
                                                  100.0 * pNewOrderData-
>w_tax,
                                                  100.0 * pNewOrderData-
>d_tax);

                                  for(i=0; i<pNewOrderData->o_ol_cnt;
i++)
                                  {
                                                  c += sprintf(szForm+c,
" %4.4d   %6.6d   %-24s  %2.2d    %3.3d    %1.1s  $%6.2f  $%7.2f  <BR>",

                pNewOrderData->OL[i].ol_supply_w_id,

                pNewOrderData->OL[i].ol_i_id,

                pNewOrderData->OL[i].ol_i_name,

                pNewOrderData->OL[i].ol_quantity,

                pNewOrderData->OL[i].ol_stock,

                pNewOrderData->OL[i].ol_brand_generic,

                pNewOrderData->OL[i].ol_i_price,

                pNewOrderData->OL[i].ol_amount );
                                  }
                }
                else
                {
                                  c += wsprintf(szForm+c,
                                                  "%Disc:<BR>"
                                                  "Order Number: %8.8d
Number of Lines:        W_tax:      D_tax:<BR> <BR>"
                                                  " Supp_W  Item_Id  Item
Name              Qty  Stock  B/G  Price    Amount<BR>"
                                                  , pNewOrderData->o_id);

                                  i = 0;
                }

                strncpy( szForm+c, szBR, (15-i)*5 );
                c += (15-i)*5;

                if ( bValid )
                                  c += sprintf(szForm+c, "Execution
Status: Transaction commited.          Total:  $%8.2f  ",
                                                  pNewOrderData-
>total_amount);
                else
                                  c += wsprintf(szForm+c, "Execution
Status: Item number is not valid.      Total:");

                strcpy(szForm+c,
                                  " <BR></font></PRE><HR>"
                                  "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                                  "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                                  "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                                  "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                                  "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                                  "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                                  "</FORM></HTML>"
                                  );
        }
}
```

```
/* FUNCTION: MakePaymentForm
 *
 * COMMENTS:            The internal client buffer is created when the terminal
id is assigned and should not
 *                                                  be freed except when the
client terminal id is no longer needed.
 */

void MakePaymentForm(int iTermId, PAYMENT_DATA *pPaymentData, BOOL
bInput, char *szForm)
{
        int c;

        c = wsprintf(szForm,
                  "<HTML><HEAD><TITLE>TPC-C
Payment</TITLE></HEAD><BODY>"
                  "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                  "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"0\">"
                  "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"
                  "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
                  "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
                  "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
                  "<PRE><font face=\"Courier\">
Payment<BR>"
                  "Date: "
                  , PAYMENT_FORM, iTermId,
Term.pClientData[iTermId].iSyncId);

        if ( !bInput )
        {
                  c += wsprintf(szForm+c, "%2.2d-%2.2d-
%4.4d %2.2d:%2.2d:%2.2d",
                                  pPaymentData->h_date.day,
                                  pPaymentData->h_date.month,
                                  pPaymentData->h_date.year,
                                  pPaymentData->h_date.hour,
                                  pPaymentData->h_date.minute,
                                  pPaymentData->h_date.second);
        }

        if ( bInput )
        {
                  c += wsprintf(szForm+c,
                                  "<BR> <BR>Warehouse: %4.4d"
                                  "          District: <INPUT
NAME=\"DID*\" SIZE=1><BR> <BR> <BR> <BR> <BR>"
                                  "Customer: <INPUT NAME=\"CID*\"
SIZE=4>"
                                  "Cust-Warehouse: <INPUT
NAME=\"CWI*\" SIZE=4>  "
                                  "Cust-District: <INPUT NAME=\"CDI*\"
SIZE=1><BR>"
                                  "Name:              <INPUT
NAME=\"CLT*\" SIZE=16>          Since:<BR>"
                                  "
Credit:<BR>"
                                  "
Disc:<BR>"
                                  "
Phone:<BR> <BR>"
                                  "Amount Paid:       $<INPUT
NAME=\"HAM*\" SIZE=7>     New Cust-Balance:<BR>"
                                  "Credit Limit:<BR> <BR>Cust-Data:
<BR> <BR> <BR> <BR> <BR></font></PRE><HR>"
                                  "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\"><INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Menu\">"
```

```
                                        "</BODY></FORM></HTML>"
                                        , Term.pClientData[iTermId].w_id);
                }
                else
                {
                        c += wsprintf(szForm+c,
                                        "<BR> <BR>Warehouse: %4.4d
District: %2.2d<BR>"
                                        "%-20s                  %-20s<BR>"
                                        "%-20s                  %-20s<BR>"
                                        "%-20s %-2s %5.5s-%4.4s      %-
20s %-2s %5.5s-%4.4s<BR> <BR>"
                                        "Customer: %4.4d  Cust-
Warehouse: %4.4d  Cust-District: %2.2d<BR>"
                                        "Name:   %-16s %-2s %-16s
Since:  %2.2d-%2.2d-%4.4d<BR>"
                                        "       %-20s                  Credit: %-
2s<BR>"

                                        , Term.pClientData[iTermId].w_id,
pPaymentData->d_id
                                        , pPaymentData->w_street_1,
pPaymentData->d_street_1
                                        , pPaymentData->w_street_2,
pPaymentData->d_street_2
                                        , pPaymentData->w_city,
pPaymentData->w_state, pPaymentData->w_zip, pPaymentData->w_zip+5
                                        , pPaymentData->d_city,
pPaymentData->d_state, pPaymentData->d_zip, pPaymentData->d_zip+5
                                        , pPaymentData->c_id, pPaymentData-
>c_w_id,      pPaymentData->c_d_id
                                        , pPaymentData->c_first,
pPaymentData->c_middle, pPaymentData->c_last
                                        , pPaymentData->c_since.day,
pPaymentData->c_since.month,            pPaymentData->c_since.year
                                        , pPaymentData->c_street_1,
pPaymentData->c_credit
                                        );

        c += sprintf(szForm+c,
                                        "       %-
20s                %%Disc:  %5.2f<BR>",
                                        pPaymentData->c_street_2,
100.0*pPaymentData->c_discount);

                        c += wsprintf(szForm+c,
                                        "       %-20s %-2s %5.5s-%4.4s
Phone:  %6.6s-%3.3s-%3.3s-%4.4s<BR> <BR>",
                                        pPaymentData->c_city, pPaymentData-
>c_state, pPaymentData->c_zip, pPaymentData->c_zip+5,
                                        pPaymentData->c_phone,
pPaymentData->c_phone+6, pPaymentData->c_phone+9, pPaymentData-
>c_phone+12 );

                        c += sprintf(szForm+c,
                                        "Amount Paid:          $%7.2f      New
Cust-Balance: $%14.2f<BR>"
                                        "Credit Limit:   $%13.2f<BR> <BR>"
                                        , pPaymentData->h_amount,
pPaymentData->c_balance
                                        , pPaymentData->c_credit_lim
                                        );

                        if ( pPaymentData->c_credit[0] == 'B' &&
pPaymentData->c_credit[1] == 'C' )
                                c += wsprintf(szForm+c,
                                                                "Cust-
Data: %-50.50s<BR>          %-50.50s<BR>          %-50.50s<BR>          %-
50.50s<BR>",

                pPaymentData->c_data, pPaymentData->c_data+50,
pPaymentData->c_data+100, pPaymentData->c_data+150 );
                else
                                strcpy(szForm+c, "Cust-Data: <BR>
<BR> <BR> <BR>");

                                strcat(szForm,                  "
<BR></font></PRE><HR>"

                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..NewOrder..\">"

                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Payment..\">"

                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Delivery..\">"

                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Order-
Status..\">"

                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Stock-
Level..\">"

                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Exit..\">"

                        "</BODY></FORM></HTML>");
                        }

}

/* FUNCTION: MakeOrderStatusForm
 *
 * COMMENTS:            The internal client buffer is created when the terminal
id is assigned and should not
 *                                                      be freed except when the
client terminal id is no longer needed.
 */

void MakeOrderStatusForm(int iTermId, ORDER_STATUS_DATA
*pOrderStatusData, BOOL bInput, char *szForm)
{
        int                             i, c;
        static char szBR[] = " <BR> <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>";

        c = wsprintf(szForm,
                        "<HTML><HEAD><TITLE>TPCC Order-
Status</TITLE></HEAD><BODY>"
                        "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
                        "<PRE><font face=\"Courier\">
Order-Status<BR>"
                        "Warehouse: %4.4d   ",
                        ORDER_STATUS_FORM, iTermId,
Term.pClientData[iTermId].iSyncId, Term.pClientData[iTermId].w_id);

        if ( bInput )
        {
                strcpy(szForm+c,
                                "District: <INPUT NAME=\"DID*\"
SIZE=1><BR>"
                                "Customer: <INPUT NAME=\"CID*\"
SIZE=4>   Name:          <INPUT NAME=\"CLT*\" SIZE=23><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></font></PRE>"
                                "<HR><INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\"><INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Menu\">"
                                "</BODY></FORM></HTML>" );
        }
        else
        {
                c += wsprintf(szForm+c,
                                "District: %2.2d<BR>"
                                "Customer: %4.4d   Name: %-16s %-
2s %-16s<BR>",
                                pOrderStatusData->d_id,
pOrderStatusData->c_id,
                                pOrderStatusData->c_first,
pOrderStatusData->c_middle, pOrderStatusData->c_last);

                c += sprintf(szForm+c, "Cust-Balance: $%9.2f<BR>
<BR>",
                                pOrderStatusData->c_balance);

                c += wsprintf(szForm+c,
                                "Order-Number: %8.8d   Entry-
Date: %2.2d-%2.2d-%4.4d %2.2d:%2.2d:%2.2d   Carrier-Number: %2.2d<BR>"
                                "Supply-W    Item-Id    Qty    Amount
Delivery-Date<BR>",
                                pOrderStatusData->o_id,
                                pOrderStatusData->o_entry_d.day,
                                pOrderStatusData->o_entry_d.month,
                                pOrderStatusData->o_entry_d.year,
                                pOrderStatusData->o_entry_d.hour,
                                pOrderStatusData->o_entry_d.minute,
                                pOrderStatusData->o_entry_d.second,
                                pOrderStatusData->o_carrier_id);

                for(i=0; i< pOrderStatusData->o_ol_cnt; i++)
                {
                                c += sprintf(szForm+c,
"  %4.4d      %6.6d     %2.2d     $%8.2f      %2.2d-%2.2d-%4.4d<BR>",
                                                pOrderStatusData-
>OL[i].ol_supply_w_id,
                                                pOrderStatusData-
>OL[i].ol_i_id,
                                                pOrderStatusData-
>OL[i].ol_quantity,
                                                pOrderStatusData-
>OL[i].ol_amount,
                                                pOrderStatusData-
>OL[i].ol_delivery_d.day,
                                                pOrderStatusData-
>OL[i].ol_delivery_d.month,
                                                pOrderStatusData-
>OL[i].ol_delivery_d.year);
                }

                strncpy( szForm+c, szBR, (15-i)*5 );
                c += (15-i)*5;

                strcpy(szForm+c,
                                "</font></PRE><HR><INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
```

```
                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                                        "</BODY></FORM></HTML>" );
                }
}

/* FUNCTION: MakeDeliveryForm
 *
 * COMMENTS:            The internal client buffer is created when the terminal
id is assigned and should not
 *                                                be freed except when the
client terminal id is no longer needed.
 */

void MakeDeliveryForm(int iTermId, DELIVERY_DATA *pDeliveryData, BOOL
bInput, char *szForm)
{
                int             c;

                c = wsprintf(szForm,
                        "<HTML><HEAD><TITLE>TPC-C
Delivery</TITLE></HEAD><BODY>"
                        "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
                        "<PRE><font face=\"Courier\">
Delivery<BR>"
                        "Warehouse: %4.4d<BR> <BR>",
                        (!bInput && (pDeliveryData->exec_status_code !=
eOK)) ? ERR_TYPE_DELIVERY_POST : 0,
                        DELIVERY_FORM, iTermId,
Term.pClientData[iTermId].iSyncId, Term.pClientData[iTermId].w_id);

                if ( bInput )
                {
                        strcpy( szForm+c,
                                "Carrier Number: <INPUT
NAME=\"OCD*\" SIZE=1><BR> <BR>"
                                "Execution Status: <BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR>"
                                " <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR> </font></PRE><HR>"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Menu\">"
                                "</BODY></FORM></HTML>" );
                }
                else
                {
                        wsprintf( szForm+c,
                                "Carrier Number: %2.2d<BR> <BR>"
                                "Execution Status: %s <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR>"
                                " <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR> </font></PRE>"
                                "<HR><INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                                "</BODY></FORM></HTML>"

                                , pDeliveryData->o_carrier_id,
                                (pDeliveryData->exec_status_code ==
eOK) ? "Delivery has been queued." : "Delivery Post Failed     "
                                );
                }
}

/* FUNCTION: ProcessNewOrderForm
 *
 * PURPOSE:             This function gets and validates the input data from
the new order form
 *                                filling in the required input variables. it
then calls the SQLNewOrder
 *                                transaction, constructs the output form
and writes it back to client
 *                                browser.
 */

void ProcessNewOrderForm(EXTENSION_CONTROL_BLOCK    *pECB, int
iTermId, char *szBuffer)
{
                PNEW_ORDER_DATA                 pNewOrder;

                pNewOrder = Term.pClientData[iTermId].pTxn->
>BuffAddr_NewOrder();

                ZeroMemory(pNewOrder, sizeof(NEW_ORDER_DATA));
                pNewOrder->w_id = Term.pClientData[iTermId].w_id;
                GetNewOrderData(pECB->lpszQueryString, pNewOrder);

                Term.pClientData[iTermId].pTxn->NewOrder();

                pNewOrder = Term.pClientData[iTermId].pTxn->
>BuffAddr_NewOrder();
                MakeNewOrderForm(iTermId, pNewOrder, OUTPUT_FORM,
szBuffer );
}

/* FUNCTION: void ProcessPaymentForm
 *
 * 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:           EXTENSION_CONTROL_BLOCK         *pECB
                passed in structure pointer from inetsrv.
 *                                                      int
                                                        iTermId         client
browser terminal id
 *
 */

void ProcessPaymentForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer)
{
                PPAYMENT_DATA           pPayment;

                pPayment = Term.pClientData[iTermId].pTxn->
>BuffAddr_Payment();
                ZeroMemory(pPayment, sizeof(PAYMENT_DATA));
                pPayment->w_id = Term.pClientData[iTermId].w_id;
                GetPaymentData(pECB->lpszQueryString, pPayment);

                Term.pClientData[iTermId].pTxn->Payment();

                pPayment = Term.pClientData[iTermId].pTxn->
>BuffAddr_Payment();
                MakePaymentForm(iTermId, pPayment, OUTPUT_FORM,
szBuffer);
}

/* FUNCTION: ProcessOrderStatusForm
 *
 * PURPOSE:             This function gets and validates the input data from
the Order Status
 *                                form filling in the required input
variables. It then calls the
 *                                SQLOrderStatus transaction, constructs
the output form and writes it
 *                                back to client browser.
 *
 * ARGUMENTS:           EXTENSION_CONTROL_BLOCK         *pECB
                passed in structure pointer from inetsrv.
 *                                                      int
                                                        iTermId         client
browser terminal id
 *
 */

void ProcessOrderStatusForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer)
{
                PORDER_STATUS_DATA      pOrderStatus;

                pOrderStatus = Term.pClientData[iTermId].pTxn->
>BuffAddr_OrderStatus();
                ZeroMemory(pOrderStatus, sizeof(ORDER_STATUS_DATA));
                pOrderStatus->w_id = Term.pClientData[iTermId].w_id;
                GetOrderStatusData(pECB->lpszQueryString, pOrderStatus);

                Term.pClientData[iTermId].pTxn->OrderStatus();

                pOrderStatus = Term.pClientData[iTermId].pTxn->
>BuffAddr_OrderStatus();
                MakeOrderStatusForm(iTermId, pOrderStatus, OUTPUT_FORM,
szBuffer);
}

/* FUNCTION: ProcessDeliveryForm
 *
 * PURPOSE:             This function gets and validates the input data from
the delivery form
 *                                filling in the required input variables. It
then calls the PostDeliveryInfo
 *                                Api, The client is then informed that the
transaction has been posted.
 *
 * ARGUMENTS:           EXTENSION_CONTROL_BLOCK         *pECB
                passed in structure pointer from inetsrv.
 *                                                      int
                                                        iTermId         client
browser terminal id
 *
 */

void ProcessDeliveryForm(EXTENSION_CONTROL_BLOCK *pECB, int iTermId,
char *szBuffer)
{
                char            *ptr = pECB->lpszQueryString;

                PDELIVERY_DATA          pDelivery;
```

```
		pDelivery = Term.pClientData[iTermId].pTxn->BuffAddr_Delivery();
		ZeroMemory(pDelivery, sizeof(DELIVERY_DATA));
		pDelivery->w_id = Term.pClientData[iTermId].w_id;

		pDelivery->o_carrier_id	= GetIntKeyValue(&ptr, "OCD*",
ERR_DELIVERY_MISSING_OCD_KEY, ERR_DELIVERY_CARRIER_INVALID);
		if ( pDelivery->o_carrier_id > 10 || pDelivery->o_carrier_id < 1 )
			throw new
CWEBCLNT_ERR( ERR_DELIVERY_CARRIER_ID_RANGE );

		if (dwNumDeliveryThreads)
		{
			//post delivery info
			if ( PostDeliveryInfo(pDelivery->w_id, pDelivery-
>o_carrier_id) )
				pDelivery->exec_status_code =
eDeliveryFailed;
			else
				pDelivery->exec_status_code = eOK;
		}
		else // delivery is done synchronously if no delivery threads
configured
			Term.pClientData[iTermId].pTxn->Delivery();

		pDelivery = Term.pClientData[iTermId].pTxn->BuffAddr_Delivery();
		MakeDeliveryForm(iTermId, pDelivery, OUTPUT_FORM, szBuffer);
}

/* FUNCTION: ProcessStockLevelForm
 *
 * 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:		EXTENSION_CONTROL_BLOCK	*pECB
		passed in structure pointer from inetsrv.
 *					int
iTermId	client
browser terminal id
 *
 */

void ProcessStockLevelForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer)
{
		char			*ptr = pECB->lpszQueryString;

		PSTOCK_LEVEL_DATA	pStockLevel;

		pStockLevel = Term.pClientData[iTermId].pTxn
>BuffAddr_StockLevel();
		ZeroMemory( pStockLevel, sizeof(STOCK_LEVEL_DATA) );

		pStockLevel->w_id = Term.pClientData[iTermId].w_id;
		pStockLevel->d_id = Term.pClientData[iTermId].d_id;

		pStockLevel->threshold = GetIntKeyValue(&ptr, "TT*",
ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,
ERR_STOCKLEVEL_THRESHOLD_INVALID);
		if ( pStockLevel->threshold >= 100 || pStockLevel->threshold < 0 )
			throw new
CWEBCLNT_ERR( ERR_STOCKLEVEL_THRESHOLD_RANGE );

		Term.pClientData[iTermId].pTxn->StockLevel();

		pStockLevel = Term.pClientData[iTermId].pTxn
>BuffAddr_StockLevel();
		MakeStockLevelForm(iTermId, pStockLevel, OUTPUT_FORM,
szBuffer);
}

/* FUNCTION: GetNewOrderData
 *
 * PURPOSE:		This function extracts and validates the new order
form data from an http command string.
 *
 * ARGUMENTS:		LPSTR
		lpszQueryString			client browser http
command string
 *					NEW_ORDER_DATA
		*pNewOrderData			pointer to new order data
structure
 *
 */

void GetNewOrderData(LPSTR lpszQueryString, NEW_ORDER_DATA
*pNewOrderData)
{
		char		szTmp[26];
		int			i;
		short		items;
		int			ol_i_id, ol_quantity;
		char		*ptr = lpszQueryString;

		static char szSP[MAX_OL_NEW_ORDER_ITEMS][6] =
			{ "SP00*", "SP01*", "SP02*", "SP03*", "SP04*",
			  "SP05*", "SP06*", "SP07*", "SP08*", "SP09*",
			  "SP10*", "SP11*", "SP12*", "SP13*", "SP14*" };
		static char szIID[MAX_OL_NEW_ORDER_ITEMS][7] =
			{ "IID00*", "IID01*", "IID02*", "IID03*", "IID04*",
			  "IID05*", "IID06*", "IID07*", "IID08*", "IID09*",
			  "IID10*", "IID11*", "IID12*", "IID13*", "IID14*" };
		static char szQty[MAX_OL_NEW_ORDER_ITEMS][7] =
			{ "Qty00*", "Qty01*", "Qty02*", "Qty03*", "Qty04*",
			  "Qty05*", "Qty06*", "Qty07*", "Qty08*", "Qty09*",
			  "Qty10*", "Qty11*", "Qty12*", "Qty13*", "Qty14*" };

		pNewOrderData->d_id = GetIntKeyValue(&ptr, "DID*",
ERR_NEWORDER_FORM_MISSING_DID,
ERR_NEWORDER_DISTRICT_INVALID);
		pNewOrderData->c_id = GetIntKeyValue(&ptr, "CID*",
ERR_NEWORDER_CUSTOMER_KEY,
ERR_NEWORDER_CUSTOMER_INVALID);

		for(i=0, items=0; i<MAX_OL_NEW_ORDER_ITEMS; i++)
		{
			GetKeyValue(&ptr, szSP[i], szTmp, sizeof(szTmp),
ERR_NEWORDER_MISSING_SUPPW_KEY);
			if ( szTmp[0] )
			{
				if ( !IsNumeric(szTmp) )
					throw new
CWEBCLNT_ERR( ERR_NEWORDER_SUPPW_INVALID );
				pNewOrderData-
>OL[items].ol_supply_w_id = (short)atoi(szTmp);

				ol_i_id = pNewOrderData-
>OL[items].ol_i_id =
					GetIntKeyValue(&ptr,
szIID[i], ERR_NEWORDER_MISSING_IID_KEY,
ERR_NEWORDER_ITEMID_INVALID);
				if ( ol_i_id > 999999 || ol_i_id < 1 )
					throw new
CWEBCLNT_ERR( ERR_NEWORDER_ITEMID_RANGE );

				ol_quantity = pNewOrderData-
>OL[items].ol_quantity =
					GetIntKeyValue(&ptr,
szQty[i], ERR_NEWORDER_MISSING_QTY_KEY,
ERR_NEWORDER_QTY_INVALID);
				if ( ol_quantity > 99 || ol_quantity < 1 )
					throw new
CWEBCLNT_ERR( ERR_NEWORDER_QTY_RANGE );

				items++;
			}
			else
			{	// nothing entered for supply warehouse,
so item id and qty must also be blank
				GetKeyValue(&ptr, szIID[i], szTmp,
sizeof(szTmp), ERR_NEWORDER_MISSING_IID_KEY);
				if ( szTmp[0] )
					throw new
CWEBCLNT_ERR( ERR_NEWORDER_ITEMID_WITHOUT_SUPPW );

				GetKeyValue(&ptr, szQty[i], szTmp,
sizeof(szTmp), ERR_NEWORDER_MISSING_QTY_KEY);
				if ( szTmp[0] )
					throw new
CWEBCLNT_ERR( ERR_NEWORDER_QTY_WITHOUT_SUPPW );
			}
		}
		if ( items == 0 )
			throw new
CWEBCLNT_ERR( ERR_NEWORDER_NOITEMS_ENTERED );

		pNewOrderData->o_ol_cnt = items;
}

/* FUNCTION: GetPaymentData
 *
 * PURPOSE:		This function extracts and validates the payment form
data from an http command string.
 *
 * ARGUMENTS:		LPSTR
		lpszQueryString				client browser http
command string
 *					PAYMENT_DATA
		*pPaymentData				pointer to payment data
structure
 */

void GetPaymentData(LPSTR lpszQueryString, PAYMENT_DATA
*pPaymentData)
{
		char		szTmp[26];
		char		*ptr = lpszQueryString;
		BOOL		bCustIdBlank;

		pPaymentData->d_id = GetIntKeyValue(&ptr, "DID*",
ERR_PAYMENT_MISSING_DID_KEY, ERR_PAYMENT_DISTRICT_INVALID);

		GetKeyValue(&ptr, "CID*", szTmp, sizeof(szTmp),
ERR_PAYMENT_MISSING_CID_KEY);
		if ( szTmp[0] == 0 )
		{
			bCustIdBlank = TRUE;
			pPaymentData->c_id = 0;
		}
		else
		{	// parse customer id and verify that last name was
NOT entered
			bCustIdBlank = FALSE;
			if ( !IsNumeric(szTmp) )
				throw new
CWEBCLNT_ERR( ERR_PAYMENT_CUSTOMER_INVALID );
			pPaymentData->c_id = atoi(szTmp);
		}

		pPaymentData->c_w_id = GetIntKeyValue(&ptr, "CWI*",
ERR_PAYMENT_MISSING_CWI_KEY, ERR_PAYMENT_CWI_INVALID);
		pPaymentData->c_d_id = GetIntKeyValue(&ptr, "CDI*",
```

```
ERR_PAYMENT_MISSING_CDI_KEY, ERR_PAYMENT_CDI_INVALID);

        if ( bCustIdBlank )
        {       // customer id is blank, so last name must be entered
                GetKeyValue(&ptr, "CLT*", szTmp, sizeof(szTmp),
ERR_PAYMENT_MISSING_CLT_KEY);
                if ( szTmp[0] == 0 )
                        throw new
CWEBCLNT_ERR( ERR_PAYMENT_MISSING_CID_CLT );

                _strupr( szTmp );
                if ( strlen(pPaymentData->c_last) >
LAST_NAME_LEN )
                        throw new
CWEBCLNT_ERR( ERR_PAYMENT_LAST_NAME_TO_LONG );
                strcpy(pPaymentData->c_last, szTmp);
        }
        else
        {       // parse customer id and verify that last name was
NOT entered
                GetKeyValue(&ptr, "CLT*", szTmp, sizeof(szTmp),
ERR_PAYMENT_MISSING_CLT_KEY);
                if ( szTmp[0] != 0 )
                        throw new
CWEBCLNT_ERR( ERR_PAYMENT_CID_AND_CLT );
        }

        GetKeyValue(&ptr, "HAM*", szTmp, sizeof(szTmp),
ERR_PAYMENT_MISSING_HAM_KEY);
        if (!IsDecimal(szTmp))
                throw new
CWEBCLNT_ERR( ERR_PAYMENT_HAM_INVALID );
        pPaymentData->h_amount = atof(szTmp);
        if ( pPaymentData->h_amount >= 10000.00 || pPaymentData-
>h_amount < 0 )
                throw new
CWEBCLNT_ERR( ERR_PAYMENT_HAM_RANGE );
}

/* FUNCTION: GetOrderStatusData
 *
 * PURPOSE:             This function extracts and validates the payment form
data from an http command string.
 *
 */
void GetOrderStatusData(LPSTR lpszQueryString, ORDER_STATUS_DATA
*pOrderStatusData)
{
        char            szTmp[26];
        char            *ptr = lpszQueryString;

        pOrderStatusData->d_id = GetIntKeyValue(&ptr, "DID*",
ERR_ORDERSTATUS_MISSING_DID_KEY,
ERR_ORDERSTATUS_DID_INVALID);

        GetKeyValue(&ptr, "CID*", szTmp, sizeof(szTmp),
ERR_ORDERSTATUS_MISSING_CID_KEY);
        if ( szTmp[0] == 0 )
        {       // customer id is blank, so last name must be entered
                pOrderStatusData->c_id = 0;
                GetKeyValue(&ptr, "CLT*", szTmp, sizeof(szTmp),
ERR_ORDERSTATUS_MISSING_CLT_KEY);
                if ( szTmp[0] == 0 )
                        throw new
CWEBCLNT_ERR( ERR_ORDERSTATUS_MISSING_CID_CLT );

                _strupr( szTmp );
                if ( strlen(pOrderStatusData->c_last) >
LAST_NAME_LEN )
                        throw new
CWEBCLNT_ERR( ERR_ORDERSTATUS_CLT_RANGE );
                strcpy(pOrderStatusData->c_last, szTmp);
        }
        else
        {       // parse customer id and verify that last name was
NOT entered
                if ( !IsNumeric(szTmp) )
                        throw new
CWEBCLNT_ERR( ERR_ORDERSTATUS_CID_INVALID );
                pOrderStatusData->c_id = atoi(szTmp);
                GetKeyValue(&ptr, "CLT*", szTmp, sizeof(szTmp),
ERR_ORDERSTATUS_MISSING_CLT_KEY);
                if ( szTmp[0] != 0 )
                        throw new
CWEBCLNT_ERR( ERR_ORDERSTATUS_CID_AND_CLT );
        }

}

/* 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'
 */

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

        while( *ptr && isdigit(*ptr) )
                ptr++;
        return ( !*ptr );
}

/* FUNCTION: BOOL IsDecimal(char *ptr)
 *
 * PURPOSE:             This function determines if a string is a non-negative
decimal value.
 *      It fails if any characters other than a series of numbers followed by
 *                              a decimal point, another series of
numbers, and a null terminator are present.
 *
 * ARGUMENTS:           char                            *ptr
        pointer to string to check.
 *
 * RETURNS:                     BOOL    FALSE   if string is not
a valid non-negative decimal value
 *
        TRUE    if string is OK
 */

BOOL IsDecimal(char *ptr)
{
        char *dotptr;
        BOOL  bValid;

        if ( *ptr == 0 )
                return FALSE;

        // find decimal point
        dotptr = strchr( ptr, '.' );
        if (dotptr == NULL)
                // no decimal point, so just check for numeric
                return IsNumeric(ptr);
        *dotptr = 0;  // temporarily replace decimal with a terminator

        if ( *ptr != 0 )
                bValid = IsNumeric(ptr);
        // string starts with decimal point
        else if (*(dotptr+1) == 0)
                return FALSE;  // nothing but a decimal point is bad
        else
                bValid = TRUE;

        if (*(dotptr+1) != 0)
                // check text after decimal point
                bValid &= IsNumeric(dotptr+1);

        *dotptr = '.';  // replace decimal point
        return bValid;
}
```

isapi_dll\src\resource.h

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by tpcc.rc
//
#define IDD_DIALOG1                     101

// Next default values for new objects
//
#ifdef APSTUDIO_INVOKED
#ifndef APSTUDIO_READONLY_SYMBOLS
#define _APS_NEXT_RESOURCE_VALUE        102
#define _APS_NEXT_COMMAND_VALUE         40001
#define _APS_NEXT_CONTROL_VALUE         1000
#define _APS_NEXT_SYMED_VALUE           101
#endif
#endif
```

db_dblib_dll\src\tpcc_dblib.h

```
/*              FILE:                           TPCC_DBLIB.H
 *                                                      Microsoft TPC-C Kit Ver.
4.20.000
 *                                                      Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                                      Version 4.10.000 audited
by Richard Gimarc, Performance Metrics, 3/17/99
 *
 *              PURPOSE:  Header file for TPC-C txn class implementation.
 *
 *  Change history:
 *                              4.20.000 - updated rev number to match kit
 */
#pragma once

#ifndef PDBPROCESS
#define DBPROCESS void   // dbprocess structure type
typedef DBPROCESS * PDBPROCESS;
#endif

// need to declare functions for import, unless define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif
```

```
class CSQLERR : public CBaseErr
{
	public:

		CSQLERR(void)
		{
			m_msgno = 0;
			m_msgstate = 0;
			m_severity = 0;
			m_msgtext = NULL;
		};

		~CSQLERR()
		{
			delete [] m_msgtext;
		};

		int		m_msgno;
		int		m_msgstate;
		int		m_severity;
		char	*m_msgtext;

		int ErrorType() {return ERR_TYPE_SQL;};
		int ErrorNum() {return m_msgno;};
		char *ErrorText() {return m_msgtext;};

};

class CDBLIBERR : public CBaseErr
{
	public:
		enum ACTION
		{
			eNone,
			eUnknown,
			eLogin,
	// error from dblogin
			eDbOpen,
	// error from dbopen
			eDbUse,
	// error from dbuse
			eDbSqlExec,
	// error from dbsqlexec
			eDbSet,
	// error from one of the dbset* routines
			eDbNextRow,
	// error from dbnextrow
			eWrongRowCount,
	// more or less rows returned than expected
			eWrongNumCols,
	// more or less columns returned than expected
			eDbResults,
	// error from dbresults
			eDbRpcExec,
	// error from dbrpcexec
			eDbSetMaxProcs,
	// error from dbsetmaxprocs
			eDbProcHandler
	// error from either dbprocerrhandle or dbprocmsghandle
		};

		CDBLIBERR(ACTION eAction, int severity = 0, int
dberror = 0, int oserr = 0)
		{
			m_eAction = eAction;
			m_severity = severity;
			m_dberror = dberror;
			m_oserr = oserr;

			m_dberrstr = NULL;
			m_oserrstr = NULL;
		};

		~CDBLIBERR()
		{
			delete [] m_dberrstr;
			delete [] m_oserrstr;
		};

		ACTION	m_eAction;
		int			m_severity;
		int			m_dberror;
		int			m_oserr;
		char	*m_dberrstr;
		char	*m_oserrstr;

		int ErrorType() {return ERR_TYPE_DBLIB;};
		int ErrorNum() {return m_dberror;};
		char *ErrorText() {return m_dberrstr;};

};

class CTPCC_DBLIB_ERR : public CBaseErr
{
	public:
		enum CTPCC_DBLIB_ERRS
		{
			ERR_WRONG_SP_VERSION = 1,
	// "Wrong version of stored procs on database server"
			ERR_INVALID_CUST,
	// "Invalid Customer id,name."
			ERR_NO_SUCH_ORDER,
		// "No orders found for customer."
			ERR_RETRIED_TRANS,
	// "Retries before transaction succeeded."
		};

		CTPCC_DBLIB_ERR( int iErr ) { m_errno = iErr;
m_iTryCount = 0; };

		CTPCC_DBLIB_ERR( int iErr, int iTryCount )
{ m_errno = iErr; m_iTryCount = iTryCount; };

		int		m_errno;
		int		m_iTryCount;

		int ErrorType() {return ERR_TYPE_TPCC_DBLIB;};
		int ErrorNum() {return m_errno;};

		char *ErrorText();
};

class DllDecl CTPCC_DBLIB : public CTPCC_BASE
{
	private:
		// declare variables and private functions here...
		PDBPROCESS		m_dbproc;
		CDBLIBERR*m_DbLibErr;
	// not allocated until needed (maybe never)
		CSQLERR			*m_SqlErr;
	// not allocated until needed (maybe never)
		int
	m_MaxRetries;			// retry count on deadlock

		void DiscardNextRows(int iExpectedCount);
		void DiscardNextResults(int iExpectedCount);
		void ThrowError( CDBLIBERR::ACTION eAction );
		void ResetError();

		union
		{
			NEW_ORDER_DATA
	NewOrder;
			PAYMENT_DATA
	Payment;
			DELIVERY_DATA
	Delivery;
			STOCK_LEVEL_DATA	StockLevel;
			ORDER_STATUS_DATA OrderStatus;
		}
m_txn;

	public:
		CTPCC_DBLIB(LPCSTR szServer, LPCSTR szUser,
LPCSTR szPassword, LPCSTR szHost, LPCSTR szDatabase );
		~CTPCC_DBLIB(void);

		inline PNEW_ORDER_DATA
	BuffAddr_NewOrder()		{ return
&m_txn.NewOrder;	};
		inline PPAYMENT_DATA
	BuffAddr_Payment()		{ return
&m_txn.Payment;	};
		inline PDELIVERY_DATA
	BuffAddr_Delivery()		{ return
&m_txn.Delivery;	};
		inline PSTOCK_LEVEL_DATA
	BuffAddr_StockLevel()	{ return &m_txn.StockLevel;	};
		inline PORDER_STATUS_DATA
	BuffAddr_OrderStatus()	{ return &m_txn.OrderStatus; };

		void NewOrder		();
		void Payment		();
		void Delivery		();
		void StockLevel		();
		void OrderStatus	();


		// these are public because they must be called from
the dblib err_handler and msg_hangler
		// outside of the class
		void SetDbLibError(int severity, int dberr, int oserr,
LPCSTR dberrstr, LPCSTR oserrstr);
		void SetSqlError( int msgno, int msgstate, int severity,
LPCSTR msgtext );

};

extern "C" DllDecl CTPCC_DBLIB* CTPCC_DBLIB_new
		( LPCSTR szServer, LPCSTR szUser, LPCSTR szPassword,
LPCSTR szHost, LPCSTR szDatabase );

typedef CTPCC_DBLIB* (TYPE_CTPCC_DBLIB)(LPCSTR, LPCSTR, LPCSTR,
LPCSTR, LPCSTR);
```

db_dblib_dll\src\tpcc_dblib.cpp

```
/*		FILE:			TPCC_DBLIB.CPP
 *		Microsoft TPC-C Kit Ver.
4.20.000
 *		Copyright Microsoft, 1999
 *	All Rights Reserved
 *
 *		Version 4.10.000 audited
by Richard Gimarc, Performance Metrics, 3/17/99
 *
 *		PURPOSE:	Implements dblib calls for TPC-C txns.
 *		Contact:	Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *			4.20.000 - updated rev number to match kit
 *			4.10.001 - not deleting error class in catch handler on
deadlock retry;
 *			not a functional bug, but
```

```
a memory leak
 *                                                              - had to tweak some
declarations to compile with latest SDK; no functional change
 */

#include <windows.h>
#include <stdio.h>
#include <assert.h>

#define DBNTWIN32
#include <sqlfront.h>
#include <sqldb.h>

#ifdef ICECAP
#include <icapexp.h>
#endif

// need to declare functions for export
#define DllDecl  __declspec( dllexport )

#include "..\..\common\src\error.h"
#include "..\..\common\src\trans.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_dblib.h"

#define     DEFCLPACKSIZE                                   4096

// version string; must match return value from tpcc_version stored proc
const char    sVersion[] = "4.10.000";

const                               iMaxRetries = 10;
            // how many retries on deadlock
static      long            iConnectionCount = 0;  // number of current dblib
connections

const int iErrOleDbProvider = 7312;
const char sErrTimeoutExpired[] = "Timeout expired";

BOOL APIENTRY DllMain(HMODULE hModule, DWORD ul_reason_for_call,
LPVOID lpReserved)
{
            switch( ul_reason_for_call )
            {
                        case DLL_PROCESS_ATTACH:
                                    DisableThreadLibraryCalls(hModule);
                                    dbinit();                   // initialize
dblib
                                    break;

                        case DLL_PROCESS_DETACH:
                                    dbexit();                   // close all
dblib structures/connections
                                    break;

                        default:
                                    /* nothing */;
            }
            return TRUE;
}


int err_handler(DBPROCESS *dbproc, int severity, int dberr, int oserr, LPCSTR
dberrstr, LPCSTR oserrstr)
{
            CTPCC_DBLIB                                     *pConn;

            assert(dbproc != NULL);
            pConn = (CTPCC_DBLIB*)dbgetuserdata(dbproc);

            if (pConn != NULL)
            {
                        pConn->SetDbLibError( severity, dberr, oserr, dberrstr,
oserrstr );
            }
            return INT_CANCEL;
}

/* FUNCTION: int msg_handler(DBPROCESS *dbproc, DBINT msgno, int
msgstate, int severity, char *msgtext)
 *
 * PURPOSE:             This function handles DB-Library SQL Server error
messages
 *
 * ARGUMENTS:           DBPROCESS                       *dbproc
                        DBPROCESS id pointer
 *                                                      DBINT
            msgno                           message number
 *                                                      int
                        msgstate            message state
 *                                                      int
                        severity            message severity
 *                                                      char
            *msgtext                message description
 *
 * RETURNS:                             int
            INT_CONTINUE            continue if error is SQLETIME else
INT_CANCEL action
 *
                        INT_CANCEL                      cancel
operation
 *
 * COMMENTS:            This function also sets the dead lock dbproc variable
if necessary.
 *
 */

// typedef INT (SQLAPI *DBMSGHANDLE_PROC)(PDBPROCESS, DBINT, INT,
INT, LPCSTR, LPCSTR, LPCSTR, DBUSMALLINT);

int msg_handler(DBPROCESS *dbproc, DBINT msgno, int msgstate, int severity,
                                                      LPCSTR msgtext,
LPCSTR srvname, LPCSTR procname, DBUSMALLINT line)
{
            CTPCC_DBLIB                                     *pConn;

            assert(dbproc != NULL);
            pConn = (CTPCC_DBLIB*)dbgetuserdata(dbproc);

            if (pConn != NULL)
            {
                        pConn->SetSqlError( msgno, msgstate, severity,
msgtext );
            }

            return 0;
}

/* FUNCTION: void UtilStrCpy(char * pDest, char * pSrc, int n)
 *
 * PURPOSE:             This function copies n characters from string pSrc to
pDst and places a
 *                                  null character at the end of the
destination string.
 *
 * ARGUMENTS:           char                            *pDest
            destination string pointer
 *                                                      char
            *pSrc       source string pointer
 *                                                      int
                        n                               number of characters to
copy
 *
 * RETURNS:                         None
 *
 * COMMENTS:            Unlike strncpy this function ensures that the result
string is
 *                                                      always null terminated.
 *
 */

inline static void UtilStrCpy(char * pDest, const BYTE * pSrc, int n)
{
   strncpy(pDest, (char *)pSrc, n);
   pDest[n] = '\0';

            return;
}

/* FUNCTION: CTPCC_DBLIB_ERR::ErrorText
 *
 */

char* CTPCC_DBLIB_ERR::ErrorText(void)
{
            int i;

            static SERRORMSG errorMsgs[] =
            {
                        { ERR_WRONG_SP_VERSION,
            "Wrong version of stored procs on database server"  },
                        { ERR_INVALID_CUST,
            "Invalid Customer id,name."
                                                                  },
                        { ERR_NO_SUCH_ORDER,
            "No orders found for customer."
                                                                  },
                        { ERR_RETRIED_TRANS,            "Retries
before transaction succeeded."
            },
                        { 0,
                        ""


                                                      }
            };

            static char szNotFound[] = "Unknown error number.";

            for(i=0; errorMsgs[i].szMsg[0]; i++)
            {
                        if ( m_errno == errorMsgs[i].iError )
                                    break;
            }
            if ( !errorMsgs[i].szMsg[0] )
                        return szNotFound;
            else
                        return errorMsgs[i].szMsg;
}

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_DBLIB* CTPCC_DBLIB_new(
            LPCSTR szServer,                // name of SQL server
            LPCSTR szUser,                                  // user name
for login
            LPCSTR szPassword,              // password for login
            LPCSTR szHost,                                  // workstation
name; shows up in sp_who; max 30 chars, only first 10 kept by SQL Server
            LPCSTR szDatabase )             // name of database to use
{
            return new CTPCC_DBLIB( szServer, szUser, szPassword, szHost,
szDatabase );
}


CTPCC_DBLIB::CTPCC_DBLIB (
            LPCSTR szServer,                // name of SQL server
            LPCSTR szUser,                                  // user name
```

```
for login
        LPCSTR szPassword,              // password for login
        LPCSTR szHost,                                  // workstation
name; shows up in sp_who; max 30 chars, only first 10 kept by SQL Server
        LPCSTR szDatabase )             // name of database to use
{
        LOGINREC  *login;
        const BYTE  *pData;

        // initialization
        m_dbproc = NULL;
        m_DbLibErr = (CDBLIBERR*)NULL;
        m_SqlErr = (CSQLERR*)NULL;

        m_MaxRetries = 10;              // how many retries on
deadlock

        // increase max number of connections if getting close
        if ( dbgetmaxprocs() < (iConnectionCount+5) )
        {
                if ( dbsetmaxprocs(iConnectionCount+10) == FAIL )

        ThrowError(CDBLIBERR::eDbSetMaxProcs);
        }

        // allocate a login structure
        login = dblogin();
        if (login == NULL)
                ThrowError(CDBLIBERR::eLogin);
        InterlockedIncrement( &iConnectionCount );

        // register error and message handler functions
        if (dbprocerrhandle(login, err_handler) == NULL)
                ThrowError(CDBLIBERR::eDbProcHandler)

        if (dbprocmsghandle(login, msg_handler) == NULL)
                ThrowError(CDBLIBERR::eDbProcHandler);


        DBSETLUSER(login, szUser);
        DBSETLPWD(login, szPassword);
        DBSETLHOST(login, szHost);
        DBSETLPACKET(login, (unsigned short)DEFCLPACKSIZE);
        DBSETLVERSION(login, DBVER60);          // use dblib
ver 6.0 client behavior

        // set time to wait for login
        if (dbsetlogintime(60) == FAIL)
                ThrowError(CDBLIBERR::eDbSet);

        // set time to wait for statement execution
        if (dbsettime(180) == FAIL)
                ThrowError(CDBLIBERR::eDbSet);

        m_dbproc = dbopen(login, szServer);

        // deallocate login structure before checking for success
        dbfreelogin( login );

        if (m_dbproc == NULL)
                ThrowError(CDBLIBERR::eDbOpen);

        // save address of class instance so that the message and error
handler
        // can get to data.
        dbsetuserdata(m_dbproc, (LPVOID)this);

        // Use the the right database
        if (dbuse(m_dbproc, szDatabase) == FAIL)
                ThrowError(CDBLIBERR::eDbUse);

        dbcmd(m_dbproc, "set nocount on ");
        // do not return row counts
        dbcmd(m_dbproc, "set XACT_ABORT ON");
        // rollback transaction on abort

        if (dbsqlexec(m_dbproc) == FAIL)
                ThrowError(CDBLIBERR::eDbSqlExec);

        DiscardNextResults(2);

        // verify that version of stored procs on server is correct
        dbrpcinit(m_dbproc, "tpcc_version", 0);

        if (dbrpcexec(m_dbproc) == FAIL)
                ThrowError(CDBLIBERR::eDbRpcExec);

        if (dbresults(m_dbproc) != SUCCEED)
                ThrowError(CDBLIBERR::eDbResults);

        if (dbnextrow(m_dbproc) != REG_ROW)
                ThrowError(CDBLIBERR::eDbNextRow);

        char szSrvVersion[16];
        pData=dbdata(m_dbproc, 1);
        if (pData)
                UtilStrCpy(szSrvVersion, pData, dbdatlen(m_dbproc,
1));
        else
                szSrvVersion[0]=0;
        if (strcmp(szSrvVersion,sVersion))
                throw new
CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_WRONG_SP_VERSION );


        DiscardNextRows(0);
        DiscardNextResults(0);
}


CTPCC_DBLIB::~CTPCC_DBLIB( void )
{
        // close db connection and deallocate resources
        dbclose(m_dbproc);
        InterlockedDecrement( &iConnectionCount );
        if (m_DbLibErr != NULL)
                delete m_DbLibErr;
        if (m_SqlErr != NULL)
                delete m_SqlErr;
}

void CTPCC_DBLIB::SetDbLibError(int severity, int dberr, int oserr, LPCSTR
dberrstr, LPCSTR oserrstr)
{
        delete m_DbLibErr;
        m_DbLibErr = new CDBLIBERR(CDBLIBERR::eUnknown, severity,
dberr, oserr);

        if (dberrstr != NULL)
        {
                m_DbLibErr->m_dberrstr = new
char[ strlen(dberrstr)+1 ];
                strcpy( m_DbLibErr->m_dberrstr, dberrstr );
        }

        if (oserrstr != NULL)
        {
                m_DbLibErr->m_oserrstr = new
char[ strlen(oserrstr)+1 ];
                strcpy( m_DbLibErr->m_oserrstr, oserrstr );
        }

}
void CTPCC_DBLIB::SetSqlError( int /*DBINT*/ msgno, int msgstate, int severity,
LPCSTR msgtext )
{
        if (m_SqlErr == NULL)
                m_SqlErr = new CSQLERR();

        m_SqlErr->m_msgno = msgno;
        m_SqlErr->m_msgstate = msgstate;
        m_SqlErr->m_severity = severity;

        delete [] m_SqlErr->m_msgtext;
        if (msgtext != NULL)
        {
                m_SqlErr->m_msgtext = new
char[ strlen(msgtext)+1 ];
                strcpy( m_SqlErr->m_msgtext, msgtext );
        }
}

void CTPCC_DBLIB::ThrowError( CDBLIBERR::ACTION eAction )
{
        // discard anything still in return buffer
        DiscardNextRows(1);
        DiscardNextResults(-1);

        // check for SQL Server error first;  if yes, throw it and ignore any
DBLib error.
        if (m_SqlErr != NULL)
        {
                CSQLERR                 *pSqlErr;
                pSqlErr = m_SqlErr;
                m_SqlErr = NULL;        // clear our pointer to
instance; catch handler will delete
                throw pSqlErr;
        }

        CDBLIBERR *pDbLibErr;
        if (m_DbLibErr == NULL)
                // this case isn't expected to happen, since it means
that an error was returned
                // but the error handlers were not called.
                pDbLibErr = new CDBLIBERR(eAction);
        else
        {
                pDbLibErr = m_DbLibErr;
                pDbLibErr->m_eAction = eAction;
                m_DbLibErr = NULL;                      // clear our
pointer to instance; catch handler will delete
        }

        throw pDbLibErr;
}

// Read and discard rows until no more.  Throw an exception if number of rows
read doesn't
// match number of rows expected.  The row count will be ignored if the
expected count value
// passed in is negative.  A typical use of this routine is to verify that there are no
more
// rows to be read.
void CTPCC_DBLIB::DiscardNextRows(int iExpectedCount)
{
        int                             iRowsRead = 0;
        RETCODE   rc;

        while (TRUE)
        {
                rc = dbnextrow(m_dbproc);
                if (rc == NO_MORE_ROWS)
                        break;
                if (rc == FAIL)
                {
```

```
                                        if (iExpectedCount >= 0)

                ThrowError(CDBLIBERR::eDbNextRow);
                                        else
                                                break;
                        }
                        iRowsRead++;
                }

                if ((iExpectedCount >= 0) &&
                        (iExpectedCount != iRowsRead))
                        ThrowError(CDBLIBERR::eWrongRowCount);
}

// Read and discard results until no more.  Throw an exception if number of
result sets read doesn't
// match number expected.  The result set count will be ignored if the expected
count value
// passed in is negative.  A typical use of this routine is to verify that there are no
more
// result sets to be read.
void CTPCC_DBLIB::DiscardNextResults(int iExpectedCount)
{
                int                     iResultsRead = 0;
                RETCODE    rc;

                while (TRUE)
                {
                        rc = dbresults(m_dbproc);
                        if (rc == NO_MORE_RESULTS)
                                break;
                        if (rc == FAIL)
                        {
                                if (iExpectedCount >= 0)

                ThrowError(CDBLIBERR::eDbResults);
                                else
                                        break;
                        }

                        DiscardNextRows(-1);
                        iResultsRead++;
                }

                if ((iExpectedCount >= 0) &&
                        (iExpectedCount != iResultsRead))
                        ThrowError(CDBLIBERR::eWrongRowCount);
}

void CTPCC_DBLIB::StockLevel()
{
                int                                     iTryCount = 0;
                const BYTE  *pData;

                ResetError();

                while (TRUE)
                {
                        try
                        {
                                dbrpcinit(m_dbproc, "tpcc_stocklevel",
0);

                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT2, -1, -1, (BYTE *) &m_txn.StockLevel.w_id);                      // @w_id
smallint
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT1, -1, -1, (BYTE *) &m_txn.StockLevel.d_id);                      // @d_id
tinyint
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT2, -1, -1, (BYTE *) &m_txn.StockLevel.threshold);   // @threshhold
smallint

                                if (dbrpcexec(m_dbproc) == FAIL)

                ThrowError(CDBLIBERR::eDbRpcExec);

                                if (dbresults(m_dbproc) != SUCCEED)

                ThrowError(CDBLIBERR::eDbResults);

                                if (dbnextrow(m_dbproc) != REG_ROW)

                ThrowError(CDBLIBERR::eDbNextRow);

                                if (pData=dbdata(m_dbproc, 1))

                m_txn.StockLevel.low_stock = *((long *) pData);

                                DiscardNextRows(0);
                                DiscardNextResults(0);

                                m_txn.StockLevel.exec_status_code =
eOK;
                                return;
                        }
                        catch (CSQLERR *e)
                        {
                                if ((e->m_msgno == 1205 ||
                                        (e->m_msgno ==
iErrOleDbProvider &&
                                        strstr(e->m_msgtext,
sErrTimeoutExpired) != NULL)) &&
                                        (++iTryCount <=
iMaxRetries))
                                {
                                        // hit deadlock; backoff for
increasingly longer period
                                        delete e;
                                        Sleep(10 * iTryCount);
                                }
                                else
                                        throw;
                        }
                }               // while (TRUE)

                //if (iTryCount)
                //              throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}


void CTPCC_DBLIB::NewOrder()
{
                int                                     i;
                DBINT                   commit_flag;
                DBDATETIME              datetime;
                DBDATEREC               daterec;

                int                                     iTryCount = 0;
                const BYTE  *pData;

                ResetError();

                while (TRUE)
                {
                        try
                        {
                                dbrpcinit(m_dbproc, "tpcc_neworder",
0);

                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT2, -1, -1, (BYTE *) &m_txn.NewOrder.w_id);
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT1, -1, -1, (BYTE *) &m_txn.NewOrder.d_id);
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT4, -1, -1, (BYTE *) &m_txn.NewOrder.c_id);
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT1, -1, -1, (BYTE *) &m_txn.NewOrder.o_ol_cnt);

                                // check whether any order lines are for
a remote warehouse
                                m_txn.NewOrder.o_all_local = 1;
                                for (i = 0; i < m_txn.NewOrder.o_ol_cnt;
i++)
                                {
                                        if
(m_txn.NewOrder.OL[i].ol_supply_w_id != m_txn.NewOrder.w_id)
                                        {

                m_txn.NewOrder.o_all_local = 0;  // at least one remote warehouse
                                                break;
                                        }
                                }
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT1, -1, -1, (BYTE *) &m_txn.NewOrder.o_all_local);

                                for (i = 0; i < m_txn.NewOrder.o_ol_cnt;
i++)
                                {
                                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *) &m_txn.NewOrder.OL[i].ol_i_id);
                                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT2, -1, -1, (BYTE *) &m_txn.NewOrder.OL[i].ol_supply_w_id);
                                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT2, -1, -1, (BYTE *) &m_txn.NewOrder.OL[i].ol_quantity);
                                }

                                if (dbrpcexec(m_dbproc) == FAIL)

                ThrowError(CDBLIBERR::eDbRpcExec);


                                // Get order line results
                                m_txn.NewOrder.total_amount = 0;
                                for (i = 0; i<m_txn.NewOrder.o_ol_cnt;
i++)
                                {
                                        if (dbresults(m_dbproc) !=
SUCCEED)

                ThrowError(CDBLIBERR::eDbResults);

                                        if
(dbnumcols(m_dbproc) != 5)

                ThrowError(CDBLIBERR::eWrongNumCols);

                                        if
(dbnextrow(m_dbproc) != REG_ROW)

                ThrowError(CDBLIBERR::eDbNextRow);


                if(pData=dbdata(m_dbproc, 1))

                UtilStrCpy(m_txn.NewOrder.OL[i].ol_i_name, pData,
dbdatlen(m_dbproc, 1));

                if(pData=dbdata(m_dbproc, 2))

                m_txn.NewOrder.OL[i].ol_stock = (*(DBSMALLINT *) pData);

                if(pData=dbdata(m_dbproc, 3))
```

```
		UtilStrCpy(m_txn.NewOrder.OL[i].ol_brand_generic, pData,
dbdatlen(m_dbproc, 3));

		if(pData=dbdata(m_dbproc, 4))

		dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,4),
                                                SQLFLT8,
(BYTE *)&m_txn.NewOrder.OL[i].ol_i_price, 8);

		if(pData=dbdata(m_dbproc, 5))


		dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,5),
                                                SQLFLT8,
(BYTE *)&m_txn.NewOrder.OL[i].ol_amount, 8);


		m_txn.NewOrder.total_amount = m_txn.NewOrder.total_amount +
m_txn.NewOrder.OL[i].ol_amount;

                                        DiscardNextRows(0);
                                }


                                // get remaining values for w_tax, d_tax,
o_id, c_last, c_discount, c_credit, o_entry_d, commit_flag
                                if (dbresults(m_dbproc) != SUCCEED)

		ThrowError(CDBLIBERR::eDbResults);

                                if (dbnextrow(m_dbproc) != REG_ROW)

		ThrowError(CDBLIBERR::eDbNextRow);

                                if (dbnumcols(m_dbproc) != 8)

		ThrowError(CDBLIBERR::eWrongNumCols);

                                if (pData=dbdata(m_dbproc, 1))



                                        dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,1), SQLFLT8, (BYTE
*)&m_txn.NewOrder.w_tax, 8);
                                if (pData=dbdata(m_dbproc, 2))



                                        dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,2), SQLFLT8, (BYTE
*)&m_txn.NewOrder.d_tax, 8);
                                if (pData=dbdata(m_dbproc, 3))
                                        m_txn.NewOrder.o_id =
(*(DBINT *) pData);
                                if (pData=dbdata(m_dbproc, 4))

		UtilStrCpy(m_txn.NewOrder.c_last, pData, dbdatlen(m_dbproc, 4));
                                if (pData=dbdata(m_dbproc, 5))
                                        dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,5), SQLFLT8, (BYTE
*)&m_txn.NewOrder.c_discount, 8);
                                if (pData=dbdata(m_dbproc, 6))

		UtilStrCpy(m_txn.NewOrder.c_credit, pData, dbdatlen(m_dbproc,
6));
                                if (pData=dbdata(m_dbproc, 7))
                                {
                                        datetime =
*((DBDATETIME *) pData);
                                        dbdatecrack(m_dbproc,
&daterec, &datetime);

		m_txn.NewOrder.o_entry_d.year   = daterec.year;

		m_txn.NewOrder.o_entry_d.month  = daterec.month;

		m_txn.NewOrder.o_entry_d.day    = daterec.day;

		m_txn.NewOrder.o_entry_d.hour   = daterec.hour;

		m_txn.NewOrder.o_entry_d.minute = daterec.minute;

		m_txn.NewOrder.o_entry_d.second = daterec.second;
                                }
                                if (pData=dbdata(m_dbproc, 8))
                                        commit_flag =
(*(DBTINYINT *) pData);

                                DiscardNextRows(0);
                                DiscardNextResults(0);


                                if (commit_flag == 1)
                                {

		m_txn.NewOrder.total_amount *= ((1 + m_txn.NewOrder.w_tax +
m_txn.NewOrder.d_tax) * (1- m_txn.NewOrder.c_discount));

		m_txn.NewOrder.exec_status_code = eOK;
                                }
                                else

		m_txn.NewOrder.exec_status_code = eInvalidItem;

                                return;
                        }
                        catch (CSQLERR *e)
                        {
                                if ((e->m_msgno == 1205 ||
                                        (e->m_msgno ==
iErrOleDbProvider &&
                                        strstr(e->m_msgtext,
sErrTimeoutExpired) != NULL)) &&
                                        (++iTryCount <=
iMaxRetries))
                                {
                                        // hit deadlock; backoff for
increasingly longer period
                                        delete e;
                                        Sleep(10 * iTryCount);
                                }
                                else
                                        throw;
                        }
                }               // while (TRUE)

//              if (iTryCount)
//                      throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}


void CTPCC_DBLIB::Payment()
{
                DBDATETIME              datetime;
                DBDATEREC               daterec;

                int                             iTryCount = 0;
                const BYTE  *pData;

                ResetError();

                while (TRUE)
                {
                        try
                        {
                                dbrpcinit(m_dbproc, "tpcc_payment", 0);

                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT2, -1, -1, (BYTE *) &m_txn.Payment.w_id);
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT2, -1, -1, (BYTE *) &m_txn.Payment.c_w_id);
                                dbrpcparam(m_dbproc, NULL, 0,
SQLFLT8, -1, -1, (BYTE *) &m_txn.Payment.h_amount);
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT1, -1, -1, (BYTE *) &m_txn.Payment.d_id);
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT1, -1, -1, (BYTE *) &m_txn.Payment.c_d_id);
                                dbrpcparam(m_dbproc, NULL, 0,
SQLINT4, -1, -1, (BYTE *) &m_txn.Payment.c_id);

                                // if customer id is zero, then payment is
by name
                                if (m_txn.Payment.c_id == 0)
                                        dbrpcparam(m_dbproc,
NULL, 0, SQLCHAR, -1, strlen(m_txn.Payment.c_last), (unsigned char
*)m_txn.Payment.c_last);

                                if (dbrpcexec(m_dbproc) == FAIL)

                ThrowError(CDBLIBERR::eDbRpcExec);

                                if (dbresults(m_dbproc) != SUCCEED)

                ThrowError(CDBLIBERR::eDbResults);

                                if (dbnextrow(m_dbproc) != REG_ROW)

                ThrowError(CDBLIBERR::eDbNextRow);

                                if (dbnumcols(m_dbproc) != 27)

                ThrowError(CDBLIBERR::eWrongNumCols);

                                if (pData=dbdata(m_dbproc, 1))
                                        m_txn.Payment.c_id =
*((DBINT *) pData);
                                if (pData=dbdata(m_dbproc, 2))

                UtilStrCpy(m_txn.Payment.c_last, pData, dbdatlen(m_dbproc, 2));
                                if (pData=dbdata(m_dbproc, 3))
                                {
                                        datetime =
*((DBDATETIME *) pData);
                                        dbdatecrack(m_dbproc,
&daterec, &datetime);

                m_txn.Payment.h_date.year   = daterec.year;

                m_txn.Payment.h_date.month  = daterec.month;

                m_txn.Payment.h_date.day    = daterec.day;

                m_txn.Payment.h_date.hour   = daterec.hour;

                m_txn.Payment.h_date.minute = daterec.minute;

                m_txn.Payment.h_date.second = daterec.second;
                                }
                                if (pData=dbdata(m_dbproc, 4))

                UtilStrCpy(m_txn.Payment.w_street_1, pData, dbdatlen(m_dbproc,
4));
```

```
                                        if (pData=dbdata(m_dbproc, 5))
                UtilStrCpy(m_txn.Payment.w_street_2, pData, dbdatlen(m_dbproc,
5));
                                        if (pData=dbdata(m_dbproc, 6))
                UtilStrCpy(m_txn.Payment.w_city, pData, dbdatlen(m_dbproc, 6));
                                        if (pData=dbdata(m_dbproc, 7))
                UtilStrCpy(m_txn.Payment.w_state, pData, dbdatlen(m_dbproc,
7));
                                        if (pData=dbdata(m_dbproc, 8))
                UtilStrCpy(m_txn.Payment.w_zip, pData, dbdatlen(m_dbproc, 8));
                                        if (pData=dbdata(m_dbproc, 9))
                UtilStrCpy(m_txn.Payment.d_street_1, pData, dbdatlen(m_dbproc,
9));
                                        if (pData=dbdata(m_dbproc, 10))
                UtilStrCpy(m_txn.Payment.d_street_2, pData, dbdatlen(m_dbproc,
10));
                                        if (pData=dbdata(m_dbproc, 11))
                UtilStrCpy(m_txn.Payment.d_city, pData, dbdatlen(m_dbproc, 11));
                                        if (pData=dbdata(m_dbproc, 12))
                UtilStrCpy(m_txn.Payment.d_state, pData, dbdatlen(m_dbproc,
12));
                                        if (pData=dbdata(m_dbproc, 13))
                UtilStrCpy(m_txn.Payment.d_zip, pData, dbdatlen(m_dbproc, 13));
                                        if (pData=dbdata(m_dbproc, 14))
                UtilStrCpy(m_txn.Payment.c_first, pData, dbdatlen(m_dbproc, 14));
                                        if (pData=dbdata(m_dbproc, 15))
                UtilStrCpy(m_txn.Payment.c_middle, pData, dbdatlen(m_dbproc,
15));
                                        if (pData=dbdata(m_dbproc, 16))
                UtilStrCpy(m_txn.Payment.c_street_1, pData, dbdatlen(m_dbproc,
16));
                                        if (pData=dbdata(m_dbproc, 17))
                UtilStrCpy(m_txn.Payment.c_street_2, pData, dbdatlen(m_dbproc,
17));
                                        if (pData=dbdata(m_dbproc, 18))
                UtilStrCpy(m_txn.Payment.c_city, pData, dbdatlen(m_dbproc, 18));
                                        if (pData=dbdata(m_dbproc, 19))
                UtilStrCpy(m_txn.Payment.c_state, pData, dbdatlen(m_dbproc,
19));
                                        if (pData=dbdata(m_dbproc, 20))
                UtilStrCpy(m_txn.Payment.c_zip, pData, dbdatlen(m_dbproc, 20));
                                        if (pData=dbdata(m_dbproc, 21))
                UtilStrCpy(m_txn.Payment.c_phone, pData, dbdatlen(m_dbproc,
21));
                                        if (pData=dbdata(m_dbproc, 22))
                                        {
                                                datetime =
*((DBDATETIME *) pData);
                                                dbdatecrack(m_dbproc,
&daterec, &datetime);
                m_txn.Payment.c_since.year   = daterec.year;
                m_txn.Payment.c_since.month  = daterec.month;
                m_txn.Payment.c_since.day    = daterec.day;
                m_txn.Payment.c_since.hour   = daterec.hour;
                m_txn.Payment.c_since.minute = daterec.minute;
                m_txn.Payment.c_since.second = daterec.second;
                                        }
                                        if(pData=dbdata(m_dbproc, 23))
                UtilStrCpy(m_txn.Payment.c_credit, pData, dbdatlen(m_dbproc,
23));
                                        if(pData=dbdata(m_dbproc, 24))
                                                dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,24), SQLFLT8, (BYTE
*)&m_txn.Payment.c_credit_lim, 8);
                                        if(pData=dbdata(m_dbproc, 25))
                                                dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,25), SQLFLT8, (BYTE
*)&m_txn.Payment.c_discount, 8);
                                        if(pData=dbdata(m_dbproc, 26))
                                                dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,26), SQLFLT8, (BYTE
*)&m_txn.Payment.c_balance, 8);
                                        if(pData=dbdata(m_dbproc, 27))
                UtilStrCpy(m_txn.Payment.c_data, pData, dbdatlen(m_dbproc,
27));
                                        DiscardNextRows(0);
                                        DiscardNextResults(0);

                                        if (m_txn.Payment.c_id == 0)
                                                throw new
CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_INVALID_CUST );
                                        else
                m_txn.Payment.exec_status_code = eOK;
                                        return;
                                }
                                catch (CSQLERR *e)
                                {
                                        if ((e->m_msgno == 1205 ||
                                                (e->m_msgno ==
iErrOleDbProvider &&
                                                strstr(e->m_msgtext,
sErrTimeoutExpired) != NULL)) &&
                                                (++iTryCount <=
iMaxRetries))
                                        {
                                                // hit deadlock; backoff for
increasingly longer period
                                                delete e;
                                                Sleep(10 * iTryCount);
                                        }
                                        else
                                                throw;
                                }
                        }               // while (TRUE)
//                      if (iTryCount)
//                              throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}


void CTPCC_DBLIB::OrderStatus()
{
                int                             i;
                DBDATETIME              datetime;
                DBDATEREC               daterec;

                int                             iTryCount = 0;
                RETCODE                 rc;
                const BYTE  *pData;

                ResetError();

                while (TRUE)
                {
                        try
                        {
                                        dbrpcinit(m_dbproc, "tpcc_orderstatus",
0);

                                        dbrpcparam(m_dbproc, NULL, 0,
SQLINT2, -1, -1, (BYTE *) &m_txn.OrderStatus.w_id);
                                        dbrpcparam(m_dbproc, NULL, 0,
SQLINT1, -1, -1, (BYTE *) &m_txn.OrderStatus.d_id);
                                        dbrpcparam(m_dbproc, NULL, 0,
SQLINT4, -1, -1, (BYTE *) &m_txn.OrderStatus.c_id);

                                        // if customer id is zero, then order
status is by name
                                        if (m_txn.OrderStatus.c_id == 0)
                                                dbrpcparam(m_dbproc,
NULL, 0, SQLCHAR, -1, strlen(m_txn.OrderStatus.c_last), (unsigned char
*)m_txn.OrderStatus.c_last);


                                        if (dbrpcexec(m_dbproc) == FAIL)
                ThrowError(CDBLIBERR::eDbRpcExec);

                                        // Get order lines
                                        if (dbresults(m_dbproc) != SUCCEED)
                                        {
                                                if ((m_DbLibErr == NULL)
&& (m_SqlErr == NULL))
                                                        throw new
CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_NO_SUCH_ORDER );
                                                else
                ThrowError(CDBLIBERR::eDbResults);
                                        }

                                        if (dbnumcols(m_dbproc) != 5)
                ThrowError(CDBLIBERR::eWrongNumCols);

                                        i = 0;
                                        while (TRUE)
                                        {
                                                rc =
dbnextrow(m_dbproc);
                                                if (rc ==
NO_MORE_ROWS)
                                                        break;
                                                if (rc != REG_ROW)
                ThrowError(CDBLIBERR::eDbNextRow);

                if(pData=dbdata(m_dbproc, 1))
                m_txn.OrderStatus.OL[i].ol_supply_w_id = (*(DBSMALLINT *)
pData);
                if(pData=dbdata(m_dbproc, 2))
```

```
		m_txn.OrderStatus.OL[i].ol_i_id = (*(DBINT *) pData);

		if(pData=dbdata(m_dbproc, 3))

		m_txn.OrderStatus.OL[i].ol_quantity = (*(DBSMALLINT *) pData);

		if(pData=dbdata(m_dbproc, 4))

		dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,4),

		 SQLFLT8, (BYTE *)&m_txn.OrderStatus.OL[i].ol_amount, 8);

		if(pData=dbdata(m_dbproc, 5))
							{
								datetime =
*((DBDATETIME *) pData);

		dbdatecrack(m_dbproc, &daterec, &datetime);

		m_txn.OrderStatus.OL[i].ol_delivery_d.year   = daterec.year;

		m_txn.OrderStatus.OL[i].ol_delivery_d.month  = daterec.month;

		m_txn.OrderStatus.OL[i].ol_delivery_d.day    = daterec.day;

		m_txn.OrderStatus.OL[i].ol_delivery_d.hour   = daterec.hour;

		m_txn.OrderStatus.OL[i].ol_delivery_d.minute = daterec.minute;

		m_txn.OrderStatus.OL[i].ol_delivery_d.second = daterec.second;
							}
							i++;
				}
				m_txn.OrderStatus.o_ol_cnt = i;


				if (dbresults(m_dbproc) != SUCCEED)

		ThrowError(CDBLIBERR::eDbResults);

				if (dbnextrow(m_dbproc) != REG_ROW)

		ThrowError(CDBLIBERR::eDbNextRow);

				if (dbnumcols(m_dbproc) != 8)

		ThrowError(CDBLIBERR::eWrongNumCols);

				if(pData=dbdata(m_dbproc, 1))
					m_txn.OrderStatus.c_id =
(*(DBINT *) pData);
				if(pData=dbdata(m_dbproc, 2))

		UtilStrCpy(m_txn.OrderStatus.c_last, pData,
dbdatlen(m_dbproc,2));
				if(pData=dbdata(m_dbproc, 3))

		UtilStrCpy(m_txn.OrderStatus.c_first, pData,
dbdatlen(m_dbproc,3));
				if(pData=dbdata(m_dbproc, 4))

		UtilStrCpy(m_txn.OrderStatus.c_middle, pData,
dbdatlen(m_dbproc, 4));
				if(pData=dbdata(m_dbproc, 5))
				{
					datetime =
*((DBDATETIME *) pData);
					dbdatecrack(m_dbproc,
&daterec, &datetime);

		m_txn.OrderStatus.o_entry_d.year   = daterec.year;

		m_txn.OrderStatus.o_entry_d.month  = daterec.month;

		m_txn.OrderStatus.o_entry_d.day    = daterec.day;

		m_txn.OrderStatus.o_entry_d.hour   = daterec.hour;

		m_txn.OrderStatus.o_entry_d.minute = daterec.minute;

		m_txn.OrderStatus.o_entry_d.second = daterec.second;
					}
					if(pData=dbdata(m_dbproc, 6))

		m_txn.OrderStatus.o_carrier_id = (*(DBSMALLINT *) pData);
					if(pData=dbdata(m_dbproc, 7))
						dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,7),

SQLFLT8, (BYTE *)&m_txn.OrderStatus.c_balance, 8);
					if(pData=dbdata(m_dbproc, 8))
						m_txn.OrderStatus.o_id =
(*(DBINT *) pData);

					DiscardNextRows(0);
					DiscardNextResults(0);


					if (m_txn.OrderStatus.o_ol_cnt == 0)
						throw new
CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_NO_SUCH_ORDER );
					else if (m_txn.OrderStatus.c_id == 0 &&
m_txn.OrderStatus.c_last[0] == 0)
						throw new
CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_INVALID_CUST);
					else

		m_txn.OrderStatus.exec_status_code = eOK;

					return;
				}
				catch (CSQLERR *e)
				{
					if ((e->m_msgno == 1205 ||
(e->m_msgno ==
iErrOleDbProvider &&
strstr(e->m_msgtext,
sErrTimeoutExpired) != NULL)) &&
(++iTryCount <=
iMaxRetries))
					{
						// hit deadlock; backoff for
increasingly longer period
						delete e;
						Sleep(10 * iTryCount);
					}
					else
						throw;
				}
		}		// while (TRUE)

//		if (iTryCount)
//			throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}


void CTPCC_DBLIB::Delivery()
{
		int				i;
		int				iTryCount = 0;
		const BYTE	*pData;

		ResetError();

		while (TRUE)
		{
			try
			{
				dbrpcinit(m_dbproc, "tpcc_delivery", 0);

				dbrpcparam(m_dbproc, NULL, 0,
SQLINT2, -1, -1, (BYTE *) &m_txn.Delivery.w_id);
				dbrpcparam(m_dbproc, NULL, 0,
SQLINT1, -1, -1, (BYTE *) &m_txn.Delivery.o_carrier_id);

				if (dbrpcexec(m_dbproc) == FAIL)

		ThrowError(CDBLIBERR::eDbRpcExec);

				if (dbresults(m_dbproc) != SUCCEED)

		ThrowError(CDBLIBERR::eDbResults);

				if (dbnextrow(m_dbproc) != REG_ROW)

		ThrowError(CDBLIBERR::eDbNextRow);

				if (dbnumcols(m_dbproc) != 10)

		ThrowError(CDBLIBERR::eWrongNumCols);

				for (i=0; i<10; i++)
				{
					if (pData =
dbdata(m_dbproc, i+1))

		m_txn.Delivery.o_id[i] =*((DBINT *)pData);
				}

				DiscardNextRows(0);
				DiscardNextResults(0);

				m_txn.Delivery.exec_status_code =
eOK;
				return;
			}
			catch (CSQLERR *e)
			{
				if ((e->m_msgno == 1205 ||
					(e->m_msgno ==
iErrOleDbProvider &&
					strstr(e->m_msgtext,
sErrTimeoutExpired) != NULL)) &&
					(++iTryCount <=
iMaxRetries))
				{
					// hit deadlock; backoff for
increasingly longer period
					delete e;
					Sleep(10 * iTryCount);
				}
				else
					throw;
			}
		}		// while (TRUE)

//		if (iTryCount)
//			throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_DBLIB::ResetError()
```

```
{
        if (m_DbLibErr != NULL)
        {
                delete m_DbLibErr;
                m_DbLibErr = (CDBLIBERR*)NULL;
        }

        if (m_SqlErr != NULL)
        {
                delete m_SqlErr;
                m_SqlErr = (CSQLERR*)NULL;
        }
        return;
}
```

tm_com_dll\src\tm_com.h

```
/*      FILE:                   TPCC_COM.H
 *                                      Microsoft TPC-C Kit Ver.
4.20.000
 *                                      Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                                      not yet audited
 *
 *      PURPOSE:  Header file for TPC-C COM+ class implementation.
 *
 *  Change history:
 *                      4.20.000 - first version
 */

#pragma once

#include <stdio.h>
#include "..\..\tpcc_com_ps\src\tpcc_com_ps.h"

// need to declare functions for import, unless define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class CCOMERR : public CBaseErr
{
        private:
                char m_szErrorText[64];

        public:
                // use this interface for genuine COM errors
                CCOMERR( HRESULT hr )
                {
                        m_hr = hr;
                        m_iErrorType = 0;
                        m_iError = 0;
                }

                // use this interface to impersonate a non-COM error
type
                CCOMERR( int iErrorType, int iError )
                {
                        m_iErrorType = iErrorType;
                        m_iError = iError;
                        m_hr = S_OK;
                }

                int                     m_hr;
                int                     m_iErrorType;
                int                     m_iError;
                // A CCOMERR class can impersonate another class,
which happens if the error
                // was not actually a COM Services error, but was
simply transmitted back via COM.
                int ErrorType()
                {
                        if (m_iErrorType == 0)
                                return ERR_TYPE_COM;
                        else
                                return m_iErrorType;
                }

                int ErrorNum() {return m_hr;}

                char *ErrorText()
                {
                        if (m_hr == S_OK)
                                sprintf( m_szErrorText,
"Error: Class %d, error # %d", m_iErrorType, m_iError );
                        else
                                sprintf( m_szErrorText,
"Error: COM HRESULT %x", m_hr );
                        return m_szErrorText;
                }
};

class DllDecl CTPCC_COM : public CTPCC_BASE
{
        private:
                BOOL m_bSinglePool;

                // COM Interface pointers
                ITPCC*
        m_pNewOrder;
                ITPCC*
        m_pPayment;
                ITPCC*
        m_pStockLevel;
                ITPCC*
        m_pOrderStatus;

                struct COM_DATA
                {
                        int ErrorType;
                        int error;
                        union
                        {
                                NEW_ORDER_DATA
        NewOrder;
                                PAYMENT_DATA
        Payment;
                                DELIVERY_DATA
        Delivery;
                                STOCK_LEVEL_DATA
        StockLevel;
                                ORDER_STATUS_DATA
        OrderStatus;
                        } u;
                } *m_pTxn;

        public:
                CTPCC_COM(BOOLbSinglePool);
                ~CTPCC_COM(void);

                inline PNEW_ORDER_DATA
        BuffAddr_NewOrder()             { return &m_pTxn-
>u.NewOrder;    };
                inline PPAYMENT_DATA
        BuffAddr_Payment()              { return &m_pTxn-
>u.Payment;     };
                inline PDELIVERY_DATA
        BuffAddr_Delivery()             { return &m_pTxn-
>u.Delivery;    };
                inline PSTOCK_LEVEL_DATA
        BuffAddr_StockLevel()       { return &m_pTxn->u.StockLevel;  };
                inline PORDER_STATUS_DATA
        BuffAddr_OrderStatus()      { return &m_pTxn->u.OrderStatus; };

                void NewOrder                   ();
                void Payment                    ();
                void StockLevel                 ();
                void OrderStatus        ();
                void Delivery           () { throw new
CCOMERR(E_NOTIMPL); }  // not supported
};


inline void ReleaseInterface(IUnknown *pUnk)
{
        if (pUnk)
        {
                pUnk->Release();
                pUnk = NULL;
        }
}


// wrapper routine for class constructor
extern "C" __declspec(dllexport) CTPCC_COM* CTPCC_COM_new(BOOL);

typedef CTPCC_COM* (TYPE_CTPCC_COM)(BOOL);
```

tm_com_dll\src\tm_com.cpp

```
/*      FILE:                   TPCC_COM.CPP
 *                                      Microsoft TPC-C Kit Ver.
4.20.000
 *                                      Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                                      not yet audited
 *
 *      PURPOSE:  Source file for TPC-C COM+ class implementation.
 *      Contact:  Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                      4.20.000 - first version
 */

// needed for CoinitializeEx
#define _WIN32_WINNT 0x0400

#include <windows.h>

// need to declare functions for export
#define DllDecl  __declspec( dllexport )

#include "..\..\common\src\trans.h"             //tpckit transaction header
contains defination of structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_com.h"

#include "..\..\tpcc_com_ps\src\tpcc_com_ps_i.c"
#include "..\..\tpcc_com_all\src\tpcc_com_all_i.c"

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_COM* CTPCC_COM_new(BOOL bSinglePool)
{
        return new CTPCC_COM(bSinglePool);
```

```
}

CTPCC_COM::CTPCC_COM(BOOL bSinglePool)
{
	HRESULT hr = NULL;
	long lRet = 0;

	m_bSinglePool = bSinglePool;

	m_pNewOrder			= NULL;
	m_pPayment			= NULL;
	m_pStockLevel		= NULL;
	m_pOrderStatus		= NULL;

	m_pTxn = (COM_DATA*)CoTaskMemAlloc(sizeof(COM_DATA));
	if (!m_pTxn)
		throw new CCOMERR( E_FAIL );

	hr = CoInitializeEx(NULL, COINIT_MULTITHREADED);
	if (FAILED(hr))
	{
		throw new CCOMERR( hr );
	}

	// create components
	if (m_bSinglePool)
	{
		hr = CoCreateInstance(CLSID_TPCC, NULL,
CLSCTX_SERVER, IID_ITPCC, (void **)&m_pNewOrder);
		if (FAILED(hr))
			throw new CCOMERR(hr);

		// all txns will use same component
		m_pPayment = m_pNewOrder;
		m_pStockLevel = m_pNewOrder;
		m_pOrderStatus = m_pNewOrder;
	}
	else
	{
		// use different components for each txn

		hr = CoCreateInstance(CLSID_NewOrder, NULL,
CLSCTX_SERVER, IID_ITPCC, (void **)&m_pNewOrder);
		if (FAILED(hr))
			throw new CCOMERR(hr);

		hr = CoCreateInstance(CLSID_Payment, NULL,
CLSCTX_SERVER, IID_ITPCC, (void **)&m_pPayment);
		if (FAILED(hr))
			throw new CCOMERR(hr);

		hr = CoCreateInstance(CLSID_StockLevel, NULL,
CLSCTX_SERVER, IID_ITPCC, (void **)&m_pStockLevel);
		if (FAILED(hr))
			throw new CCOMERR(hr);

		hr = CoCreateInstance(CLSID_OrderStatus, NULL,
CLSCTX_SERVER, IID_ITPCC, (void **)&m_pOrderStatus);
		if (FAILED(hr))
			throw new CCOMERR(hr);
	}

	// call setcomplete to release each component back into pool
	hr = m_pNewOrder->CallSetComplete();
	if (FAILED(hr))
		throw new CCOMERR(hr);

	if (!m_bSinglePool)
	{
		hr = m_pPayment->CallSetComplete();
		if (FAILED(hr))
			throw new CCOMERR(hr);

		hr = m_pStockLevel->CallSetComplete();
		if (FAILED(hr))
			throw new CCOMERR(hr);

		hr = m_pOrderStatus->CallSetComplete();
		if (FAILED(hr))
			throw new CCOMERR(hr);
	}
}

CTPCC_COM::~CTPCC_COM()
{
	if (m_pTxn)
		CoTaskMemFree(m_pTxn);

	ReleaseInterface(m_pNewOrder);
	if (!m_bSinglePool)
	{
		ReleaseInterface(m_pPayment);
		ReleaseInterface(m_pStockLevel);
		ReleaseInterface(m_pOrderStatus);
	}
	CoUninitialize();
}

void CTPCC_COM::NewOrder()
{
	int iSize = sizeof(COM_DATA);

	HRESULT hr = m_pNewOrder->NewOrder(&iSize, (unsigned
char**)&m_pTxn);
	if (FAILED(hr))
		throw new CCOMERR( hr );

	if ( m_pTxn->ErrorType != ERR_SUCCESS )
		throw new CCOMERR( m_pTxn->ErrorType, m_pTxn-
>error );
}

void CTPCC_COM::Payment()
{
	int iSize = sizeof(COM_DATA);

	HRESULT hr = m_pPayment->Payment(&iSize, (unsigned
char**)&m_pTxn);
	if (FAILED(hr))
		throw new CCOMERR( hr );

	if ( m_pTxn->ErrorType != ERR_SUCCESS )
		throw new CCOMERR( m_pTxn->ErrorType, m_pTxn-
>error );
}

void CTPCC_COM::StockLevel()
{
	int iSize = sizeof(COM_DATA);

	HRESULT hr = m_pStockLevel->StockLevel(&iSize, (unsigned
char**)&m_pTxn);
	if (FAILED(hr))
		throw new CCOMERR( hr );

	if ( m_pTxn->ErrorType != ERR_SUCCESS )
		throw new CCOMERR( m_pTxn->ErrorType, m_pTxn-
>error );
}

void CTPCC_COM::OrderStatus()
{
	int iSize = sizeof(COM_DATA);

	HRESULT hr = m_pOrderStatus->OrderStatus(&iSize, (unsigned
char**)&m_pTxn);
	if (FAILED(hr))
		throw new CCOMERR( hr );

	if ( m_pTxn->ErrorType != ERR_SUCCESS )
		throw new CCOMERR( m_pTxn->ErrorType, m_pTxn-
>error );
}
```

tpcc_com_all\src\tpcc_com_all.rgs

```
HKCR
{
	TPCC.AllTxns.1 = s 'All Txns Class'
	{
		CLSID = s '{122A31282520-11D3-BA71-
00C04FBFE08B}'
	}
	TPCC.AllTxns = s 'TPCC Class'
	{
		CurVer = s 'TPCC.AllTxns.1'
	}
	NoRemove CLSID
	{
		ForceRemove {122A31282520-11D3-BA71-
00C04FBFE08B} = s 'TPCC Class'
		{
			ProgID = s 'TPCC.AllTxns.1'
			VersionIndependentProgID = s
'TPCC.AllTxns'
			InprocServer32 = s '%MODULE%'
			{
				val ThreadingModel = s
'Both'
			}
		}
	}
}
```

tpcc_com_all\src\tpcc_com_all.rc

```
//Microsoft Developer Studio generated resource script.
//
#include "resource.h"

#define APSTUDIO_READONLY_SYMBOLS
////////////////////////////////////////////////////////////////////
//
// Generated from the TEXTINCLUDE 2 resource.
//
#include "winres.h"

////////////////////////////////////////////////////////////////////
#undef APSTUDIO_READONLY_SYMBOLS

////////////////////////////////////////////////////////////////////
// English (U.S.) resources

#if !defined(AFX_RESOURCE_DLL) || defined(AFX_TARG_ENU)
#ifdef _WIN32
LANGUAGE LANG_ENGLISH, SUBLANG_ENGLISH_US
#pragma code_page(1252)
#endif //_WIN32

#ifdef APSTUDIO_INVOKED
```

```
//////////////////////////////////////////////////////////////////////
//
// TEXTINCLUDE
//

1 TEXTINCLUDE DISCARDABLE
BEGIN
   "resource.h\0"
END

2 TEXTINCLUDE DISCARDABLE
BEGIN
   "#include ""winres.h""\r\n"
   "\0"
END

3 TEXTINCLUDE DISCARDABLE
BEGIN
   "1 TYPELIB ""tpcc_com_all.tlb""\r\n"
   "\0"
END

#endif    // APSTUDIO_INVOKED


#ifndef _MAC
//////////////////////////////////////////////////////////////////////
//
// Version
//

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 1,0,0,1
 PRODUCTVERSION 1,0,0,1
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x4L
 FILETYPE 0x2L
 FILESUBTYPE 0x0L
BEGIN
   BLOCK "StringFileInfo"
   BEGIN
      BLOCK "040904B0"
      BEGIN
         VALUE "CompanyName", "\0"
         VALUE "FileDescription", "tpcc_com_all Module\0"
         VALUE "FileVersion", "1, 0, 0, 1\0"
         VALUE "InternalName", "TPCCNEWORDER\0"
         VALUE "LegalCopyright", "Copyright 1997\0"
         VALUE "OriginalFilename", "tpcc_com_all.DLL\0"
         VALUE "ProductName", "tpcc_com_all Module\0"
         VALUE "ProductVersion", "1, 0, 0, 1\0"
         VALUE "OLESelfRegister", "\0"
      END
   END
   BLOCK "VarFileInfo"
   BEGIN
      VALUE "Translation", 0x409, 1200
   END
END

#endif    // !_MAC


//////////////////////////////////////////////////////////////////////
//
// REGISTRY
//

IDR_TPCC              REGISTRY DISCARDABLE    "tpcc_com_all.rgs"
IDR_NEWORDER          REGISTRY DISCARDABLE    "tpcc_com_no.rgs"
IDR_ORDERSTATUS       REGISTRY DISCARDABLE    "tpcc_com_os.rgs"
IDR_PAYMENT           REGISTRY DISCARDABLE    "tpcc_com_pay.rgs"
IDR_STOCKLEVEL        REGISTRY DISCARDABLE    "tpcc_com_sl.rgs"

//////////////////////////////////////////////////////////////////////
//
// String Table
//

STRINGTABLE DISCARDABLE
BEGIN
   IDS_PROJNAME          "tpcc_com_all"
END

#endif    // English (U.S.) resources
////////////////////////////////////////////// //////////////////////////


#ifndef APSTUDIO_INVOKED
//////////////////////////////////////////////////////////////////////
//
// Generated from the TEXTINCLUDE 3 resource.
//
1 TYPELIB "tpcc_com_all.tlb"

//////////////////////////////////////// //////////////////////////////
#endif    // not APSTUDIO_INVOKED
```

tpcc_com_all\src\tpcc_com_all.idl

```
/*              FILE:                           TPCC.IDL
 *                                                      Microsoft TPC-C Kit Ver.
4.20.000
 *                                                      Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                                      not yet audited
 *
 *              PURPOSE:  IDL source for TPCC.dll.  This file is processed by the
MIDL tool to
 *                                                      produce the type library
(TPCC.tlb) and marshalling code.
 *
 *  Change history:
 *                              4.20.000 - first version
 */

interface TPCC;
interface NewOrder;
interface OrderStatus;
interface Payment;
interface StockLevel;


import "oaidl.idl";
import "ocidl.idl";
import "..\tpcc_com_ps\src\tpcc_com_ps.idl";

[
                uuid(122A3117-2520-11D3-BA71-00C04FBFE08B),
                version(1.0),
                helpstring("TPC-C 1.0 Type Library")
]
library TPCCLib
{
                importlib("stdole32.tlb");
                importlib("stdole2.tlb");

                [
                                uuid(122A3128-2520-11D3-BA71-00C04FBFE08B),
                                helpstring("All Txns Class")
                ]
                coclass TPCC
                {
                                [default] interface ITPCC;
                };


                [
                                uuid(975BAABF-84A7-11D2-BA47-00C04FBFE08B),
                                helpstring("NewOrder Class")
                ]
                coclass NewOrder
                {
                                [default] interface ITPCC;
                };


                [
                                uuid(266836AD-A50D-11D2-BA4E-00C04FBFE08B),
                                helpstring("OrderStatus Class")
                ]
                coclass OrderStatus
                {
                                [default] interface ITPCC;
                };


                [
                                uuid(CD02F7EF-A4FA-11D2-BA4E-00C04FBFE08B),
                                helpstring("Payment Class")
                ]
                coclass Payment
                {
                                [default] interface ITPCC;
                };


                [
                                uuid(2668369E-A50D-11D2-BA4E-00C04FBFE08B),
                                helpstring("StockLevel Class")
                ]
                coclass StockLevel
                {
                                [default] interface ITPCC;
                };

};
```

tpcc_com_all\src\tpcc_com_all.h

```
#pragma warning( disable: 4049 )  /* more than 64k source lines */

/* this ALWAYS GENERATED file contains the definitions for the interfaces */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jan 24 20:00:20 2000
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
```

```
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )


/* verify that the <rpcndr.h> version is high enough to compile this file*/
#ifndef __REQUIRED_RPCNDR_H_VERSION__
#define __REQUIRED_RPCNDR_H_VERSION__ 440
#endif

#include "rpc.h"
#include "rpcndr.h"

#ifndef __tpcc_com_all_h__
#define __tpcc_com_all_h__

/* Forward Declarations */

#ifndef __TPCC_FWD_DEFINED__
#define __TPCC_FWD_DEFINED__

#ifdef __cplusplus
typedef class TPCC TPCC;
#else
typedef struct TPCC TPCC;
#endif /* __cplusplus */

#endif          /* __TPCC_FWD_DEFINED__ */


#ifndef __NewOrder_FWD_DEFINED__
#define __NewOrder_FWD_DEFINED__

#ifdef __cplusplus
typedef class NewOrder NewOrder;
#else
typedef struct NewOrder NewOrder;
#endif /* __cplusplus */

#endif          /* __NewOrder_FWD_DEFINED__ */


#ifndef __OrderStatus_FWD_DEFINED__
#define __OrderStatus_FWD_DEFINED__

#ifdef __cplusplus
typedef class OrderStatus OrderStatus;
#else
typedef struct OrderStatus OrderStatus;
#endif /* __cplusplus */

#endif          /* __OrderStatus_FWD_DEFINED__ */


#ifndef __Payment_FWD_DEFINED__
#define __Payment_FWD_DEFINED__

#ifdef __cplusplus
typedef class Payment Payment;
#else
typedef struct Payment Payment;
#endif /* __cplusplus */

#endif          /* __Payment_FWD_DEFINED__ */


#ifndef __StockLevel_FWD_DEFINED__
#define __StockLevel_FWD_DEFINED__

#ifdef __cplusplus
typedef class StockLevel StockLevel;
#else
typedef struct StockLevel StockLevel;
#endif /* __cplusplus */

#endif          /* __StockLevel_FWD_DEFINED__ */


/* header files for imported files */
#include "oaidl.h"
#include "ocidl.h"
#include "tpcc_com_ps.h"

#ifdef __cplusplus
extern "C"{
#endif

void __RPC_FAR * __RPC_USER MIDL_user_allocate(size_t);
void __RPC_USER MIDL_user_free( void __RPC_FAR * );

/* interface __MIDL_itf_tpcc_com_all_0000 */
/* [local] */




extern RPC_IF_HANDLE __MIDL_itf_tpcc_com_all_0000_v0_0_c_ifspec;
extern RPC_IF_HANDLE __MIDL_itf_tpcc_com_all_0000_v0_0_s_ifspec;


#ifndef __TPCCLib_LIBRARY_DEFINED__
#define __TPCCLib_LIBRARY_DEFINED__

/* library TPCCLib */
/* [helpstring][version][uuid] */


EXTERN_C const IID LIBID_TPCCLib;

EXTERN_C const CLSID CLSID_TPCC;

#ifdef __cplusplus

class DECLSPEC_UUID("122A3128-2520-11D3-BA71-00C04FBFE08B")
TPCC;
#endif

EXTERN_C const CLSIDCLSID_NewOrder;

#ifdef __cplusplus

class DECLSPEC_UUID("975BAABF-84A7-11D2-BA47-00C04FBFE08B")
NewOrder;
#endif

EXTERN_C const CLSID CLSID_OrderStatus;

#ifdef __cplusplus

class DECLSPEC_UUID("266836AD-A50D-11D2-BA4E-00C04FBFE08B")
OrderStatus;
#endif

EXTERN_C const CLSID CLSID_Payment;

#ifdef __cplusplus

class DECLSPEC_UUID("CD02F7EF-A4FA-11D2-BA4E-00C04FBFE08B")
Payment;
#endif

EXTERN_C const CLSID CLSID_StockLevel;

#ifdef __cplusplus

class DECLSPEC_UUID("2668369E-A50D-11D2-BA4E-00C04FBFE08B")
StockLevel;
#endif
#endif /* __TPCCLib_LIBRARY_DEFINED__ */

/* Additional Prototypes for ALL interfaces */

/* end of Additional Prototypes */

#ifdef __cplusplus
}
#endif

#endif
```

tpcc_com_all\src\tpcc_com_ps.h

```
#pragma warning( disable: 4049 )  /* more than 64k source lines */

/* this ALWAYS GENERATED file contains the definitions for the interfaces */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jan 24 20:00:07 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )


/* verify that the <rpcndr.h> version is high enough to compile this file*/
#ifndef __REQUIRED_RPCNDR_H_VERSION__
#define __REQUIRED_RPCNDR_H_VERSION__ 440
#endif

#include "rpc.h"
#include "rpcndr.h"

#ifndef __RPCNDR_H_VERSION__
#error this stub requires an updated version of <rpcndr.h>
#endif // __RPCNDR_H_VERSION__

#ifndef COM_NO_WINDOWS_H
#include "windows.h"
#include "ole2.h"
#endif /*COM_NO_WINDOWS_H*/

#ifndef __tpcc_com_ps_h__
#define __tpcc_com_ps_h__

/* Forward Declarations */

#ifndef __ITPCC_FWD_DEFINED__
#define __ITPCC_FWD_DEFINED__
typedef interface ITPCC ITPCC;
```

```
#endif          /* __ITPCC_FWD_DEFINED__ */


/* header files for imported files */
#include "oaidl.h"
#include "ocidl.h"

#ifdef __cplusplus
extern "C"{
#endif

void __RPC_FAR * __RPC_USER MIDL_user_allocate(size_t);
void __RPC_USER MIDL_user_free( void __RPC_FAR * );

#ifndef __ITPCC_INTERFACE_DEFINED__
#define __ITPCC_INTERFACE_DEFINED__

/* interface ITPCC */
/* [unique][helpstring][uuid] [object] */


EXTERN_C const IID IID_ITPCC;

#if defined(__cplusplus) && !defined(CINTERFACE)

    MIDL_INTERFACE("FEEE6AA2-84B1-11d2-BA47-00C04FBFE08B")
    ITPCC : public IUnknown
    {
    public:
        virtual HRESULT __stdcall NewOrder(
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn) = 0;

        virtual HRESULT __stdcall Payment(
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn) = 0;

        virtual HRESULT __stdcall Delivery(
            /* [in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn)
= 0;

        virtual HRESULT __stdcall StockLevel(
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn) = 0;

        virtual HRESULT __stdcall OrderStatus(
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn) = 0;

        virtual HRESULT __stdcall CallSetComplete( void) = 0;

    };

#else           /* C style interface */

    typedef struct ITPCCVtbl
    {
        BEGIN_INTERFACE

        HRESULT ( STDMETHODCALLTYPE __RPC_FAR *QueryInterface )(
            ITPCC __RPC_FAR * This,
            /* [in] */ REFIID riid,
            /* [iid_is][out] */ void __RPC_FAR *__RPC_FAR *ppvObject);

        ULONG ( STDMETHODCALLTYPE __RPC_FAR *AddRef )(
            ITPCC __RPC_FAR * This);

        ULONG ( STDMETHODCALLTYPE __RPC_FAR *Release )(
            ITPCC __RPC_FAR * This);

        HRESULT ( __stdcall __RPC_FAR *NewOrder )(
            ITPCC __RPC_FAR * This,
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn);

        HRESULT ( __stdcall __RPC_FAR *Payment )(
            ITPCC __RPC_FAR * This,
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn);

        HRESULT ( __stdcall __RPC_FAR *Delivery )(
            ITPCC __RPC_FAR * This,
            /* [in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);

        HRESULT ( __stdcall __RPC_FAR *StockLevel )(
            ITPCC __RPC_FAR* This,
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn);

        HRESULT ( __stdcall __RPC_FAR *OrderStatus )(
            ITPCC __RPC_FAR * This,
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn);

        HRESULT ( __stdcall __RPC_FAR *CallSetComplete )(
            ITPCC __RPC_FAR * This);

        END_INTERFACE
    } ITPCCVtbl;

    interface ITPCC
    {
        CONST_VTBL struct ITPCCVtbl __RPC_FAR *lpVtbl;
    };


#ifdef COBJMACROS


#define ITPCC_QueryInterface(This,riid,ppvObject)    \
    (This)->lpVtbl -> QueryInterface(This,riid,ppvObject)

#define ITPCC_AddRef(This)              \
    (This)->lpVtbl -> AddRef(This)

#define ITPCC_Release(This)             \
    (This)->lpVtbl -> Release(This)


#define ITPCC_NewOrder(This,iSize,txn)              \
    (This)->lpVtbl -> NewOrder(This,iSize,txn)

#define ITPCC_Payment(This,iSize,txn)\
    (This)->lpVtbl -> Payment(This,iSize,txn)

#define ITPCC_Delivery(This,iSize,txn) \
    (This)->lpVtbl -> Delivery(This,iSize,txn)

#define ITPCC_StockLevel(This,iSize,txn)            \
    (This)->lpVtbl -> StockLevel(This,iSize,txn)

#define ITPCC_OrderStatus(This,iSize,txn)           \
    (This)->lpVtbl -> OrderStatus(This,iSize,txn)

#define ITPCC_CallSetComplete(This) \
    (This)->lpVtbl -> CallSetComplete(This)

#endif /* COBJMACROS */


#endif          /* C style interface */


HRESULT __stdcall ITPCC_NewOrder_Proxy(
    ITPCC __RPC_FAR * This,
    /* [out][in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_NewOrder_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_Payment_Proxy(
    ITPCC __RPC_FAR * This,
    /* [out][in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_Payment_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_Delivery_Proxy(
    ITPCC __RPC_FAR * This,
    /* [in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_Delivery_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_StockLevel_Proxy(
    ITPCC __RPC_FAR * This,
    /* [out][in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_StockLevel_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_OrderStatus_Proxy(
    ITPCC __RPC_FAR * This,
    /* [out][in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_OrderStatus_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
```

```
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_CallSetComplete_Proxy(
    ITPCC __RPC_FAR * This);


void __RPC_STUB ITPCC_CallSetComplete_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);



#endif          /* __ITPCC_INTERFACE_DEFINED__ */


/* Additional Prototypes for ALL interfaces */

/* end of Additional Prototypes */

#ifdef __cplusplus
}
#endif

#endif
```

tpcc_com_all\src\resource.h

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by tpcc_com_all.rc
//
#define IDS_PROJNAME                100
#define IDR_TPCC                    101
#define IDR_NEWORDER                102
#define IDR_ORDERSTATUS             103
#define IDR_PAYMENT                 104
#define IDR_STOCKLEVEL              105

// Next default values for new objects
//
#ifdef APSTUDIO_INVOKED
#ifndef APSTUDIO_READONLY_SYMBOLS
#define _APS_NEXT_RESOURCE_VALUE        202
#define _APS_NEXT_COMMAND_VALUE         32768
#define _APS_NEXT_CONTROL_VALUE         201
#define _APS_NEXT_SYMED_VALUE           106
#endif
#endif
```

tpcc_com_all\src\methods.h

```
/*              FILE:                       METHODS.H
 *                                          Microsoft TPC-C Kit Ver.
4.20.000
 *                                          Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                          not yet audited
 *
 *              PURPOSE:  Header file for COM components.
 *
 *  Change history:
 *                          4.20.000 - first version
 */


enum COMPONENT_ERROR
{
        ERR_MISSING_REGISTRY_ENTRIES = 1,
        ERR_LOADDLL_FAILED,
        ERR_GETPROCADDR_FAILED,
        ERR_UNKNOWN_DB_PROTOCOL
};

class CCOMPONENT_ERR : public CBaseErr
{
        public:
                CCOMPONENT_ERR(COMPONENT_ERROR Err)
                {
                        m_Error = Err;
                        m_szTextDetail = NULL;
                        m_SystemErr = 0;
                        m_szErrorText = NULL;
                };

                CCOMPONENT_ERR(COMPONENT_ERROR Err,
char *szTextDetail, DWORD dwSystemErr)
                {
                        m_Error = Err;
                        m_szTextDetail = new
char[strlen(szTextDetail)+1];
                        strcpy( m_szTextDetail, szTextDetail );
                        m_SystemErr = dwSystemErr;
                        m_szErrorText = NULL;
                };

                ~CCOMPONENT_ERR()
                {
                        if (m_szTextDetail != NULL)
                                delete [] m_szTextDetail;
                        if (m_szErrorText != NULL)
                                delete [] m_szErrorText;
                };

                COMPONENT_ERROR    m_Error;
                char
        *m_szTextDetail;
                char
        *m_szErrorText;
                DWORD
        m_SystemErr;

                int ErrorType() {return ERR_TYPE_COMPONENT;};
                int ErrorNum() {return m_Error;};
                char *ErrorText();
};


static void WriteMessageToEventLog(LPTSTR lpszMsg);


/////////////////////////////////////////////////////////////////////////////
// CTPCC_Common
class CTPCC_Common :
        public ITPCC,
        public IObjectControl,
        public IObjectConstruct,
        public CComObjectRootEx<CComSingleThreadModel>
{
public:
BEGIN_COM_MAP(CTPCC_Common)
        COM_INTERFACE_ENTRY(ITPCC)
        COM_INTERFACE_ENTRY(IObjectControl)
        COM_INTERFACE_ENTRY(IObjectConstruct)
END_COM_MAP()

        CTPCC_Common();
        ~CTPCC_Common();

// ITPCC
public:
        HRESULT __stdcall NewOrder(                     int* iSize,
UCHAR** txn);
        HRESULT __stdcall Payment(                      int* iSize,
UCHAR** txn);
        HRESULT __stdcall Delivery(                     int* iSize,
UCHAR** txn) {return E_NOTIMPL;}
        HRESULT __stdcall StockLevel(       int* iSize, UCHAR** txn);
        HRESULT __stdcall OrderStatus(      int* iSize, UCHAR** txn);

        HRESULT __stdcall CallSetComplete();

// IObjectControl
        STDMETHODIMP_(BOOL) CanBePooled() { return
m_bCanBePooled; }
        STDMETHODIMP Activate() { return S_OK; }        // we don't
support COM Services transactions (no enlistment)
        STDMETHODIMP_(void) Deactivate() { /* nothing to do */ }

// IObjectConstruct
        STDMETHODIMP Construct(IDispatch * pUnk);

        // helper methods
private:
        BOOL                    m_bCanBePooled;
        CTPCC_BASE              *m_pTxn;

        struct COM_DATA
        {
                int retval;
                int error;
                union
                {
                        NEW_ORDER_DATA
        NewOrder;
                        PAYMENT_DATA
        Payment;
                        DELIVERY_DATA
        Delivery;
                        STOCK_LEVEL_DATA    StockLevel;
                        ORDER_STATUS_DATA OrderStatus;
                } u;
        };

};

/////////////////////////////////////////////////////////////////////////////
// CTPCC
class CTPCC :
        public CTPCC_Common,
        public CComCoClass<CTPCC, &CLSID_TPCC>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_TPCC)

BEGIN_COM_MAP(CTPCC)
        COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
        COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

};


/////////////////////////////////////////////////////////////////////////////
// CNewOrder
class CNewOrder :
```

```
		public CTPCC_Common,
		public CComCoClass<CNewOrder, &CLSID_NewOrder>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_NEWORDER)

BEGIN_COM_MAP(CNewOrder)
		COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
		COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
//		HRESULT __stdcall NewOrder(			int* iSize,
UCHAR** txn) {return E_NOTIMPL;}
		HRESULT __stdcall Payment(			int* iSize,
UCHAR** txn) {return E_NOTIMPL;}
		HRESULT __stdcall StockLevel(		int* iSize, UCHAR** txn)
{return E_NOTIMPL;}
		HRESULT __stdcall OrderStatus(		int* iSize, UCHAR** txn)
{return E_NOTIMPL;}
};


		//////////////////////////////////////////////////////////////
// COrderStatus
class COrderStatus :
		public CTPCC_Common,
		public CComCoClass<COrderStatus, &CLSID_OrderStatus>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_ORDERSTATUS)

BEGIN_COM_MAP(COrderStatus)
		COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
		COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
		HRESULT __stdcall NewOrder(			int* iSize,
UCHAR** txn) {return E_NOTIMPL;}
		HRESULT __stdcall Payment(			int* iSize,
UCHAR** txn) {return E_NOTIMPL;}
		HRESULT __stdcall StockLevel(		int* iSize, UCHAR** txn)
{return E_NOTIMPL;}
//		HRESULT __stdcall OrderStatus(		int* iSize, UCHAR** txn)
{return E_NOTIMPL;}
};


//////////////////////////////////////////////////////////////
// CPayment
class CPayment :
		public CTPCC_Common,
		public CComCoClass<CPayment, &CLSID_Payment>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_PAYMENT)

BEGIN_COM_MAP(CPayment)
		COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
		COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
		HRESULT __stdcall NewOrder(			int* iSize,
UCHAR** txn) {return E_NOTIMPL;}
//		HRESULT __stdcall Payment(			int* iSize,
UCHAR** txn) {return E_NOTIMPL;}
		HRESULT __stdcall StockLevel(		int* iSize, UCHAR** txn)
{return E_NOTIMPL;}
		HRESULT __stdcall OrderStatus(		int* iSize, UCHAR** txn)
{return E_NOTIMPL;}
};


//////////////////////////////////////////////////////////////
// CStockLevel
class CStockLevel :
		public CTPCC_Common,
		public CComCoClass<CStockLevel, &CLSID_StockLevel>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_STOCKLEVEL)

BEGIN_COM_MAP(CStockLevel)
		COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
		COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
		HRESULT __stdcall NewOrder(			int* iSize,
UCHAR** txn) {return E_NOTIMPL;}
		HRESULT __stdcall Payment(			int* iSize,
UCHAR** txn) {return E_NOTIMPL;}
//		HRESULT __stdcall StockLevel(		int* iSize, UCHAR** txn)
{return E_NOTIMPL;}
		HRESULT __stdcall OrderStatus(		int* iSize, UCHAR** txn)
{return E_NOTIMPL;}
};
```

tpcc_com_all\src\tpcc_com_all.def

```
; tpcc_com_all.def : Declares the module parameters.

LIBRARY	"tpcc_com_all.dll"

EXPORTS
		DllCanUnloadNow	@1 PRIVATE
		DllGetClassObject	@2 PRIVATE
		DllRegisterServer	@3 PRIVATE
		DllUnregisterServer		@4 PRIVATE
```

Tpcc_com_all\src\tpcc_com_all.cpp

```
/*		FILE:				TPCC_COM_ALL.CPP
 *							Microsoft TPC-C Kit Ver.
4.20.000
 *							Copyright Microsoft, 1999
 *	All Rights Reserved
 *
 *							Version 4.10.000 audited
by Richard Gimarc, Performance Metrics, 3/17/99
 *
 *		PURPOSE:	Implementation for TPC-C Tuxedo class.
 *		Contact:	Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *				4.20.000 - updated rev number to match kit
 */

#define STRICT
#define _WIN32_WINNT 0x0400
#define _ATL_APARTMENT_THREADED

#include <stdio.h>
#include <atlbase.h>
//You may derive a class from CComModule and use it if you want to override
//something, but do not change the name of _Module
extern CComModule _Module;

#include <atlcom.h>
#include <initguid.h>
#include <transact.h>
#include <atlimpl.cpp>
#include <comsvcs.h>

#include <sqltypes.h>
#include <sql.h>
#include <sqlext.h>

#include "tpcc_com_ps.h"
#include "..\..\common\src\trans.h"
		//tpckit transaction header contains defination of structures
specific to TPC-C
#include "..\..\common\src\txn_base.h"
#include "..\..\common\src\error.h"
#include "..\..\common\src\ReadRegistry.h"
#include "..\..\db_dblib_dll\src\tpcc_dblib.h"		// DBLIB
implementation of TPC-C txns
#include "..\..\db_odbc_dll\src\tpcc_odbc.h"		// ODBC
implementation of TPC-C txns


#include "resource.h"
#include "tpcc_com_all.h"
#include "tpcc_com_all_i.c"
#include "Methods.h"
#include "..\..\tpcc_com_ps\src\tpcc_com_ps_i.c"
#include "..\..\common\src\ReadRegistry.cpp"


CComModule _Module;

BEGIN_OBJECT_MAP(ObjectMap)
		OBJECT_ENTRY(CLSID_TPCC, CTPCC)
		OBJECT_ENTRY(CLSID_NewOrder, CNewOrder)
		OBJECT_ENTRY(CLSID_OrderStatus, COrderStatus)
		OBJECT_ENTRY(CLSID_Payment, CPayment)
		OBJECT_ENTRY(CLSID_StockLevel, CStockLevel)
END_OBJECT_MAP()


// configuration settings from registry
TPCCREGISTRYDATA	Reg;
char
		szMyComputerName[MAX_COMPUTERNAME_LENGTH+1];

static  HINSTANCE hLibInstanceDb = NULL;

TYPE_CTPCC_DBLIB	*pCTPCC_DBLIB_new;
TYPE_CTPCC_ODBC			*pCTPCC_ODBC_new;


//////////////////////////////////////////////////////////////
// DLL Entry Point

extern "C"
BOOL WINAPI DllMain(HINSTANCE hInstance, DWORD dwReason, LPVOID
/*lpReserved*/)
{
		char szDllName[128];

		try
		{
```

```
                        if (dwReason == DLL_PROCESS_ATTACH)
                        {
                                _Module.Init(ObjectMap, hInstance);
                                DisableThreadLibraryCalls(hInstance);

                                DWORD dwSize =
MAX_COMPUTERNAME_LENGTH+1;

        GetComputerName(szMyComputerName, &dwSize);
                                szMyComputerName[dwSize] = 0;

                                if
( ReadTPCCRegistrySettings( &Reg ) )
                                        throw new
CCOMPONENT_ERR( ERR_MISSING_REGISTRY_ENTRIES );

                                if (Reg.eDB_Protocol == DBLIB)
                                {
                                        strcpy( szDllName,
Reg.szPath );
                                        strcat( szDllName,
"tpcc_dblib.dll");
                                        hLibInstanceDb =
LoadLibrary( szDllName );
                                        if (hLibInstanceDb ==
NULL)
                                                throw new
CCOMPONENT_ERR( ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                        // get function pointer to
wrapper for class constructor
                                        pCTPCC_DBLIB_new =
(TYPE_CTPCC_DBLIB*)
GetProcAddress(hLibInstanceDb,"CTPCC_DBLIB_new");
                                        if (pCTPCC_DBLIB_new
== NULL)
                                                throw new
CCOMPONENT_ERR( ERR_GETPROCADDR_FAILED, szDllName,
GetLastError() );
                                }
                                else if (Reg.eDB_Protocol == ODBC)
                                {
                                        strcpy( szDllName,
Reg.szPath );
                                        strcat( szDllName,
"tpcc_odbc.dll");
                                        hLibInstanceDb =
LoadLibrary( szDllName );
                                        if (hLibInstanceDb ==
NULL)
                                                throw new
CCOMPONENT_ERR( ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                        // get function pointer to
wrapper for class constructor
                                        pCTPCC_ODBC_new =
(TYPE_CTPCC_ODBC*)
GetProcAddress(hLibInstanceDb,"CTPCC_ODBC_new");
                                        if (pCTPCC_ODBC_new
== NULL)
                                                throw new
CCOMPONENT_ERR( ERR_GETPROCADDR_FAILED, szDllName,
GetLastError() );
                                }
                                else
                                        throw new
CCOMPONENT_ERR( ERR_UNKNOWN_DB_PROTOCOL );
                        }
                        else if (dwReason == DLL_PROCESS_DETACH)
                                _Module.Term();

        }
        catch (CBaseErr *e)
        {
                WriteMessageToEventLog(e->ErrorText());
                delete e;
                return FALSE;
        }
        catch (...)
        {
                WriteMessageToEventLog(TEXT("Unhandled
exception in object DllMain"));
                return FALSE;
        }

        return TRUE;// OK
}

////////////////////////////////////////////////////////////////////
// Used to determine whether the DLL can be unloaded by OLE

STDAPI DllCanUnloadNow(void)
{
        return (_Module.GetLockCount()==0) ? S_OK : S_FALSE;
}

////////////////////////////////////////////////////////////////////
// Returns a class factory to create an object of the requested type

STDAPI DllGetClassObject(REFCLSID rclsid, REFIID riid, LPVOID* ppv)
{
        return _Module.GetClassObject(rclsid, riid, ppv);
}

////////////////////////////////////////////////////////////////////
// DllRegisterServer - Adds entries to the system registry

STDAPI DllRegisterServer(void)
{
        // registers object, typelib and all interfaces in typelib
        return _Module.RegisterServer(TRUE);
}

////////////////////////////////////////////////////////////////////
// DllUnregisterServer - Removes entries from the system registry

STDAPI DllUnregisterServer(void)
{
        _Module.UnregisterServer();
        return S_OK;
}


static void WriteMessageToEventLog(LPTSTR lpszMsg)
{
   TCHAR   szMsg[256];
   HANDLE  hEventSource;
   LPTSTR  lpszStrings[2];

   // Use event logging to log the error.
   //
   hEventSource = RegisterEventSource(NULL, TEXT("tpcc_com_all.dll"));

   _stprintf(szMsg, TEXT("Error in COM+ TPGC Component: "));
   lpszStrings[0] = szMsg;
   lpszStrings[1] = lpszMsg;

   if (hEventSource != NULL)
        {
      ReportEvent(hEventSource, // handle of event source
         EVENTLOG_ERROR_TYPE,  // event type
         0,                    // event category
         0,                    // event ID
         NULL,                 // current user's SID
         2,                    // strings in lpszStrings
         0,                    // no bytes of raw data
         (LPCTSTR *)lpszStrings,    // array of error strings
         NULL);                // no raw data

      (VOID) DeregisterEventSource(hEventSource);
   }
}

inline void ReleaseInterface(IUnknown *pUnk)
{
        if (pUnk)
        {
                pUnk->Release();
                pUnk = NULL;
        }
}

/* FUNCTION: CCOMPONENT_ERR::ErrorText
 *
 */

char* CCOMPONENT_ERR::ErrorText(void)
{
        static SERRORMSG errorMsgs[] =
        {
                { ERR_MISSING_REGISTRY_ENTRIES,
        "Required entries missing from registry."
                },
                { ERR_LOADDLL_FAILED,
        "Load of DLL failed.  DLL="
                                                        },
                { ERR_GETPROCADDR_FAILED,
        "Could not map proc in DLL.  GetProcAddr error.  DLL="
        },
                { ERR_UNKNOWN_DB_PROTOCOL,
        "Unknown database protocol specified in registry."
        },
                { 0,
                        ""
                                                                }
        };

        char szTmp[256];
        int i = 0;
        while (TRUE)
        {
                if (errorMsgs[i].szMsg[0] == 0)
                {
                        strcpy( szTmp, "Unknown error
number." );
                        break;
                }
                if (m_Error == errorMsgs[i].iError)
                {
                        strcpy( szTmp, errorMsgs[i].szMsg );
                        break;
                }
                i++;
        }

        if (m_szTextDetail)
                strcat( szTmp, m_szTextDetail );
        if (m_SystemErr)
                wsprintf( szTmp+strlen(szTmp), "  Error=%d",
m_SystemErr );

        m_szErrorText = new char[strlen(szTmp)+1];
        strcpy( m_szErrorText, szTmp );
        return m_szErrorText;
}
```

```
CTPCC_Common::CTPCC_Common()
{
	m_pTxn = NULL;
	m_bCanBePooled = TRUE;
}

CTPCC_Common::~CTPCC_Common()
{
	if (m_pTxn)
		delete m_pTxn;
}

HRESULT CTPCC_Common::CallSetComplete()
{
	IObjectContext* pObjectContext = NULL;

	// get our object context
	HRESULT hr = CoGetObjectContext( IID_IObjectContext, (void
**)&pObjectContext );
	pObjectContext->SetComplete();
	ReleaseInterface(pObjectContext);
	return hr;
}

//
//	called by the ctor activator
//
STDMETHODIMP CTPCC_Common::Construct(IDispatch * pUnk)
{
	// Code to access construction string, if needed later...
	//	if (!pUnk)
	//		return E_UNEXPECTED;
	//	IObjectConstructString * pString = NULL;
	//	HRESULT hr = pUnk-
>QueryInterface(IID_IObjectConstructString, (void **)&pString);
	//	pString->Release();

	try
	{
		if (Reg.eDB_Protocol == ODBC)
			m_pTxn =
pCTPCC_ODBC_new( Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword,
szMyComputerName, Reg.szDbName );
		else if (Reg.eDB_Protocol == DBLIB)
			m_pTxn =
pCTPCC_DBLIB_new( Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword,
szMyComputerName, Reg.szDbName );
	}
	catch (CBaseErr *e)
	{
		WriteMessageToEventLog(e->ErrorText());
		delete e;
		return E_FAIL;
	}
	catch (...)
	{
		WriteMessageToEventLog(TEXT("Unhandled
exception in object ::Construct"));
		return E_FAIL;
	}

	return S_OK;
}

HRESULT CTPCC_Common::NewOrder(int* iSize, UCHAR **txn)
{
	PNEW_ORDER_DATA	pNewOrder;
	COM_DATA		*pData;

	try
	{
		pData = (COM_DATA*)*txn;
		pNewOrder = m_pTxn->BuffAddr_NewOrder();

		memcpy(pNewOrder, &pData->u.NewOrder,
sizeof(NEW_ORDER_DATA));
		m_pTxn->NewOrder();
		memcpy( &pData->u.NewOrder, pNewOrder,
sizeof(NEW_ORDER_DATA));

		pData->retval = ERR_SUCCESS;
		pData->error = 0;
		return S_OK;
	}
	catch (CBaseErr *e)
	{
		// check for lost database connection; if yes,
component is toast
		if ( ((e->ErrorType() == ERR_TYPE_DBLIB) && (e
>ErrorNum() == 10005)) ||
			((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
			m_bCanBePooled = FALSE;

		pData->retval = e->ErrorType();
		pData->error = e->ErrorNum();
		delete e;
		return E_FAIL;
	}
	catch (...)
	{
		WriteMessageToEventLog(TEXT("Unhandled
exception."));
		pData->retval = ERR_TYPE_LOGIC;
		pData->error = 0;
		m_bCanBePooled = FALSE;
		return E_FAIL;
	}
}

HRESULT CTPCC_Common::Payment(int* iSize, UCHAR** txn)
{
	PPAYMENT_DATA	pPayment;
	COM_DATA		*pData;

	try
	{
		pData = (COM_DATA*)*txn;
		pPayment = m_pTxn->BuffAddr_Payment();

		memcpy(pPayment, &pData->u.Payment,
sizeof(PAYMENT_DATA) );
		m_pTxn->Payment();
		memcpy( &pData->u.Payment, pPayment,
sizeof(PAYMENT_DATA) );

		pData->retval = ERR_SUCCESS;
		pData->error = 0;
		return S_OK;
	}
	catch (CBaseErr *e)
	{
		// check for lost database connection; if yes,
component is toast
		if ( ((e->ErrorType() == ERR_TYPE_DBLIB) && (e
>ErrorNum() == 10005)) ||
			((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
			m_bCanBePooled = FALSE;

		pData->retval = e->ErrorType();
		pData->error = e->ErrorNum();
		delete e;
		return E_FAIL;
	}
	catch (...)
	{
		WriteMessageToEventLog(TEXT("Unhandled
exception."));
		pData->retval = ERR_TYPE_LOGIC;
		pData->error = 0;
		m_bCanBePooled = FALSE;
		return E_FAIL;
	}
}

HRESULT CTPCC_Common::StockLevel(int* iSize, UCHAR** txn)
{
	PSTOCK_LEVEL_DATA	pStockLevel;
	COM_DATA		*pData;

	try
	{
		pData = (COM_DATA*)*txn;
		pStockLevel = m_pTxn->BuffAddr_StockLevel();

		memcpy(pStockLevel, &pData->u.StockLevel,
sizeof(STOCK_LEVEL_DATA));
		m_pTxn->StockLevel();
		memcpy( &pData->u.StockLevel, pStockLevel,
sizeof(STOCK_LEVEL_DATA) );

		pData->retval = ERR_SUCCESS;
		pData->error = 0;
		return S_OK;
	}
	catch (CBaseErr *e)
	{
		// check for lost database connection; if yes,
component is toast
		if ( ((e->ErrorType() == ERR_TYPE_DBLIB) && (e
>ErrorNum() == 10005)) ||
			((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
			m_bCanBePooled = FALSE;

		pData->retval = e->ErrorType();
		pData->error = e->ErrorNum();
		delete e;
		return E_FAIL;
	}
	catch (...)
	{
		WriteMessageToEventLog(TEXT("Unhandled
exception."));
		pData->retval = ERR_TYPE_LOGIC;
		pData->error = 0;
		m_bCanBePooled = FALSE;
		return E_FAIL;
	}
}

HRESULT CTPCC_Common::OrderStatus(int* iSize, UCHAR** txn)
{
	PORDER_STATUS_DATA	pOrderStatus;
	COM_DATA		*pData;

	try
	{
		pData = (COM_DATA*)*txn;
		pOrderStatus = m_pTxn->BuffAddr_OrderStatus();

		memcpy(pOrderStatus, &pData->u.OrderStatus,
sizeof(ORDER_STATUS_DATA) );
```

```
                        m_pTxn->OrderStatus();
                        memcpy( &pData->u.OrderStatus, pOrderStatus,
sizeof(ORDER_STATUS_DATA) );

                        pData->retval = ERR_SUCCESS;
                        pData->error = 0;
                        return S_OK;
                }
                catch (CBaseErr *e)
                {
                        // check for lost database connection; if yes,
component is toast
                        if ( ((e->ErrorType() == ERR_TYPE_DBLIB) && (e-
>ErrorNum() == 10005)) ||
                                        ((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
                                m_bCanBePooled = FALSE;

                        pData->retval = e->ErrorType();
                        pData->error = e->ErrorNum();
                        delete e;
                        return E_FAIL;
                }
                catch (...)
                {
                        WriteMessageToEventLog(TEXT("Unhandled
exception."));
                        pData->retval = ERR_TYPE_LOGIC;
                        pData->error = 0;
                        m_bCanBePooled = FALSE;
                        return E_FAIL;
                }
}
```

tpcc_com_all\src\tpcc_com_all_i.c

```
#pragma warning( disable: 4049 )  /* more than 64k source lines */

/* this ALWAYS GENERATED file contains the IIDs and CLSIDs */

/* link this file in with the server and any clients */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jan 24 20:00:20 2000
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if !defined(_M_IA64) && !defined(_M_AXP64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)\
        DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)\
        const type name = {l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
LIBID_TPCCLib,0x122A3117,0x2520,0x11D3,0xBA,0x71,0x00,0xC0,0x4F,0xBF,0
xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC,0x122A3128,0x2520,0x11D3,0xBA,0x71,0x00,0xC0,0x4F,0xBF,0x
E0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder,0x975BAABF,0x84A7,0x11D2,0xBA,0x47,0x00,0xC0,0x4F,0x
BF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_OrderStatus,0x266836AD,0xA50D,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0
xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_Payment,0xCD02F7EF,0xA4FA,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0xB
F,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_StockLevel,0x2668369E,0xA50D,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0x
BF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif
```

```
#endif /* !defined(_M_IA64) && !defined(_M_AXP64)*/


#pragma warning( disable: 4049 )  /* more than 64k source lines */

/* this ALWAYS GENERATED file contains the IIDs and CLSIDs */

/* link this file in with the server and any clients */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jan 24 20:00:20 2000
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), ms_ext, c_ext,
robust
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if defined(_M_IA64) || defined(_M_AXP64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)\
        DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8) \
        const type name = {l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
```

```
LIBID_TPCCLib,0x122A3117,0x2520,0x11D3,0xBA,0x71,0x00,0xC0,0x4F,0xBF,0
xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC,0x122A3128,0x2520,0x11D3,0xBA,0x71,0x00,0xC0,0x4F,0xBF,0x
E0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder,0x975BAABF,0x84A7,0x11D2,0xBA,0x47,0x00,0xC0,0x4F,0x
BF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_OrderStatus,0x266836AD,0xA50D,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0
xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_Payment,0xCD02F7EF,0xA4FA,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0xB
F,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_StockLevel,0x2668369E,0xA50D,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0x
BF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* defined(_M_IA64) || defined(_M_AXP64)*/
```

tpcc_com_ps\src\tpcc_com_ps.idl

```
/*              FILE:                           ITPCC.IDL
 *                                              Microsoft TPC-C Kit Ver.
4.20.000
 *                                              Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                              not yet audited
 *
 *              PURPOSE:  Defines the interface used by TPCC. This interface
can be implemented by C++ components.
 *
 *  Change history:
 *                          4.20.000 - first version
 */

// Forward declare all types defined
//interface ITPCC;
import "oaidl.idl";
import "ocidl.idl";

            [
                        object,
                        uuid(FEEE6AA2-84B1-11d2-BA47-00C04FBFE08B),
                        helpstring("ITPCC Interface"),
                        pointer_default(unique)
            ]
            interface ITPCC : IUnknown
            {
                        HRESULT _stdcall NewOrder
                                    (
                                    [in, out] int* iSize,
                                    [in, out, size_is( , *iSize)] char** txn
                                    );
                        HRESULT _stdcall Payment
                                    (
                                    [in, out] int* iSize,
                                    [in, out, size_is( , *iSize)] char** txn
                                    );
                        HRESULT _stdcall Delivery
                                    (
                                    [in] int* iSize,
                                    [in, size_is( , *iSize)] char** txn
                                    );
                        HRESULT _stdcall StockLevel
                                    (
                                    [in, out] int* iSize,
                                    [in, out, size_is( , *iSize)] char** txn
                                    );
                        HRESULT _stdcall OrderStatus
                                    (
                                    [in, out] int* iSize,
                                    [in, out, size_is( , *iSize)] char** txn
                                    );
                        HRESULT _stdcall CallSetComplete
                                    (
                                    );
            };          // interface ITPCC
```

tpcc_com_ps\src\tpcc_com_ps.h

```
#pragma warning( disable: 4049 )  /* more than 64k source lines */

/* this ALWAYS GENERATED file contains the definitions for the interfaces */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jan 24 20:00:07 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )


/* verify that the <rpcndr.h> version is high enough to compile this file*/
#ifndef __REQUIRED_RPCNDR_H_VERSION__
#define __REQUIRED_RPCNDR_H_VERSION__ 440
#endif

#include "rpc.h"
#include "rpcndr.h"

#ifndef __RPCNDR_H_VERSION__
#error this stub requires an updated version of <rpcndr.h>
#endif // __RPCNDR_H_VERSION__

#ifndef COM_NO_WINDOWS_H
#include "windows.h"
#include "ole2.h"
#endif /*COM_NO_WINDOWS_H*/

#ifndef __tpcc_com_ps_h__
#define __tpcc_com_ps_h__

/* Forward Declarations */

#ifndef __ITPCC_FWD_DEFINED__
#define __ITPCC_FWD_DEFINED__
typedef interface ITPCC ITPCC;
#endif          /* __ITPCC_FWD_DEFINED__ */


/* header files for imported files */
#include "oaidl.h"
#include "ocidl.h"

#ifdef __cplusplus
extern "C"{
#endif

void __RPC_FAR * __RPC_USER MIDL_user_allocate(size_t);
void __RPC_USER MIDL_user_free( void __RPC_FAR * );

#ifndef __ITPCC_INTERFACE_DEFINED__
#define __ITPCC_INTERFACE_DEFINED__

/* interface ITPCC */
/* [unique][helpstring][uuid][object] */


EXTERN_C const IID IID_ITPCC;

#if defined(__cplusplus) && !defined(CINTERFACE)

    MIDL_INTERFACE("FEEE6AA284B1-11d2-BA47-00C04FBFE08B")
    ITPCC : public IUnknown
    {
    public:
        virtual HRESULT __stdcall NewOrder(
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn) = 0;

        virtual HRESULT __stdcall Payment(
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
```

```
*txn) = 0;

        virtual HRESULT __stdcall Delivery(
            /* [in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn)
= 0;

        virtual HRESULT __stdcall StockLevel(
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn) = 0;

        virtual HRESULT __stdcall OrderStatus(
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn) = 0;

        virtual HRESULT __stdcall CallSetComplete( void) = 0;

    };

#else           /* C style interface */

    typedef struct ITPCCVtbl
    {
        BEGIN_INTERFACE

        HRESULT ( STDMETHODCALLTYPE __RPC_FAR *QueryInterface )(
            ITPCC __RPC_FAR * This,
            /* [in] */ REFIID riid,
            /* [iid_is][out] */ void __RPC_FAR *__RPC_FAR *ppvObject);

        ULONG ( STDMETHODCALLTYPE __RPC_FAR *AddRef )(
            ITPCC __RPC_FAR * This);

        ULONG ( STDMETHODCALLTYPE __RPC_FAR *Release )(
            ITPCC __RPC_FAR * This);

        HRESULT ( __stdcall __RPC_FAR *NewOrder )(
            ITPCC __RPC_FAR * This,
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn);

        HRESULT ( __stdcall __RPC_FAR *Payment )(
            ITPCC __RPC_FAR * This,
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn);

        HRESULT ( __stdcall __RPC_FAR *Delivery )(
            ITPCC __RPC_FAR * This,
            /* [in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);

        HRESULT ( __stdcall __RPC_FAR *StockLevel )(
            ITPCC __RPC_FAR * This,
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn);

        HRESULT ( __stdcall __RPC_FAR *OrderStatus )(
            ITPCC __RPC_FAR * This,
            /* [out][in] */ int __RPC_FAR *iSize,
            /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR
*txn);

        HRESULT ( __stdcall __RPC_FAR *CallSetComplete )(
            ITPCC __RPC_FAR * This);

        END_INTERFACE
    } ITPCCVtbl;

    interface ITPCC
    {
        CONST_VTBL struct ITPCCVtbl __RPC_FAR *lpVtbl;
    };


#ifdef COBJMACROS


#define ITPCC_QueryInterface(This,riid,ppvObject)    \
    (This)->lpVtbl -> QueryInterface(This,riid,ppvObject)

#define ITPCC_AddRef(This)              \
    (This)->lpVtbl -> AddRef(This)

#define ITPCC_Release(This)             \
    (This)->lpVtbl -> Release(This)


#define ITPCC_NewOrder(This,iSize,txn)              \
    (This)->lpVtbl -> NewOrder(This,iSize,txn)

#define ITPCC_Payment(This,iSize,txn)\
    (This)->lpVtbl -> Payment(This,iSize,txn)

#define ITPCC_Delivery(This,iSize,txn) \
    (This)->lpVtbl -> Delivery(This,iSize,txn)

#define ITPCC_StockLevel(This,iSize,txn)            \
    (This)->lpVtbl -> StockLevel(This,iSize,txn)

#define ITPCC_OrderStatus(This,iSize,txn)           \
    (This)->lpVtbl -> OrderStatus(This,iSize,txn)

#define ITPCC_CallSetComplete(This)  \
    (This)->lpVtbl -> CallSetComplete(This)

#endif /* COBJMACROS */


#endif          /* C style interface */


HRESULT __stdcall ITPCC_NewOrder_Proxy(
    ITPCC __RPC_FAR * This,
    /* [out][in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_NewOrder_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_Payment_Proxy(
    ITPCC __RPC_FAR * This,
    /* [out][in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_Payment_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_Delivery_Proxy(
    ITPCC __RPC_FAR * This,
    /* [in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_Delivery_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_StockLevel_Proxy(
    ITPCC __RPC_FAR * This,
    /* [out][in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_StockLevel_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_OrderStatus_Proxy(
    ITPCC __RPC_FAR * This,
    /* [out][in] */ int __RPC_FAR *iSize,
    /* [size_is][size_is][out][in] */ unsigned char __RPC_FAR *__RPC_FAR *txn);


void __RPC_STUB ITPCC_OrderStatus_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_CallSetComplete_Proxy(
    ITPCC __RPC_FAR * This);


void __RPC_STUB ITPCC_CallSetComplete_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);



#endif          /* __ITPCC_INTERFACE_DEFINED__ */


/* Additional Prototypes for ALL interfaces */

/* end of Additional Prototypes */

#ifdef __cplusplus
}
#endif

#endif
```

tpcc_com_ps\src\tpcc_com_ps.def

```
LIBRARY     "tpcc_com_ps"
```

```
DESCRIPTION  'Proxy/Stub DLL'

EXPORTS
        DllGetClassObject       @1 PRIVATE
        DllCanUnloadNow         @2              PRIVATE
        GetProxyDllInfo         @3   PRIVATE
        DllRegisterServer                       @4          PRIVATE
        DllUnregisterServer                     @5          PRIVATE
```

Tpcc_com_ps\src\tpcc_com_ps_p.c

```
#pragma warning( disable: 4049 )  /* more than 64k source lines */

/* this ALWAYS GENERATED file contains the proxy stub code */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jan 24 20:00:07 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if !defined(_M_IA64) &&!defined(_M_AXP64)
#define USE_STUBLESS_PROXY


/* verify that the <rpcproxy.h> version is high enough to compile this file*/
#ifndef __REDQ_RPCPROXY_H_VERSION__
#define __REQUIRED_RPCPROXY_H_VERSION__ 440
#endif


#include "rpcproxy.h"
#ifndef __RPCPROXY_H_VERSION__
#error this stub requires an updated version of <rpcproxy.h>
#endif // __RPCPROXY_H_VERSION__


#include "tpcc_com_ps.h"

#define TYPE_FORMAT_STRING_SIZE   33
#define PROC_FORMAT_STRING_SIZE   193
#define TRANSMIT_AS_TABLE_SIZE    0
#define WIRE_MARSHAL_TABLE_SIZE   0

typedef struct _MIDL_TYPE_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ TYPE_FORMAT_STRING_SIZE ];
    } MIDL_TYPE_FORMAT_STRING;

typedef struct _MIDL_PROC_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ PROC_FORMAT_STRING_SIZE ];
    } MIDL_PROC_FORMAT_STRING;


extern const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString;
extern const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString;

/* Object interface: IUnknown, ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0x00,0x00,0x00,0x46}
} */


/* Object interface: ITPCC, ver. 0.0,

GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0x4F,0xBF,0xE0,0x
8B}} */


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;

#pragma code_seg(".orpc")
static const unsigned short ITPCC_FormatStringOffsetTable[] =
    {
    0,
    34,
    68,
    102,
    136,
    170
    };

static const MIDL_SERVER_INFO ITPCC_ServerInfo =
    {
    &Object_StubDesc,
    0,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0,
    0
    };

static const MIDL_STUBLESS_PROXY_INFO ITPCC_ProxyInfo =
    {
    &Object_StubDesc,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0
    };

CINTERFACE_PROXY_VTABLE(9) _ITPCCProxyVtbl =
{
    &ITPCC_ProxyInfo,
    &IID_ITPCC,
    IUnknown_QueryInterface_Proxy,
    IUnknown_AddRef_Proxy,
    IUnknown_Release_Proxy ,
    (void *)-1 /* ITPCC::NewOrder */ ,
    (void *)-1 /* ITPCC::Payment */ ,
    (void *)-1 /* ITPCC::Delivery */ ,
    (void *)-1 /* ITPCC::StockLevel */ ,
    (void *)-1 /* ITPCC::OrderStatus */ ,
    (void *)-1 /* ITPCC::CallSetComplete */
};

const CInterfaceStubVtbl _ITPCCStubVtbl =
{
    &IID_ITPCC,
    &ITPCC_ServerInfo,
    9,
    0, /* pure interpreted */
    CStdStubBuffer_METHODS
};


static const MIDL_STUB_DESC Object_StubDesc =
    {
    0,
    NdrOleAllocate,
    NdrOleFree,
    0,
    0,
    0,
    0,
    0,
    __MIDL_TypeFormatString.Format,
    1, /* -error bounds_check flag */
    0x20000, /* Ndr library version */
    0,
    0x5030118, /* MIDL Version 5.3.280 */
    0,
    0,
    0,  /* notify & notify_flag routine table */
    0x1, /* MIDL flag */
    0,  /* Reserved3 */
    0,  /* Reserved4 */
    0   /* Reserved5 */
    };

#pragma data_seg(".rdata")

#if !defined(__RPC_WIN32__)
#error  Invalid build platform for this stub.
#endif

#if !(TARGET_IS_NT40_OR_LATER)
#error You need a Windows NT 4.0 or later to run this stub because it uses
these features:
#error   -Oif or -Oicf.
#error However, your C/C++ compilation flags indicate you intend to run this app
on earlier systems.
#error This app will die there with the RPC_X_WRONG_STUB_VERSION error.
#endif


static const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString =
    {
        0,
        {

                /* Procedure NewOrder */

                                        0x33,               /*
FC_AUTO_HANDLE */
                                        0x6c,               /* Old Flags:
object, Oi2 */
/*  2 */        NdrFcLong( 0x0 ),       /* 0 */
/*  6 */        NdrFcShort( 0x3 ),      /* 3 */
#ifndef _ALPHA_
/*  8 */        NdrFcShort( 0x10 ),     /* x86, MIPS, PPC Stack size/offset =
16 */
#else
                                        NdrFcShort( 0x20 ),     /* Alpha
Stack size/offset = 32 */
#endif
/* 10 */        NdrFcShort( 0x8 ),      /* 8 */
/* 12 */        NdrFcShort( 0x10 ),     /* 16 */
/* 14 */        0x7,                    /* Oi2 Flags:  srv must size, clt must
size, has return, */
                                        0x3,                /* 3 */

                /* Parameter iSize */
```

```
/* 16 */        NdrFcShort( 0x158 ),        /* Flags:  in, out, base type, simple ref,
*/
#ifndef _ALPHA_
/* 18 */        NdrFcShort( 0x4 ),          /* x86, MIPS, PPC Stack size/offset = 4
*/
#else
                                            NdrFcShort( 0x8 ),          /* Alpha
Stack size/offset = 8 */
#endif
/* 20 */        0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Parameter txn */

/* 22 */        NdrFcShort( 0x201b ),       /* Flags:  must size, must free, in, out,
srv alloc size=8 */
#ifndef _ALPHA_
/* 24 */        NdrFcShort( 0x8 ),          /* x86, MIPS, PPC Stack size/offset = 8
*/
#else
                                            NdrFcShort( 0x10 ),         /* Alpha
Stack size/offset = 16 */
#endif
/* 26 */        NdrFcShort( 0x6 ),          /* Type Offset=6 */

                /* Return value */

/* 28 */        NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 30 */        NdrFcShort( 0xc ),          /* x86, MIPS, PPC Stack size/offset =
12 */
#else
                                            NdrFcShort( 0x18 ),         /* Alpha
Stack size/offset = 24 */
#endif
/* 32 */        0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Procedure Payment */

/* 34 */        0x33,                       /* FC_AUTO_HANDLE */
                                            0x6c,                       /* Old Flags:
object, Oi2 */
/* 36 */        NdrFcLong( 0x0 ),           /* 0 */
/* 40 */        NdrFcShort( 0x4 ),          /* 4 */
#ifndef _ALPHA_
/* 42 */        NdrFcShort( 0x10 ),         /* x86, MIPS, PPC Stack size/offset =
16 */
#else
                                            NdrFcShort( 0x20 ),         /* Alpha
Stack size/offset = 32 */
#endif
/* 44 */        NdrFcShort( 0x8 ),          /* 8 */
/* 46 */        NdrFcShort( 0x10 ),         /* 16 */
/* 48 */        0x7,                        /* Oi2 Flags:  srv must size, clt must
size, has return, */
                                            0x3,                        /* 3 */

                /* Parameter iSize */

/* 50 */        NdrFcShort( 0x158 ),        /* Flags:  in, out, base type, simple ref,
*/
#ifndef _ALPHA_
/* 52 */        NdrFcShort( 0x4 ),          /* x86, MIPS, PPC Stack size/offset = 4
*/
#else
                                            NdrFcShort( 0x8 ),          /* Alpha
Stack size/offset = 8 */
#endif
/* 54 */        0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Parameter txn */

/* 56 */        NdrFcShort( 0x201b ),       /* Flags:  must size, must free, in, out,
srv alloc size=8 */
#ifndef _ALPHA_
/* 58 */        NdrFcShort( 0x8 ),          /* x86, MIPS, PPC Stack size/offset = 8
*/
#else
                                            NdrFcShort( 0x10 ),         /* Alpha
Stack size/offset = 16 */
#endif
/* 60 */        NdrFcShort( 0x6 ),          /* Type Offset=6 */

                /* Return value */

/* 62 */        NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 64 */        NdrFcShort( 0xc ),          /* x86, MIPS, PPC Stack size/offset =
12 */
#else
                                            NdrFcShort( 0x18 ),         /* Alpha
Stack size/offset = 24 */
#endif
/* 66 */        0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Procedure Delivery */

/* 68 */        0x33,                       /* FC_AUTO_HANDLE*/
                                            0x6c,                       /* Old Flags:
object, Oi2 */
/* 70 */        NdrFcLong( 0x0 ),           /* 0 */
/* 74 */        NdrFcShort( 0x5 ),          /* 5 */
#ifndef _ALPHA_
/* 76 */        NdrFcShort( 0x10 ),         /* x86, MIPS, PPC Stack size/offset =
16 */
#else
                                            NdrFcShort( 0x20 ),         /* Alpha
Stack size/offset = 32 */
#endif
/* 78 */        NdrFcShort( 0x8 ),          /* 8 */
/* 80 */        NdrFcShort( 0x8 ),          /* 8 */
/* 82 */        0x6,                        /* Oi2 Flags:  clt must size, has return,
*/
                                            0x3,                        /* 3 */

                /* Parameter iSize */

/* 84 */        NdrFcShort( 0x148 ),        /* Flags:  in, base type, simple ref, */
#ifndef _ALPHA_
/* 86 */        NdrFcShort( 0x4 ),          /* x86, MIPS, PPC Stack size/offset = 4
*/
#else
                                            NdrFcShort( 0x8 ),          /* Alpha
Stack size/offset = 8 */
#endif
/* 88 */        0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Parameter txn */

/* 90 */        NdrFcShort( 0x200b ),       /* Flags:  must size, must free, in, srv
alloc size=8 */
#ifndef _ALPHA_
/* 92 */        NdrFcShort( 0x8 ),          /* x86, MIPS, PPC Stack size/offset = 8
*/
#else
                                            NdrFcShort( 0x10 ),         /* Alpha
Stack size/offset = 16 */
#endif
/* 94 */        NdrFcShort( 0x18 ),         /* Type Offset=24 */

                /* Return value */

/* 96 */        NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 98 */        NdrFcShort( 0xc ),          /* x86, MIPS, PPC Stack size/offset =
12 */
#else
                                            NdrFcShort( 0x18 ),         /* Alpha
Stack size/offset = 24 */
#endif
/* 100 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Procedure StockLevel */

/* 102 */       0x33,                       /* FC_AUTO_HANDLE */
                                            0x6c,                       /* Old Flags:
object, Oi2 */
/* 104 */       NdrFcLong( 0x0 ),           /* 0 */
/* 108 */       NdrFcShort( 0x6 ),          /* 6 */
#ifndef _ALPHA_
/* 110 */       NdrFcShort( 0x10 ),         /* x86, MIPS, PPC Stack size/offset =
16 */
#else
                                            NdrFcShort( 0x20 ),         /* Alpha
Stack size/offset = 32 */
#endif
/* 112 */       NdrFcShort( 0x8 ),          /* 8 */
/* 114 */       NdrFcShort( 0x10 ),         /* 16 */
/* 116 */       0x7,                        /* Oi2 Flags:  srv must size, clt must
size, has return, */
                                            0x3,                        /* 3 */

                /* Parameter iSize */

/* 118 */       NdrFcShort( 0x158 ),        /* Flags:  in, out, base type, simple ref,
*/
#ifndef _ALPHA_
/* 120 */       NdrFcShort( 0x4 ),          /* x86, MIPS, PPC Stack size/offset = 4
*/
#else
                                            NdrFcShort( 0x8 ),          /* Alpha
Stack size/offset = 8 */
#endif
/* 122 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Parameter txn */

/* 124 */       NdrFcShort( 0x201b ),       /* Flags:  must size, must free, in, out,
srv alloc size=8 */
#ifndef _ALPHA_
/* 126 */       NdrFcShort( 0x8 ),          /* x86, MIPS, PPC Stack size/offset = 8
*/
#else
                                            NdrFcShort( 0x10 ),         /* Alpha
Stack size/offset = 16 */
#endif
/* 128 */       NdrFcShort( 0x6 ),          /* Type Offset=6 */

                /* Return value */

/* 130 */       NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 132 */       NdrFcShort( 0xc ),          /* x86, MIPS, PPC Stack size/offset =
12 */
#else
                                            NdrFcShort( 0x18 ),         /* Alpha
Stack size/offset = 24 */
#endif
/* 134 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */
```

```
            /* Procedure OrderStatus */

/* 136 */      0x33,                /* FC_AUTO_HANDLE */
                                    0x6c,                /* Old Flags:
object, Oi2 */
/* 138 */      NdrFcLong( 0x0 ),    /* 0 */
/* 142 */      NdrFcShort( 0x7 ),   /* 7 */
#ifndef _ALPHA_
/* 144 */      NdrFcShort( 0x10 ),  /* x86, MIPS, PPC Stack size/offset =
16 */
#else
                                    NdrFcShort( 0x20 ),  /* Alpha
Stack size/offset = 32 */
#endif
/* 146 */      NdrFcShort( 0x8 ),   /* 8 */
/* 148 */      NdrFcShort( 0x10 ),  /* 16 */
/* 150 */      0x7,                 /* Oi2 Flags:  srv must size, clt must
size, has return, */
                                    0x3,                 /* 3 */

            /* Parameter iSize */

/* 152 */      NdrFcShort( 0x158 ), /* Flags:  in, out, base type, simple ref,
*/
#ifndef _ALPHA_
/* 154 */      NdrFcShort( 0x4 ),   /* x86, MIPS, PPC Stack size/offset = 4
*/
#else
                                    NdrFcShort( 0x8 ),   /* Alpha
Stack size/offset = 8 */
#endif
/* 156 */      0x8,                 /* FC_LONG */
                                    0x0,                 /* 0 */

            /* Parameter txn */

/* 158 */      NdrFcShort( 0x201b ), /* Flags:  must size, must free, in, out,
srv alloc size=8 */
#ifndef _ALPHA_
/* 160 */      NdrFcShort( 0x8 ),   /* x86, MIPS, PPC Stack size/offset = 8
*/
#else
                                    NdrFcShort( 0x10 ),  /* Alpha
Stack size/offset = 16 */
#endif
/* 162 */      NdrFcShort( 0x6 ),   /* Type Offset=6 */

            /* Return value */

/* 164 */      NdrFcShort( 0x70 ),  /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 166 */      NdrFcShort( 0xc ),   /* x86, MIPS, PPC Stack size/offset =
12 */
#else
                                    NdrFcShort( 0x18 ),  /* Alpha
Stack size/offset = 24 */
#endif
/* 168 */      0x8,                 /* FC_LONG */
                                    0x0,                 /* 0 */

            /* Procedure CallSetComplete */

/* 170 */      0x33,                /* FC_AUTO_HANDLE */
                                    0x6c,                /* Old Flags:
object, Oi2 */
/* 172 */      NdrFcLong( 0x0 ),    /* 0 */
/* 176 */      NdrFcShort( 0x8 ),   /* 8 */
#ifndef _ALPHA_
/* 178 */      NdrFcShort( 0x8 ),   /* x86, MIPS, PPC Stack size/offset = 8
*/
#else
                                    NdrFcShort( 0x10 ),  /* Alpha
Stack size/offset = 16 */
#endif
/* 180 */      NdrFcShort( 0x0 ),   /* 0 */
/* 182 */      NdrFcShort( 0x8 ),   /* 8 */
/* 184 */      0x4,                 /* Oi2 Flags:  has return, */
                                    0x1,                 /* 1 */

            /* Return value */

/* 186 */      NdrFcShort( 0x70 ),  /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 188 */      NdrFcShort( 0x4 ),   /* x86, MIPS, PPC Stack size/offset = 4
*/
#else
                                    NdrFcShort( 0x8 ),   /* Alpha
Stack size/offset = 8 */
#endif
/* 190 */      0x8,                 /* FC_LONG */
                                    0x0,                 /* 0 */

                                    0x0
        }
    };

static const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString =
    {
        0,
        {
                                    NdrFcShort( 0x0 ),   /* 0 */
/*  2 */
                                    0x11, 0x8,   /* FC_RP [simple_pointer]
*/
/*  4 */        0x8,                /* FC_LONG */
                                    0x5c,                /* FC_PAD */
/*  6 */
                                    0x11, 0x14,  /* FC_RP
[alloced_on_stack] [pointer_deref] */
/*  8 */        NdrFcShort( 0x2 ),  /* Offset= 2 (10) */
/* 10 */
                                    0x13, 0x0,   /* FC_OP */
/* 12 */        NdrFcShort( 0x2 ),  /* Offset= 2 (14) */
/* 14 */
                                    0x1b,                /*
FC_CARRAY */
                                    0x0,                 /* 0 */
/* 16 */        NdrFcShort( 0x1 ),  /* 1 */
/* 18 */        0x28,               /* Corr desc:  parameter, FC_LONG */
                                    0x54,                /*
FC_DEREFERENCE */
#ifndef _ALPHA_
/* 20 */        NdrFcShort( 0x4 ),  /* x86, MIPS, PPC Stack size/offset = 4
*/
#else
                                    NdrFcShort( 0x8 ),   /* Alpha
Stack size/offset = 8 */
#endif
/* 22 */        0x2,                /* FC_CHAR */
                                    0x5b,                /* FC_END */
/* 24 */
                                    0x11, 0x14,  /* FC_RP
[alloced_on_stack] [pointer_deref] */
/* 26 */        NdrFcShort( 0x2 ),  /* Offset= 2 (28) */
/* 28 */
                                    0x12, 0x0,   /* FC_UP */
/* 30 */        NdrFcShort( 0xffffffd0 ), /* Offset= -16 (14) */

                                    0x0
        }
    };

const CInterfaceProxyVtbl * _tpcc_com_ps_ProxyVtblList[] =
{
    ( CInterfaceProxyVtbl *) &_ITPCCProxyVtbl,
    0
};

const CInterfaceStubVtbl * _tpcc_com_ps_StubVtblList[] =
{
    ( CInterfaceStubVtbl *) &_ITPCCStubVtbl,
    0
};

PCInterfaceName const _tpcc_com_ps_InterfaceNamesList[] =
{
    "ITPCC",
    0
};


#define _tpcc_com_ps_CHECK_IID(n)
                IID_GENERIC_CHECK_IID( _tpcc_com_ps, pIID, n)

int __stdcall _tpcc_com_ps_IID_Lookup( const IID * pIID, int * pIndex )
{

    if(!_tpcc_com_ps_CHECK_IID(0))
        {
        *pIndex = 0;
        return 1;
        }

    return 0;
}

const ExtendedProxyFileInfo tpcc_com_ps_ProxyFileInfo =
{
    (PCInterfaceProxyVtblList *) & _tpcc_com_ps_ProxyVtblList,
    (PCInterfaceStubVtblList *) & _tpcc_com_ps_StubVtblList,
    (const PCInterfaceName * ) & _tpcc_com_ps_InterfaceNamesList,
    0, // no delegation
    & _tpcc_com_ps_IID_Lookup,
    1,
    2,
    0, /* table of [async_uuid] interfaces */
    0, /* Filler1 */
    0, /* Filler2 */
    0  /* Filler3 */
};


#endif /* !defined(_M_IA64) && !defined(_M_AXP64)*/


#pragma warning( disable: 4049 )  /* more than 64k source lines */

/* this ALWAYS GENERATED file contains the proxy stub code */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jan 24 20:00:07 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), ms_ext, c_ext,
robust
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if defined(_M_IA64) || defined(_M_AXP64)
#define USE_STUBLESS_PROXY
```

```
/* verify that the <rpcproxy.h> version is high enough to compile this file*/
#ifndef __REDQ_RPCPROXY_H_VERSION__
#define __REQUIRED_RPCPROXY_H_VERSION__ 475
#endif


#include "rpcproxy.h"
#ifndef __RPCPROXY_H_VERSION__
#error this stub requires an updated version of <rpcproxy.h>
#endif // __RPCPROXY_H_VERSION__


#include "tpcc_com_ps.h"

#define TYPE_FORMAT_STRING_SIZE   35
#define PROC_FORMAT_STRING_SIZE   253
#define TRANSMIT_AS_TABLE_SIZE    0
#define WIRE_MARSHAL_TABLE_SIZE   0

typedef struct _MIDL_TYPE_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ TYPE_FORMAT_STRING_SIZE ];
    } MIDL_TYPE_FORMAT_STRING;

typedef struct _MIDL_PROC_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ PROC_FORMAT_STRING_SIZE ];
    } MIDL_PROC_FORMAT_STRING;


extern const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString;
extern const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString;


/* Object interface: IUnknown, ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0x00,0x00,0x00,0x46}
} */


/* Object interface: ITPCC, ver. 0.0,

GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0x4F,0xBF,0xE0,0x
8B}} */


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;

#pragma code_seg(".orpc")
static const unsigned short ITPCC_FormatStringOffsetTable[] =
    {
    0,
    44,
    88,
    132,
    176,
    220
    };

static const MIDL_SERVER_INFO ITPCC_ServerInfo =
    {
    &Object_StubDesc,
    0,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0,
    0
    };

static const MIDL_STUBLESS_PROXY_INFO ITPCC_ProxyInfo =
    {
    &Object_StubDesc,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0
    };

CINTERFACE_PROXY_VTABLE(9) _ITPCCProxyVtbl =
{
    &ITPCC_ProxyInfo,
    &IID_ITPCC,
    IUnknown_QueryInterface_Proxy,
    IUnknown_AddRef_Proxy,
    IUnknown_Release_Proxy ,
    (void *)-1 /* ITPCC::NewOrder */ ,
    (void *)-1 /* ITPCC::Payment */ ,
    (void *)-1 /* ITPCC::Delivery */ ,
    (void *)-1 /* ITPCC::StockLevel */ ,
    (void *)-1 /* ITPCC::OrderStatus */ ,
    (void *)-1 /* ITPCC::CallSetComplete */
};

const CInterfaceStubVtbl _ITPCCStubVtbl =
{
    &IID_ITPCC,
    &ITPCC_ServerInfo,
    9,
    0, /* pure interpreted */
    CStdStubBuffer_METHODS
};


static const MIDL_STUB_DESC Object_StubDesc =
    {
    0,
    NdrOleAllocate,
    NdrOleFree,
    0,
    0,
    0,
    0,
    0,
    __MIDL_TypeFormatString.Format,
    1, /* -error bounds_check flag */
    0x50002, /* Ndr library version */
    0,
    0x5030118, /* MIDL Version 5.3.280 */
    0,
    0,
    0,  /* notify & notify_flag routine table */
    0x1, /* MIDL flag */
    0,  /* Reserved3 */
    0,  /* Reserved4 */
    0   /* Reserved5 */
    };

#pragma data_seg(".rdata")

#if !defined(__RPC_WIN64__)
#error  Invalid build platform for this stub.
#endif

static const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString =
    {
        0,
        {

            /* Procedure NewOrder */

                                                0x33,                   /*
FC_AUTO_HANDLE */
                                                0x6c,                   /* Old Flags:
object, Oi2 */
/*  2 */        NdrFcLong( 0x0 ),           /* 0 */
/*  6 */        NdrFcShort( 0x3 ),          /* 3 */
/*  8 */        NdrFcShort( 0x20 ),         /* ia64, axp64 Stack size/offset = 32 */
/* 10 */        NdrFcShort( 0x8 ),          /* 8 */
/* 12 */        NdrFcShort( 0x10 ),         /* 16 */
/* 14 */        0x47,                       /* Oi2 Flags:  srv must size, clt must
size, has return, has ext, */
                                                0x3,                    /* 3 */
/* 16 */        0xa,                        /* 10 */
                                                0x7,                    /* Ext Flags:
new corr desc, clt corr check, srv corr check, */
/* 18 */        NdrFcShort( 0x1 ),          /* 1 */
/* 20 */        NdrFcShort( 0x1 ),          /* 1 */
/* 22 */        NdrFcShort( 0x0 ),          /* 0 */
/* 24 */        NdrFcShort( 0x0 ),          /* 0 */

                /* Parameter iSize */

/* 26 */        NdrFcShort( 0x158 ),        /* Flags:  in, out, base type, simple ref,
*/
/* 28 */        NdrFcShort( 0x8 ),          /* ia64, axp64 Stack size/offset = 8 */
/* 30 */        0x8,                        /* FC_LONG */
                                                0x0,                    /* 0 */

                /* Parameter txn */

/* 32 */        NdrFcShort( 0x201b ),       /* Flags:  must size, must free, in, out,
srv alloc size=8 */
/* 34 */        NdrFcShort( 0x10 ),         /* ia64, axp64 Stack size/offset = 16 */
/* 36 */        NdrFcShort( 0x6 ),          /* Type Offset=6 */

                /* Return value */

/* 38 */        NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
/* 40 */        NdrFcShort( 0x18 ),         /* ia64, axp64 Stack size/offset = 24 */
/* 42 */        0x8,                        /* FC_LONG */
                                                0x0,                    /* 0 */

                /* Procedure Payment */

/* 44 */        0x33,                       /* FC_AUTO_HANDLE */
                                                0x6c,                   /* Old Flags:
object, Oi2 */
/* 46 */        NdrFcLong( 0x0 ),           /* 0 */
/* 50 */        NdrFcShort( 0x4 ),          /* 4 */
/* 52 */        NdrFcShort( 0x20 ),         /* ia64, axp64 Stack size/offset = 32 */
/* 54 */        NdrFcShort( 0x8 ),          /* 8 */
/* 56 */        NdrFcShort( 0x10 ),         /* 16 */
/* 58 */        0x47,                       /* Oi2 Flags:  srv must size, clt must
size, has return, has ext, */
                                                0x3,                    /* 3 */
/* 60 */        0xa,                        /* 10 */
                                                0x7,                    /* Ext Flags:
new corr desc, clt corr check, srv corr check, */
/* 62 */        NdrFcShort( 0x1 ),          /* 1 */
/* 64 */        NdrFcShort( 0x1 ),          /* 1 */
/* 66 */        NdrFcShort( 0x0 ),          /* 0 */
/* 68 */        NdrFcShort( 0x0 ),          /* 0 */

                /* Parameter iSize */

/* 70 */        NdrFcShort( 0x158 ),        /* Flags:  in, out, base type, simple ref,
```

```
*/
/* 72 */        NdrFcShort( 0x8 ),          /* ia64, axp64 Stack size/offset = 8 */
/* 74 */        0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Parameter txn */

/* 76 */        NdrFcShort( 0x201b ),       /* Flags:  must size, must free, in, out,
srv alloc size=8 */
/* 78 */        NdrFcShort( 0x10 ),         /* ia64, axp64 Stack size/offset = 16 */
/* 80 */        NdrFcShort( 0x6 ),          /* Type Offset=6 */

                /* Return value */

/* 82 */        NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
/* 84 */        NdrFcShort( 0x18 ),         /* ia64, axp64 Stack size/offset = 24 */
/* 86 */        0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Procedure Delivery */

/* 88 */        0x33,                       /* FC_AUTO_HANDLE */
                                            0x6c,                       /* Old Flags:
object, Oi2 */
/* 90 */        NdrFcLong( 0x0 ),           /* 0 */
/* 94 */        NdrFcShort( 0x5 ),          /* 5 */
/* 96 */        NdrFcShort( 0x20 ),         /* ia64, axp64 Stack size/offset = 32 */
/* 98 */        NdrFcShort( 0x8 ),          /* 8 */
/* 100 */       NdrFcShort( 0x8 ),          /* 8 */
/* 102 */       0x46,                       /* Oi2 Flags:  clt must size, has return,
has ext, */
                                            0x3,                        /* 3 */
/* 104 */       0xa,                        /* 10 */
                                            0x5,                        /* Ext Flags:
new corr desc, srv corr check, */
/* 106 */       NdrFcShort( 0x0 ),          /* 0 */
/* 108 */       NdrFcShort( 0x1 ),          /* 1 */
/* 110 */       NdrFcShort( 0x0 ),          /* 0 */
/* 112 */       NdrFcShort( 0x0 ),          /* 0 */

                /* Parameter iSize */

/* 114 */       NdrFcShort( 0x148 ),        /* Flags:  in, base type, simple ref, */
/* 116 */       NdrFcShort( 0x8 ),          /* ia64, axp64 Stack size/offset = 8 */
/* 118 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Parameter txn */

/* 120 */       NdrFcShort( 0x200b ),       /* Flags:  must size, must free, in, srv
alloc size=8 */
/* 122 */       NdrFcShort( 0x10 ),         /* ia64, axp64 Stack size/offset = 16 */
/* 124 */       NdrFcShort( 0x1a ),         /* Type Offset=26 */

                /* Return value */

/* 126 */       NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
/* 128 */       NdrFcShort( 0x18 ),         /* ia64, axp64 Stack size/offset = 24 */
/* 130 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Procedure StockLevel */

/* 132 */       0x33,                       /* FC_AUTO_HANDLE */
                                            0x6c,                       /* Old Flags:
object, Oi2 */
/* 134 */       NdrFcLong( 0x0 ),           /* 0 */
/* 138 */       NdrFcShort( 0x6 ),          /* 6 */
/* 140 */       NdrFcShort( 0x20 ),         /* ia64, axp64 Stack size/offset = 32 */
/* 142 */       NdrFcShort( 0x8 ),          /* 8 */
/* 144 */       NdrFcShort( 0x10 ),         /* 16 */
/* 146 */       0x47,                       /* Oi2 Flags:  srv must size, clt must
size, has return, has ext, */
                                            0x3,                        /* 3 */
/* 148 */       0xa,                        /* 10 */
                                            0x7,                        /* Ext Flags:
new corr desc, clt corr check, srv corr check, */
/* 150 */       NdrFcShort( 0x1 ),          /* 1 */
/* 152 */       NdrFcShort( 0x1 ),          /* 1 */
/* 154 */       NdrFcShort( 0x0 ),          /* 0 */
/* 156 */       NdrFcShort( 0x0 ),          /* 0 */

                /* Parameter iSize */

/* 158 */       NdrFcShort( 0x158 ),        /* Flags:  in, out, base type, simple ref,
*/
/* 160 */       NdrFcShort( 0x8 ),          /* ia64, axp64 Stack size/offset = 8 */
/* 162 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Parameter txn */

/* 164 */       NdrFcShort( 0x201b ),       /* Flags:  must size, must free, in, out,
srv alloc size=8 */
/* 166 */       NdrFcShort( 0x10 ),         /* ia64, axp64 Stack size/offset = 16 */
/* 168 */       NdrFcShort( 0x6 ),          /* Type Offset=6 */

                /* Return value */

/* 170 */       NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
/* 172 */       NdrFcShort( 0x18 ),         /* ia64, axp64 Stack size/offset = 24 */
/* 174 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Procedure OrderStatus */

/* 176 */       0x33,                       /* FC_AUTO_HANDLE */
                                            0x6c,                       /* Old Flags:
object, Oi2 */
/* 178 */       NdrFcLong( 0x0 ),           /* 0 */
/* 182 */       NdrFcShort( 0x7 ),          /* 7 */
/* 184 */       NdrFcShort( 0x20 ),         /* ia64, axp64 Stack size/offset = 32 */
/* 186 */       NdrFcShort( 0x8 ),          /* 8 */
/* 188 */       NdrFcShort( 0x10 ),         /* 16 */
/* 190 */       0x47,                       /* Oi2 Flags:  srv must size, clt must
size, has return, has ext, */
                                            0x3,                        /* 3 */
/* 192 */       0xa,                        /* 10 */
                                            0x7,                        /* Ext Flags:
new corr desc, clt corr check, srv corr check, */
/* 194 */       NdrFcShort( 0x1 ),          /* 1 */
/* 196 */       NdrFcShort( 0x1 ),          /* 1 */
/* 198 */       NdrFcShort( 0x0 ),          /* 0 */
/* 200 */       NdrFcShort( 0x0 ),          /* 0 */

                /* Parameter iSize */

/* 202 */       NdrFcShort( 0x158 ),        /* Flags:  in, out, base type, simple ref,
*/
/* 204 */       NdrFcShort( 0x8 ),          /* ia64, axp64 Stack size/offset = 8 */
/* 206 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Parameter txn */

/* 208 */       NdrFcShort( 0x201b ),       /* Flags:  must size, must free, in, out,
srv alloc size=8 */
/* 210 */       NdrFcShort( 0x10 ),         /* ia64, axp64 Stack size/offset = 16 */
/* 212 */       NdrFcShort( 0x6 ),          /* Type Offset=6 */

                /* Return value */

/* 214 */       NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
/* 216 */       NdrFcShort( 0x18 ),         /* ia64, axp64 Stack size/offset = 24 */
/* 218 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                /* Procedure CallSetComplete */

/* 220 */       0x33,                       /* FC_AUTO_HANDLE */
                                            0x6c,                       /* Old Flags:
object, Oi2 */
/* 222 */       NdrFcLong( 0x0 ),           /* 0 */
/* 226 */       NdrFcShort( 0x8 ),          /* 8 */
/* 228 */       NdrFcShort( 0x10 ),         /* ia64, axp64 Stack size/offset = 16 */
/* 230 */       NdrFcShort( 0x0 ),          /* 0 */
/* 232 */       NdrFcShort( 0x8 ),          /* 8 */
/* 234 */       0x44,                       /* Oi2 Flags:  has return, has ext, */
                                            0x1,                        /* 1 */
/* 236 */       0xa,                        /* 10 */
                                            0x1,                        /* Ext Flags:
new corr desc, */
/* 238 */       NdrFcShort( 0x0 ),          /* 0 */
/* 240 */       NdrFcShort( 0x0 ),          /* 0 */
/* 242 */       NdrFcShort( 0x0 ),          /* 0 */
/* 244 */       NdrFcShort( 0x0 ),          /* 0 */

                /* Return value */

/* 246 */       NdrFcShort( 0x70 ),         /* Flags:  out, return, base type, */
/* 248 */       NdrFcShort( 0x8 ),          /* ia64, axp64 Stack size/offset = 8 */
/* 250 */       0x8,                        /* FC_LONG */
                                            0x0,                        /* 0 */

                                            0x0
    }
  };

static const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString =
  {
    0,
    {
                                            NdrFcShort( 0x0 ),          /* 0 */
/*  2 */
                                            0x11, 0x8,    /* FC_RP [simple_pointer]
*/
/*  4 */        0x8,                        /* FC_LONG */
                                            0x5c,                       /* FC_PAD */
/*  6 */
                                            0x11, 0x14,  /* FC_RP
[alloced_on_stack] [pointer_deref] */
/*  8 */        NdrFcShort( 0x2 ),          /* Offset= 2 (10) */
/* 10 */
                                            0x13, 0x0,    /* FC_OP */
/* 12 */        NdrFcShort( 0x2 ),          /* Offset= 2 (14) */
/* 14 */
                                            0x1b,                       /*
FC_CARRAY */
                                            0x0,                        /* 0 */
/* 16 */        NdrFcShort( 0x1 ),          /* 1 */
/* 18 */        0x28,                       /* Corr desc:  parameter, FC_LONG */
                                            0x54,                       /*
FC_DEREFERENCE */
/* 20 */        NdrFcShort( 0x8 ),          /* ia64, axp64 Stack size/offset = 8 */
/* 22 */        NdrFcShort( 0x1 ),          /* Corr flags:  early, */
/* 24 */        0x2,                        /* FC_CHAR */
                                            0x5b,                       /* FC_END */
/* 26 */
                                            0x11, 0x14,  /* FC_RP
[alloced_on_stack] [pointer_deref] */
/* 28 */        NdrFcShort( 0x2 ),          /* Offset= 2 (30) */
/* 30 */
                                            0x12, 0x0,    /* FC_UP */
/* 32 */        NdrFcShort( 0xffffffee ),   /* Offset= -18 (14) */

                                            0x0
```

```
    }
  };

const CInterfaceProxyVtbl * _tpcc_com_ps_ProxyVtblList[] =
{
    ( CInterfaceProxyVtbl *) &_ITPCCProxyVtbl,
    0
};

const CInterfaceStubVtbl * _tpcc_com_ps_StubVtblList[] =
{
    ( CInterfaceStubVtbl *) &_ITPCCStubVtbl,
    0
};

PCInterfaceName const _tpcc_com_ps_InterfaceNamesList[]=
{
    "ITPCC",
    0
};


#define _tpcc_com_ps_CHECK_IID(n)
                IID_GENERIC_CHECK_IID( _tpcc_com_ps, pIID, n)

int __stdcall _tpcc_com_ps_IID_Lookup( const IID * pIID, int * pIndex )
{

    if(!_tpcc_com_ps_CHECK_IID(0))
        {
        *pIndex = 0;
        return 1;
        }

    return 0;
}

const ExtendedProxyFileInfo tpcc_com_ps_ProxyFileInfo =
{
    (PCInterfaceProxyVtblList *) & _tpcc_com_ps_ProxyVtblList,
    (PCInterfaceStubVtblList *) & _tpcc_com_ps_StubVtblList,
    (const PCInterfaceName* ) & _tpcc_com_ps_InterfaceNamesList,
    0, // no delegation
    & _tpcc_com_ps_IID_Lookup,
    1,
    2,
    0, /* table of [async_uuid] interfaces */
    0, /* Filler1 */
    0, /* Filler2 */
    0  /* Filler3 */
};


#endif /* defined(_M_IA64) || defined(_M_AXP64)*/
```

tpcc_com_ps\src\tpcc_com_ps_i.c

```
#pragma warning( disable: 4049 )  /* more than 64k source lines */

/* this ALWAYS GENERATED file contains the IIDs and CLSIDs */

/* link this file in with the server and any clients */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jan 24 20:00:07 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if !defined(_M_IA64) && !defined(_M_AXP64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)\
        DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)\
        const type name = {l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
IID_ITPCC,0xFEEE6AA2,0x84B1,0x11d2,0xBA,0x47,0x00,0xC0,0x4F,0xBF,0xE0
,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif


#endif /* !defined(_M_IA64) && !defined(_M_AXP64)*/
```

```
#pragma warning( disable: 4049 )  /* more than 64k source lines */

/* this ALWAYS GENERATED file contains the IIDs and CLSIDs */

/* link this file in with the server and any clients */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jan 24 20:00:07 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), ms_ext, c_ext,
robust
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if defined(_M_IA64) || defined(_M_AXP64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)\
        DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)\
        const type name = {l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
IID_ITPCC,0xFEEE6AA2,0x84B1,0x11d2,0xBA,0x47,0x00,0xC0,0x4F,0xBF,0xE0
,0x8B);
```

```
#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* defined(_M_IA64) || defined(_M_AXP64)*/
```

tpcc_com_ps\src\dlldata.c

```
/*********************************************************
   DllData file -- generated by MIDL compiler

       DO NOT ALTER THIS FILE

   This file is regenerated by MIDL on every IDL file compile.

   To completely reconstruct this file, delete it and rerun MIDL
   on all the IDL files in this DLL, specifying this file for the
   /dlldata command line option

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


#include <rpcproxy.h>

#ifdef __cplusplus
extern "C"   {
#endif

EXTERN_PROXY_FILE( tpcc_com_ps )


PROXYFILE_LIST_START
/* Start of list */
  REFERENCE_PROXY_FILE( tpcc_com_ps ),
/* End of list */
PROXYFILE_LIST_END


DLLDATA_ROUTINES( aProxyFileList, GET_DLL_CLSID )

#ifdef __cplusplus
}  /*extern "C" */
#endif

/* end of generated dlldata file */
```

common\src\txn_base.h

```
/*              FILE:                           TXN_BASE.H
 *                                                      Microsoft TPC-C Kit Ver.
4.20.000
 *                                                      Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                                      Version 4.10.000 audited
by Richard Gimarc, Performance Metrics, 3/17/99
 *
 *              PURPOSE:  Header file for TPC-C txn class implementation.
 *
 *  Change history:
 *                          4.20.000 - updated rev number to match kit
 */

#pragma once

// need to declare functions for import, unless define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class DllDecl CTPCC_BASE
{
        public:
                CTPCC_BASE(void) {};
                virtual ~CTPCC_BASE(void) {};

                virtual PNEW_ORDER_DATA
        BuffAddr_NewOrder()             = 0;
                virtual PPAYMENT_DATA
        BuffAddr_Payment()              = 0;
                virtual PDELIVERY_DATA
        BuffAddr_Delivery()             = 0;
                virtual PSTOCK_LEVEL_DATA
        BuffAddr_StockLevel()   = 0;
                virtual PORDER_STATUS_DATA
        BuffAddr_OrderStatus()  = 0;

                virtual void NewOrder           () = 0;
                virtual void Payment            () = 0;
                virtual void Delivery           () = 0;
                virtual void StockLevel         () = 0;
                virtual void OrderStatus        () = 0;
};
```

common\src\trans.h

```
/*              FILE:                           TRANS.H
 *                                                      Microsoft TPC-C Kit Ver.
4.20.000
 *                                                      Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                                      Version 4.10.000 audited
by Richard Gimarc, Performance Metrics, 3/17/99
 *
 *              PURPOSE:  Header file for TPC-C structure templates.
 *
 *  Change history:
 *                          4.20.000 - updated rev number to match kit
 */
#pragma once

// String length constants
#define SERVER_NAME_LEN         20
#define DATABASE_NAME_LEN       20
#define USER_NAME_LEN           20
#define PASSWORD_LEN            20
#define TABLE_NAME_LEN          20
#define I_DATA_LEN              50
#define I_NAME_LEN              24
#define BRAND_LEN               1
#define LAST_NAME_LEN           16
#define W_NAME_LEN              10
#define ADDRESS_LEN             20
#define STATE_LEN               2
#define ZIP_LEN                 9
#define S_DIST_LEN              24
#define S_DATA_LEN              50
#define D_NAME_LEN              10
#define FIRST_NAME_LEN          16
#define MIDDLE_NAME_LEN         2
#define PHONE_LEN               16
#define DATETIME_LEN            30
#define CREDIT_LEN              2
#define C_DATA_LEN              250
#define H_DATA_LEN              24
#define DIST_INFO_LEN           24
#define MAX_OL_NEW_ORDER_ITEMS  15
#define MAX_OL_ORDER_STATUS_ITEMS 15
#define STATUS_LEN              25
#define OL_DIST_INFO_LEN                        24

// TIMESTAMP_STRUCT is provided by the ODBC header file sqltypes.h, but is
not available
// when compiling with dblib, so redefined here.  Note: we are using the symbol
"__SQLTYPES"
// (declared in sqltypes.h) as a way to determine if TIMESTAMP_STRUCT has
been declared.
#ifndef __SQLTYPES
        typedef struct
        {
                                short
        /* SQLSMALLINT */       year;
                                unsigned short          /*
SQLUSMALLINT */         month;
                                unsigned short          /*
SQLUSMALLINT */         day;
                                unsigned short          /*
SQLUSMALLINT */         hour;
                                unsigned short          /*
SQLUSMALLINT */         minute;
                                unsigned short          /*
SQLUSMALLINT */         second;
                                unsigned long           /*
SQLUINTEGER */          fraction;
        } TIMESTAMP_STRUCT;
#endif

// possible values for exec_status_code after transaction completes
enum EXEC_STATUS
{
        eOK,                                    // 0            "Transaction
commited."
        eInvalidItem, // 1            "Item number is not valid."
        eDeliveryFailed         // 2            "Delivery Post Failed."
};

// transaction structures
typedef struct
{
        // input params
        short
        ol_supply_w_id;
        long                                                    ol_i_id;
        short                                                   ol_quantity;

        // output params
        char
        ol_i_name[I_NAME_LEN+1];
        char
        ol_brand_generic[BRAND_LEN+1];
        double                                                  ol_i_price;
        double                                                  ol_amount;
        short                                                   ol_stock;
} OL_NEW_ORDER_DATA;

typedef struct
{
        // input params
        short           w_id;
```

```
        short       d_id;
        long        c_id;
        short       o_ol_cnt;

        // output params
        EXEC_STATUS
        exec_status_code;
        char        c_last[LAST_NAME_LEN+1];
        char        c_credit[CREDIT_LEN+1];
        double              c_discount;
        double              w_tax;
        double              d_tax;
        long                        o_id;
        short
        o_commit_flag;
        TIMESTAMP_STRUCT    o_entry_d;
        short       o_all_local;
        double              total_amount;
        OL_NEW_ORDER_DATAOL[MAX_OL_NEW_ORDER_ITEMS];
} NEW_ORDER_DATA, *PNEW_ORDER_DATA;

typedef struct
{       // input params
        short                       w_id;
        short                       d_id;
        long                        c_id;
        short                       c_d_id;
        short                       c_w_id;
        double                      h_amount;
        char                c_last[LAST_NAME_LEN+1];

        // output params
        EXEC_STATUS
exec_status_code;
        TIMESTAMP_STRUCT    h_date;
        char
w_street_1[ADDRESS_LEN+1];
        char
w_street_2[ADDRESS_LEN+1];
        char
w_city[ADDRESS_LEN+1];
        char                        w_state[STATE_LEN+1];
        char                        w_zip[ZIP_LEN+1];
        char
d_street_1[ADDRESS_LEN+1];
        char
d_street_2[ADDRESS_LEN+1];
        char
d_city[ADDRESS_LEN+1];
        char                        d_state[STATE_LEN+1];
        char                d_zip[ZIP_LEN+1];
        char
c_first[FIRST_NAME_LEN+1];
        char
c_middle[MIDDLE_NAME_LEN + 1];
        char
c_street_1[ADDRESS_LEN+1];
        char
c_street_2[ADDRESS_LEN+1];
        char
c_city[ADDRESS_LEN+1];
        char                        c_state[STATE_LEN+1];
        char                        c_zip[ZIP_LEN+1];
        char
c_phone[PHONE_LEN+1];
        TIMESTAMP_STRUCT    c_since;
        char                        c_credit[CREDIT_LEN+1];
        double                      c_credit_lim;
        double                      c_discount;
        double                      c_balance;
        char                        c_data[200+1];
} PAYMENT_DATA, *PPAYMENT_DATA;

typedef struct
{
        long                        ol_i_id;
        short                       ol_supply_w_id;
        short                       ol_quantity;
        double                      ol_amount;
        TIMESTAMP_STRUCT    ol_delivery_d;
} OL_ORDER_STATUS_DATA;

typedef struct
{       // input params
        short       w_id;
        short       d_id;
        long        c_id;
        char        c_last[LAST_NAME_LEN+1];

        // output params
        EXEC_STATUS
exec_status_code;
        char        c_first[FIRST_NAME_LEN+1];
        char        c_middle[MIDDLE_NAME_LEN+1];
        double       c_balance;
        long        o_id;
        TIMESTAMP_STRUCT    o_entry_d;
        short       o_carrier_id;
        OL_ORDER_STATUS_DATA
OL[MAX_OL_ORDER_STATUS_ITEMS];
        short       o_ol_cnt;
} ORDER_STATUS_DATA, *PORDER_STATUS_DATA;


typedef struct
{       // input params
        short               w_id;
        short               o_carrier_id;

        // output params
        EXEC_STATUS
        exec_status_code;
        SYSTEMTIME                  queue_time;
        long                                o_id[10];
        // id's of delivered orders for districts 1 to 10
} DELIVERY_DATA, *PDELIVERY_DATA;

//This structure is used for posting delivery transactions and for writing them to
the delivery server.
typedef struct _DELIVERY_TRANSACTION
{
        SYSTEMTIME          queue;
        //time delivery transaction queued
        short               w_id;
        //delivery warehouse
        short               o_carrier_id; //carrier id
} DELIVERY_TRANSACTION;

typedef struct
{       // input params
        short                                   w_id;
        short                                   d_id;
        short                                   threshold;

        // output params
        EXEC_STATUS
        exec_status_code;
        long                                    low_stock;
} STOCK_LEVEL_DATA, *PSTOCK_LEVEL_DATA;
```

common\src\readregistry.h

```
/*      FILE:                   ReadRegistry.h
 *                                              Microsoft TPC-C Kit Ver.
4.20.000
 *                                              Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                                              not audited
 *
 *      PURPOSE:  Header for registry related code.
 *
 *  Change history:
 *                      4.20.000 - first version
 */

enum DBPROTOCOL { Unspecified, ODBC, DBLIB };
const char *szDBNames[] = { "Unspecified", "ODBC", "DBLIB" };

enum TXNMON { None, TUXEDO, ENCINA, COM };
const char *szTxnMonNames[] = { "NONE", "TUXEDO", "ENCINA", "COM" };

//This structure defines the data necessary to keep distinct for each terminal or
client connection.
typedef struct _TPCCREGISTRYDATA
{
        enum DBPROTOCOL eDB_Protocol;
        enum TXNMON eTxnMon;
        BOOL bCOM_SinglePool;
        DWORD dwMaxConnections;
        DWORD dwMaxPendingDeliveries;
        DWORD dwNumberOfDeliveryThreads;
        char szPath[128];
        char szDbServer[32];
        char szDbName[32];
        char szDbUser[32];
        char szDbPassword[32];
} TPCCREGISTRYDATA, *PTPCCREGISTRYDATA;

BOOL ReadTPCCRegistrySettings( TPCCREGISTRYDATA *pReg );
```

common\src\error.h

```
/*      FILE:                   ERROR.H
 *                                              Microsoft TPC-C Kit Ver.
4.20.000
 *                                              Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                                              Version 4.10.000 audited
by Richard Gimarc, Performance Metrics, 3/17/99
 *
 *      PURPOSE:  Header file for error exception classes.
 *
 *  Change history:
 *                      4.20.000 - updated rev number to match kit
 */

#pragma once

#ifndef _INC_STRING
        #include <string.h>
#endif

const int m_szMsg_size = 512;
const int m_szApp_size = 64;
const int m_szLoc_size = 64;

//error message structure used in ErrorText routines
typedef struct _SERRORMSG
{
        int                     iError;
```

```
        //error id of message
        char    szMsg[256];                     //message to
sent to browser
} SERRORMSG;

#define ERR_FATAL_LEVEL                         1
#define ERR_WARNING_LEVEL               2
#define ERR_INFORMATION_LEVEL   3


#define ERR_TYPE_LOGIC
                        -1                      //logic error
in program; internal error
#define ERR_SUCCESS
                        0                       //success (a
non-error error)
#define ERR_BAD_ITEM_ID
                        1                       //expected
abort record in txnRecord
#define ERR_TYPE_DELIVERY_POST
        2               //expected delivery post failed
#define     ERR_TYPE_WEBDLL
                        3                       //tpcc web
generated error
#define     ERR_TYPE_SQL
                        4                       //sql server
generated error
#define     ERR_TYPE_DBLIB
                        5                       //dblib
generated error
#define     ERR_TYPE_ODBC
                        6                       //odbc
generated error
#define ERR_TYPE_SOCKET
                        7                       //error on
communication socket client rte only
#define ERR_TYPE_DEADLOCK
                        8               //dblib and odbc only
deadlock condition
#define ERR_TYPE_COM
                        9               //error from COM call
#define ERR_TYPE_TUXEDO
                        10                      //tuxedo error
#define ERR_TYPE_OS
                        11                      //operating
system error
#define ERR_TYPE_MEMORY
                        12                      //memory
allocation error
#define ERR_TYPE_TPCC_ODBC
                        13              //error from tpcc odbc txn
module
#define ERR_TYPE_TPCC_DBLIB
                        14              //error from tpcc dblib txn
module
#define ERR_TYPE_DELISRV
                        15              //delivery server error
#define ERR_TYPE_TXNLOG
                        16                      //txn log error
#define ERR_TYPE_BCCONN
                        17                      //Benchcraft
connection class
#define ERR_TYPE_TPCC_CONN
                        18              //Benchcraft connection
class
#define ERR_TYPE_ENCINA
                        19                      //Encina
error
#define ERR_TYPE_COMPONENT
                        20              //error from COM
component
```

```
class CBaseErr
{
public:
        char    *m_szApp;
        char    *m_szMsg;
        char    *m_szLoc;   // code location where the error
occurred
        int                     m_idMsg;

        CBaseErr(void)
        {
                m_idMsg         = 0;
                m_szMsg         = new
char[m_szMsg_size];
                m_szApp         = new
char[m_szApp_size];
                m_szLoc         = NULL;

                m_szMsg[0] = 0;
                m_szApp[0]  = 0;

                GetModuleFileName(GetModuleHandle(NULL),
m_szApp, m_szApp_size);
        }

        ~CBaseErr(void)
        {
                if (m_szMsg)
                        delete [] m_szMsg;
                if (m_szApp)
                        delete [] m_szApp;
                if (m_szLoc)
                        delete [] m_szLoc;
        };

        CBaseErr(int idMsg)
        {
                m_idMsg         = idMsg;
                m_szApp         = new
char[m_szApp_size];
                m_szMsg         = new
char[m_szMsg_size];
                m_szLoc         = NULL;

                GetModuleFileName(GetModuleHandle(NULL),
m_szApp, m_szApp_size);
                LoadString(GetModuleHandle(NULL), idMsg,
m_szMsg, m_szMsg_size);
        }

        CBaseErr(LPCTSTR szMsg)
        {
                m_idMsg         = 0;
                m_szApp         = new
char[m_szApp_size];
                m_szMsg         = new
char[m_szMsg_size];
                m_szLoc         = NULL;

                GetModuleFileName(GetModuleHandle(NULL),
m_szApp, m_szApp_size);
                strcpy(m_szMsg, szMsg);
        }

        void SetError(char *szMsg, LPCTSTR szLocation)
        {
                if (szMsg != NULL)
                        strcpy(m_szMsg, szMsg);
                else
                        m_szMsg[0] = 0;

                if (szLocation != NULL)
                {
                        delete [] m_szLoc;
                        m_szLoc = new
char[strlen(szLocation)+1];
                        strcpy(m_szLoc, szLocation);
                }
                else
                {
                        delete [] m_szLoc;
                        m_szLoc = NULL;
                }
        }

        virtual void Draw(HWND hwnd, LPCTSTR szStr = NULL)
        {
                int             j;
                char    szTmp[512];

                if (szStr)
                        j = wsprintf(szTmp, "%s\n",szStr);
                if (m_szLoc)
                        j += wsprintf(szTmp+j,
"Location=%s\n",m_szLoc);
                if (m_szMsg)
                        j += wsprintf(szTmp+j, "%s\n",
m_szMsg);

                ::MessageBox(hwnd, szTmp, m_szApp, MB_OK);
        }

        char *GetApp(void) { return m_szApp; }
        char *GetMsg(void) { return m_szMsg; }
        char *GetLocation(void) { return m_szLoc; }

        virtual int ErrorType() = 0;  // a value which distinguishes the kind
of error that occurred
        virtual int ErrorNum() = 0;             // an error value specific to
the error type
        virtual char *ErrorText() = 0;          // a string (i.e., human
readable) representation of the error

};

class CSocketErr : public CBaseErr
{
public:
        enum Action
        {
                eNone,
                eSend,
                eSocket,
                eConnect
        };

        CSocketErr(Action eAction, LPCTSTR szLocation);
        CSocketErr(int iError) { m_errId = iError; };
        int             m_errId;
        Action  m_eAction;

        int ErrorType() { return ERR_TYPE_SOCKET;};
        int ErrorNum() { return m_errId;};
        char *ErrorText(void);
};

class CSystemErr : public CBaseErr
{
public:
        enum Action
        {
                eNone,
                eTransactNamedPipe,
                eWaitNamedPipe,
```

```
                        eSetNamedPipeHandleState,
                        eCreateFile,
                        eCreateProcess,
                        eCallNamedPipe,
                        eCreateEvent,
                        eCreateThread,
                        eVirtualAlloc,
                        eReadFile,
                        eWriteFile,
                        eMapViewOfFile,
                        eCreateFileMapping,
                        eInitializeSecurityDescriptor,
                        eSetSecurityDescriptorDacl,
                        eCreateNamedPipe,
                        eConnectNamedPipe,
        };

        CSystemErr(Action eAction, LPCTSTR szLocation);

        void Draw(HWND hwnd, LPCTSTR szStr = NULL);

        int                     m_errId;
        Action          m_eAction;

        int ErrorType() { return ERR_TYPE_OS;}
        int ErrorNum() { return m_errId;}
        char *ErrorText() { return "";}                 // TODO:
need to code error text
};

class CMemoryErr : public CBaseErr
{
public:
        CMemoryErr(void);

        int ErrorType() { return ERR_TYPE_MEMORY;}
        int ErrorNum() { return 0;}
        char *ErrorText() { return "";}                 // TODO:
need to code error text
};
```

common\src\readregistry.cpp

```
/*      FILE:                   READREGISTRY.CPP
 *                                      Microsoft TPC-C Kit Ver.
4.20.000
 *                                      Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                                      not yet audited
 *
 *      PURPOSE:  Implementation for TPC-C Tuxedo class.
 *      Contact:  Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                      4.20.000 - first version
 */


/* FUNCTION: ReadTPCCRegistrySettings
 *
 * PURPOSE:             This function reads the NT registry for startup
parameters. There parameters are
 *                              under the TPCC key.
 *
 * RETURNS:FALSE = no errors
 *                              TRUE  = error reading registry
 */
BOOL ReadTPCCRegistrySettings( TPCCREGISTRYDATA *pReg )
{
        HKEY    hKey;
        DWORD   size;
        DWORD   type;
        DWORD   dwTmp;
        char    szTmp[256];

        if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SOFTWARE\\Microsoft\\TPCC", 0, KEY_READ, &hKey) !=
ERROR_SUCCESS )
                return TRUE;

        // determine database protocol to use; may be either ODBC or
DBLIB
        pReg->eDB_Protocol = Unspecified;
        size = sizeof(szTmp);
        if ( RegQueryValueEx(hKey, "DB_Protocol", 0, &type, (BYTE
*)&szTmp, &size) == ERROR_SUCCESS )
        {
                if ( !stricmp(szTmp, szDBNames[ODBC]) )
                        pReg->eDB_Protocol = ODBC;
                else if ( !stricmp(szTmp, szDBNames[DBLIB]) )
                        pReg->eDB_Protocol = DBLIB;
        }

        pReg->eTxnMon = None;
        // determine txn monitor to use; may be either TUXEDO, or blank
        size = sizeof(szTmp);
        if ( RegQueryValueEx(hKey, "TxnMonitor", 0, &type, (BYTE
*)&szTmp, &size) == ERROR_SUCCESS )
        {
                if ( !stricmp(szTmp, szTxnMonNames[TUXEDO]) )
                        pReg->eTxnMon = TUXEDO;
                else if ( !stricmp(szTmp,
szTxnMonNames[ENCINA]) )
                        pReg->eTxnMon = ENCINA;
                else if ( !stricmp(szTmp, szTxnMonNames[COM]) )
                        pReg->eTxnMon = COM;
        }

        pReg->bCOM_SinglePool = FALSE;
        size = sizeof(szTmp);
        if ( RegQueryValueEx(hKey, "COM_SinglePool", 0, &type, (BYTE
*)&szTmp, &size) == ERROR_SUCCESS )
        {
                if ( !stricmp(szTmp, "YES") )
                        pReg->bCOM_SinglePool = TRUE;
        }

        pReg->dwMaxConnections = 0;
        size = sizeof(dwTmp);
        if ( ( RegQueryValueEx(hKey, "MaxConnections", 0, &type,
(LPBYTE)&dwTmp, &size) == ERROR_SUCCESS )
                && (type == REG_DWORD) )
                pReg->dwMaxConnections = dwTmp;

        pReg->dwMaxPendingDeliveries = 0;
        size = sizeof(dwTmp);
        if ( ( RegQueryValueEx(hKey, "MaxPendingDeliveries", 0, &type,
(LPBYTE)&dwTmp, &size) == ERROR_SUCCESS )
                && (type == REG_DWORD) )
                pReg->dwMaxPendingDeliveries = dwTmp;

        pReg->dwNumberOfDeliveryThreads = 0;
        size = sizeof(dwTmp);
        if ( ( RegQueryValueEx(hKey, "NumberOfDeliveryThreads", 0,
&type, (LPBYTE)&dwTmp, &size) == ERROR_SUCCESS )
                && (type == REG_DWORD) )
                pReg->dwNumberOfDeliveryThreads = dwTmp;

        size = sizeof( pReg->szPath );
        if ( RegQueryValueEx(hKey, "Path", 0, &type, (BYTE *)&pReg-
>szPath, &size) != ERROR_SUCCESS )
                pReg->szPath[0] = 0;

        size = sizeof( pReg->szDbServer );
        if ( RegQueryValueEx(hKey, "DbServer", 0, &type, (BYTE *)&pReg
>szDbServer, &size) != ERROR_SUCCESS )
                pReg->szDbServer[0] = 0;

        size = sizeof( pReg->szDbName );
        if ( RegQueryValueEx(hKey, "DbName", 0, &type, (BYTE *)&pReg-
>szDbName, &size) != ERROR_SUCCESS )
                pReg->szDbName[0] = 0;

        size = sizeof( pReg->szDbUser );
        if ( RegQueryValueEx(hKey, "DbUser", 0, &type, (BYTE *)&pReg-
>szDbUser, &size) != ERROR_SUCCESS )
                pReg->szDbUser[0] = 0;

        size = sizeof( pReg->szDbPassword );
        if ( RegQueryValueEx(hKey, "DbPassword", 0, &type, (BYTE
*)&pReg->szDbPassword, &size) != ERROR_SUCCESS )
                pReg->szDbPassword[0] = 0;

        RegCloseKey(hKey);

        return FALSE;
}
```

common\txnlog\include\txnlog.h

```
/*      FILE:                   TXNLOG.H
 *                                      Microsoft TPC-C Kit Ver.
4.10.000
 *
 *                                      NOTE: this file is RTE
specific and should not be included
 *                                      in Full Disclosure Reports.
 *
 *                                      Copyright Microsoft, 1999
 *
 *      PURPOSE:  Structure definitions for logging delivery txn completion
stats.
 *      Contact:  Charles Levine (clevine@microsoft.com)
 */


  typedef struct _TXN_NEWORDER
        {
    BYTE    OL_Count;       //range 0 to 31
    BYTE    OL_Remote_Count;    //range 0 to 31
    WORD    c_id;
    int                 o_id;
        } TXN_NEWORDER;

  typedef struct _TXN_PAYMENT
        {
    BYTE    CustByName;
    BYTE    IsRemote;
        } TXN_PAYMENT;

  typedef struct _TXN_ORDERSTATUS
        {
                BYTE            CustByName;
        } TXN_ORDERSTATUS;

        typedef union _TXN_DETAILS
```

```
        {
                TXN_NEWORDER            NewOrder;
                TXN_PAYMENT                             Payment;
                TXN_ORDERSTATUS         OrderStatus;
        } TXN_DETAILS;


        // Common header for all records in txn log.  The TxnType field is
        // a switch which identifies the particular variant.
        #define TXN_REC_TYPE_CONTROL                    1
        //
        #define TXN_REC_TYPE_TPCC
        2               // replaces TRANSACTION_TYPE_TPCC
        #define TXN_REC_TYPE_TPCC_DELIV_DEF             3

        typedef struct _TXN_RECORD_HEADER
        {
                JULIAN_TIME             TxnStartT0;
        // start of txn
                BYTE            TxnType;
        // one of TXN_REC_TYPE_*
                BYTE            TxnSubType;
        // depends on TxnType
        } TXN_RECORD_HEADER, *PTXN_RECORD_HEADER;


        typedef struct _TXN_RECORD_CONTROL
        {
                // common header; must exactly match
TXN_RECORD_HEADER
                JULIAN_TIME             TxnStartT0;
        // start of txn
                BYTE            TxnType;
        // = TXN_REC_TYPE_CONTROL
                BYTE            TxnSubType;
        // depends on TxnType
                // end of common header

                DWORD       Len;
        // number of bytes after this field
        } TXN_RECORD_CONTROL, *PTXN_RECORD_CONTROL;


        // TPC-C Txn Record Layout:
        //
  //'TxnStartT0' is a Julian timestamp corresponding to the moment the
  //txn is sent to the SUT, i.e., beginning of response time.  Deltas
  //are in milliseconds.  Note that if RTDelay > 0, then the txn was
  //delayed by this amount.  The delay occurs at the beginning of the
  //response time.  So if RTDelay > 0, then the txn was actually sent
  //at TxnStartT0 + RTDelay.
  //
  //Graphically:
  //
  //  time -->
  //
  //    |--- Menu  ---|-- Keying --|-- Response --|--- Think  --|
  //     <- DeltaT1 -> <- DeltaT2 -> <- DeltaT4  -> <- DeltaT3 ->
  //                   ^
  //                   ^ TxnStartT0
  //
  //RTDelay is the amount of response time delay included in DeltaT4.
  //RTDelay is recorded per txn because this value can be changed on
  //the fly, and so may vary from txn to txn.
  //
  //TxnStatus is the txn completion code.  It is used to indicate errors.
  //For example, in the New Order txn, 1% of txns abort.  TxnStatus will
  //reflect this.
```

```
        typedef struct _TXN_RECORD_TPCC
        {
                // common header; must exactly match
TXN_RECORD_HEADER
                JULIAN_TIME             TxnStartT0;
        // start of txn
                BYTE            TxnType;
        // = TXN_REC_TYPE_TPCC
                BYTE            TxnSubType;
        // depends on TxnType
                // end of common header

                int     DeltaT1;        // menu time (ms)
                int     DeltaT2;        // keying time (ms)
                int     DeltaT3;        // think time (ms)
                int     DeltaT4;        // response time (ms)
                int     RTDelay;                // response
time delay (ms)
                int                     TxnError;
        // error code providing more detail for TxnStatus
                WORD            w_id;
        // warehouse ID
                BYTE            d_id;
        // assigned district ID for this thread
                BYTE            d_id_ThisTxn;// district ID chosen for this
particular
                BYTE            TxnStatus;              // completion
status for txn to indicate errors
                BYTE            reserved;               // for word
alignment
                TXN_DETAILS             TxnDetails;     //
        } TXN_RECORD_TPCC, *PTXN_RECORD_TPCC;

        // TPC-C Deferred Delivery Txn Record Layout:
        //
  //Incorporating delivery transaction information into the above
        //structure would increase the size of TXN_DETAILS from 8 to 42 bytes.
  //Hence, we store delivery transaction details in a separate structure.
  //
        typedef struct _TXN_RECORD_TPCC_DELIV_DEF
        {
                // common header; must exactly match
TXN_RECORD_HEADER
                JULIAN_TIME             TxnStartT0;
        // start of txn
                BYTE            TxnType;
        // = TXN_REC_TYPE_TPCC_DELIV_DEF
                BYTE            TxnSubType;
        // = 0
                // end of common header

                int     DeltaT4;        // response time (ms)
                int                     DeltaTxnExec;
        // execution time (ms)
                WORD            w_id;
        // warehouse ID
                BYTE            TxnStatus;              // completion
status for txn to indicate errors
                BYTE            reserved;               // for word
alignment
                short   o_carrier_id;   // carrier id
                long            o_id[10];               // returned
delivery transaction ids
        } TXN_RECORD_TPCC_DELIV_DEF,
*PTXN_RECORD_TPCC_DELIV_DEF;



#define                 TXN_LOG_VERSION                 1
```

```
#define                 TXN_DATA_START                  4096
        // offset in log file where log records start
#define                 TXN_LOG_EYE_CATCHER             "BC"
        // signature bytes at the start of log file


        ////////////////////////////////////////////////////////////////////
        // The transaction log has a header as the first 4K block.
        //
        typedef struct _TXN_LOG_HEADER
        {
                char
        EyeCatcher[2];          // signature bytes; should always be "BC"
                int
        LogVersion;             // set to TXN_LOG_VERSION
                JULIAN_TIME                             BeginTxnTS;
        // timestamp of first (lowest) txn start
                JULIAN_TIME                             EndTxnTS;
        // timestamp of last (highest) txn completion time
                int
        iRecCount;              // number of records in log file
                BOOL                                    bLogSorted;
                int
        iFileSize;              // file size in bytes

                // the record map provides a fast way to get close to a
particular timestamp in a sorted log file.
        //              struct
        //              {
        //                      JULIAN_TIME
        //      TS;                                     // timestamp of record
        //                      int
        //      iPos;           // byte position in file
        //              }
        //      RecMap[RecMapSize];
        //#define               RecMapSize                      200

        } TXN_LOG_HEADER, *PTXN_LOG_HEADER;



#define         READ_BUFFER_SIZE                64*1024
#define         WRITE_BUFFER_SIZE                8*1024

#define         NUM_READ_BUFFERS                1
#define         NUM_WRITE_BUFFERS               2
#define         MAX_NUM_BUFFERS                         2

// flags passed in to the constructor
#define         TXN_LOG_WRITE                   0x01
#define         TXN_LOG_READ                    0x02
#define         TXN_LOG_SORTED                  0x04

#define         TXN_LOG_OS_ERROR        1
#define         TXN_LOG_NOT_SORTED      2

#define SKIP_CTRL_RECS          1

class CTxnLog
{
        private:
                DWORD                   iBufferSize;
        //buffer allocated size
                DWORD                   iBytesFreeInBuffer;
        //total bytes available for use in buffer
                int                                     iNumBuffers;
                //buffers in use
                int                                     iActiveBuffer;
```

```
                        //indicates which buffer is active: 0 or 1
                        int                                     iIoBuffer;
                                //buffer for any pending IO operation
                        int                                     iFilePointer;
                        //position in file.
                        int                                     iNextRec;
                                //when reading, ordinal value of next record

                        // A "save point" is remembered each time GetNextRecord
is called with a start time specified.
                        // The next time it is called, if start time is after the save
point, we start scanning from the
                        // save point.  This is particularly useful in FindBestInterval,
where the log is scanned repeatedly.
                        JULIAN_TIME                             SavePtTime;
                        int
                iSavePtFilePointer;
                        int
                iSavePtNextRec;

                        JULIAN_TIME             lastTS;
                                //when writing sorted output, used to verify
records are sorted
                        BOOL                    bWrite;
                                //writing log file

                        BOOL                                    bLogSorted;
                        // is log file sorted?  applies to both input and output
                        JULIAN_TIME                             BeginTxnTS;
                        // timestamp of first (lowest) txn start
                        JULIAN_TIME                             EndTxnTS;
                        // timestamp of last (highest) txn completion time
                        int
                iRecCount;                              // number of records in log
file

                        BYTE                    *pCurrent;
                        //ptr to current buffer
                        BYTE
                *pBuffer[MAX_NUM_BUFFERS];

                        PTXN_RECORD_HEADER *TxnArray;
                //transaction record pointer array for sort

                        DWORD                   dwError;
                        HANDLE                  hTxnFile;
                        //handle to log file
                        HANDLE                  hMapFile;
                        //map file used when sorting the log
                        HANDLE                  hIoComplete;
                //event to signify that there are no pending IOs
                        HANDLE                  hLogFileIo;
                        //event to signal the IO thread to write the inactive buffer

                        Spinlock        Spin;
                        //spin lock to protect the txn log file buffers

                        int Write(BYTE *ptr, DWORD Size);
                        static void LogFileIO(CTxnLog *);

                public:
                        CTxnLog::CTxnLog(LPCTSTR szFileName, DWORD
dwOpts);
                        ~CTxnLog(void);

                        int WriteToLog(PTXN_RECORD_TPCC pTxnRcrd);
                        int WriteToLog(PTXN_RECORD_TPCC_DELIV_DEF
pTxnRcrd);
                        int WriteToLog(PTXN_RECORD_CONTROL pCtrlRec);
                        int WriteToLog(PTXN_RECORD_HEADER pCtrlRec);

                        int WriteCtrlRecToLog(BYTE SubType, LPTSTR lpStr,
DWORD dwLen);

                        void CloseTransactionLogFile(void);

                        PTXN_RECORD_HEADER GetNextRecord(BOOL
bSkipCtrlRecs = FALSE);
                        PTXN_RECORD_HEADER
GetNextRecord(JULIAN_TIME SeekTimeT0, BOOL bSkipCtrlRecs = FALSE);

                        int Sort(void);
                        PTXN_RECORD_HEADER GetSortedRecord(int index);

                        inline BOOL IsSorted(void) { return bLogSorted; };
                        inline JULIAN_TIME BeginTS(void) { return
BeginTxnTS; };
                        inline JULIAN_TIME EndTS(void) { return EndTxnTS; };
                        inline int RecordCount(void) { return iRecCount; };

};

class CTXNLOG_ERR : public CBaseErr
{
        public:
                enum CTPCC_DBLIB_ERRS
                {
                        ERR_BAD_FILE_FORMAT = 1,
        // "File format is invalid."
                        ERR_UNKNOWN_LOG_VERSION,
        // "Log file version is unknown."
                        ERR_BROKEN_LOG_FILE,
        // "Log file is broken."
                        ERR_LOG_NOT_SORTED,
        // "Log file is not sorted"
                        ERR_INVALID_TIME_SEQ,
        // "Internal Error: Record Time Sequence invalid."
                };

                CTXNLOG_ERR( int iErr ) { m_errno = iErr; };

                int                             m_errno;

                int ErrorType() {return ERR_TYPE_TXNLOG;};
                int ErrorNum() {return m_errno;};

                // TODO: need to complete...
                char *ErrorText() {return "";};
};
```

common\txnlog\include\spinlock.h

```
/*              FILE: SPINLOCK.H
 *
 * Copyright 1997 Microsoft Corp., All rights reserved.
 *
 * Authors: Mike Parkes, Charles Levine, Philip Durr
 *                                      Microsoft Corp.
 */

#ifndef _INC_Spinlock

        const LONG LockClosed  = 1;
        const LONG LockOpen            = 0;

        /*****************************************************************
         *
         *  Spinlock and Semaphore locking.
         *
         *  This class provides a very conservative locking scheme.
         *  The assumption behind the code is that locks will be
         *  held for a very short time.  When a lock is taken a memory
         *  location is exchanged.  All other threads that want this
         *  lock wait by spinning and sometimes sleeping on a semaphore
         *  until it becomes free again.  The only other choice is not
         *  to wait at all and move on to do something else.  This
         *  module should normally be used in conjunction with cache
         *  aligned memory in minimize cache line misses.
         *
         *****************************************************************/

        class Spinlock
        {
                // Private data.
                HANDLE          Semaphore;
                volatile LONG   m_Spinlock;
                volatile LONG   Waiting;

                #ifdef _DEBUG
                        // Counters for debugging builds.
                        volatile LONG           TotalLocks;
                        volatile LONG           TotalSleeps;
                        volatile LONG           TotalSpins;
                        volatile LONG           TotalWaits;
                #endif

                public:
                        // Public functions.

                        Spinlock( void );

                        inline BOOL ClaimLock( BOOL Wait =
TRUE );
                        inline void ReleaseLock( void );
                        ~Spinlock( void );
                        // Disabled operations.
                        Spinlock( const Spinlock & Copy );
                        void operator=( const Spinlock &
Copy );

                private:
                        // Private functions.
                        inline BOOL ClaimSpinlock( volatile
LONG *sl );
                        void WaitForLock( void );
                        void WakeAllSleepers( void );
        };

        /*****************************************************************
         *
         *  A guaranteed atomic exchange.
         *
         *  An attempt is made to claim the Spinlock.  This action is
         *  guaranteed to be atomic.
         *
         *****************************************************************/

        inline BOOL Spinlock::ClaimSpinlock( volatile LONG *Spinlock )
        {
                #ifdef _DEBUG
                        InterlockedIncrement( (LPLONG) &
TotalLocks );
                #endif
                return ( ((*Spinlock) == LockOpen) &&
(InterlockedExchange( (LPLONG)Spinlock LockClosed ) == LockOpen) );
        }

        /*****************************************************
```

```
 *
 *  Claim the Spinlock.
 *
 *  Claim the lock if available else wait or exit.
 *
 ************************************************************/

inline BOOL Spinlock::ClaimLock( BOOL Wait )
{
        if ( ! ClaimSpinlock( (volatile LONG*) &
m_Spinlock ) )
        {
                if ( Wait )
                        WaitForLock();
                return Wait;
        }
        return TRUE;
}

/************************************************************
 *
 *  Release the Spinlock.
 *
 *  Release the lock and if needed wakeup any sleepers.
 *
 ************************************************************/

inline void Spinlock::ReleaseLock( void )
{
        m_Spinlock = LockOpen;
        if ( Waiting > 0 )
                WakeAllSleepers();
}

#define _INC_Spinlock

#endif
```

common\txnlog\include\rtetime.h

```
/* FILE: rtetime.h : header file
 * Copyright 1997 Microsoft Corp., All rights reserved.
 *
 * Authors: Charles Levine, Philip Durr
 *                                      Microsoft Corp.
 */

#define     MAX_JULIAN_TIME                 0x7FFFFFFFFFFFFFFF
#define JULIAN_TIME     __int64
#define     TC_TIME                 DWORD
extern "C"
{
BOOL                    InitJulianTime(LPSYSTEMTIME lpInitTime);
JULIAN_TIME             GetJulianTime(void);
DWORD                   MyTickCount(void);
void                    GetJulianAndTC(JULIAN_TIME *pJulian, DWORD
*pTC);
JULIAN_TIME             ConvertTo64BitTime(int iYear, int iMonth, int iDay, int
iHour, int iMinute, int iSecond);
JULIAN_TIME             Get64BitTime(LPSYSTEMTIME lpInitTime);
int                             JulianDay( int yr, int mm, int dd );
void                    JulianToTime(JULIAN_TIME julianTS, int* yr, int* mm,
int* dd, int *hh, int *mi, int *ss );
void                    JulianToCalendar( int day, int* yr, int* mm, int* dd );
}
```

Appendix B : Database Design

Build Scripts

BACKUP.SQL

```
-- File:    BACKUP.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates backup of tpcc database


declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

dump database tpcc to tpccback1, tpccback2, tpccback3, tpccback4 with init,
stats = 1

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

BACKUPDEV.SQL

```
-- File:    BACKUPDEVB.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates tpcc database Backup Devices


use master
go

-- create backup devices

exec sp_addumpdevice 'disk','tpccback1','V:\tpccback1.dmp'
go
exec sp_addumpdevice 'disk','tpccback2','V:\tpccback2.dmp'
go
exec sp_addumpdevice 'disk','tpccback3','W:\tpccback3.dmp'
go
exec sp_addumpdevice 'disk','tpccback4','W:\tpccback4.dmp'
go
```

CREATEDB.SQL

```
-- File:    CREATEDB.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates tpcc database and backup files


use master
go

--              Create temporary table for timing

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

create table tpcc_timer
(
        start_date                                      char(30),
        end_date                                        char(30)
)

insert  into tpcc_timer values (0,0)
go

--      Store starting time

update  tpcc_timer
set     start_date  = (select convert(char(30), getdate(),9))
go

-- create main database files

CREATE DATABASE tpcc
ON PRIMARY
(       NAME                    = MSSQL70_tpcc_root,
        FILENAME  = "C:\MSSQL70_tpcc_root.mdf",
        SIZE                    = 8MB,
        FILEGROWTH              =0),
FILEGROUP MSSQL70_misc_fg
(       NAME                    = MSSQL70_misc1,
        FILENAME  = "F:",
        SIZE                    = 16500MB,
        FILEGROWTH              = 0),
(       NAME                    = MSSQL70_misc2,
        FILENAME  = "G:",
        SIZE                    = 16500MB,
        FILEGROWTH              = 0),
(       NAME                    = MSSQL70_misc3,
        FILENAME  = "H:",
        SIZE                    = 16500MB,
        FILEGROWTH              = 0),
(       NAME                    = MSSQL70_misc4,
        FILENAME  = "I:",
        SIZE                    = 16500MB,
        FILEGROWTH              = 0),
(       NAME                    = MSSQL70_misc5,
        FILENAME  = "J:",
        SIZE                    = 16500MB,
        FILEGROWTH              = 0),
FILEGROUP MSSQL70_cs_fg
(       NAME                    = MSSQL70_cs1,
        FILENAME  = "K:",
        SIZE                    = 30000MB,
        FILEGROWTH              = 0),
(       NAME                    = MSSQL70_cs2,
        FILENAME  = "L:",
        SIZE                    = 30000MB,
        FILEGROWTH              = 0),
(       NAME                    = MSSQL70_cs3,
        FILENAME  = "M:",
        SIZE                    = 30000MB,
        FILEGROWTH              = 0),
(       NAME                    = MSSQL70_cs4,
        FILENAME  = "N:",
        SIZE                    = 30000MB,
        FILEGROWTH              = 0),
(       NAME                    = MSSQL70_cs5,
        FILENAME  = "O:",
        SIZE                    = 30000MB,
        FILEGROWTH              = 0)
LOG ON
(       NAME                    =MSSQL70_tpcc_log,
        FILENAME  ="E:",
        SIZE                    =30000MB,
        FILEGROWTH              =0)
go

-- Store ending time
update  tpcc_timer
set     end_date    = (select convert(char(30), getdate(),9))
go

select "Elapsed time (in seconds): ", datediff(second,(select start_date from
tpcc_timer),(select end_date from tpcc_timer))

--              remove temporary table

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

DBOPT1.SQL

```
-- File:    DBOPT1.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Sets database options for data load


use master
go

exec sp_dboption tpcc,'select into/bulkcopy',true
exec sp_dboption tpcc,'trunc. log on chkpt.',true
go

use tpcc
go

checkpoint
go
```

DBOPT2.SQL

```
-- File:    DBOPT2.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Resets database options after data load

sp_dboption tpcc,'select into/bulkcopy',FALSE
GO

sp_dboption tpcc,'trunc. log on chkpt.',FALSE
GO

USE tpcc
GO

CHECKPOINT
GO

sp_configure 'allow updates',1
GO

RECONFIGURE WITH OVERRIDE
GO

DECLARE    @msg                        varchar(50)

IF (SELECT (SUBSTRING((SELECT @@version),125))) = 'Microsoft SQL
Server 2000'
        BEGIN
                --                              --
                --      OPTIONS FOR SQL SERVER 8.0      --
```

```
                -- Set option values for user-defined indexes --
                --                                      --

                SET     @msg    = ' '
                PRINT   @msg                            --
                SET     @msg    = 'Setting SQL Server 8.0
indexoptions'
                PRINT   @msg
                SET     @msg    = ' '
                PRINT   @msg                            --

                EXEC sp_indexoption     'customer',
        'DisAllowPageLocks',    TRUE
                EXEC sp_indexoption     'district',
        'DisAllowPageLocks',    TRUE
                EXEC sp_indexoption     'warehouse',
        'DisAllowPageLocks',    TRUE
                EXEC sp_indexoption     'stock',
        'DisAllowPageLocks',    TRUE
                EXEC sp_indexoption     'order_line',
        'DisAllowRowLocks',     TRUE
                EXEC sp_indexoption     'orders',
        'DisAllowRowLocks',     TRUE
                EXEC sp_indexoption     'new_order',
        'DisAllowRowLocks',     TRUE
                EXEC sp_indexoption     'item',
        'DisAllowRowLocks',     TRUE
                EXEC sp_indexoption     'item',
        'DisAllowPageLocks',    TRUE
        END
ELSE
        BEGIN
                --                                      --
                --      OPTIONS FOR SQL SERVER 7.0      --
                -- Set option values for user-defined indexes --
                --

                SET     @msg    = ' '
                PRINT   @msg                            --
                SET     @msg    = 'Setting SQL Server 7.0
indexoptions'
                PRINT   @msg
                SET     @msg    = ' '
                PRINT   @msg                            --

                EXEC sp_indexoption     'customer',
        'AllowPageLocks',       FALSE
                EXEC sp_indexoption     'district',
        'AllowPageLocks',       FALSE
                EXEC sp_indexoption     'warehouse',
        'AllowPageLocks',       FALSE
                EXEC sp_indexoption     'stock',
        'AllowPageLocks',       FALSE
                EXEC sp_indexoption     'order_line',
        'AllowRowLocks',        FALSE
                EXEC sp_indexoption     'orders',
        'AllowRowLocks',        FALSE
                EXEC sp_indexoption     'new_order',
        'AllowRowLocks',        FALSE
                EXEC sp_indexoption     'item',
        'AllowRowLocks',        FALSE
                EXEC sp_indexoption     'item',
        'AllowPageLocks',       FALSE

        END
GO

Print ' '
Print '******************'
Print 'Pre-specified Locking Hierarchy:'
Print '         Lockflag = 0 ==> No pre-specified hierarchy'
Print '   Lockflag = 1 ==> Lock at Page-level then Table-level'
Print '   Lockflag = 2 ==> Lock at Row-level then Table-level'
Print '   Lockflag = 3 ==> Lock at Table-level'
Print ' '

SELECT  name,lockflags
FROM    sysindexes
WHERE   object_id('warehouse')  = id OR
        object_id('district')   = id OR
        object_id('customer')   = id OR
        object_id('stock')      = id OR
        object_id('orders')     = id OR
        object_id('order_line') = id OR
        object_id('history')    = id OR
        object_id('new_order')  = id OR
        object_id('item')       = id
ORDER   BY lockflags asc
GO

sp_configure 'allow updates',0
GO

RECONFIGURE WITH OVERRIDE
GO

EXEC sp_dboption tpcc,  'auto update statistics',   FALSE
EXEC sp_dboption tpcc,  'auto create statistics',   FALSE
GO

EXEC sp_tableoption     'district',     'pintable',true
EXEC sp_tableoption     'warehouse',    'pintable',true
EXEC sp_tableoption     'new_order',    'pintable',true
EXEC sp_tableoption     'item',                 'pintable',true
GO
```

IDXCUSCL.SQL

```
-- File:    IDXCUSCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates clustered index on customer table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'customer_c1' )
        drop index customer.customer_c1

create unique clustered index customer_c1 on customer(c_w_id, c_d_id, c_id)
        on MSSQL70_cs_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

IDXCUSNC.SQL

```
-- File:    IDXCUSNC.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates non-clustered index on customer table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'customer_nc1' )
        drop index customer.customer_nc1

create unique nonclustered index customer_nc1 on customer(c_w_id, c_d_id,
c_last, c_first, c_id)
        on MSSQL70_cs_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

IDXDISCL.SQL

```
-- File:    IDXDISCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates clustered index on district table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'district_c1' )
        drop index district.district_c1

create unique clustered index  district_c1 on district(d_w_id, d_id)
        with fillfactor=100 on MSSQL70_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

IDXITMCL.SQL

```
-- File:    IDXITMCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates clustered index on item table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'item_c1' )
        drop index item.item_c1
```

```
create unique clustered index item_c1 on item(i_id)
        on MSSQL70_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

IDXNODCL.SQL

```
-- File:    IDXNODCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates clustered index on new_order table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'new_order_c1' )
        drop index new_order.new_order_c1

create unique clustered index new_order_c1 on new_order(no_w_id, no_d_id,
no_o_id)
        on MSSQL70_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

IDXODLCL.SQL

```
-- File:    IDXODLCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates clustered index on order_line table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'order_line_c1' )
        drop index order_line.order_line_c1

create unique clustered index order_line_c1 on order_line(ol_w_id, ol_d_id,
ol_o_id, ol_number)
        on MSSQL70_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

IDXORDCL.SQL

```
-- File:    IDXORDCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates clustered index on orders table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'orders_c1' )
        drop index orders.orders_c1

create unique clustered index orders_c1 on orders(o_w_id, o_d_id, o_id)
        on MSSQL70_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

IDXORDNC.SQL

```
-- File:    IDXORDNC.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates non-clustered index on orders table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'orders_nc1' )
        drop index orders.orders_nc1

create index orders_nc1 on orders(o_w_id, o_d_id, o_c_id, o_id)
        on MSSQL70_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

IDXSTKCL.SQL

```
-- File:    IDXSTKCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates clustered index on stock table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'stock_c1' )
        drop index stock.stock_c1

create unique clustered index stock_c1 on stock(s_i_id, s_w_id)
        on MSSQL70_cs_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

IDXWARCL.SQL

```
-- File:    IDXWARCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates clustered index on warehouse table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'warehouse_c1' )
        drop index warehouse.warehouse_c1

create unique clustered index warehouse_c1 on warehouse(w_id)
        with fillfactor=100 on MSSQL70_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

TABLES.SQL

```
-- File:    TABLES.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates TPC-C tables


use tpcc
go

--
-- Remove all existing TPC-C tables
--

if exists ( select name from sysobjects where name = 'warehouse' )
        drop table warehouse
go
if exists ( select name from sysobjects where name = 'district' )
        drop table district
go
if exists ( select name from sysobjects where name = 'customer' )
        drop table customer
go
if exists ( select name from sysobjects where name = 'history' )
```

```
        drop table history
go
if exists ( select name from sysobjects where name = 'new_order' )
        drop table new_order
go
if exists ( select name from sysobjects where name = 'orders' )
        drop table orders
go
if exists ( select name from sysobjects where name = 'order_line' )
        drop table order_line
go
if exists ( select name from sysobjects where name = 'item' )
        drop table item
go
if exists ( select name from sysobjects where name = 'stock' )
        drop table stock
go

--
--  Create new tables
--

create table warehouse
(
        w_id                    smallint,
        w_name                  char(10),
        w_street_1              char(20),
        w_street_2              char(20),
        w_city                  char(20),
        w_state                 char(2),
        w_zip                   char(9),
        w_tax                   numeric(4,4),
        w_ytd                   numeric(12,2)
) on MSSQL70_misc_fg
go

create table district
(
        d_id                    tinyint,
        d_w_id                  smallint,
        d_name                  char(10),
        d_street_1              char(20),
        d_street_2              char(20),
        d_city                  char(20),
        d_state                 char(2),
        d_zip                   char(9),
        d_tax                   numeric(4,4),
        d_ytd                   numeric(12,2),
        d_next_o_id             int
) on MSSQL70_misc_fg
go

create table customer
(
        c_id                    int,
        c_d_id                  tinyint,
        c_w_id                  smallint,
        c_first                 char(16),
        c_middle                char(2),
        c_last                  char(16),
        c_street_1              char(20),
        c_street_2              char(20),
        c_city                  char(20),
        c_state                 char(2),
        c_zip                   char(9),
        c_phone                 char(16),
        c_since                 datetime,
        c_credit                char(2),
        c_credit_lim            numeric(12,2),
        c_discount              numeric(4,4),
        c_balance               numeric(12,2),
        c_ytd_payment           numeric(12,2),
        c_payment_cnt           smallint,
        c_delivery_cnt          smallint,
        c_data                  char(500)
) on MSSQL70_cs_fg
go

create table history
(
        h_c_id                  int,
        h_c_d_id                tinyint,
        h_c_w_id                smallint,
        h_d_id                  tinyint,
        h_w_id                  smallint,
        h_date                  datetime,
        h_amount                numeric(6,2),
        h_data                  char(24)
) on MSSQL70_misc_fg
go

create table new_order
(
        no_o_id                 int,
        no_d_id                 tinyint,
        no_w_id                 smallint
) on MSSQL70_misc_fg
go

create table orders
(
        o_id                    int,
        o_d_id                  tinyint,
        o_w_id                  smallint,
        o_c_id                  int,
        o_entry_d               datetime,
        o_carrier_id            tinyint,
        o_ol_cnt                tinyint,
        o_all_local             tinyint
) on MSSQL70_misc_fg
go

create table order_line
(
        ol_o_id                 int,
        ol_d_id                 tinyint,
        ol_w_id                 smallint,
        ol_number               tinyint,
        ol_i_id                 int,
        ol_supply_w_id          smallint,
        ol_delivery_d           datetime,
        ol_quantity             smallint,
        ol_amount               numeric(6,2),
        ol_dist_info            char(24)
) on MSSQL70_misc_fg
go

create table item
(
        i_id                    int,
        i_im_id                 int,
        i_name                  char(24),
        i_price                 numeric(5,2),
        i_data                  char(50)
) on MSSQL70_misc_fg
go

create table stock
(
        s_i_id                  int,
        s_w_id                  smallint,
        s_quantity              smallint,
        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),
        s_ytd                   int,
        s_order_cnt             smallint,
        s_remote_cnt            smallint,
        s_data                  char(50)
) on MSSQL70_cs_fg
go
```

Stored Procedure

DELIVERY.SQL

```
-- File:    DELIVERY.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21.000
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates delivery transaction stored procedure
--
--              Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_delivery" )
        drop procedure tpcc_delivery
go

create proc tpcc_delivery   @w_id         smallint,
                                                  @o_carrier_id   smallint
as


declare @d_id               tinyint,
      @o_id   int,
      @c_id   int,
      @total  numeric(12,2),
      @oid1   int,
      @oid2   int,
      @oid3   int,
      @oid4   int,
      @oid5   int,
      @oid6   int,
      @oid7   int,
      @oid8   int,
      @oid9   int,
      @oid10 int

select @d_id = 0

begin tran d

        while (@d_id < 10)
        begin

            select   @d_id  = @d_id + 1,
                              @total = 0,
                              @o_id  = 0

                    select        top 1
```

```
                        @o_id       = no_o_id
                from    new_order (serializable updlock)
                where   no_w_id     = @w_id and
                        no_d_id     = @d_id
                order   by no_o_id asc

        if (@@rowcount <> 0)
                begin

--  claim the order for this district

                        delete      new_order
                        where       no_w_id     = @w_id and
                                    no_d_id     = @d_id and
                                    no_o_id     = @o_id

--  set carrier_id on this order (and get customer id)

                        update      orders
                        set         o_carrier_id  =
@o_carrier_id,
                                    @c_id
        = o_c_id
                        where       o_w_id
        = @w_id and
                                    o_d_id
        = @d_id and
                                    o_id
        = @o_id

--  set date in all lineitems for this order (and sum amounts)

                        update      order_line
                        set         ol_delivery_d = getdate(),
                                    @total
        = @total + ol_amount
                        where       ol_w_id
        = @w_id and
                                    ol_d_id
        = @d_id and
                                    ol_o_id
        = @o_id

--  accummulate lineitem amounts for this order into customer

                        update      customer
                        set         c_balance     = c_balance
+ @total,
                                    c_delivery_cnt
        = c_delivery_cnt + 1
                        where       c_w_id
        = @w_id and
                                    c_d_id
        = @d_id and
                                    c_id
        = @c_id

                end

        select @oid1 = case @d_id when  1  then @o_id else @oid1 end,
    @oid2 = case @d_id when  2  then @o_id else @oid2 end,
    @oid3 = case @d_id when  3  then @o_id else @oid3 end,
    @oid4 = case @d_id when  4  then @o_id else @oid4 end,
    @oid5 = case @d_id when  5  then @o_id else @oid5 end,
    @oid6 = case @d_id when  6  then @o_id else @oid6 end,
    @oid7 = case @d_id when  7  then @o_id else @oid7 end,
    @oid8 = case @d_id when  8  then @o_id else @oid8 end,
    @oid9 = case @d_id when  9  then @o_id else @oid9 end,
    @oid10 = case @d_id when 10 then @o_id else @oid10 end

end

commit tran d

-- return delivery data to client

select @oid1,
    @oid2,
    @oid3,
    @oid4,
    @oid5,
    @oid6,
    @oid7,
    @oid8,
    @oid9,
    @oid10

go
```

NEWORD.SQL

```
-- File:    NEWORD.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21.000
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates new order transaction stored procedure
--
--              Interface Level: 4.10.000

use tpcc
go

if exists ( select name from sysobjects where name = "tpcc_neworder" )
            drop procedure tpcc_neworder
go

create proc tpcc_neworder
                                                        @w_id
smallint,
                                                        @d_id
tinyint,
                                                        @c_id
int,
                                                        @o_ol_cnt
tinyint,
                                                        @o_all_local
tinyint,
                                                        @i_id1  int =
0, @s_w_id1  smallint = 0, @ol_qty1  smallint = 0,
                                                        @i_id2  int =
0, @s_w_id2  smallint = 0, @ol_qty2  smallint = 0,
                                                        @i_id3  int =
0, @s_w_id3  smallint = 0, @ol_qty3  smallint = 0,
                                                        @i_id4  int =
0, @s_w_id4  smallint = 0, @ol_qty4  smallint = 0,
                                                        @i_id5  int =
0, @s_w_id5  smallint = 0, @ol_qty5  smallint = 0,
                                                        @i_id6  int =
0, @s_w_id6  smallint = 0, @ol_qty6  smallint = 0,
                                                        @i_id7  int =
0, @s_w_id7  smallint = 0, @ol_qty7  smallint = 0,
                                                        @i_id8  int =
0, @s_w_id8  smallint = 0, @ol_qty8  smallint = 0,
                                                        @i_id9  int =
0, @s_w_id9  smallint = 0, @ol_qty9  smallint = 0,
                                                        @i_id10 int =
0, @s_w_id10 smallint = 0, @ol_qty10 smallint = 0,
                                                        @i_id11 int =
0, @s_w_id11 smallint = 0, @ol_qty11 smallint = 0,
                                                        @i_id12 int =
0, @s_w_id12 smallint = 0, @ol_qty12 smallint = 0,
                                                        @i_id13 int =
0, @s_w_id13 smallint = 0, @ol_qty13 smallint = 0,
                                                        @i_id14 int =
0, @s_w_id14 smallint = 0, @ol_qty14 smallint = 0,
                                                        @i_id15 int =
0, @s_w_id15 smallint = 0, @ol_qty15 smallint = 0


as
declare     @w_tax          numeric(4,4),
        @d_tax          numeric(4,4),
        @c_last         char(16),
        @c_credit       char(2),
        @c_discount     numeric(4,4),
        @i_price        numeric(5,2),
        @i_name         char(24),
        @i_data         char(50),
        @o_entry_d      datetime,
        @remote_flag    int,
        @s_quantity     smallint,
        @s_data         char(50),
        @s_dist         char(24),
                @li_no          int,
                @o_id                           int,
                @commit_flag    tinyint,
        @li_id          int,
        @li_s_w_id      smallint,
        @li_qty         smallint,
                @ol_number int,
                @c_id_local  int

begin

begin transaction n

-- get district tax and next availible order id and update
-- plus initialize local variables

                update      district
                set         @d_tax      = d_tax,
                            @o_id       = d_next_o_id,
                            d_next_o_id  = d_next_o_id + 1,
                            @o_entry_d   = getdate(),
                            @li_no      = 0,
                            @commit_flag = 1
                where       d_w_id      = @w_id and
                            d_id        = @d_id

-- process orderlines

                while (@li_no < @o_ol_cnt)
                begin

                        select @li_no = @li_no + 1

-- set i_id, s_w_id, and qty for this lineitem

                        select          @li_id = case @li_no
                                                when 1 then @i_id1
                                                when 2 then @i_id2
                                                when 3 then @i_id3
                                                when 4 then @i_id4
                                                when 5 then @i_id5
                                                when 6 then @i_id6
                                                when 7 then @i_id7
                                                when 8 then @i_id8
                                                when 9 then @i_id9
                                                when 10 then @i_id10
                                                when 11 then @i_id11
                                                when 12 then @i_id12
                                                when 13 then @i_id13
                                                when 14 then @i_id14
                                                when 15 then @i_id15
                                                end,
```

```
                        @li_s_w_id = case @li_no
                                when 1 then @s_w_id1
                                when 2 then @s_w_id2
                                when 3 then @s_w_id3
                                when 4 then @s_w_id4
                                when 5 then @s_w_id5
                                when 6 then @s_w_id6
                                when 7 then @s_w_id7
                                when 8 then @s_w_id8
                                when 9 then @s_w_id9
                                when 10 then
@s_w_id10
                                when 11 then
@s_w_id11
                                when 12 then
@s_w_id12
                                when 13 then
@s_w_id13
                                when 14 then
@s_w_id14
                                when 15 then
@s_w_id15
                                end,

                        @li_qty = case  @li_no
                                when 1 then @ol_qty1
                                when 2 then @ol_qty2
                                when 3 then @ol_qty3
                                when 4 then @ol_qty4
                                when 5 then @ol_qty5
                                when 6 then @ol_qty6
                                when 7 then @ol_qty7
                                when 8 then @ol_qty8
                                when 9 then @ol_qty9
                                when 10 then @ol_qty10
                                when 11 then @ol_qty11
                                when 12 then @ol_qty12
                                when 13 then @ol_qty13
                                when 14 then @ol_qty14
                                when 15 then @ol_qty15
                                end

-- get item data (no one updates item)

                select  @i_price = i_price,
                        @i_name  = i_name,
                        @i_data  = i_data
                from    item (tablock repeatableread)
                where   i_id = @li_id

-- update stock values

                update  stock
                set     s_ytd                   = s_ytd +
@li_qty,
                        @s_quantity = s_quantity   = s_quantity
- @li_qty +

case when (s_quantity - @li_qty < 10) then 91 else 0 end,
                        s_order_cnt  = s_order_cnt + 1,
                        s_remote_cnt            =
s_remote_cnt + case when (@li_s_w_id = @w_id) then 0 else 1 end,
                        @s_data                 = s_data,
                        @s_dist                 = case
@d_id
                                                  when 1
then s_dist_01
                                                  when 2
then s_dist_02
                                                  when 3
then s_dist_03
                                                  when 4
then s_dist_04
                                                  when 5
then s_dist_05
                                                  when 6
then s_dist_06
                                                  when 7
then s_dist_07
                                                  when 8
then s_dist_08
                                                  when 9
then s_dist_09
                                                  when 10
then s_dist_10
                                                  end
                        where   s_i_id          = @li_id and
                                s_w_id          =
@li_s_w_id

-- if there actually is a stock (and item) with these ids, go to work

                        if (@@rowcount > 0)
                        begin

-- insert order_line data (using data from item and stock)

                                insert into order_line values(@o_id,

@d_id,

@w_id,

@li_no,

@li_id,

@li_s_w_id,

"dec 31, 1899",

@li_qty,

@i_price * @li_qty,

@s_dist)

-- send line-item data to client

                                select  @i_name,
                                        @s_quantity,
                                        b_g = case when
( (patindex("%ORIGINAL%",@i_data) > 0) and

(patindex("%ORIGINAL%",@s_data) > 0) )
                                            then "B" else "G" end,
                                        @i_price,
                                        @i_price * @li_qty

                        end
                        else
                        begin

-- no item (or stock) found - triggers rollback condition

                                select "",0,"",0,0
                                select @commit_flag = 0

                        end
                end

-- get customer last name, discount, and credit rating

                select  @c_last     = c_last,
                        @c_discount = c_discount,
                        @c_credit   = c_credit,
                        @c_id_local = c_id
                from    customer (repeatableread)
                where   c_id                    = @c_id and
                        c_w_id                  = @w_id and
                        c_d_id                  = @d_id

-- insert fresh row into orders table

                insert into orders values (  @o_id,
                                                        @d_id,
                                                        @w_id,
                                                        @c_id_local,
                                                        @o_entry_d,
                                                        0,
                                                        @o_ol_cnt,

                @o_all_local)

-- insert corresponding row into new-order table

                insert into new_order values (          @o_id,
                                                        @d_id,
                                                        @w_id)

-- select warehouse tax

                select  @w_tax      = w_tax
                from    warehouse (repeatableread)
                where   w_id        = @w_id

                if (@commit_flag = 1)
                        commit transaction n
                else

-- all that work for nuthin!!!

                        rollback transaction n

-- return order data to client

                select  @w_tax,
                        @d_tax,
                        @o_id,
                        @c_last,
                        @c_discount,
                        @c_credit,
                        @o_entry_d,
                        @commit_flag

end

go
```

ORDSTAT.SQL

```
-- File:    ORDSTAT.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21.000
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates order status transaction stored procedure
--
--              Interface Level: 4.10.000

use tpcc
go

if exists ( select name from sysobjects where name = "tpcc_orderstatus" )
                drop procedure   tpcc_orderstatus
go
```

```
create proc tpcc_orderstatus        @w_id       smallint,
                                    @d_id       tinyint,

                                    @c_id       int,
                                    @c_last     char(16) = ""

as

declare @c_balance                  numeric(12,2),
        @c_first                    char(16),
        @c_middle                   char(2),
        @o_id                       int,
        @o_entry_d                  datetime,
        @o_carrier_id               smallint,
        @cnt                        smallint

begin tran o

if (@c_id = 0)
        begin

-- get customer id and info using last name

                select      @cnt        = (count(*)+1)/2
                from        customer (repeatableread)
                where       c_last      = @c_last and
                            c_w_id      = @w_id and
                            c_d_id      = @d_id

                set         rowcount @cnt

                select      @c_id                       = c_id,
                            @c_balance = c_balance,
                              @c_first  = c_first,
                              @c_last   = c_last,
                              @c_middle               = c_middle
                from        customer (repeatableread)
                where       c_last                      = @c_last
and
                            c_w_id                      = @w_id and
                            c_d_id                      = @d_id
                order       by c_w_id, c_d_id, c_last, c_first

                set         rowcount 0
        end

        else

        begin

-- get customer info if by id

                select      @c_balance = c_balance,
                            @c_first    = c_first,
                            @c_middle   = c_middle,
                            @c_last                     = c_last
                from        customer (repeatableread)
                where       c_id                        = @c_id and
                            c_d_id                      = @d_id and
                            c_w_id                      = @w_id


                select      @cnt        = @@rowcount

        end

-- if no such customer

        if (@cnt = 0)
        begin
                raiserror("Customer not found",18,1)
                goto custnotfound
        end

-- get order info

                select      @o_id                       = o_id,
                            @o_entry_d  = o_entry_d,
                            @o_carrier_id               = o_carrier_id

                from        orders (serializable)
                where       o_c_id                      = @c_id and
                            o_d_id                      = @d_id and
                            o_w_id                      = @w_id
                order       by o_id asc

-- select order lines for the current order

                select      ol_supply_w_id,
                            ol_i_id,
                            ol_quantity,
                            ol_amount,
                            ol_delivery_d
                from        order_line (repeatableread)
                where       ol_o_id = @o_id and
                            ol_d_id = @d_id and
                            ol_w_id = @w_id

custnotfound:

commit tran o

-- return data to client

select      @c_id,
            @c_last,
            @c_first,
            @c_middle,
            @o_entry_d,
            @o_carrier_id,
            @c_balance,
            @o_id

go
```

PAYMENT.SQL

```
-- File:    PAYMENT.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21.000
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates payment transaction stored procedure
--
--              Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_payment" )
            drop procedure tpcc_payment
go

create proc tpcc_payment @w_id          smallint,
                                                    @c_w_id         smallint,
                                                    @h_amount
numeric(6,2),
                                                    @d_id           tinyint,
                                                    @c_d_id         tinyint,
                                                    @c_id           int,
                                                    @c_last         char(16) = ""
as
declare  @w_street_1    char(20),
        @w_street_2     char(20),
        @w_city         char(20),
        @w_state        char(2),
        @w_zip          char(9),
        @w_name         char(10),
        @d_street_1     char(20),
        @d_street_2     char(20),
        @d_city         char(20),
        @d_state        char(2),
        @d_zip          char(9),
        @d_name         char(10),
        @c_first        char(16),
        @c_middle       char(2),
        @c_street_1     char(20),
        @c_street_2     char(20),
        @c_city         char(20),
        @c_state        char(2),
        @c_zip          char(9),
        @c_phone        char(16),
        @c_since        datetime,
        @c_credit       char(2),
        @c_credit_lim   numeric(12,2),
        @c_balance      numeric(12,2),
        @c_discount     numeric(4,4),
        @data           char(500),
        @c_data         char(500),
        @datetime       datetime,
        @w_ytd          numeric(12,2),
        @d_ytd          numeric(12,2),
        @cnt            smallint,
        @val            smallint,
        @screen_data            char(200),
                @d_id_local tinyint,
                @w_id_local                 smallint,
                @c_id_local int

select @screen_data = ""

begin tran p

-- get payment date

                select          @datetime = getdate()

                if (@c_id = 0)
                begin

-- get customer id and info using last name

                                select          @cnt        = count(*)
                                from            customer (repeatableread)
                                where           c_last      = @c_last and
                                                c_w_id      = @c_w_id and
                                                c_d_id      = @c_d_id


                                select          @val = (@cnt + 1) / 2
                                set             rowcount @val

                                select          @c_id       = c_id
                                from            customer (repeatableread)
                                where           c_last      = @c_last and
                                                c_w_id      = @c_w_id and
                                                c_d_id      = @c_d_id
                                order           by c_last, c_first

                                set             rowcount 0
                end

-- get customer info and update balances
```

```
		update	customer
		set	@c_balance = c_balance - @h_amount,
			c_payment_cnt = c_payment_cnt + 1,
			c_ytd_payment = c_ytd_payment +
@h_amount,
			@c_first = c_first,
			@c_middle = c_middle,
			@c_last = c_last,
			@c_street_1 = c_street_1,
			@c_street_2 = c_street_2,
			@c_city = c_city,
			@c_state = c_state,
			@c_zip = c_zip,
			@c_phone = c_phone,
			@c_credit = c_credit,
			@c_credit_lim = c_credit_lim,
			@c_discount = c_discount,
			@c_since = c_since,
			@data = c_data,
			@c_id_local = c_id
		where	c_id = @c_id and
			c_w_id = @c_w_id and
			c_d_id = @c_d_id

-- if customer has bad credit get some more info

		if (@c_credit = "BC")
		begin

--		compute new info

			select @c_data = convert(char(5),@c_id) +
				convert(char(4),@c_d_id)
+
convert(char(5),@c_w_id) +
				convert(char(4),@d_id) +
				convert(char(5),@w_id) +
convert(char(19),@h_amount) +
				substring(@data, 1, 458)

-- update customer info

			update	customer
			set	c_data = @c_data

			where	c_id = @c_id and
				c_w_id = @c_w_id and
				c_d_id = @c_d_id

			select	@screen_data = substring
(@c_data,1,200)
		end

-- get district data and update year-to-date

		update	district
		set	d_ytd = d_ytd + @h_amount,
			@d_street_1 = d_street_1,
			@d_street_2 = d_street_2,
			@d_city = d_city,
			@d_state = d_state,
			@d_zip = d_zip,
			@d_name = d_name,
			@d_id_local = d_id
		where	d_w_id = @w_id and
			d_id = @d_id

-- get warehouse data and update year-to-date

		update	warehouse
		set	w_ytd = w_ytd + @h_amount,
			@w_street_1 = w_street_1,
			@w_street_2 = w_street_2,
			@w_city = w_city,
			@w_state = w_state,
			@w_zip = w_zip,
			@w_name = w_name,
			@w_id_local = w_id
		where	w_id = @w_id

-- create history record

		insert into history values (  @c_id_local,
							@c_d_id,
							@c_w_id,
							@d_id_local,
							@w_id_local,
							@datetime,
							@h_amount,
							@w_name +

"    " + @d_name)
commit tran p

-- return data to client

select		@c_id,
		@c_last,
		@datetime,
		@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,
		@screen_data

go
```

STOCKLEV.SQL

```
-- File:    STOCKLEV.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.21.000
--          Copyright Microsoft, 1999, 2000
-- Purpose:  Creates stock level transaction stored procedure
--
--              Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_stocklevel" )
		drop procedure tpcc_stocklevel
go

create proc tpcc_stocklevel		@w_id	smallint,
					@d_id	tinyint,
					@threshhold
		smallint
as

declare	@o_id_low int,
		@o_id_high int

select	@o_id_low = (d_next_o_id - 20),
		@o_id_high = (d_next_o_id - 1)
from	district
where	d_w_id = @w_id and
		d_id = @d_id

select	count(distinct(s_i_id))
from	stock, order_line
where	ol_w_id = @w_id and
		ol_d_id = @d_id and
		ol_o_id between @o_id_low and
			@o_id_high and
		s_w_id = ol_w_id and
		s_i_id = ol_i_id and
		s_quantity < @threshhold

go
```

Loader Source Code

GETARGS.C

```
//		File:		GETARGS.C
//					Microsoft TPC-C Kit Ver.
4.21
//					Copyright Microsoft, 1996,
1997, 1998, 1999, 2000
//		Purpose:	Source file for command line processing


// Includes
#include "tpcc.h"

//============================================================
============
//
// Function name: GetArgsLoader
//
//============================================================
============

void GetArgsLoader(int argc, char **argv, TPCCLDR_ARGS *pargs)
{
   int		i;
   char		*ptr;

#ifdef DEBUG
   printf("[%ld]DBG: Entering GetArgsLoader()\n", (int) GetCurrentThreadId());
#endif

   /* init args struct with some useful values */
   pargs->server		= SERVER;
   pargs->user		= USER;
   pargs->password		= PASSWORD;
   pargs->database		= DATABASE;
   pargs->batch		= BATCH;
   pargs->num_warehouses		= UNDEF;
```

```
        pargs->tables_all                       = TRUE;
        pargs->table_item                       = FALSE;
        pargs->table_warehouse          = FALSE;
        pargs->table_customer           = FALSE;
        pargs->table_orders                     = FALSE;
        pargs->loader_res_file          = LOADER_RES_FILE;
        pargs->pack_size                = DEFLDPACKSIZE;
        pargs->starting_warehouse       =
DEF_STARTING_WAREHOUSE;
        pargs->build_index                      =
BUILD_INDEX;
        pargs->index_order                      =
INDEX_ORDER;
        pargs->index_script_path  =  INDEX_SCRIPT_PATH;
        pargs->scale_down                       =
SCALE_DOWN;

    /* check for zero command line args */
    if ( argc == 1 )
                GetArgsLoaderUsage();

    for (i = 1; i < argc; ++i)
    {
                if (argv[i][0] != '-' && argv[i][0] != '/')
                {
                printf("\nUnrecognized command");
                GetArgsLoaderUsage();
                exit(1);
                }

                ptr = argv[i];

                switch (ptr[1])
                {
                case 'h':    /* Fall throught */
                case 'H':
                                        GetArgsLoaderUsage();
                                        break;

                case 'D':
                                        pargs->database = ptr+2;
                                        break;

                case 'P':
                                        pargs->password = ptr+2;
                                        break;

                case 'S':
                                        pargs->server = ptr+2;
                                        break;

                case 'U':
                                        pargs->user = ptr+2;
                                        break;

                case 'b':
                                        pargs->batch = atol(ptr+2);
                                        break;

                case 'W':
                                        pargs->num_warehouses
= atol(ptr+2);
                                        break;

                case 's':
                                        pargs-
>starting_warehouse = atol(ptr+2);
                                        break;

                case 't':
                                        {
                                        pargs-
>tables_all = FALSE;
                                        if
(strcmp(ptr+2,"item") == 0)

                pargs->table_item = TRUE;
                                        else if
(strcmp(ptr+2,"warehouse") == 0)

                pargs->table_warehouse = TRUE;
                                        else if
(strcmp(ptr+2,"customer") == 0)

                pargs->table_customer = TRUE;
                                        else if
(strcmp(ptr+2,"orders") == 0)

                pargs->table_orders = TRUE;
                                        else
                                        {

                printf("\nUnrecognized command");

                GetArgsLoaderUsage();
                                        exit(1);
                                        }

                                        break;
                                        }

                                case 'f':
                                        pargs->loader_res_file =
ptr+2;
                                        break;

                                case 'p':
                                        pargs->pack_size =
atol(ptr+2);
                                        break;

                                case 'i':
                                        pargs->build_index =
atol(ptr+2);
                                        break;

                                case 'o':
                                        pargs->index_order =
atol(ptr+2);
                                        break;

                                case 'c':
                                        pargs->scale_down =
atol(ptr+2);
                                        break;

                        case 'd':
                                        pargs->index_script_path
= ptr+2;
                                        break;

                        default:
                                GetArgsLoaderUsage();
                                exit(-1);
                                break;
                        }
    }

    /* check for required args */
    if (pargs->num_warehouses == UNDEF )
    {
                        printf("Number of Warehouses is required\n");
                        exit(-2);
    }

    return;
}


//============================================================
============
//
// Function name: GetArgsLoaderUsage
//
//============================================================
============

void GetArgsLoaderUsage()
{

#ifdef DEBUG
    printf("[%ld]DBG: Entering GetArgsLoaderUsage()\n", (int)
GetCurrentThreadId());
#endif


    printf("TPCCLDR:\n\n");
                printf("Parameter                                       Default\n");
                printf("-------------------------------------------------------------\n");
    printf("-W Number of Warehouses to Load                 Required\n");
    printf("-S Server                                   %s\n", SERVER);
    printf("-U Username                                   %s\n", USER);
    printf("-P Password                                   %s\n", PASSWORD);
    printf("-D Database                                   %s\n", DATABASE);
                printf("-b Batch Size                                   %ld\n", (long)
BATCH);
                printf("-p TDS packet size                              %ld\n", (long)
DEFLDPACKSIZE);
                printf("-f Loader Results Output Filename               %s\n",
LOADER_RES_FILE);
                printf("-s Starting Warehouse                           %ld\n", (long)
DEF_STARTING_WAREHOUSE);
                printf("-i Build Option (data = 0, data and index = 1)  %ld\n",
(long) BUILD_INDEX);
                printf("-o Cluster Index Build Order (before = 1, after = 0)  %ld\n",
(long) INDEX_ORDER);
                printf("-c Build Scaled Database (normal = 0, tiny = 1)  %ld\n",
(long) SCALE_DOWN);
                printf("-d Index Script Path                            %s\n",
INDEX_SCRIPT_PATH);
                printf("-t Table to Load                                all tables\n");
    printf("   [item|warehouse|customer|orders]\n");
    printf("   Notes: \n");
    printf("     - the '-t' parameter may be included multiple times to \n");
    printf("       specify multiple tables to be loaded\n");
    printf("     - 'item' loads ITEM table \n");
    printf("     - 'warehouse' loads WAREHOUSE, DISTRICT, and STOCK tables
\n");
    printf("     - 'customer' loads CUSTOMER and HISTORY tables \n");
    printf("     - 'orders' load NEW-ORDER, ORDERS, ORDER-LINE tables \n");

                printf("\nNote:  Command line switches are case sensitive.\n");

    exit(0);
}
```

RANDOM.C

```
//              File:                   RANDOM.C
//                                                      Microsoft TPC-C Kit Ver.
4.21
//                                                      Copyright Microsoft, 1996,
1997, 1998, 1999, 2000
```

```
//                Purpose:      Random number generation routines for database
loader


// Includes
#include "tpcc.h"
#include "math.h"

// Defines
#define A           16807
#define M       2147483647
#define Q           127773      /* M div A */
#define R            2836      /* M mod A */
#define Thread                  __declspec(thread)

// Globals
long            Thread Seed = 0;       /* thread local seed */

/**********************************************************************
*                                                                     *
* random -                                                            *
*      Implements a GOOD pseudo random number generator.  This generator
*
*      will/should? run the complete period before repeating.         *
*                                                                     *
* Copied from:                                                        *
*      Random Numbers Generators: Good Ones Are Hard to Find.         *
*      Communications of the ACM - October 1988 Volume 31 Number 10   *
*                                                                     *
* Machine Dependencies:                                               *
*      long must be 2 ^ 31 - 1 or greater.                            *
*                                                                     *
**********************************************************************/

/**********************************************************************
* seed - load the Seed value used in irand and drand.  Should be used before  *
*      first call to irand or drand.                                  *
**********************************************************************/

void seed(long val)
{

#ifdef DEBUG
   printf("[%ld]DBG: Entering seed()...\n", (int) GetCurrentThreadId());
            printf("Old Seed %ld New Seed %ld\n",Seed, val);
#endif

   if ( val < 0 )
                val = abs(val);

   Seed = val;

}


/**********************************************************************
*                                                                     *
* irand - returns a 32 bit integer pseudo random number with a period of     *
*      1 to 2 ^ 32 - 1.                                               *
*                                                                     *
* parameters:                                                         *
*      none.                                                          *
*                                                                     *
* returns:                                                            *
*      32 bit integer - defined as long ( see above ).                *
*                                                                     *
* side effects:                                                       *
*      seed get recomputed.                                           *
**********************************************************************/

long irand()
{
   register long    s;      /* copy of seed */
   register long    test;   /* test flag */
   register long    hi;     /* tmp value for speed */
   register long    lo;     /* tmp value for speed */

#ifdef DEBUG
   printf("[%ld]DBG: Entering irand()...\n", (int) GetCurrentThreadId());
#endif

   s = Seed;
   hi = s / Q;
   lo = s % Q;

   test = A * lo - R * hi;
   if ( test > 0 )
                        Seed = test;
   else
                        Seed = test + M;

   return( Seed );
}


/**********************************************************************
*                                                                     *
* drand - returns a double pseudo random number between 0.0 and 1.0.         *
*      See irand.                                                     *
**********************************************************************/
double drand()
{

#ifdef DEBUG
   printf("[%ld]DBG: Entering drand()...\n", (int) GetCurrentThreadId());
#endif

   return( (double)irand() / 2147483647.0);
}


//============================================================
============
// Function   : RandomNumber
//
// Description:
//============================================================
============
long RandomNumber(long lower, long upper)
{
   long rand_num;

#ifdef DEBUG
   printf("[%ld]DBG: Entering RandomNumber()...\n", (int) GetCurrentThreadId());
#endif

            if ( upper == lower )          /* pgd 08-13-96 perf enhancement */
                        return lower;

            upper++;

   if ( upper <= lower )
                        rand_num = upper;
   else
                        rand_num = lower + irand() % (upper - lower); /* pgd
08-13-96 perf enhancement */


#ifdef DEBUG
   printf("[%ld]DBG: RandomNumber between %ld & %ld ==> %ld\n",
                                                   (int) GetCurrentThreadId(),
lower, upper, rand_num);
#endif

   return rand_num;
}


#if 0

//Orginal code pgd 08/13/96

long RandomNumber(long lower,
                                                                long upper)
{
   long rand_num;

#ifdef DEBUG
   printf("[%ld]DBG: Entering RandomNumber()...\n", (int) GetCurrentThreadId());
#endif

            upper++;

   if ((upper <= lower))
                        rand_num = upper;
   else
                        rand_num = lower + irand() % ((upper > lower) ?
upper - lower : upper);


#ifdef DEBUG
   printf("[%ld]DBG: RandomNumber between %ld & %ld ==> %ld\n",
                                                   (int) GetCurrentThreadId(),
lower, upper, rand_num);
#endif


   return rand_num;
}
#endif

//============================================================
============
// Function   : NURand
//
// Description:
//============================================================
============
long NURand(int iConst,
            long x,
            long y,
            long C)
{
   long rand_num;

#ifdef DEBUG
   printf("[%ld]DBG: Entering NURand()...\n", (int) GetCurrentThreadId());
#endif

   rand_num = (((RandomNumber(0,iConst) | RandomNumber(x,y)) + C) % (y-
x+1))+x;

#ifdef DEBUG
   printf("[%ld]DBG: NURand: num = %d\n", (int) GetCurrentThreadId(),
rand_num);
#endif

   return rand_num;
}
```

STRINGS.C

```
//                File:                   STRINGS.C
```

```
//                                                      Microsoft TPC-C Kit Ver.
4.21
//                                                      Copyright Microsoft, 1996,
1997, 1998, 1999, 2000
//              Purpose:        Source file for database loader string functions


// Includes
#include "tpcc.h"
#include <string.h>
#include <ctype.h>

//=============================================================
============
//
// Function name: MakeAddress
//
//=============================================================
============

void MakeAddress(char *street_1,
                                                        char *street_2,
                                                        char *city,
                                                        char *state,
                                                        char *zip)
{

#ifdef DEBUG
   printf("[%ld]DBG: Entering MakeAddress()\n", (int) GetCurrentThreadId());
#endif

   MakeAlphaString (10, 20, ADDRESS_LEN, street_1);
   MakeAlphaString (10, 20, ADDRESS_LEN, street_2);
   MakeAlphaString (10, 20, ADDRESS_LEN, city);
   MakeAlphaString ( 2,  2, STATE_LEN, state);
   MakeZipNumberString( 9,  9, ZIP_LEN, zip);

#ifdef DEBUG
   printf("[%ld]DBG: MakeAddress: street_1: %s, street_2: %s, city: %s,
state: %s, zip: %s\n",
                                        (int) GetCurrentThreadId(), street_1,
street_2, city, state, zip);
#endif

   return;

}


//=============================================================
============
//
// Function name: LastName
//
//=============================================================
============

void LastName(int  num,
                                char *name)
{
   static char *n[] =
   {
                                "BAR" , "OUGHT", "ABLE" , "PRI"  , "PRES",
                                "ESE" , "ANTI" , "CALLY", "ATION", "EING"
   };

#ifdef DEBUG
   printf("[%ld]DBG: Entering LastName()\n", (int) GetCurrentThreadId());
#endif

   if ((num >= 0) && (num < 1000))
   {
                                strcpy(name, n[(num/100)%10]);
                                strcat(name, n[(num/10)%10]);
                                strcat(name, n[(num/1)%10]);

                                if (strlen(name) < LAST_NAME_LEN)
                                {
                                        PaddString(LAST_NAME_LEN, name);
                                }

   }
   else
   {
                                printf("\nError in LastName()... num <%ld> out of
range (0,999)\n", num);
                                exit(-1);
   }


#ifdef DEBUG
   printf("[%ld]DBG: LastName: num = [%d] ==> [%d][%d][%d]\n",
                                        (int) GetCurrentThreadId(), num,
num/100, (num/10)%10, num%10);
        printf("[%ld]DBG: LastName: String = %s\n", (int)
GetCurrentThreadId(), name);
#endif

   return;

}


//=============================================================
============
//
// Function name: MakeAlphaString
//
//=============================================================
============

//philipdu 08/13/96 Changed MakeAlphaString to use A-Z, a-z, and 0-9 in
//accordance with spec see below:
//The spec says:
//4.3.2.2       The notation random a-string [x .. y]
//(respectively, n-string [x .. y]) represents a string of random alphanumeric
//(respectively, numeric) characters of a random length of minimum x, maximum
y,
//and mean (y+x)/2. Alphanumerics are A..Z, a..z, and 0..9.  The only other
//requirement is that the character set used "must be able to represent a
minimum
//of 128 different characters".  We are using 8-bit chars, so this is a non issue.
//It is completely unreasonable to stuff non-printing chars into the text fields.
//-CLevine 08/13/96

int MakeAlphaString( int  x, int  y, int  z, char *str)
{
        int                     len;
        int                     i;
   char   cc = 'a';
        static          char chArray[] =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxy
z";
        static          int             chArrayMax = 61;

#ifdef DEBUG
   printf("[%ld]DBG: Entering MakeAlphaString()\n", (int) GetCurrentThreadId());
#endif

        len= RandomNumber(x, y);

        for (i=0; i<len; i++)
        {
                cc = chArray[RandomNumber(0, chArrayMax)];
      str[i] = cc;
   }
        if ( len < z )
                memset(str+len, ' ', z - len);
        str[len] = 0;

   return len;
}


//=============================================================
============
//
// Function name: MakeOriginalAlphaString
//
//=============================================================
============

int MakeOriginalAlphaString(int  x,

int  y,

        int  z,

char *str,

        int  percent)
{
   int                  len;
   int                  val;
   int                  start;

#ifdef DEBUG
   printf("[%ld]DBG: Entering MakeOriginalAlphaString()\n", (int)
GetCurrentThreadId());
#endif

   // verify prercentage is valid
   if ((percent < 0) || (percent > 100))
   {
                printf("MakeOrigianlAlphaString: Invalid
percentage: %d\n", percent);
                exit(-1);
   }

   // verify string is at least 8 chars in length
   if ((x + y) <= 8)
   {
                printf("MakeOriginalAlphaString: string length must
be >= 8\n");
                exit(-1);
   }

   // Make Alpha String
   len = MakeAlphaString(x,y, z, str);

   val = RandomNumber(1,100);
   if (val <= percent)
   {
                start = RandomNumber(0, len - 8);
                strncpy(str + start, "ORIGINAL", 8);
   }


#ifdef DEBUG
   printf("[%ld]DBG: MakeOriginalAlphaString: : %s\n",
                                        (int) GetCurrentThreadId(), str);
#endif

   return strlen(str);
}
```

```
//============================================================
============
//
// Function name: MakeNumberString
//
//============================================================
============
int MakeNumberString(int  x, int  y, int  z, char *str)
{
        char tmp[16];

        //MakeNumberString is always called MakeZipNumberString(16,
16, 16, string)

        memset(str, '0', 16);
        itoa(RandomNumber(0, 99999999), tmp, 10);
        memcpy(str, tmp, strlen(tmp));

        itoa(RandomNumber(0, 99999999), tmp, 10);
        memcpy(str+8, tmp, strlen(tmp));

        str[16] = 0;

   return 16;
}


//============================================================
============
//
// Function name: MakeZipNumberString
//
//============================================================
============
int MakeZipNumberString(int  x, int  y, int  z, char *str)
{
        char tmp[16];

        //MakeZipNumberString is always called MakeZipNumberString(9,
9, 9, string)

        strcpy(str, "000011111");

        itoa(RandomNumber(0, 9999), tmp, 10);
        memcpy(str, tmp, strlen(tmp));

   return 9;
}


//============================================================
============
//
// Function name: InitString
//
//============================================================
============
void InitString(char *str, int len)
{
#ifdef DEBUG
   printf("[%ld]DBG: Entering InitString()\n", (int) GetCurrentThreadId());
#endif

        memset(str, ' ', len);
   str[len] = 0;
}


//============================================================
============
// Function name: InitAddress
//
// Description:
//
//============================================================
============

void InitAddress(char *street_1, char *street_2, char *city, char *state, char *zip)
{
        memset(street_1, ' ', ADDRESS_LEN+1);
        memset(street_2, ' ', ADDRESS_LEN+1);
        memset(city, ' ', ADDRESS_LEN+1);

   street_1[ADDRESS_LEN+1] = 0;
   street_2[ADDRESS_LEN+1] = 0;
   city[ADDRESS_LEN+1]     = 0;

        memset(state, ' ', STATE_LEN+1);
   state[STATE_LEN+1] = 0;

        memset(zip, ' ', ZIP_LEN+1);
   zip[ZIP_LEN+1] = 0;
}


//============================================================
============
//
// Function name: PaddString
//
//============================================================
============

void PaddString(int max, char *name)
{
        int                     len;

        len = strlen(name);
        if ( len < max )
                memset(name+len, ' ', max - len);
        name[max] = 0;

        return;
}
```

TIME.C

```
//      File:           TIME.C
//                                      Microsoft TPC-C Kit Ver.
4.21
//                                      Copyright Microsoft, 1996,
1997, 1998, 1999, 2000
//      Purpose:    Source file for time functions


// Includes
#include "tpcc.h"

// Globals
static long start_sec;


//============================================================
============
//
// Function name: TimeNow
//
//============================================================
============

long TimeNow()
{
  long                  time_now;
  struct        _timeb el_time;

#ifdef DEBUG
   printf("[%ld]DBG: Entering TimeNow()\n", (int) GetCurrentThreadId());
#endif

  _ftime(&el_time);

  time_now = ((el_time.time - start_sec) * 1000) + el_time.millitm;

  return time_now;
}
```

TPCC.H

```
//      File:           TPCC.H
//                                      Microsoft TPC-C Kit Ver.
4.21
//                                      Copyright Microsoft,
1996, 1997, 1998, 1999, 2000
//      Purpose:    Header file for TPC-C database loader


// Build number of TPC Benchmark Kit
#define TPCKIT_VER      "4.21"

// General headers
#include <windows.h>
#include <winbase.h>
#include <stdlib.h>
#include <stdio.h>
#include <process.h>
#include <stddef.h>
#include <stdarg.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <sys\types.h>

// ODBC headers
#include <sql.h>
#include <sqlext.h>
#include <odbcss.h>

// General constants
#define MILLI                   1000
#define FALSE                   0
#define TRUE                    1
#define UNDEF
-1
#define MINPRINTASCII           32
#define MAXPRINTASCII           126

// Default environment constants
#define SERVER                  ""
#define DATABASE                "tpcc"
#define USER                    "sa"
#define PASSWORD                ""

// Default loader arguments
#define BATCH                   10000
#define DEFLDPACKSIZE                   32768
#define LOADER_RES_FILE         "logs\\load.out"
```

```
#define LOADER_NURAND_C                                 123
#define DEF_STARTING_WAREHOUSE                          1
#define BUILD_INDEX
        1       // build both data and indexes
#define INDEX_ORDER
        1       // build indexes before load
#define SCALE_DOWN
        0   // build a normal scale database
#define INDEX_SCRIPT_PATH       "scripts"

typedef struct
{
   char                                 *server;
   char                                 *database;
   char                                 *user;
   char                                 *password;
        BOOL                                            tables_all;
                // set if loading all tables
        BOOL                                            table_item;
                // set if loading ITEM table specifically
        BOOL
        table_warehouse;        // set if loading WAREHOUSE,
DISTRICT, and STOCK
        BOOL
        table_customer;                 // set if loading
CUSTOMER and HISTORY
        BOOL
        table_orders;                   // set if loading NEW-
ORDER, ORDERS, ORDER-LINE
   long                                 num_warehouses;
   long                                 batch;
   long                                 verbose;
        long                                            pack_size;
        char
        *loader_res_file;
        char
        *synch_servername;
        long
        case_sensitivity;
        long
        starting_warehouse;
        long                                            build_index;
        long                                            index_order;
        long                                            scale_down;
        char
        *index_script_path;
} TPCCLDR_ARGS;

// String length constants
        #define SERVER_NAME_LEN         20
        #define DATABASE_NAME_LEN       20
        #define USER_NAME_LEN           20
        #define PASSWORD_LEN            20
        #define TABLE_NAME_LEN          20
        #define I_DATA_LEN              50
        #define I_NAME_LEN              24
        #define BRAND_LEN               1
        #define LAST_NAME_LEN           16
        #define W_NAME_LEN              10
        #define ADDRESS_LEN             20
        #define STATE_LEN               2
        #define ZIP_LEN                 9
        #define S_DIST_LEN              24
        #define S_DATA_LEN              50
        #define D_NAME_LEN              10
        #define FIRST_NAME_LEN          16
        #define MIDDLE_NAME_LEN         2
        #define PHONE_LEN               16
        #define CREDIT_LEN              2
        #define C_DATA_LEN              500
        #define H_DATA_LEN              24
        #define DIST_INFO_LEN           24
        #define MAX_OL_NEW_ORDER_ITEMS  15
        #define MAX_OL_ORDER_STATUS_ITEMS 15
        #define STATUS_LEN              25
        #define OL_DIST_INFO_LEN                        24
        #define C_SINCE_LEN
23
        #define H_DATE_LEN
23
        #define OL_DELIVERY_D_LEN                       23
        #define O_ENTRY_D_LEN           23


// Functions in random.c
void    seed();
long    irand();
double  drand();
void    WUCreate();
short   WURand();
long    RandomNumber(long lower, long upper);

// Functions in getargs.c;
void    GetArgsLoader();
void    GetArgsLoaderUsage();

// Functions in time.c
long    TimeNow();

// Functions in strings.c
void    MakeAddress();
void    LastName();
int     MakeAlphaString();
int     MakeOriginalAlphaString();
int     MakeNumberString();
int     MakeZipNumberString();
void    InitString();
void    InitAddress();
void    PaddString();
```

TPCCLDR.C

```
//              File:                   TPCCLDR.C
//                                                      Microsoft TPC-C Kit Ver.
4.21
//                                                      Copyright Microsoft, 1996,
1997, 1998, 1999, 2000
//              Purpose:        Source file for TPC-C database loader


// Includes
#include "tpcc.h"
#include "search.h"

// Defines
#define MAXITEMS                100000
#define MAXITEMS_SCALE_DOWN                     100
#define CUSTOMERS_PER_DISTRICT  3000
#define CUSTOMERS_SCALE_DOWN 30
#define DISTRICT_PER_WAREHOUSE  10
#define ORDERS_PER_DISTRICT     3000
#define ORDERS_SCALE_DOWN       30
#define MAX_CUSTOMER_THREADS    2
#define MAX_ORDER_THREADS       3
#define MAX_MAIN_THREADS        4

// Functions declarations

void HandleErrorDBC (SQLHDBC  hdbc1);

void CheckSQL();
void CheckDataBase();

long NURand();
void LoadItem();
void LoadWarehouse();

void Stock();
void District();

void LoadCustomer();
void CustomerBufInit();
void CustomerBufLoad();
void LoadCustomerTable();
void LoadHistoryTable();

void LoadOrders();
void OrdersBufInit();
void OrdersBufLoad();
void LoadOrdersTable();
void LoadNewOrderTable();
void LoadOrderLineTable();
void GetPermutation();
void CheckForCommit();
void OpenConnections();
void BuildIndex();
void FormatDate ();

// Shared memory structures

typedef struct
{
   long         ol;
   long         ol_i_id;
   short        ol_supply_w_id;
   short        ol_quantity;
   double        ol_amount;
   char         ol_dist_info[DIST_INFO_LEN+1];
                char
                ol_delivery_d[OL_DELIVERY_D_LEN+1];
} ORDER_LINE_STRUCT;

typedef struct
{
   long         o_id;
   short        o_d_id;
   short        o_w_id;
   long         o_c_id;
   short        o_carrier_id;
   short        o_ol_cnt;
   short        o_all_local;
                ORDER_LINE_STRUCT   o_ol[15];
} ORDERS_STRUCT;

typedef struct
{
   long                                                 c_id;
   short                                                c_d_id;
   short                                                c_w_id;
                char
                c_first[FIRST_NAME_LEN+1];
   char
                c_middle[MIDDLE_NAME_LEN+1];
   char
                c_last[LAST_NAME_LEN+1];
   char
                c_street_1[ADDRESS_LEN+1];
   char
```

```
                c_street_2[ADDRESS_LEN+1];
    char                                        c_city[ADDRESS_LEN+1];
    char                                        c_state[STATE_LEN+1];
    char                                        c_zip[ZIP_LEN+1];
    char                                        c_phone[PHONE_LEN+1];
    char                                        c_credit[CREDIT_LEN+1];
    double                                      c_credit_lim;
    double                                      c_discount;
//  fix to avoid ODBC float to numeric conversion problem.
//  double                                      c_balance;
                char
                c_balance[6];

    double                                      c_ytd_payment;
                short
                c_payment_cnt;
                short
                c_delivery_cnt;
                char
                c_data[C_DATA_LEN+1];
                double                                          h_amount;
    char                                        h_data[H_DATA_LEN+1];
} CUSTOMER_STRUCT;

typedef struct
{
                char
                c_last[LAST_NAME_LEN+1];
                char
                c_first[FIRST_NAME_LEN+1];
    long                                        c_id;
} CUSTOMER_SORT_STRUCT;

typedef struct
{
    long            time_start;
} LOADER_TIME_STRUCT;


// Global variables

char            szLastError[300];

HENV            henv;

HDBC            v_hdbc;
                // for SQL Server version verification
HDBC            i_hdbc1;
                // for ITEM table
HDBC            w_hdbc1;
                // for WAREHOUSE, DISTRICT, STOCK
HDBC            c_hdbc1;
                // for CUSTOMER
HDBC            c_hdbc2;
                // for HISTORY
HDBC            o_hdbc1;
                // for ORDERS
HDBC            o_hdbc2;
                // for NEW-ORDER
HDBC            o_hdbc3;
                // for ORDER-LINE

HSTMT           v_hstmt;
                // for SQL Server version verification
HSTMT           i_hstmt1;
HSTMT           w_hstmt1;
HSTMT           c_hstmt1, c_hstmt2;
HSTMT           o_hstmt1, o_hstmt2, o_hstmt3;

ORDERS_STRUCT   orders_buf[ORDERS_PER_DISTRICT];
CUSTOMER_STRUCT customer_buf[CUSTOMERS_PER_DISTRICT];
long            orders_rows_loaded;
long            new_order_rows_loaded;
long            order_line_rows_loaded;
long            history_rows_loaded;
long            customer_rows_loaded;
long            stock_rows_loaded;
long            district_rows_loaded;
long            item_rows_loaded;
long            warehouse_rows_loaded;
long            main_time_start;
long            main_time_end;
long                                        max_items;
long                                        customers_per_district;
long                                        orders_per_district;
long                                        first_new_order;
long                                        last_new_order;


TPCCLDR_ARGS    *aptr, args;


//============================================================
============
//
// Function name: main
//
//============================================================
============

int main(int  argc, char **argv)
{

                DWORD           dwThreadID[MAX_MAIN_THREADS];
                HANDLE          hThread[MAX_MAIN_THREADS];
                FILE            *fLoader;
                char            buffer[255];
                int                                                     i;

                for (i=0; i<MAX_MAIN_THREADS; i++)
                        hThread[i] = NULL;

    printf("\n*********************************************************");
                printf("\n*                                               *");
                printf("\n*  Microsoft SQL Server                         *");
                printf("\n*                                               *");
                printf("\n*  TPC-C BENCHMARK KIT:  Database loader        *");
                printf("\n*  Version %s                                   *", TPCKIT_VER);
                printf("\n*                                               *");
                printf("\n*********************************************************\n\n");

    // process command line arguments

    aptr = &args;
    GetArgsLoader(argc, argv, aptr);

                // verify database and tables exist before attempting to load

                CheckDataBase();

                printf("Build interface is ODBC.\n");

                if (aptr->build_index == 0)
                        printf("Data load only - no index creation.\n");
                else
                        printf("Data load and index creation.\n");

                if (aptr->index_order == 0)
                        printf("Clustered indexes will be created after bulk
load.\n");
                else
                        printf("Clustered indexes will be created before bulk
load.\n");

                // set database scale values
                if (aptr->scale_down == 1)
                {
                        printf("*** Scaled Down Database ***\n");
                        max_items = MAXITEMS_SCALE_DOWN;
                        customers_per_district =
CUSTOMERS_SCALE_DOWN;
                        orders_per_district = ORDERS_SCALE_DOWN;
                        first_new_order = 0;
                        last_new_order  = 30;
                }
                else
                {
                        max_items = MAXITEMS;
                        customers_per_district =
CUSTOMERS_PER_DISTRICT;
                        orders_per_district = ORDERS_PER_DISTRICT;
                        first_new_order = 2100;
                        last_new_order  = 3000;
                }


                // open connections to SQL Server

                OpenConnections();

                // open file for loader results
    fLoader = fopen(aptr->loader_res_file, "w");

    if (fLoader == NULL)
                {
                        printf("Error, loader result file open failed.");
                        exit(-1);
                }

    // start loading data

    sprintf(buffer,"TPC-C load started for %ld warehouses.\n",aptr-
>num_warehouses);

                printf("%s",buffer);
                fprintf(fLoader,"%s",buffer);

                main_time_start = (TimeNow() / MILLI);

                // start parallel load threads


                if (aptr->tables_all || aptr->table_item)
                {
                        fprintf(fLoader, "\nStarting loader threads for: item\n");

                        hThread[0] = CreateThread(NULL,

                          0,

                          (LPTHREAD_START_ROUTINE) LoadItem,

                          NULL,

                          0,

                          &dwThreadID[0]);

                        if (hThread[0] == NULL)
                        {
                                printf("Error, failed in creating creating
thread = 0.\n");
                                exit(-1);
                        }
                }
```

```
        if (aptr->tables_all || aptr->table_warehouse)
        {
                fprintf(fLoader, "Starting loader threads for:
warehouse\n");

                hThread[1] = CreateThread(NULL,

                  0,

                  (LPTHREAD_START_ROUTINE) LoadWarehouse,

                  NULL,

                  0,

                  &dwThreadID[1]);

                if (hThread[1] == NULL)
                {
                        printf("Error, failed in creating creating
thread = 1.\n");
                        exit(-1);
                }
        }

        if (aptr->tables_all || aptr->table_customer)
        {
                fprintf(fLoader, "Starting loader threads for:
customer\n");

                hThread[2] = CreateThread(NULL,

                  0,

                  (LPTHREAD_START_ROUTINE) LoadCustomer,

                  NULL,

                  0,

                  &dwThreadID[2]);

                if (hThread[2] == NULL)
                {
                        printf("Error, failed in creating creating
main thread = 2.\n");
                        exit(-1);
                }
        }

        if (aptr->tables_all || aptr->table_orders)
        {
                fprintf(fLoader, "Starting loader threads for: orders\n");

                hThread[3] = CreateThread(NULL,

                  0,

                  (LPTHREAD_START_ROUTINE) LoadOrders,

                  NULL,

                  0,

                  &dwThreadID[3]);

                if (hThread[3] == NULL)
                {
                        printf("Error, failed in creating creating
main thread = 3.\n");
                        exit(-1);
                }
        }

        // Wait for threads to finish...
        for (i=0; i<MAX_MAIN_THREADS; i++)
        {
                if (hThread[i] != NULL)
                {
                        WaitForSingleObject( hThread[i],
INFINITE );
                        CloseHandle(hThread[i]);
                        hThread[i] = NULL;
                }
        }

        main_time_end = (TimeNow() / MILLI);

   sprintf(buffer,"\nTPC-C load completed successfully in %ld minutes.\n",
                        (main_time_end - main_time_start)/60);

        printf("%s",buffer);
        fprintf(fLoader, "%s", buffer);

        fclose(fLoader);

        SQLFreeEnv(henv);

   exit(0);

        return 0;
}


//============================================================
============
//
// Function name: LoadItem
//
//============================================================
============

void LoadItem()
{
   long                 i_id;
        long                    i_im_id;
   char                 i_name[I_NAME_LEN+1];
   double               i_price;
   char                 i_data[I_DATA_LEN+1];
        char                    name[20];
        long                    time_start;
        RETCODE                 rc;
        DBINT                   rcint;
        char                    bcphint[128];

        // Seed with unique number
        seed(1);

        printf("Loading item table...\n");

        // if build index before load
        if ((aptr->build_index == 1) && (aptr->index_order == 1))
                BuildIndex("idxitmcl");

        InitString(i_name, I_NAME_LEN+1);
        InitString(i_data, I_DATA_LEN+1);

        sprintf(name, "%s..%s", aptr->database, "item");

        rc = bcp_init(i_hdbc1, name, NULL, "logs\\item.err", DB_IN);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        if ((aptr->build_index == 1) && (aptr->index_order == 1))
        {
                sprintf(bcphint, "tablock, order (i_id),
ROWS_PER_BATCH = 100000");
                rc = bcp_control(i_hdbc1, BCPHINTS, (void*)
bcphint);
                if (rc != SUCCEED)
                        HandleErrorDBC(i_hdbc1);
        }

        rc = bcp_bind(i_hdbc1, (BYTE *) &i_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT4, 1);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        rc = bcp_bind(i_hdbc1, (BYTE *) &i_im_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT4, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        rc = bcp_bind(i_hdbc1, (BYTE *) i_name, 0, I_NAME_LEN, NULL,
0, 0, 3);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

       rc = bcp_bind(i_hdbc1, (BYTE *) &i_price, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 4);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        rc = bcp_bind(i_hdbc1, (BYTE *) i_data, 0, I_DATA_LEN, NULL, 0,
0, 5);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        time_start = (TimeNow() / MILLI);

        item_rows_loaded = 0;

        for (i_id = 1; i_id <= max_items; i_id++)
        {
                i_im_id = RandomNumber(1L, 10000L);

                MakeAlphaString(14, 24, I_NAME_LEN, i_name);

                i_price = ((float) RandomNumber(100L,
10000L))/100.0;

                MakeOriginalAlphaString(26, 50, I_DATA_LEN,
i_data, 10);

                rc = bcp_sendrow(i_hdbc1);

                if (rc != SUCCEED)
                        HandleErrorDBC(i_hdbc1);

                item_rows_loaded++;
                CheckForCommit(i_hdbc1, i_hstmt1,
item_rows_loaded, "item", &time_start);
        }

        rcint = bcp_done(i_hdbc1);
        if (rcint < 0)
                HandleErrorDBC(i_hdbc1);

        printf("Finished loading item table.\n");

        SQLFreeStmt(i_hstmt1, SQL_DROP);
        SQLDisconnect(i_hdbc1);
        SQLFreeConnect(i_hdbc1);

        // if build index after load
        if ((aptr->build_index == 1) && (aptr->index_order == 0))
```

```
                        BuildIndex("idxitmcl");

}


//=============================================================
=================
//
// Function   : LoadWarehouse
//
// Loads WAREHOUSE table and loads Stock and District as Warehouses are
created
//
//=============================================================
=================

void LoadWarehouse()
{
   short       w_id;
   char        w_name[W_NAME_LEN+1];
   char        w_street_1[ADDRESS_LEN+1];
   char        w_street_2[ADDRESS_LEN+1];
   char        w_city[ADDRESS_LEN+1];
   char        w_state[STATE_LEN+1];
   char        w_zip[ZIP_LEN+1];
   double      w_tax;
   double      w_ytd;
               char        name[20];
               long        time_start;
               RETCODE     rc;
               DBINT       rcint;
               char        bcphint[128];


               // Seed with unique number
               seed(2);

               printf("Loading warehouse table...\n");

               // if build index before load...
               if ((aptr->build_index == 1) && (aptr->index_order == 1))
                        BuildIndex("idxwarcl");

               InitString(w_name, W_NAME_LEN+1);
               InitAddress(w_street_1, w_street_2, w_city, w_state, w_zip);

               sprintf(name, "%s..%s", aptr->database, "warehouse");

               rc = bcp_init(w_hdbc1, name, NULL, "logs\\whouse.err", DB_IN);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               if ((aptr->build_index == 1) && (aptr->index_order == 1))
               {
                        sprintf(bcphint, "tablock, order (w_id),
ROWS_PER_BATCH = %d", aptr->num_warehouses);
                        rc = bcp_control(w_hdbc1, BCPHINTS, (void*)
bcphint);
                        if (rc != SUCCEED)
                                 HandleErrorDBC(w_hdbc1);
               }

               rc = bcp_bind(w_hdbc1, (BYTE *) &w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 1);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               rc = bcp_bind(w_hdbc1, (BYTE *) w_name, 0, W_NAME_LEN,
NULL, 0, 0, 2);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               rc = bcp_bind(w_hdbc1, (BYTE *) w_street_1, 0, ADDRESS_LEN,
NULL, 0, 0, 3);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               rc = bcp_bind(w_hdbc1, (BYTE *) w_street_2, 0, ADDRESS_LEN,
NULL, 0, 0, 4);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               rc = bcp_bind(w_hdbc1, (BYTE *) w_city, 0, ADDRESS_LEN,
NULL, 0, 0, 5);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               rc = bcp_bind(w_hdbc1, (BYTE *) w_state, 0, STATE_LEN, NULL,
0, 0, 6);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               rc = bcp_bind(w_hdbc1, (BYTE *) w_zip, 0, ZIP_LEN, NULL, 0, 0,
7);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

              rc = bcp_bind(w_hdbc1, (BYTE *) &w_tax, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 8);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               rc = bcp_bind(w_hdbc1, (BYTE *) &w_ytd, 0,
SQL_VARLEN_DATA, NULL, 0, SQLFLT8, 9);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               time_start = (TimeNow() / MILLI);

               warehouse_rows_loaded = 0;

               for (w_id = (short)aptr->starting_warehouse; w_id <= aptr-
>num_warehouses; w_id++)
               {
                        MakeAlphaString(6,10, W_NAME_LEN, w_name);

                        MakeAddress(w_street_1, w_street_2, w_city,
w_state, w_zip);

                        w_tax = ((float)
RandomNumber(0L,2000L))/10000.00;

                        w_ytd = 300000.00;

                        rc = bcp_sendrow(w_hdbc1);
                        if (rc != SUCCEED)
                                 HandleErrorDBC(w_hdbc1);

                        warehouse_rows_loaded++;
                        CheckForCommit(w_hdbc1, i_hstmt1,
warehouse_rows_loaded, "warehouse", &time_start);
               }

               rcint = bcp_done(w_hdbc1);
               if (rcint < 0)
                        HandleErrorDBC(w_hdbc1);

               printf("Finished loading warehouse table.\n");

               // if build index after load...
               if ((aptr->build_index == 1) && (aptr->index_order == 0))
                        BuildIndex("idxwarcl");

               stock_rows_loaded = 0;

               district_rows_loaded = 0;

               District();
               Stock();

}


//=============================================================
============
//
// Function   : District
//
//=============================================================
============

void District()
{
   short       d_id;
   short       d_w_id;
   char        d_name[D_NAME_LEN+1];
   char        d_street_1[ADDRESS_LEN+1];
   char        d_street_2[ADDRESS_LEN+1];
   char        d_city[ADDRESS_LEN+1];
   char        d_state[STATE_LEN+1];
   char        d_zip[ZIP_LEN+1];
   double      d_tax;
   double      d_ytd;
               char        name[20];
   long        d_next_o_id;
               long        time_start;
               int                     w_id;
               RETCODE     rc;
               DBINT       rcint;
               char        bcphint[128];

               // Seed with unique number
               seed(4);

               printf("Loading district table...\n");

               // build index before load
               if ((aptr->build_index == 1) && (aptr->index_order == 1))
                        BuildIndex("idxdiscl");

               InitString(d_name, D_NAME_LEN+1);
               InitAddress(d_street_1, d_street_2, d_city, d_state, d_zip);
               sprintf(name, "%s..%s", aptr->database, "district");

               rc = bcp_init(w_hdbc1, name, NULL, "logs\\district.err", DB_IN);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               if ((aptr->build_index == 1) && (aptr->index_order == 1))
               {
                        sprintf(bcphint, "tablock, order (d_w_id, d_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 10));
                        rc = bcp_control(w_hdbc1, BCPHINTS, (void*)
bcphint);
                        if (rc != SUCCEED)
                                 HandleErrorDBC(w_hdbc1);
               }

               rc = bcp_bind(w_hdbc1, (BYTE *) &d_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 1);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

               rc = bcp_bind(w_hdbc1, (BYTE *) &d_w_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 2);
               if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);
```

```
		rc = bcp_bind(w_hdbc1, (BYTE *) d_name, 0, D_NAME_LEN,
NULL, 0, 0, 3);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) d_street_1, 0, ADDRESS_LEN,
NULL, 0, 0, 4);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) d_street_2, 0, ADDRESS_LEN,
NULL, 0, 0, 5);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) d_city, 0, ADDRESS_LEN,
NULL, 0, 0, 6);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) d_state, 0, STATE_LEN, NULL,
0, 0, 7);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) d_zip, 0, ZIP_LEN, NULL, 0, 0,
8);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) &d_tax, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 9);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) &d_ytd, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 10);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) &d_next_o_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT4, 11);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		d_ytd  = 30000.0;

		d_next_o_id = orders_per_district+1;

		time_start = (TimeNow() / MILLI);

		for (w_id = aptr->starting_warehouse; w_id <= aptr-
>num_warehouses; w_id++)
		{
			d_w_id = w_id;

			for (d_id = 1; d_id <=
DISTRICT_PER_WAREHOUSE; d_id++)
			{
				MakeAlphaString(6,10,D_NAME_LEN,
d_name);

				MakeAddress(d_street_1, d_street_2,
d_city, d_state, d_zip);

				d_tax = ((float)
RandomNumber(0L,2000L))/10000.00;

				rc = bcp_sendrow(w_hdbc1);
				if (rc != SUCCEED)
					HandleErrorDBC(w_hdbc1);

				district_rows_loaded++;
				CheckForCommit(w_hdbc1, w_hstmt1,
district_rows_loaded, "district", &time_start);
			}
		}

		rcint = bcp_done(w_hdbc1);
		if (rcint < 0)
			HandleErrorDBC(w_hdbc1);

		printf("Finished loading district table.\n");

		// if build index after load...
		if ((aptr->build_index == 1) && (aptr->index_order == 0))
			BuildIndex("idxdiscl");

	return;
}


//============================================================
============
//
// Function   : Stock
//
//============================================================
============

void Stock()
{
	long		s_i_id;
	short		s_w_id;
	short		s_quantity;
	char		s_dist_01[S_DIST_LEN+1];
	char		s_dist_02[S_DIST_LEN+1];
	char		s_dist_03[S_DIST_LEN+1];
	char		s_dist_04[S_DIST_LEN+1];
	char		s_dist_05[S_DIST_LEN+1];
	char		s_dist_06[S_DIST_LEN+1];
	char		s_dist_07[S_DIST_LEN+1];
	char		s_dist_08[S_DIST_LEN+1];
	char		s_dist_09[S_DIST_LEN+1];
	char		s_dist_10[S_DIST_LEN+1];
	long		s_ytd;
	short		s_order_cnt;
	short		s_remote_cnt;
	char		s_data[S_DATA_LEN+1];
	short		len;
		char		name[20];
		long		time_start;
		RETCODE	rc;
		DBINT		rcint;
		char		bcphint[128];

		// Seed with unique number
		seed(3);

		// if build index before load...
		if ((aptr->build_index == 1) && (aptr->index_order == 1))
			BuildIndex("idxstkcl");

		sprintf(name, "%s..%s", aptr->database, "stock");

		rc = bcp_init(w_hdbc1, name, NULL, "logs\\stock.err", DB_IN);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		if ((aptr->build_index == 1) && (aptr->index_order == 1))
		{
			sprintf(bcphint, "tablock, order (s_i_id, s_w_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 100000));
			rc = bcp_control(w_hdbc1, BCPHINTS, (void*)
bcphint);
			if (rc != SUCCEED)
				HandleErrorDBC(w_hdbc1);
		}

		rc = bcp_bind(w_hdbc1, (BYTE *) &s_i_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT4, 1);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		bcp_bind(w_hdbc1, (BYTE *) &s_w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 2);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) &s_quantity, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 3);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_01, 0, S_DIST_LEN,
NULL, 0, 0, 4);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_02, 0, S_DIST_LEN,
NULL, 0, 0, 5);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_03, 0, S_DIST_LEN,
NULL, 0, 0, 6);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_04, 0, S_DIST_LEN,
NULL, 0, 0, 7);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_05, 0, S_DIST_LEN,
NULL, 0, 0, 8);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_06, 0, S_DIST_LEN,
NULL, 0, 0, 9);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_07, 0, S_DIST_LEN,
NULL, 0, 0, 10);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_08, 0, S_DIST_LEN,
NULL, 0, 0, 11);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_09, 0, S_DIST_LEN,
NULL, 0, 0, 12);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_10, 0, S_DIST_LEN,
NULL, 0, 0, 13);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);
```

```
            rc = bcp_bind(w_hdbc1, (BYTE *) &s_ytd, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT4, 14);
            if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

            rc = bcp_bind(w_hdbc1, (BYTE *) &s_order_cnt, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 15);
            if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

            rc = bcp_bind(w_hdbc1, (BYTE *) &s_remote_cnt, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 16);
            if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

            rc = bcp_bind(w_hdbc1, (BYTE *) s_data, 0, S_DATA_LEN, NULL,
0, 0, 17);
            if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);

            s_ytd = s_order_cnt = s_remote_cnt = 0;

            time_start = (TimeNow() / MILLI);

            printf("...Loading stock table\n");

            for (s_i_id=1; s_i_id <= max_items; s_i_id++)
            {

                        for (s_w_id = (short)aptr->starting_warehouse;
s_w_id <= aptr->num_warehouses; s_w_id++)
                        {

                                    s_quantity =
(short)RandomNumber(10L,100L);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_01);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_02);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_03);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_04);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_05);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_06);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_07);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_08);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_09);
                                    len =
MakeAlphaString(24,24,S_DIST_LEN, s_dist_10);

                                    len = MakeOriginalAlphaString(26,50,
S_DATA_LEN, s_data,10);

                                    rc = bcp_sendrow(w_hdbc1);
                                    if (rc != SUCCEED)

            HandleErrorDBC(w_hdbc1);

                                    stock_rows_loaded++;
                                    CheckForCommit(w_hdbc1, w_hstmt1,
stock_rows_loaded, "stock", &time_start);

                        }
            }

            rcint = bcp_done(w_hdbc1);
            if (rcint < 0)
                        HandleErrorDBC(w_hdbc1);

            printf("Finished loading stock table.\n");

            SQLFreeStmt(w_hstmt1, SQL_DROP);
            SQLDisconnect(w_hdbc1);
            SQLFreeConnect(w_hdbc1);

            // if build index after load...
            if ((aptr->build_index == 1) && (aptr->index_order == 0))
                        BuildIndex("idxstkcl");

            return;
}


//============================================================
============
//
// Function   : LoadCustomer
//
//============================================================
============

void LoadCustomer()
{
            LOADER_TIME_STRUCT      customer_time_start;
            LOADER_TIME_STRUCT      history_time_start;
            short                   w_id;
   short                d_id;
            DWORD
            dwThreadID[MAX_CUSTOMER_THREADS];
            HANDLE
            hThread[MAX_CUSTOMER_THREADS];
            char                    name[20];
            RETCODE
            rc;
            DBINT
            rcint;
            char
            bcphint[128];
            char
            cmd[256];
            // SQLRETURN
            rc_1;
            // SQLSMALLINT
            recnum, MsgLen;
            // SQLCHAR
            SqlState[6], Msg[SQL_MAX_MESSAGE_LENGTH];
            // SQLINTEGER
            NativeError;

            // Seed with unique number
            seed(5);

            printf("Loading customer and history tables...\n");

            // if build index before load...
            if ((aptr->build_index == 1) && (aptr->index_order == 1))
                        BuildIndex("idxcuscl");

            // Initialize bulk copy
            sprintf(name, "%s..%s", aptr->database, "customer");

            rc = bcp_init(c_hdbc1, name, NULL, "logs\\customer.err", DB_IN);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

            if ((aptr->build_index == 1) && (aptr->index_order == 1))
            {
                        sprintf(bcphint, "tablock, order (c_w_id, c_d_id, c_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 30000));
                        rc = bcp_control(c_hdbc1, BCPHINTS, (void*)
bcphint);
                        if (rc != SUCCEED)
                                    HandleErrorDBC(c_hdbc1);
            }

            sprintf(name, "%s..%s", aptr->database, "history");

            rc = bcp_init(c_hdbc2, name, NULL, "logs\\history.err", DB_IN);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

            sprintf(bcphint, "tablock");
            rc = bcp_control(c_hdbc2, BCPHINTS, (void*) bcphint);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

            customer_rows_loaded    = 0;
            history_rows_loaded     = 0;

            CustomerBufInit();

            customer_time_start.time_start = (TimeNow() / MILLI);
            history_time_start.time_start = (TimeNow() / MILLI);

            for (w_id = (short)aptr->starting_warehouse; w_id <= aptr-
>num_warehouses; w_id++)
            {
                        for (d_id = 1; d_id <=
DISTRICT_PER_WAREHOUSE; d_id++)
                        {

                                    CustomerBufLoad(d_id, w_id);

                                    // Start parallel loading threads here...

                                    // Start customer table thread

                                    printf("...Loading customer table for:
d_id = %d, w_id = %d\n", d_id, w_id);

                                    hThread[0] = CreateThread(NULL,

                                     0,

                                     (LPTHREAD_START_ROUTINE)
LoadCustomerTable,

                                     &customer_time_start,

                                     0,

                                     &dwThreadID[0]);

                                    if (hThread[0] == NULL)
                                    {
                                                printf("Error, failed in
creating creating thread = 0.\n");
                                                exit(-1);
                                    }

                                    // Start History table thread

                                    printf("...Loading history table for: d_id
= %d, w_id = %d\n", d_id, w_id);

                                    hThread[1] = CreateThread(NULL,

                                     0,

                                     (LPTHREAD_START_ROUTINE)
```

```
LoadHistoryTable,
                                        &history_time_start,
                                        0,
                                        &dwThreadID[1]);
                                    if (hThread[1] == NULL)
                                    {
                                            printf("Error, failed in
creating creating thread = 1.\n");
                                            exit(-1);
                                    }
                                    WaitForSingleObject( hThread[0],
INFINITE );
                                    WaitForSingleObject( hThread[1],
INFINITE );

                                    if (CloseHandle(hThread[0]) == FALSE)
                                    {
                                            printf("Error, failed in
closing customer thread handle with errno: %d\n", GetLastError());
                                    }
                                    if (CloseHandle(hThread[1]) == FALSE)
                                    {
                                            printf("Error, failed in
closing history thread handle with errno: %d\n", GetLastError());
                                    }

                            }

                    }

                    // flush the bulk connection
                    rcint = bcp_done(c_hdbc1);
                    if (rcint < 0)
                            HandleErrorDBC(c_hdbc1);

                    rcint = bcp_done(c_hdbc2);
                    if (rcint < 0)
                            HandleErrorDBC(c_hdbc2);

                    printf("Finished loading customer table.\n");

                    // if build index after load...
                    if ((aptr->build_index == 1) && (aptr->index_order == 0))
                            BuildIndex("idxcuscl");

                    // build non-clustered index
                    if (aptr->build_index == 1)
                            BuildIndex("idxcusnc");

                    // Output the NURAND used for the loader into C_FIRST for C_ID =
1,
                    // C_W_ID = 1, and C_D_ID = 1
                    sprintf(cmd, "isql -S%s -U%s -P%s -d%s -e -Q\"update customer
set c_first = 'C_LOAD = %d' where c_id = 1 and c_w_id = 1 and c_d_id = 1\" >
logs\\nurand_load.log",
                                                    aptr->server,
                                                    aptr->user,
                                                    aptr->password,
                                                    aptr->database,
                                                    LOADER_NURAND_C);

                    system(cmd);

                    SQLFreeStmt(c_hstmt1, SQL_DROP);
                    SQLDisconnect(c_hdbc1);
                    SQLFreeConnect(c_hdbc1);

                    SQLFreeStmt(c_hstmt2, SQL_DROP);
                    SQLDisconnect(c_hdbc2);
                    SQLFreeConnect(c_hdbc2);


            return;

}


//============================================================
============
//
// Function   : CustomerBufInit
//
//============================================================
============

void CustomerBufInit()
{
            int     i;

            for (i=0;i<customers_per_district;i++)
            {
                    customer_buf[i].c_id = 0;
                    customer_buf[i].c_d_id = 0;
                    customer_buf[i].c_w_id = 0;

                    strcpy(customer_buf[i].c_first,"");
                    strcpy(customer_buf[i].c_middle,"");
                    strcpy(customer_buf[i].c_last,"");
                    strcpy(customer_buf[i].c_street_1,"");
                    strcpy(customer_buf[i].c_street_2,"");
                    strcpy(customer_buf[i].c_city,"");
                    strcpy(customer_buf[i].c_state,"");
                    strcpy(customer_buf[i].c_zip,"");
                    strcpy(customer_buf[i].c_phone,"");
                    strcpy(customer_buf[i].c_credit,"");

                    customer_buf[i].c_credit_lim = 0;
                    customer_buf[i].c_discount = (float) 0;

                    //  fix to avoid ODBC float to numeric conversion
problem.
                    //              customer_buf[i].c_balance = 0;
                    strcpy(customer_buf[i].c_balance,"");

                    customer_buf[i].c_ytd_payment = 0;
                    customer_buf[i].c_payment_cnt = 0;
                    customer_buf[i].c_delivery_cnt = 0;

                    strcpy(customer_buf[i].c_data,"");

                    customer_buf[i].h_amount = 0;

                    strcpy(customer_buf[i].h_data,"");

            }


}


//============================================================
============
//
// Function   : CustomerBufLoad
//
// Fills shared buffer for HISTORY and CUSTOMER
//============================================================
============

void CustomerBufLoad(int d_id, int w_id)
{
            long                                                    i;
   CUSTOMER_SORT_STRUCT    c[CUSTOMERS_PER_DISTRICT];


            for (i=0;i<customers_per_district;i++)
            {
                    if (i < 1000)
                            LastName(i, c[i].c_last);
                    else

            LastName(NURand(255,0,999,LOADER_NURAND_C), c[i].c_last);

                    MakeAlphaString(8,16,FIRST_NAME_LEN,
c[i].c_first);

                    c[i].c_id = i+1;

            }

            printf("...Loading customer buffer for: d_id = %d, w_id = %d\n",
                                    d_id, w_id);

            for (i=0;i<customers_per_district;i++)
            {

                    customer_buf[i].c_d_id = d_id;
                    customer_buf[i].c_w_id = w_id;
                    customer_buf[i].h_amount = 10.0;

                    customer_buf[i].c_ytd_payment  = 10.0;

                    customer_buf[i].c_payment_cnt  = 1;
                    customer_buf[i].c_delivery_cnt = 0;

                    // Generate CUSTOMER and HISTORY data

                    customer_buf[i].c_id = c[i].c_id;

                    strcpy(customer_buf[i].c_first, c[i].c_first);
                    strcpy(customer_buf[i].c_last, c[i].c_last);

                    customer_buf[i].c_middle[0] = 'O';
                    customer_buf[i].c_middle[1] = 'E';

                    MakeAddress(customer_buf[i].c_street_1,
customer_buf[i].c_street_2,
                                                    customer_buf[i].c_city,
                                                    customer_buf[i].c_state,
                                                    customer_buf[i].c_zip);

                    MakeNumberString(16, 16, PHONE_LEN,
customer_buf[i].c_phone);

                    if (RandomNumber(1L, 100L) > 10)
                            customer_buf[i].c_credit[0] = 'G';
                    else
                            customer_buf[i].c_credit[0] = 'B';
                    customer_buf[i].c_credit[1] = 'C';

                    customer_buf[i].c_credit_lim = 50000.0;
                    customer_buf[i].c_discount = ((float)
RandomNumber(0L, 5000L)) / 10000.0;

                    //  fix to avoid ODBC float to numeric conversion
problem.
                    //  customer_buf[i].c_balance = -10.0;
```

```
                        strcpy(customer_buf[i].c_balance,"-10.0");

                        MakeAlphaString(300, 500, C_DATA_LEN,
customer_buf[i].c_data);

                        // Generate HISTORY data
                        MakeAlphaString(12, 24, H_DATA_LEN,
customer_buf[i].h_data);

                }
}

//============================================================
============
//
// Function   : LoadCustomerTable
//
//============================================================
============

void LoadCustomerTable(LOADER_TIME_STRUCT *customer_time_start)
{
                int     i;
   long     c_id;
   short    c_d_id;
   short    c_w_id;
   char     c_first[FIRST_NAME_LEN+1];
   char     c_middle[MIDDLE_NAME_LEN+1];
   char     c_last[LAST_NAME_LEN+1];
   char     c_street_1[ADDRESS_LEN+1];
   char     c_street_2[ADDRESS_LEN+1];
   char     c_city[ADDRESS_LEN+1];
   char     c_state[STATE_LEN+1];
   char     c_zip[ZIP_LEN+1];
   char     c_phone[PHONE_LEN+1];
   char     c_credit[CREDIT_LEN+1];
   double    c_credit_lim;
   double    c_discount;

                // fix to avoid ODBC float to numeric conversion problem.

                //  double                  c_balance;
                char                    c_balance[6];

   double    c_ytd_payment;
   short    c_payment_cnt;
   short    c_delivery_cnt;
   char     c_data[C_DATA_LEN+1];
                char                    c_since[C_SINCE_LEN+1];
                RETCODE                 rc;

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

                rc = bcp_bind(c_hdbc1, (BYTE *) &c_w_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 3);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_first, 0, FIRST_NAME_LEN, NULL, 0, 0,
4);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_middle, 0, MIDDLE_NAME_LEN,NULL, 0,
0, 5);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_last, 0, LAST_NAME_LEN, NULL, 0, 0,
6);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *)c_street_1, 0, ADDRESS_LEN, NULL, 0, 0,
7);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_street_2, 0, ADDRESS_LEN, NULL,0,0,
8);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *)c_city, 0, ADDRESS_LEN, NULL, 0, 0, 9);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_state, 0, STATE_LEN, NULL, 0, 0, 10);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_zip, 0, ZIP_LEN, NULL, 0, 0, 11);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_phone, 0, PHONE_LEN, NULL, 0, 0, 12);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

                rc = bcp_bind(c_hdbc1, (BYTE *) &c_since, 0, C_SINCE_LEN,
NULL, 0, SQLCHARACTER, 13);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_credit, 0, CREDIT_LEN, NULL, 0, 0, 14);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_credit_lim, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 15);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_discount, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 16);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);


                // fix to avoid ODBC float to numeric conversion problem.

   //  rc = bcp_bind(c_hdbc1, (BYTE *) &c_balance, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 17);
                //  if (rc != SUCCEED)
                //              HandleErrorDBC(c_hdbc1);
   rc = bcp_bind(c_hdbc1, (BYTE *) c_balance, 0, 5,NULL, 0, SQLCHARACTER,
17);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);


   rc = bcp_bind(c_hdbc1, (BYTE *) &c_ytd_payment, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 18);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_payment_cnt, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 19);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_delivery_cnt,0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 20);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_data, 0, 500, NULL, 0, 0, 21);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   for (i = 0; i < customers_per_district; i++)
   {
                        c_id = customer_buf[i].c_id;
                        c_d_id = customer_buf[i].c_d_id;
                        c_w_id = customer_buf[i].c_w_id;

                        strcpy(c_first, customer_buf[i].c_first);
                        strcpy(c_middle, customer_buf[i].c_middle);
                        strcpy(c_last, customer_buf[i].c_last);
                        strcpy(c_street_1, customer_buf[i].c_street_1);
                        strcpy(c_street_2, customer_buf[i].c_street_2);
                        strcpy(c_city, customer_buf[i].c_city);
                        strcpy(c_state, customer_buf[i].c_state);
                        strcpy(c_zip, customer_buf[i].c_zip);
                        strcpy(c_phone, customer_buf[i].c_phone);
                        strcpy(c_credit, customer_buf[i].c_credit);

                        FormatDate(&c_since);


                        c_credit_lim = customer_buf[i].c_credit_lim;
                        c_discount = customer_buf[i].c_discount;

                        //  fix to avoid ODBC float to numeric conversion
problem.
                        //  c_balance = customer_buf[i].c_balance;
                        strcpy(c_balance, customer_buf[i].c_balance);

                        c_ytd_payment = customer_buf[i].c_ytd_payment;
                        c_payment_cnt = customer_buf[i].c_payment_cnt;
                        c_delivery_cnt = customer_buf[i].c_delivery_cnt;

                        strcpy(c_data, customer_buf[i].c_data);

                        // Send data to server
                        rc = bcp_sendrow(c_hdbc1);
                        if (rc != SUCCEED)
                                HandleErrorDBC(c_hdbc1);


                        customer_rows_loaded++;
                        CheckForCommit(c_hdbc1, c_hstmt1,
customer_rows_loaded, "customer", &customer_time_start->time_start);
   }

}


//============================================================
============
//
// Function   : LoadHistoryTable
//
//============================================================
============

void LoadHistoryTable(LOADER_TIME_STRUCT *history_time_start)
{
```

```
        int     i;
    long    c_id;
    short   c_d_id;
    short   c_w_id;
        double      h_amount;
    char    h_data[H_DATA_LEN+1];
        char            h_date[H_DATE_LEN+1];
        RETCODE         rc;

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
        if (rc != SUCCEED)
            HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
        if (rc != SUCCEED)
            HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
        if (rc != SUCCEED)
            HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 4);
        if (rc != SUCCEED)
            HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 5);
        if (rc != SUCCEED)
            HandleErrorDBC(c_hdbc2);

        rc = bcp_bind(c_hdbc2, (BYTE *) &h_date, 0, H_DATE_LEN, NULL,
0, SQLCHARACTER, 6);
        if (rc != SUCCEED)
            HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &h_amount, 0, SQL_VARLEN_DATA, NULL,
0, SQLFLT8, 7);
        if (rc != SUCCEED)
            HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) h_data, 0, H_DATA_LEN, NULL, 0, 0, 8);
        if (rc != SUCCEED)
            HandleErrorDBC(c_hdbc2);

    for (i = 0; i < customers_per_district; i++)
    {
            c_id = customer_buf[i].c_id;
            c_d_id = customer_buf[i].c_d_id;
            c_w_id = customer_buf[i].c_w_id;
            h_amount = customer_buf[i].h_amount;
            strcpy(h_data, customer_buf[i].h_data);

            FormatDate(&h_date);

            // send to server
            rc = bcp_sendrow(c_hdbc2);
            if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc2);


            history_rows_loaded++;
            CheckForCommit(c_hdbc2, c_hstmt2,
history_rows_loaded, "history", &history_time_start->time_start);
    }

}
```

```
//============================================================
==-==============
//
// Function   : LoadOrders
//
//============================================================
==================

void LoadOrders()
{
        LOADER_TIME_STRUCT      orders_time_start;
        LOADER_TIME_STRUCT      new_order_time_start;
        LOADER_TIME_STRUCT      order_line_time_start;
        short                   w_id;
    short               d_id;
        DWORD
        dwThreadID[MAX_ORDER_THREADS];
        HANDLE
        hThread[MAX_ORDER_THREADS];
        char                    name[20];
        RETCODE
        rc;
        char
        bcphint[128];

        // seed with unique number
        seed(6);

        printf("Loading orders...\n");

        // if build index before load...
        if ((aptr->build_index == 1) && (aptr->index_order == 1))
        {
                        BuildIndex("idxordcl");
                        BuildIndex("idxnodcl");
                        BuildIndex("idxodlcl");
        }

        // initialize bulk copy
        sprintf(name, "%s..%s", aptr->database, "orders");

        rc = bcp_init(o_hdbc1, name, NULL, "logs\\orders.err", DB_IN);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

        if ((aptr->build_index == 1) && (aptr->index_order == 1))
        {
                sprintf(bcphint, "tablock, order (o_w_id, o_d_id, o_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 30000));
                rc = bcp_control(o_hdbc1, BCPHINTS, (void*)
bcphint);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);
        }

        sprintf(name, "%s..%s", aptr->database, "new_order");

        rc = bcp_init(o_hdbc2, name, NULL, "logs\\neword.err", DB_IN);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

        if ((aptr->build_index == 1) && (aptr->index_order == 1))
        {
                sprintf(bcphint, "tablock, order (no_w_id, no_d_id,
no_o_id), ROWS_PER_BATCH = %u", (aptr->num_warehouses * 9000));
                rc = bcp_control(o_hdbc2, BCPHINTS, (void*)
bcphint);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc2);
        }

        sprintf(name, "%s..%s", aptr->database, "order_line");
```

```
        rc = bcp_init(o_hdbc3, name, NULL, "logs\\ordline.err", DB_IN);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc3);

    if ((aptr->build_index == 1) && (aptr->index_order == 1))
        {
                sprintf(bcphint, "tablock, order (ol_w_id, ol_d_id,
ol_o_id, ol_number), ROWS_PER_BATCH = %u", (aptr->num_warehouses *
300000));
                rc = bcp_control(o_hdbc3, BCPHINTS, (void*)
bcphint);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc3);
        }

        orders_rows_loaded      = 0;
        new_order_rows_loaded   = 0;
        order_line_rows_loaded  = 0;

        OrdersBufInit();

        orders_time_start.time_start = (TimeNow() / MILLI);
        new_order_time_start.time_start = (TimeNow() / MILLI);
        order_line_time_start.time_start = (TimeNow() / MILLI);

        for (w_id = (short)aptr->starting_warehouse; w_id <= aptr-
>num_warehouses; w_id++)
        {
                for (d_id = 1; d_id <=
DISTRICT_PER_WAREHOUSE; d_id++)
                {

                        OrdersBufLoad(d_id, w_id);

                        // start parallel loading threads here...

                        // start Orders table thread

                        printf("...Loading Order Table for: d_id
= %d, w_id = %d\n", d_id, w_id);

                        hThread[0] = CreateThread(NULL,

                          0,

                          (LPTHREAD_START_ROUTINE)
LoadOrdersTable,

                          &orders_time_start,

                          0,

                          &dwThreadID[0]);

                        if (hThread[0] == NULL)
                        {
                                printf("Error, failed in
creating creating thread = 0.\n");

                                exit(-1);
                        }

                        // start NewOrder table thread

                        printf("...Loading New-Order Table for:
d_id = %d, w_id = %d\n", d_id, w_id);

                        hThread[1] = CreateThread(NULL,

                          0,

                          (LPTHREAD_START_ROUTINE)
```

```
LoadNewOrderTable,
                                        &new_order_time_start,
                                        0,
                                        &dwThreadID[1]);
                                    if (hThread[1] == NULL)
                                    {
                                            printf("Error, failed in
creating creating thread = 1.\n");
                                            exit(-1);
                                    }
                                    // start Order-Line table thread
                                    printf("...Loading Order-Line Table for:
d_id = %d, w_id = %d\n", d_id, w_id);
                                    hThread[2] = CreateThread(NULL,
                                        0,
                                        (LPTHREAD_START_ROUTINE)
LoadOrderLineTable,
                                        &order_line_time_start,
                                        0,
                                        &dwThreadID[2]);
                                    if (hThread[2] == NULL)
                                    {
                                            printf("Error, failed in
creating creating thread = 2.\n");
                                            exit(-1);
                                    }
                                    WaitForSingleObject( hThread[0],
INFINITE );
                                    WaitForSingleObject( hThread[1],
INFINITE );
                                    WaitForSingleObject( hThread[2],
INFINITE );
                                    if (CloseHandle(hThread[0]) == FALSE)
                                    {
                                            printf("Error, failed in
closing Orders thread handle with errno: %d\n", GetLastError());
                                    }
                                    if (CloseHandle(hThread[1]) == FALSE)
                                    {
                                            printf("Error, failed in
closing NewOrder thread handle with errno: %d\n", GetLastError());
                                    }
                                    if (CloseHandle(hThread[2]) == FALSE)
                                    {
                                            printf("Error, failed in
closing OrderLine thread handle with errno: %d\n", GetLastError());
                                    }
                            }
                    }
                    printf("Finished loading orders.\n");
  return;
}
//============================================================
============
//
// Function   : OrdersBufInit
//
// Clears shared buffer for ORDERS, NEWORDER, and ORDERLINE
//
//============================================================
============
void OrdersBufInit()
{
            int     i;
            int                     j;
            for (i=0;i<orders_per_district;i++)
            {
                    orders_buf[i].o_id = 0;
                    orders_buf[i].o_d_id = 0;
                    orders_buf[i].o_w_id = 0;
                    orders_buf[i].o_c_id = 0;
                    orders_buf[i].o_carrier_id = 0;
                    orders_buf[i].o_ol_cnt = 0;
                    orders_buf[i].o_all_local = 0;
                    for (j=0;j<=14;j++)
                    {
                            orders_buf[i].o_ol[j].ol = 0;
                            orders_buf[i].o_ol[j].ol_i_id = 0;
                            orders_buf[i].o_ol[j].ol_supply_w_id = 0;
                            orders_buf[i].o_ol[j].ol_quantity = 0;
                            orders_buf[i].o_ol[j].ol_amount = 0;
            strcpy(orders_buf[i].o_ol[j].ol_dist_info,"");
                    }
            }
}
//============================================================
============
//
// Function   : OrdersBufLoad
//
// Fills shared buffer for ORDERS, NEWORDER, and ORDERLINE
//
//============================================================
============
void OrdersBufLoad(int d_id, int w_id)
{
            int     cust[ORDERS_PER_DISTRICT+1];
            long    o_id;
            short   ol;
            printf("...Loading Order Buffer for: d_id = %d, w_id = %d\n",
                    d_id, w_id);
            GetPermutation(cust, orders_per_district);
            for (o_id=0;o_id<orders_per_district;o_id++)
            {
                    // Generate ORDER and NEW-ORDER data
                    orders_buf[o_id].o_d_id = d_id;
                    orders_buf[o_id].o_w_id = w_id;
                    orders_buf[o_id].o_id = o_id+1;
                    orders_buf[o_id].o_c_id = cust[o_id+1];
                    orders_buf[o_id].o_ol_cnt =
(short)RandomNumber(5L, 15L);
                    if (o_id < first_new_order)
                    {
                            orders_buf[o_id].o_carrier_id =
(short)RandomNumber(1L, 10L);
                            orders_buf[o_id].o_all_local  = 1;
                    }
                    else
                    {
                            orders_buf[o_id].o_carrier_id = 0;
                            orders_buf[o_id].o_all_local  = 1;
                    }
                    for (ol=0; ol<orders_buf[o_id].o_ol_cnt; ol++)
                    {
                            orders_buf[o_id].o_ol[ol].ol = ol+1;
                            orders_buf[o_id].o_ol[ol].ol_i_id =
RandomNumber(1L, max_items);
            orders_buf[o_id].o_ol[ol].ol_supply_w_id = w_id;
                            orders_buf[o_id].o_ol[ol].ol_quantity = 5;
                            MakeAlphaString(24, 24,
OL_DIST_INFO_LEN, &orders_buf[o_id].o_ol[ol].ol_dist_info);
                            // Generate ORDER-LINE data
                            if (o_id < first_new_order)
                            {
            orders_buf[o_id].o_ol[ol].ol_amount = 0;
                                                    // Added to insure
ol_delivery_d set properly during load
                    FormatDate(&orders_buf[o_id].o_ol[ol].ol_delivery_d);
                            }
                            else
                            {
            orders_buf[o_id].o_ol[ol].ol_amount =
RandomNumber(1,999999)/100.0;
                                                    // Added to insure
ol_delivery_d set properly during load
                                                    // odbc datetime format
                    strcpy(orders_buf[o_id].o_ol[ol].ol_delivery_d,"1899-12-31
00:00:00.000");
                            }
                    }
            }
}
//============================================================
============
//
// Function   : LoadOrdersTable
//
//============================================================
============
void LoadOrdersTable(LOADER_TIME_STRUCT *orders_time_start)
```

```
{
        int     i;
  long  o_id;
        short   o_d_id;
        short   o_w_id;
  long  o_c_id;
  short o_carrier_id;
  short o_ol_cnt;
  short o_all_local;
        char                    o_entry_d[O_ENTRY_D_LEN+1];
        RETCODE                 rc;
        DBINT                   rcint;

        // bind ORDER data
  rc = bcp_bind(o_hdbc1, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

  rc = bcp_bind(o_hdbc1, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

  rc = bcp_bind(o_hdbc1, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

  rc = bcp_bind(o_hdbc1, (BYTE *) &o_c_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 4);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

        rc = bcp_bind(o_hdbc1, (BYTE *) &o_entry_d, 0,
O_ENTRY_D_LEN, NULL, 0, SQLCHARACTER, 5);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

  rc = bcp_bind(o_hdbc1, (BYTE *) &o_carrier_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 6);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

  rc = bcp_bind(o_hdbc1, (BYTE *) &o_ol_cnt, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT2, 7);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

  rc = bcp_bind(o_hdbc1, (BYTE *) &o_all_local, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 8);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

  for (i = 0; i < orders_per_district; i++)
  {
                o_id        = orders_buf[i].o_id;
                o_d_id      = orders_buf[i].o_d_id;
                o_w_id      = orders_buf[i].o_w_id;
                o_c_id      = orders_buf[i].o_c_id;
                o_carrier_id = orders_buf[i].o_carrier_id;
                o_ol_cnt    = orders_buf[i].o_ol_cnt;
                o_all_local  = orders_buf[i].o_all_local;

                FormatDate(&o_entry_d);

                // send data to server
                rc = bcp_sendrow(o_hdbc1);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);

                orders_rows_loaded++;
                CheckForCommit(o_hdbc1, o_hstmt1,
orders_rows_loaded, "orders", &orders_time_start->time_start);
  }

        // rcint = bcp_batch(o_hdbc1);
        // if (rcint < 0)
        //      HandleErrorDBC(o_hdbc1);

        if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
        {
                rcint = bcp_done(o_hdbc1);
                if (rcint < 0)
                        HandleErrorDBC(o_hdbc1);


                SQLFreeStmt(o_hstmt1, SQL_DROP);
                SQLDisconnect(o_hdbc1);
                SQLFreeConnect(o_hdbc1);

                // if build index after load...
                if ((aptr->build_index == 1) && (aptr->index_order ==
0))
                        BuildIndex("idxordcl");

                // build non-clustered index
                if (aptr->build_index == 1)
                        BuildIndex("idxordnc");
        }

}


//============================================================
============
//
// Function   : LoadNewOrderTable
//
//============================================================
============

void LoadNewOrderTable(LOADER_TIME_STRUCT *new_order_time_start)
{
  int       i;
  long      o_id;
  short     o_d_id;
  short     o_w_id;
        RETCODE                 rc;
        DBINT                   rcint;

        // Bind NEW-ORDER data

  rc = bcp_bind(o_hdbc2, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

  rc = bcp_bind(o_hdbc2, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

  rc = bcp_bind(o_hdbc2, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

        for (i = first_new_order; i < last_new_order; i++)
        {
                o_id    = orders_buf[i].o_id;
                o_d_id  = orders_buf[i].o_d_id;
                o_w_id  = orders_buf[i].o_w_id;

                rc = bcp_sendrow(o_hdbc2);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc2);


                new_order_rows_loaded++;

                CheckForCommit(o_hdbc2, o_hstmt2,
new_order_rows_loaded, "new_order", &new_order_time_start->time_start);
        }

        // rcint = bcp_batch(o_hdbc2);
        // if (rcint < 0)
        //      HandleErrorDBC(o_hdbc2);

        if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
        {
                rcint = bcp_done(o_hdbc2);
                if (rcint < 0)
                        HandleErrorDBC(o_hdbc2);


                SQLFreeStmt(o_hstmt2, SQL_DROP);
                SQLDisconnect(o_hdbc2);
                SQLFreeConnect(o_hdbc2);

                // if build index after load...
                if ((aptr->build_index == 1) && (aptr->index_order ==
0))
                        BuildIndex("idxnodcl");

        }

}


//============================================================
============
//
// Function   : LoadOrderLineTable
//
//============================================================
============

void LoadOrderLineTable(LOADER_TIME_STRUCT *order_line_time_start)
{
        int     i,j;
  long      o_id;
        short           o_d_id;
        short           o_w_id;
  long      ol;
        long            ol_i_id;
  short     ol_supply_w_id;
  short     ol_quantity;
  double    ol_amount;
  char      ol_dist_info[DIST_INFO_LEN+1];
        char
        ol_delivery_d[OL_DELIVERY_D_LEN+1];
        RETCODE                 rc;
        DBINT                   rcint;

        // bind ORDER-LINE data
  rc = bcp_bind(o_hdbc3, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc3);

  rc = bcp_bind(o_hdbc3, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc3);
```

```
    rc = bcp_bind(o_hdbc3, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 4);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_i_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 5);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_supply_w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 6);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc3);

                rc = bcp_bind(o_hdbc3, (BYTE *) &ol_delivery_d, 0,
OL_DELIVERY_D_LEN, NULL, 0, SQLCHARACTER, 7);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_quantity, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 8);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_amount, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 9);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) ol_dist_info, 0, DIST_INFO_LEN, NULL, 0, 0,
10);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc3);

                for (i = 0; i < orders_per_district; i++)
  {
                        o_id    = orders_buf[i].o_id;
                        o_d_id  = orders_buf[i].o_d_id;
                        o_w_id  = orders_buf[i].o_w_id;

                        for (j=0; j < orders_buf[i].o_ol_cnt; j++)
                        {
                                ol          = orders_buf[i].o_ol[j].ol;
                                ol_i_id     =
orders_buf[i].o_ol[j].ol_i_id;
                                ol_supply_w_id =
orders_buf[i].o_ol[j].ol_supply_w_id;
                                ol_quantity    =
orders_buf[i].o_ol[j].ol_quantity;
                                ol_amount      =
orders_buf[i].o_ol[j].ol_amount;

                strcpy(ol_delivery_d,orders_buf[i].o_ol[j].ol_delivery_d);


                strcpy(ol_dist_info,orders_buf[i].o_ol[j].ol_dist_info);

                                rc = bcp_sendrow(o_hdbc3);
                                if (rc != SUCCEED)


                HandleErrorDBC(o_hdbc3);

                                order_line_rows_loaded++;
                                CheckForCommit(o_hdbc3, o_hstmt3,
order_line_rows_loaded, "order_line", &order_line_time_start->time_start);
                        }

                }

                // rcint = bcp_batch(o_hdbc3);
                // if (rcint < 0)
                //      HandleErrorDBC(o_hdbc3);

                if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
                {
                        rcint = bcp_done(o_hdbc3);
                        if (rcint < 0)
                                HandleErrorDBC(o_hdbc3);


                        SQLFreeStmt(o_hstmt3, SQL_DROP);
                        SQLDisconnect(o_hdbc3);
                        SQLFreeConnect(o_hdbc3);

                        // if build index after load...
                        if ((aptr->build_index == 1) && (aptr->index_order ==
0))
                                BuildIndex("idxodlcl");

                }
}


//============================================================
============
//
// Function   : GetPermutation
//
//============================================================
============

void GetPermutation(int perm[], int n)
{
                int i, r, t;

                for (i=1;i<=n;i++)
                        perm[i] = i;

                for (i=1;i<=n;i++)
                {
                        r = RandomNumber(i,n);
                        t = perm[i];
                        perm[i] = perm[r];
                        perm[r] = t;
                }

}


//============================================================
============
//
// Function   : CheckForCommit
//
//============================================================
============

void CheckForCommit(HDBC hdbc,
                                                        HSTMT
hstmt,
                                                int rows_loaded,
                                                        char
*table_name,
                                                long *time_start)
{
    long        time_end, time_diff;
                // DBINT       rcint;

    if ( !(rows_loaded % aptr->batch) )
    {
                        // rcint = bcp_batch(hdbc);
                        // if (rcint < 0)
                        //      HandleErrorDBC(hdbc);

                        time_end = (TimeNow() / MILLI);
                        time_diff = time_end - *time_start;

                        printf("-> Loaded %ld rows into %s in %ld sec - Total
= %d (%.2f rps)\n",
                                aptr->batch,
                                table_name,
                                        time_diff,
                                rows_loaded,
                                        (float) aptr->batch /
(time_diff ? time_diff : 1L));

                        *time_start = time_end;
    }

    return;
}


//============================================================
============
//
// Function   : OpenConnections
//
//============================================================
============

void OpenConnections()
{

                RETCODE         rc;

                char                                    szDriverString[300];
                char                                    szDriverStringOut[1024];
                SQLSMALLINT                             cbDriverStringOut;


                SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE,
&henv );

                SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION,
(void*)SQL_OV_ODBC3, 0 );

                SQLAllocHandle(SQL_HANDLE_DBC, henv , &i_hdbc1);
                SQLAllocHandle(SQL_HANDLE_DBC, henv , &w_hdbc1);
                SQLAllocHandle(SQL_HANDLE_DBC, henv , &c_hdbc1);
                SQLAllocHandle(SQL_HANDLE_DBC, henv , &c_hdbc2);
                SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc1);
                SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc2);
                SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc3);

                SQLSetConnectAttr(i_hdbc1, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
                SQLSetConnectAttr(w_hdbc1, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
                SQLSetConnectAttr(c_hdbc1, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
                SQLSetConnectAttr(c_hdbc2, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
                SQLSetConnectAttr(o_hdbc1, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
```

```
		SQLSetConnectAttr(o_hdbc2, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
		SQLSetConnectAttr(o_hdbc3, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );

		// Open connections to SQL Server

		// Connection 1

		sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,

aptr->user,

aptr->password,

aptr->database );

		rc = SQLSetConnectOption (i_hdbc1, SQL_PACKET_SIZE, aptr-
>pack_size);
		if (rc != SUCCEED)
			HandleErrorDBC(i_hdbc1);

		rc = SQLDriverConnect ( i_hdbc1,
									NULL,

		(SQLCHAR*)&szDriverString[0] ,

		SQL_NTS,

		(SQLCHAR*)&szDriverStringOut[0],

		sizeof(szDriverStringOut),

		&cbDriverStringOut,

		SQL_DRIVER_NOPROMPT );
		if (rc != SUCCEED)
			HandleErrorDBC(i_hdbc1);

		// Connection 2

		sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,

aptr->user,

aptr->password,

aptr->database );

		rc = SQLSetConnectOption (w_hdbc1, SQL_PACKET_SIZE, aptr-
>pack_size);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = SQLDriverConnect ( w_hdbc1,

		NULL,

		(SQLCHAR*)&szDriverString[0] ,

		SQL_NTS,

		(SQLCHAR*)&szDriverStringOut[0],

		sizeof(szDriverStringOut),

		&cbDriverStringOut,

		SQL_DRIVER_NOPROMPT );
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		// Connection 3

		sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,

aptr->user,

aptr->password,

aptr->database );

		rc = SQLSetConnectOption (c_hdbc1, SQL_PACKET_SIZE, aptr-
>pack_size);
		if (rc != SUCCEED)
			HandleErrorDBC(c_hdbc1);

		rc = SQLDriverConnect ( c_hdbc1,

		NULL,

		(SQLCHAR*)&szDriverString[0] ,

		SQL_NTS,

		(SQLCHAR*)&szDriverStringOut[0],

		sizeof(szDriverStringOut),

		&cbDriverStringOut,

		SQL_DRIVER_NOPROMPT );
		if (rc != SUCCEED)
			HandleErrorDBC(c_hdbc1);

		// Connection 4

		sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,

aptr->user,

aptr->password,

aptr->database );

		rc = SQLSetConnectOption (c_hdbc2, SQL_PACKET_SIZE, aptr-
>pack_size);
		if (rc != SUCCEED)
			HandleErrorDBC(c_hdbc2);

		rc = SQLDriverConnect ( c_hdbc2,

		NULL,

		(SQLCHAR*)&szDriverString[0] ,

		SQL_NTS,

		(SQLCHAR*)&szDriverStringOut[0],

		sizeof(szDriverStringOut),

		&cbDriverStringOut,

		SQL_DRIVER_NOPROMPT );
		if (rc != SUCCEED)
			HandleErrorDBC(c_hdbc2);

		// Connection 5

		sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,

aptr->user,

aptr->password,

aptr->database );

		rc = SQLSetConnectOption (o_hdbc1, SQL_PACKET_SIZE, aptr-
>pack_size);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc1);

		rc = SQLDriverConnect ( o_hdbc1,

		NULL,

		(SQLCHAR*)&szDriverString[0] ,

		SQL_NTS,

		(SQLCHAR*)&szDriverStringOut[0],

		sizeof(szDriverStringOut),

		&cbDriverStringOut,

		SQL_DRIVER_NOPROMPT );
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc1);

		// Connection 6

		sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,

aptr->user,

aptr->password,

aptr->database );

		rc = SQLSetConnectOption (o_hdbc2, SQL_PACKET_SIZE, aptr-
>pack_size);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc2);

		rc = SQLDriverConnect ( o_hdbc2,

		NULL,

		(SQLCHAR*)&szDriverString[0] ,

		SQL_NTS,

		(SQLCHAR*)&szDriverStringOut[0],

		sizeof(szDriverStringOut),
```

```
		&cbDriverStringOut,

		SQL_DRIVER_NOPROMPT );
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc2);

		// Connection 7

		sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,

aptr->user,

aptr->password,

aptr->database );

		rc = SQLSetConnectOption (o_hdbc3, SQL_PACKET_SIZE, aptr-
>pack_size);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

		rc = SQLDriverConnect ( o_hdbc3,

		NULL,

		(SQLCHAR*)&szDriverString[0] ,

		SQL_NTS,

		(SQLCHAR*)&szDriverStringOut[0],

		sizeof(szDriverStringOut),

		&cbDriverStringOut,

		SQL_DRIVER_NOPROMPT );
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

}

//============================================================
============
//
// Function name: BuildIndex
//
//============================================================
============

void BuildIndex(char	*index_script)
{
	char	cmd[256];

	printf("Starting index creation:  %s\n",index_script);

	sprintf(cmd, "isql -S%s -U%s -P%s -e -i%s\\%s.sql > logs\\%s.log",
					aptr->server,
					aptr->user,
					aptr->password,
					aptr->index_script_path,
					index_script,
					index_script);

	system(cmd);

	printf("Finished index creation:  %s\n",index_script);
}

void HandleErrorDBC (SQLHDBC  hdbc1)
{

		SQLCHAR		SqlState[6],
Msg[SQL_MAX_MESSAGE_LENGTH];
		SQLINTEGER  NativeError;
		SQLSMALLINT i, MsgLen;
		SQLRETURN   rc2;
		char		timebuf[128];
		char		datebuf[128];
		FILE		*fp1;

		i = 1;
		while (( rc2 = SQLGetDiagRec(SQL_HANDLE_DBC , hdbc1, i,
SqlState , &NativeError,
					Msg, sizeof(Msg) ,
&MsgLen )) != SQL_NO_DATA )
		{

			sprintf( szLastError , "%s" ,  Msg );

			_strtime(timebuf);
			_strdate(datebuf);

			printf( "[%s : %s] %s\n" , datebuf, timebuf,
szLastError);

			fp1 = fopen("logs\\tpccldr.err","w");
			if (fp1 == NULL)
				printf("ERROR:  Unable to open errorlog
file.\n");
			else
			{
				fprintf(fp1, "[%s : %s] %s\n" , datebuf,
timebuf, szLastError);
				fclose(fp1);
			}

			i++;

		}
}

void HandleErrorSTMT (HSTMT  hstmt1)
{

		SQLCHAR		SqlState[6],
Msg[SQL_MAX_MESSAGE_LENGTH];
		SQLINTEGER  NativeError;
		SQLSMALLINT i, MsgLen;
		SQLRETURN   rc2;
		char		timebuf[128];
		char		datebuf[128];
		FILE		*fp1;

		i = 1;
		while (( rc2 = SQLGetDiagRec(SQL_HANDLE_STMT, hstmt1, i,
SqlState , &NativeError,
					Msg, sizeof(Msg) ,
&MsgLen )) != SQL_NO_DATA )
		{

			sprintf( szLastError , "%s" ,  Msg );

			_strtime(timebuf);
			_strdate(datebuf);

			printf( "[%s : %s] %s\n" , datebuf, timebuf,
szLastError);

			fp1 = fopen("logs\\tpccldr.err","w");
			if (fp1 == NULL)
				printf("ERROR:  Unable to open errorlog
file.\n");
			else
			{
				fprintf(fp1, "[%s : %s] %s\n" , datebuf,
timebuf, szLastError);
				fclose(fp1);
			}

			i++;

		}
}

void FormatDate ( char* szTimeCOutput )
{

		struct tm when;
		time_t now;

		time( &now );
		when  = *localtime( &now );

		mktime( &when );

		// odbc datetime format
		strftime( szTimeCOutput , 30 , "%Y-%m-%d %H:%M:%S.000",
&when );

		return;

}

//============================================================
============
//
// Function   : CheckDataBase
//
//============================================================
============

void CheckDataBase()
{

		RETCODE		rc;

		char				szDriverString[300];
		char				szDriverStringOut[1024];
		char				TablesBitMap[9] =
{"000000000"};
		int					i, ExitFlag;

		SQLSMALLINT			cbDriverStringOut;
		SQLCHAR				TabName[10];
		SQLINTEGER			TabNameInd, TabCount,
TabCountInd;


		ExitFlag = 0;

		SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE,
&henv );

		SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION,
(void*)SQL_OV_ODBC3, 0 );

		SQLAllocHandle(SQL_HANDLE_DBC, henv , &v_hdbc);

		SQLSetConnectAttr(v_hdbc, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
```

```
		// Open connection to SQL Server

		sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,

aptr->user,

aptr->password,

aptr->database );

		rc = SQLSetConnectAttr( v_hdbc, SQL_ATTR_PACKET_SIZE,
(SQLPOINTER)aptr->pack_size, SQL_IS_UINTEGER );
		if (rc != SQL_SUCCESS)
			HandleErrorDBC(v_hdbc);

		rc = SQLDriverConnect ( v_hdbc,
									NULL,

		(SQLCHAR*)&szDriverString[0] ,

		SQL_NTS,

		(SQLCHAR*)&szDriverStringOut[0],

		sizeof(szDriverStringOut),

		&cbDriverStringOut,

		SQL_DRIVER_NOPROMPT );

		// if the rc is SQL_ERROR, the the TPCC database probably does
not exist
		if (rc == SQL_ERROR)
		{
			printf("The database TPCC does not appear to
exist!\n");
			printf("'\nCheck LOGS\\ directory for database
creation errors.\n");

			// cleanup database connections and handles
			SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
			SQLDisconnect(v_hdbc);
			SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

			// since there is not a database, exit back to
SETUP.CMD
			exit(1);
		}

		if ( SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt) !=
SQL_SUCCESS )
			HandleErrorDBC(v_hdbc);

		if ( SQLBindCol(v_hstmt, 1, SQL_C_ULONG, &TabCount, 0,
&TabCountInd) != SQL_SUCCESS )
			HandleErrorSTMT(v_hstmt);

		// count the number of user tables from sysobjects
		rc = SQLExecDirect(v_hstmt, "select count(*) from sysobjects
where xtype = \'U\'", SQL_NTS);
		if ((rc != SQL_SUCCESS) && (rc !=
SQL_SUCCESS_WITH_INFO))
			HandleErrorSTMT(v_hstmt);

		if ( SQLFetch(v_hstmt) != SQL_SUCCESS )
			HandleErrorSTMT(v_hstmt);

		// if the number of tables is less than 9, select all the user tables in
TPCC
		if (TabCount != 9)
		{
			SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);

			SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc ,
&v_hstmt);

			if ( SQLBindCol(v_hstmt, 1, SQL_C_CHAR,
&TabName, sizeof(TabName), &TabNameInd) != SQL_SUCCESS )
				HandleErrorSTMT(v_hstmt);

			// select the list of user tables into a result set
			rc = SQLExecDirect(v_hstmt, "select * from
sysobjects where xtype = \'U\'", SQL_NTS);
			if ((rc != SQL_SUCCESS) && (rc !=
SQL_SUCCESS_WITH_INFO))
				HandleErrorSTMT(v_hstmt);

			// go through the result set and set the bitmap for
each found table
			// set the bitmap to '1' if the table name is found

			while ((rc = SQLFetch(v_hstmt)) != SQL_NO_DATA)
			{
				switch( TabName[0] )
				{
				case 'w':
					TablesBitMap[0] = '1';
					break;
				case 'd':
					TablesBitMap[1] = '1';
					break;
				case 'c':
					TablesBitMap[2] = '1';
					break;
				case 'h':
					TablesBitMap[3] = '1';
					break;
				case 'n':
					TablesBitMap[4] = '1';
					break;
				case 'o':
					if (TabName[5] = 's')
		TablesBitMap[5] = '1';
					if (TabName[5] = '_')
		TablesBitMap[6] = '1';
					break;
				case 'i':
					TablesBitMap[7] = '1';
					break;
				case 's':
					TablesBitMap[8] = '1';
					break;
				}
			}

			// a '0' ExitFlag means do NOT exit the loader early, a
'1' means exit the loader early
			ExitFlag = 0;

			// interate through the bitmap to display which
table(s) is actually missing
			for (i = 0; i <= 8; i++)
			{
				switch(i)
				{
				case 0:
					if (TablesBitMap[i] == '0')
					{
						printf("The
Warehouse table is missing or damaged.\n");
						ExitFlag = 1;
					}
					break;
				case 1:
					if (TablesBitMap[i] == '0')
					{
						printf("The
District table is missing or damaged.\n");
						ExitFlag = 1;
					}
					break;
				case 2:
					if (TablesBitMap[i] == '0')
					{
						printf("The
Customer table is missing or damaged.\n");
						ExitFlag = 1;
					}
					break;
				case 3:
					if (TablesBitMap[i] == '0')
					{
						printf("The
History table is missing or damaged.\n");
						ExitFlag = 1;
					}
					break;
				case 4:
					if (TablesBitMap[i] == '0')
					{
						printf("The
New_Order table is missing or damaged.\n");
						ExitFlag = 1;
					}
					break;
				case 5:
					if (TablesBitMap[i] == '0')
					{
						printf("The
Orders table is missing or damaged.\n");
						ExitFlag = 1;
					}
					break;
				case 6:
					if (TablesBitMap[i] == '0')
					{
						printf("The
Order_Line table is missing or damaged.\n");
						ExitFlag = 1;
					}
					break;
				case 7:
					if (TablesBitMap[i] == '0')
					{
						printf("The
Item table is missing or damaged.\n");
						ExitFlag = 1;
					}
					break;
				case 8:
					if (TablesBitMap[i] == '0')
					{
						printf("The
Stock table is missing or damaged.\n");
						ExitFlag = 1;
					}
					break;
				}
			}

			// if one or more tables are missing, display message
```

```
and exit the loader
                        if (ExitFlag = 1)
                        {
                                printf("\nExiting TPC-C Loader!\n");
                                printf("\nCheck LOGS\\ directory for
database\n");
                                printf("or table creation errors.\n");

                                // cleanup database connections and
handles
                                SQLFreeHandle(SQL_HANDLE_STMT,
v_hstmt);
                                SQLDisconnect(v_hdbc);
                                SQLFreeHandle(SQL_HANDLE_DBC,
v_hdbc);

                                exit(1);
                        }
        }

        // cleanup database connections and handles
        SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
        SQLDisconnect(v_hdbc);
        SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

        return;
}
```

Appendix C : Tunable Parameters

RTE input parameter

The following parameters were used with Microsoft BenchCraft RTE..

Profile: nectpcc4cl2520w
File Path: C:\benchcrf\nectpcc4cl2520w.pro
Version: 1.0.1

Number of Engines: 28

Name: DRIVER1
Description: r1-1
Directory: c:\11.out
Machine: cl01
Parameter Set: PARAM2
Index: 0
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER13218078
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER10
Description: r3-2
Directory: c:\32.out
Machine: cl03
Parameter Set: PARAM2
Index: 45000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER104635171
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER11
Description: r4-2
Directory: c:\42.out
Machine: cl04
Parameter Set: PARAM2
Index: 50000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER114658109
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER12
Description: r5-2
Directory: c:\52.out
Machine: cl05
Parameter Set: PARAM2
Index: 55000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER124712578
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER13
Description: r6-2
Directory: c:\62.out
Machine: cl06
Parameter Set: PARAM2
Index: 60000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER134742437
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER14
Description: r7-2
Directory: c:\72.out
Machine: cl07
Parameter Set: PARAM2
Index: 65000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER144762515
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER15
Description: r1-3
Directory: c:\13.out
Machine: cl01
Parameter Set: PARAM2
Index: 70000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER154787125
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER16
Description: r2-3
Directory: c:\23.out
Machine: cl02
Parameter Set: PARAM2
Index: 75000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER164817640
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER17
Description: r3-3
Directory: c:\33.out
Machine: cl03
Parameter Set: PARAM2
Index: 80000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER174850515
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER18
Description: r4-3
Directory: c:\43.out
Machine: cl04
Parameter Set: PARAM2
Index: 85000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER184875750
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER19
Description: r5-3
Directory: c:\53.out
Machine: cl05
Parameter Set: PARAM2
Index: 90000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER194902984
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER2
Description: r2-1
Directory: c:\21.out
Machine: cl02
Parameter Set: PARAM2
Index: 5000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER23286218
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER20
Description: r6-3

Directory: c:\63.out
Machine: cl06
Parameter Set: PARAM2
Index: 95000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER204928281
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER21
Description: r7-3
Directory: c:\73.out
Machine: cl07
Parameter Set: PARAM2
Index: 100000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER214962937
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER22
Description: r1-4
Directory: c:\14.out
Machine: cl01
Parameter Set: PARAM2
Index: 105000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER224988515
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER23
Description: r2-4
Directory: c:\24.out
Machine: cl02
Parameter Set: PARAM2
Index: 110000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER235015671
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER24
Description: r3-4
Directory: c:\34.out
Machine: cl03
Parameter Set: PARAM2
Index: 115000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER245045312
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER25
Description: r4-4
Directory: c:\44.out
Machine: cl04
Parameter Set: PARAM2
Index: 120000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER255093406
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER26
Description: r5-4
Directory: c:\54.out
Machine: cl05
Parameter Set: PARAM2
Index: 125000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER265125296
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER27
Description: r6-4
Directory: c:\64.out
Machine: cl06
Parameter Set: PARAM2
Index: 13000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER275143484
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER28
Description: r7-4
Directory: c:\74.out
Machine: cl07
Parameter Set: PARAM2
Index: 135000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER285162250
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER3
Description: r3-1
Directory: c:\31.out
Machine: cl03
Parameter Set: PARAM2
Index: 10000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER34372625
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER4
Description: r4-1
Directory: c:\41.out
Machine: cl04
Parameter Set: PARAM2
Index: 15000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER44404234
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER5
Description: r5-1
Directory: c:\51.out
Machine: cl05
Parameter Set: PARAM2
Index: 20000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER54436546
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER6
Description: r6-1
Directory: c:\61.out
Machine: cl06
Parameter Set: PARAM2
Index: 25000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER64498953
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER7
Description: r7-1
Directory: c:\71.out
Machine: cl07
Parameter Set: PARAM2
Index: 30000000

Seed: 32558
Configured Users: 900
Pipe Name: DRIVER74535546
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER8
Description: r1-2
Directory: c:\12.out
Machine: cl01
Parameter Set: PARAM2
Index: 35000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER84584265
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER9
Description: r2-2
Directory: c:\22.out
Machine: cl02
Parameter Set: PARAM2
Index: 40000000
Seed: 32558
Configured Users: 900
Pipe Name: DRIVER94609718
Connect Rate: 100
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Number of User groups: 28

Driver Engine: DRIVER1
IIS Server: acl01
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1 - 90
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER10
IIS Server: acl02
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 811 - 900
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER11
IIS Server: acl02
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 901 - 990
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER12
IIS Server: acl02
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 991 - 1080
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER13
IIS Server: acl02
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1081 - 1170
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER14
IIS Server: acl02
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1171 - 1260
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER15
IIS Server: acl03
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1261 - 1350
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER16
IIS Server: acl03
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1351 - 1440
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER17
IIS Server: acl03
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1441 - 1530
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER18
IIS Server: acl03
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1531 - 1620
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER19
IIS Server: acl03
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1621 - 1710
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER2
IIS Server: acl01
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 91 - 180
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER20
IIS Server: acl03
SQL Server: tpc02
User: sa

Protocol: Html
w_id Range: 1711 - 1800
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER21
IIS Server: acl03
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1801 - 1890
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER22
IIS Server: acl04
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1891 - 1980
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER23
IIS Server: acl04
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 1981 - 2070
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER24
IIS Server: acl04
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 2071 - 2160
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER25
IIS Server: acl04
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 2161 - 2250
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER26
IIS Server: acl04
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 2251 - 2340
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER27
IIS Server: acl04
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 2341 - 2430
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER28
IIS Server: acl04
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 2431 - 2520
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER3
IIS Server: acl01
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 181 - 270
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER4
IIS Server: acl01
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 271 - 360
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER5
IIS Server: acl01
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 361 - 450
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER6
IIS Server: acl01
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 451 - 540
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER7
IIS Server: acl01
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 541 - 630
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER8
IIS Server: acl02
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 631 - 720
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1
Scale Down: No

Driver Engine: DRIVER9
IIS Server: acl02
SQL Server: tpc02
User: sa
Protocol: Html
w_id Range: 721 - 810
w_id Max Warehouse: 2520
Scale: Normal
User Count: 900
District id: 1

Scale Down: No

Number of Parameter Sets: 2

PARAM2
TPCC1

		Txn Weight	Think Time	Key Time	RT Delay	RT Fence
Menu						
		New Order	44.88	12.05	18.01	
0.10	5.00	0.10				
		Payment	43.03	12.05	3.01	
0.10	5.00	0.10				
		Delivery	4.03	5.05	2.01	
0.10	5.00	0.10				
		Stock Level	4.03	5.05	2.01	
0.10	20.00	0.10				
		Order Status	4.03	10.05	2.01	
0.10	5.00	0.10				

~Default
Default Parameter Set

		Txn Weight	Think Time	Key Time	RT Delay	RT Fence
Menu						
		New Order	10.00	12.05	18.01	
0.10	5.00	0.10				
		Payment	10.00	12.05	3.01	
0.10	5.00	0.10				
		Delivery	1.00	5.05	2.01	
0.10	5.00	0.10				
		Stock Level	1.00	5.05	2.01	
0.10	20.00	0.10				
		Order Status	1.00	10.05	2.01	
0.10	5.00	0.10				

<Server Configuration>

Microsoft Windows 2000 Advanced Server Configuration Parameters

The following services were disabledor stopped in the Windows NT Control Panel/Service:

-Alerter
-Application Management
-Computer Browser
-Distributed File System
-DHCP Client
-DNS Client
-IIS Admin Service
-Intersite Messaging
-Kerberos Key Distribution Center
-License Logging Service
-Distributed Transaction Coordinator
-Microsoft Search
-Network DDE
-Network DDE DSDM
-Removable Storage
-IPSEC Policy Agent
-Remote Access Auto Connection Manager
-Remote Access Connection Manager
-Routing and Remote Access
-Remote Registry Service
-Task Scheduler
-Terminal Services Licensing
-Distributed Link Tracking Client
-World Wide Web Publishing Service
-Windows Time
-Utility Manager
-Uninterruptible Power Supply
-Distributed Link Tracking Server
-Telnet
-Terminal Services
-Telephony
-Performance Logs and Alerts
-Print Spooler
-Simple Mail Transport Protocol
-Internet Connection Sharing
-System Event Notification
-RunAs Service
-Smart Card Helper
-Smart Card
-Security Accounts Manager
-QoS RSVP
-File Replication
-Network Connections
-Net Logon
-Windows Installer
-Messenger
-TCP/IP NetBIOS Helper Service
-Server
-Fax Service
-COM+ Event System
-Indexing Service
-ClipBook

BOOT. INI

The /3gb switch was added to the boot. ini file to cause NT Enterprise Server to allow 3GB of user and 1GB of kernel virtual address space, rather than the usual 2GB of virtual address space.

The /PAE switch was added to the boot.ini fileto cause Windows 2000 to support more than 4GB of physical memory.

NT Registry

The Registry keys are modified as follows;

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\NDIS\Parameters]
"ProcessorAffinityMask"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\I/O System]
"CountOperations"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management]
"LargeSystemCache"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\PerfDisk]
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\PerfDisk\Performance]
"Open Timeout"=dword:00002710
"Collect Timeout"=dword:00001f40
"Disable Performance Counters"=dword:00000001

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\PerfOS]
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\PerfOS\Performance]
"Open Timeout"=dword:00002710
"Collect Timeout"=dword:00001f40
"Disable Performance Counters"=dword:00000001

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\PerfProc]
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\PerfProc\Performance]
"Open Timeout"=dword:00002710
"Collect Timeout"=dword:00001f40
"Disable Performance Counters"=dword:00000001

System Configuration Report

[system Infomation]

Item	Value
OS Name	Microsoft Windows 2000 Advanced Server
Version	5.0.2195 Build 2195
OS Manufacturer	Microsoft Corporation
System Name	TPC02
System Manufacturer	NEC
System Model	Express5800/140Hb
System Type	X86-based PC
Processor	x86 Family 6 Model 10 Stepping 0 GenuineIntel ~700 Mhz
Processor	x86 Family 6 Model 10 Stepping 0 GenuineIntel ~700 Mhz
Processor	x86 Family 6 Model 10 Stepping 0 GenuineIntel ~700 Mhz
Processor	x86 Family 6 Model 10 Stepping 0 GenuineIntel ~700 Mhz
BIOS Version	PhoenixBIOS 4.0 Release 6.0.0021
Windows Directory	C:\WINNT
System Directory	C:\WINNT\System32
Boot Device	\Device\Harddisk0\Partition1

Locale	United States
User Name	TPC02\Administrator
Total Physical Memory	7,863,592 KB
Available Physical Memory	7,679,792 KB
Total Virtual Memory	17,682,712 KB
Available Virtual Memory	17,443,264 KB
Page File Space	9,819,120 KB
Page File	C:\pagefile.sys

[Software Environment]
[Drivers]

Name	Description	File	Type	Started	Start Mode
	State	Status	Error Control	Accept Pause	
	Accept Stop				
aac	Adaptec Aac Driver	c:\winnt\system32\drivers\aac.sys			
	Kernel Driver	True	Boot	Running	OK
	Normal	False	True		
abiosdsk	Abiosdsk	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Ignore	False	False
abp480n5	abp480n5	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
acpi	ACPI	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
acpiec	ACPIEC	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
adpu160m	adpu160m	c:\winnt\system32\drivers\adpu160m.sys			
	Kernel Driver	True	Boot	Running	OK
	Normal	False	True		
afd	AFD Networking Support Environment				
	c:\winnt\system32\drivers\afd.sys		Kernel Driver	True	
	Auto	Running	OK	Normal	False
	True				
aha154x	Aha154x	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
aic116x	aic116x	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
aic78u2	aic78u2	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
aic78xx	aic78xx	c:\winnt\system32\drivers\aic78xx.sys			Kernel Driver
	True	Boot	Running	OK	Normal
	False	True			
ami0nt	ami0nt	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
amsint	amsint	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
asc	asc	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
asc3350p	asc3350p	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
asc3550	asc3550	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
asyncmac	RAS Asynchronous Media Driver				
	c:\winnt\system32\drivers\asyncmac.sys				Kernel Driver
	False	Manual	Stopped	OK	Normal
	False	False			
atapi	Standard IDE/ESDI Hard Disk Controller				
	c:\winnt\system32\drivers\atapi.sys		Kernel Driver	True	
	Boot	Running	OK	Normal	False
	True				
atdisk	Atdisk	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Ignore	False	False
atirage_	atirage_	c:\winnt\system32\drivers\atiragem.sys			Kernel Driver
	False	Manual	Stopped	OK	Ignore
	False	False			
atmarpc	ATM ARP Client Protocol	c:\winnt\system32\drivers\atmarpc.sys			
	Kernel Driver	False	Manual	Stopped	OK
	Normal	False	False		
audstub	Audio Stub Driver	c:\winnt\system32\drivers\audstub.sys			
	Kernel Driver	True	Manual	Running	OK
	Normal	False	True		
beep	Beep	c:\winnt\system32\drivers\beep.sys			Kernel Driver
	True	System	Running	OK	Normal
	False	True			
buslogic	BusLogic	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
cd20xrnt	cd20xrnt	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
cdaudio	Cdaudio	c:\winnt\system32\drivers\cdaudio.sys			Kernel Driver
	False	System	Stopped	OK	Ignore
	False	False			
cdfs	Cdfs	c:\winnt\system32\drivers\cdfs.sys			File System
Driver	True	Disabled	Running	OK	Normal
	False	True			
cdrom	CD-ROM Driver		c:\winnt\system32\drivers\cdrom.sys		
	Kernel Driver	True	System	Running	OK
	Normal	False	True		
changer	Changer	Not Available	Kernel Driver	False	System
	Stopped	OK	Ignore	False	False
cpqarray	Cpqarray	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
cpqarry2	cpqarry2	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
cpqfcalm	cpqfcalm	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
cpqfws2e	cpqfws2e	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
dac2w2k	dac2w2k	c:\winnt\system32\drivers\dac2w2k.sys			Kernel Driver
	True	Boot	Running	OK	Normal
	False	True			
dac960nt	dac960nt	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
deckzpsx	deckzpsx	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
dfsdriver	DfsDriver	c:\winnt\system32\drivers\dfs.sys			File System
Driver	True	Boot	Running	OK	Normal
	False	True			
disk	Disk Driver	c:\winnt\system32\drivers\disk.sys			Kernel Driver
	True	Boot	Running	OK	Normal
	False	True			
diskperf	Diskperf	c:\winnt\system32\drivers\diskperf.sys			Kernel Driver
	False	Disabled	Stopped	OK	Normal
	False	False			
dmboot	dmboot	c:\winnt\system32\drivers\dmboot.sys			Kernel Driver
	False	Disabled	Stopped	OK	Normal
	False	False			
dmio	Logical Disk Manager Driver				
	c:\winnt\system32\drivers\dmio.sys		Kernel Driver	True	
	Boot	Running	OK	Normal	False
	True				
dmload	dmload	c:\winnt\system32\drivers\dmload.sys			Kernel Driver
	True	Boot	Running	OK	Normal
	False	True			
e100b	Intel PRO Adapter Driver	c:\winnt\system32\drivers\e100bnt5.sys			
	Kernel Driver	True	Manual	Running	OK
	Normal	False	True		
efs	EFS	c:\winnt\system32\drivers\efs.sys			File System
Driver	True	Disabled	Running	OK	Normal
	False	True			
fastfat	Fastfat	c:\winnt\system32\drivers\fastfat.sys			File System
Driver	True	Disabled	Running	OK	Normal
	False	True			
fd16_700	Fd16_700	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
fdc	Floppy Disk Controller Driver				
	c:\winnt\system32\drivers\fdc.sys		Kernel Driver	True	
	Manual	Running	OK	Normal	False
	True				
fireport	fireport	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
flashpnt	flashpnt	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
flpydisk	Floppy Disk Driver	c:\winnt\system32\drivers\flpydisk.sys			
	Kernel Driver	True	Manual	Running	OK
	Normal	False	True		
ftdisk	Volume Manager Driver	c:\winnt\system32\drivers\ftdisk.sys			
	Kernel Driver	True	Boot	Running	OK
	Normal	False	True		
gamdrv	gamdrv	c:\winnt\system32\drivers\gamdrv.sys			Kernel Driver
	True	Dsabled	Stopped	OK	Normal
	False	True			
gpc	Generic Packet Classifier	c:\winnt\system32\drivers\msgpc.sys			
	Kernel Driver	True	Manual	Running	OK
	Normal	False	True		
i8042prt	i8042 Keyboard and PS/2 Mouse Port Driver				
	c:\winnt\system32\drivers\i8042prt.sys		Kernel Driver	True	
	System	Running	OK	Normal	False
	True				
ini910u	ini910u	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
intelide	Intellde	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
ipfilterdriver	IP Traffic Filter Driver	c:\winnt\system32\drivers\ipfltdrv.sys			
	Kernel Driver	False	Manual	Stopped	OK
	Normal	False	False		
ipinip	IP in IP Tunnel Driver	c:\winnt\system32\drivers\ipinip.sys			
	Kernel Driver	False	Manual	Stopped	OK
	Normal	False	False		
ipnat	IP Network Address Translator				
	c:\winnt\system32\drivers\ipnat.sys		Kernel Driver	False	
	Manual	Stopped	OK	Normal	False
	False				
ipsec	IPSEC driver	c:\winnt\system32\drivers\ipsec.sys			Kernel Driver
	False	Manual	Stopped	OK	Normal
	False	False			
ipsraidn	ipsraidn	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
isapnp	PnP ISA/EISA Bus Driver	c:\winnt\system32\drivers\isapnp.sys			
	Kernel Driver	True	Boot	Running	OK
	Critical	False	True		
kbdclass	Keyboard Class Driver	c:\winnt\system32\drivers\kbdclass.sys			
	Kernel Driver	True	System	Running	OK
	Normal	False	True		
ksecdd	KSecDD	c:\winnt\system32\drivers\ksecdd.sys			Kernel Driver
	True	Boot	Running	OK	Normal
	False	True			
lbrtfdc	lbrtfdc	Not Available	Kernel Driver	False	System
	Stopped	OK	Ignore	False	False
lp6nds35	lp6nds35	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
macdisk	macdisk	c:\winnt\system32\drivers\mac2w2k.sys			Kernel Driver
	True	Boot	Running	OK	Normal
	False	True			
mnmdd	mnmdd	c:\winnt\system32\drivers\mnmdd.sys			Kernel Driver
	True	System	Running	OK	Ignore
	False	True			
modem	Modem	c:\winnt\system32\drivers\modem.sys			Kernel Driver
	False	Manual	Stopped	OK	Ignore
	False	False			
mouclass	Mouse Class Driver	c:\winnt\system32\drivers\mouclass.sys			
	Kernel Driver	True	System	Running	OK
	Normal	False	True		
mountmgr	MountMgr	c:\winnt\system32\drivers\mountmgr.sys			
	Kernel Driver	True	Boot	Running	OK
	Normal	False	True		
mraid35x	mraid35x	Not Available	Kernel Driver	False	Disabled
	Stopped	OK	Normal	False	False
mrxsmb	MRXSMB	c:\winnt\system32\drivers\mrxsmb.sys			File System
Driver	True	System	Running	OK	Normal
	False	True			
msfs	Msfs	c:\winnt\system32\drivers\msfs.sys			File System
Driver	True	System	Running	OK	Normal
	False	True			

```
mskssrv   Microsoft Streaming Service Proxy
          c:\winnt\system32\drivers\mskssrv.sys  Kernel Driver  False
          Manual    Stopped   OK        Normal    False
          False
mspclock  Microsoft Streaming Clock Proxy
          c:\winnt\system32\drivers\mspclock.sys  Kernel Driver  False
          Manual    Stopped   OK        Normal    False
          False
mspqm     Microsoft Streaming Quality Manager Proxy
          c:\winnt\system32\drivers\mspqm.sys  Kernel Driver  False
          Manual    Stopped   OK        Normal    False
          False
mup       Mup       c:\winnt\system32\drivers\mup.sys  File System
Driver    True      Boot      Running   OK        Normal
          False     True
ncrc710   Ncrc710   Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
ndis      NDIS System Driver  c:\winnt\system32\drivers\ndis.sys
          Kernel Driver  True  Boot      Running   OK
          Normal    False     True
ndistapi  Remote Access NDIS TAPI Driver
          c:\winnt\system32\drivers\ndistapi.sys  Kernel Driver  True
          Manual    Running   OK        Normal    False
          True
ndiswan   Remote Access NDIS WAN Driver
          c:\winnt\system32\drivers\ndiswan.sys  Kernel Driver  True
          Manual    Running   OK        Normal    False
          True
ndproxy   NDIS Proxy  c:\winnt\system32\drivers\ndproxy.sys  Kernel Driver
          True      Manual    Running   OK        Normal
          False     True
netbios   NetBIOS Interface  c:\winnt\system32\drivers\netbios.sys
          File System Driver  True  System    Running
          OK        Normal    False     True
netbt     NetBios over Tcpip  c:\winnt\system32\drivers\netbt.sys
          Kernel Driver  True  System    Running   OK
          Normal    False     True
netdetect NetDetect  c:\winnt\system32\drivers\netdtect.sys  Kernel Driver
          False     Manual    Stopped   OK        Normal
          False     False
npfs      Npfs      c:\winnt\system32\drivers\npfs.sys  File System
Driver    True      System    Running   OK        Normal
          False     True
ntfs      Ntfs      c:\winnt\system32\drivers\ntfs.sys  File System
Driver    True      Disabled  Running   OK        Normal
          False     True
null      Null      c:\winnt\system32\drivers\null.sys  Kernel Driver
          True      System    Running   OK        Normal
          False     True
nwlnkflt  IPX Traffic Filter Driver  c:\winnt\system32\drivers\nwlnkflt.sys
          Kernel Driver  False  Manual    Stopped   OK
          Normal    False     False
nwlnkfwd  IPX Traffic Forwarder Driver
          c:\winnt\system32\drivers\nwlnkfwd.sys  Kernel Driver  False
          Manual    Stopped   OK        Normal    False
          False
parallel  Parallel class driver  c:\winnt\system32\drivers\parallel.sys
          Kernel Driver  True  Manual    Running   OK
          Normal    False     True
parport   Parallel port driver  c:\winnt\system32\drivers\parport.sys
          Kernel Driver  True  System    Running   OK
          Ignore    False     True
partmgr   PartMgr   c:\winnt\system32\drivers\partmgr.sys  Kernel Driver
          True      Boot      Running   OK        Normal
          False     True
parvdm    ParVdm    c:\winnt\system32\drivers\parvdm.sys  Kernel Driver
          True      Auto      Running   OK        Ignore
          False     True
pci       PCI Bus Driver  c:\winnt\system32\drivers\pci.sys
          Kernel Driver  True  Boot      Running   OK
          Critical  False     True
pcidump   PCIDump   Not Available  Kernel Driver  False  System
          Stopped   OK        Ignore    False     False
pciide    PCIIde    c:\winnt\system32\drivers\pciide.sys  Kernel Driver
          True      Boot      Running   OK        Normal
          False     True
pcmcia    Pcmcia    c:\winnt\system32\drivers\pcmcia.sys  Kernel Driver
          False     Disabled  Stopped   OK        Normal
          False     False
pdcomp    PDCOMP    Not Available  Kernel Driver  False  Manual
          Stopped   OK        Ignore    False     False
pdframe   PDFRAME   Not Available  Kernel Driver  False  Manual
          Stopped   OK        Ignore    False     False
pdreli    PDRELI    Not Available  Kernel Driver  False  Manual
          Stopped   OK        Ignore    False     False
pdrframe  PDRFRAME  Not Available  Kernel Driver  False  Manual
          Stopped   OK        Ignore    False     False
pptpminiport  WAN Miniport (PPTP)  c:\winnt\system32\drivers\raspptp.sys
          Kernel Driver  True  Manual    Running   OK
          Normal    False     True
ptilink   Direct Parallel Link Driver  c:\winnt\system32\drivers\ptilink.sys
          Kernel Driver  True  Manual    Running   OK
          Normal    False     True
ql1080    ql1080    Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
ql10wnt   Ql10wnt   Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
ql1240    ql1240    Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
ql2100    ql2100    Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
rasacd    Remote Access Auto Connection Driver
          c:\winnt\system32\drivers\rasacd.sys  Kernel Driver  True
          System    Running   OK        Normal    False
          True
rasl2tp   WAN Miniport (L2TP)  c:\winnt\system32\drivers\rasl2tp.sys
          Kernel Driver  True  Manual    Running   OK
          Normal    False     True
raspti    Direct Parallel  c:\winnt\system32\drivers\raspti.sys
          Kernel Driver  True  Manual    Running   OK
          Normal    False     True
rca       Microsoft Streaming Network Raw Channel Access
          c:\winnt\system32\drivers\rca.sys  Kernel Driver  False
          Manual    Stopped   OK        Normal    False
          False
rdbss     Rdbss     c:\winnt\system32\drivers\rdbss.sys  File System
Driver    True      System    Running   OK        Normal
          False     True
rdpwd     RDPWD     c:\winnt\system32\drivers\rdpwd.sys  Kernel Driver
          False     Manual    Stopped   OK        Ignore
          False     False
redbook   Digital CD Audio Playback Filter Driver
          c:\winnt\system32\drivers\redbook.sys  Kernel Driver  False
          System    Stopped   OK        Normal    False
          False
serenum   Serenum Filter Driver  c:\winnt\system32\drivers\serenum.sys
          Kernel Driver  True  Manual    Running   OK
          Normal    False     True
serial    Serial port driver  c:\winnt\system32\drivers\serial.sys
          Kernel Driver  True  System    Running   OK
          Ignore    False     True
sfloppy   Sfloppy   c:\winnt\system32\drivers\sfloppy.sys  Kernel Driver
          False     System    Stopped   OK        Ignore
          False     False
sglfb     sglfb     Not Available  Kernel Driver  False  System
          Stopped   OK        Normal    False     False
simbad    Simbad    Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
sparrow   Sparrow   Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
spud      Special Purpose Utility Driver
          c:\winnt\system32\drivers\spud.sys  Kernel Driver  False
          Manual    Stopped   OK        Normal    False
          False
srv       Srv       c:\winnt\system32\drivers\srv.sys  File System
Driver    False     Manual    Stopped   OK        Normal
          False     False
swenum    Software Bus Driver  c:\winnt\system32\drivers\swenum.sys
          Kernel Driver  True  Manual    Running   OK
          Normal    False     True
symc810   symc810   Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
symc8xx   symc8xx   Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
sym_hi    sym_hi    Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
tcpip     TCP/IP Protocol Driver  c:\winnt\system32\drivers\tcpip.sys
          Kernel Driver  True  System    Running   OK
          Normal    False     True
tdasync   TDASYNC   c:\winnt\system32\drivers\tdasync.sys  Kernel Driver
          False     Manual    Stopped   OK        Ignore
          False     False
tdipx     TDIPX     c:\winnt\system32\drivers\tdipx.sys  Kernel Driver
          False     Manual    Stopped   OK        Ignore
          False     False
tdnetb    TDNETB    c:\winnt\system32\drivers\tdnetb.sys  Kernel Driver
          False     Manual    Stopped   OK        Ignore
          False     False
tdpipe    TDPIPE    c:\winnt\system32\drivers\tdpipe.sys  Kernel Driver
          False     Manual    Stopped   OK        Ignore
          False     False
tdspx     TDSPX     c:\winnt\system32\drivers\tdspx.sys  Kernel Driver
          False     Manual    Stopped   OK        Ignore
          False     False
tdtcp     TDTCP     c:\winnt\system32\drivers\tdtcp.sys  Kernel Driver
          False     Manual    Stopped   OK        Ignore
          False     False
termdd    Terminal Device Driver  c:\winnt\system32\drivers\termdd.sys
          Kernel Driver  True  Auto      Running   OK
          Normal    False     True
tga       tga       Not Available  Kernel Driver  False  System
          Stopped   OK        Ignore    False     False
udfs      Udfs      c:\winnt\system32\drivers\udfs.sys  File System
Driver    False     Disabled  Stopped   OK        Normal
          False     False
ultra66   ultra66   Not Available  Kernel Driver  False  Disabled
          Stopped   OK        Normal    False     False
update    Microcode Update Driver  c:\winnt\system32\drivers\update.sys
          Kernel Driver  True  Manual    Running   OK
          Normal    False     True
vgasave   VgaSave   c:\winnt\system32\drivers\vga.sys  Kernel Driver
          True      System    Running   OK        Ignore
          False     True
wanarp    Remote Access IP ARP Driver
          c:\winnt\system32\drivers\wanarp.sys  Kernel Driver  True
          Manual    Running   OK        Normal    False
          True
wdica     WDICA     Not Available  Kernel Driver  False  Manual
          Stopped   OK        Ignore    False     False


[Environment Variables]
Variable    Value       User Name
ComSpec     %SystemRoot%\system32\cmd.exe  <SYSTEM>
NUMBER_OF_PROCESSORS  4  <SYSTEM>
OS          Windows_NT  <SYSTEM>
Os2LibPath  %SystemRoot%\system32\os2\dll;  <SYSTEM>
Path
            %SystemRoot%\system32;%SystemRoot%;%SystemRoot%Syste
m32\Wbem;C:\Program Files\Microsoft SQL
Server\MSSQL\BINN;c:\mksnt;C:\Program Files\Microsoft SQL
Server\80\Tools\BINN  <SYSTEM>
PATHEXT     .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH
            <SYSTEM>
```

```
PROCESSOR_ARCHITECTURE          x86             <SYSTEM>
PROCESSOR_IDENTIFIER            x86 Family 6 Model 10 Stepping 0,
GenuineIntel <SYSTEM>
PROCESSOR_LEVEL     6           <SYSTEM>
PROCESSOR_REVISION  0a00        <SYSTEM>
TEMP        %SystemRoot%\TEMP   <SYSTEM>
TMP         %SystemRoot%\TEMP   <SYSTEM>
windir      %SystemRoot%        <SYSTEM>
TEMP        %USERPROFILE%\Local Settings\Temp
            TPC02\Administrator
TMP         %USERPROFILE%\Local Settings\Temp
            TPC02\Administrator


[Network Connections]
Local Name  Remote Name             Type        Status      User Name
No network connections information


[Running Tasks]
Name        Path            Process ID  Priority    Min Working Set
            Max Working Set             Start Time  Version     Size
            File Date
system idle process         Not Available0          0           Not Available
            Not AvailableNot AvailableUnknown       Unknown     Unknown
system      Not Available8              8           0           1413120
            Not AvailableUnknown        Unknown     Unknown
smss.exe    c:\winnt\system32\smss.exe              164         11
            204800      1413120     6/6/2000 7:18:23 PM     5.00.2170.1
            44.27 KB (45,328 bytes)     12/7/1999 9:00:00 AM
csrss.exe   Not Available192           13          Not AvailableNot Available
            6/6/2000 7:18:31 PM         Unknown     Unknown     Unknown
winlogon.exe c:\winnt\system32\winlogon.exe         216         13
            204800      1413120     6/6/2000 7:18:32 PM     5.00.2182.1
            173.27 KB (177,424 bytes)       12/7/1999 9:00:00 AM
services.exe c:\winnt\system32\services.exe         244         9
            204800      1413120     6/6/2000 7:18:34 PM     5.00.2134.1
            86.77 KB (88,848 bytes)     12/7/1999 9:00:00 AM
lsass.exe   c:\winnt\system32\lsass.exe             256         13
            204800      1413120     6/6/2000 7:18:34 PM     5.00.2184.1
            32.77 KB (33,552 bytes)     12/7/1999 9:00:00 AM
svchost.exe c:\winnt\system32\svchost.exe           388         8
            204800      1413120     6/6/2000 7:18:37 PM     5.00.2134.1
            7.77 KB (7,952 bytes)       12/7/1999 9:00:00 AM
locator.exe c:\winnt\system32\locator.exe           424         8
            204800      1413120     6/6/2000 7:18:43 PM     5.00.2135.1
            70.77 KB (72,464 bytes)     12/7/1999 9:00:00 AM
svchost.exe c:\winnt\system32\svchost.exe           476         8
            204800      1413120     6/6/2000 7:18:51 PM     5.00.2134.1
            7.77 KB (7,952 bytes)       12/7/1999 9:00:00 AM
explorer.exe c:\winnt\explorer.exe      536         8           204800
            1413120     6/6/2000 7:20:05 PM     5.00.2920.0000
            232.77 KB (238,352 bytes)       12/7/1999 9:00:00 AM
sqlmangr.exe            c:\program files\common files\microsoft
shared\service manager\sqlmangr.exe 620         8           204800
            1413120     6/6/2000 7:20:07 PM     2000.080.0100.00
            60.00 KB (61,440 bytes)     5/9/2000 8:26:06 PM
cmd.exe     c:\winnt\system32\cmd.exe               556         8
            204800      1413120     6/6/2000 7:21:30 PM     5.00.2144.1
            230.77 KB (236,304 bytes)       12/7/1999 9:00:00 AM
cmd.exe     c:\winnt\system32\cmd.exe               744         8
            204800      1413120     6/6/2000 7:22:22 PM     5.00.2144.1
            230.77 KB (236,304 bytes)       12/7/1999 9:00:00 AM
mmc.exe     c:\winnt\system32\mmc.exe               652         8
            204800      1413120     6/6/2000 7:36:35 PM     5.00.2153.1
            589.27 KB (603,408 bytes)       12/7/1999 9:00:00 AM
winmgmt.exe             c:\winnt\system32\wbem\winmgmt.exe  748
            8           204800      1413120     6/6/2000 7:36:36 PM
            1.50.1085.0001          188.05 KB (192,567 bytes)
            12/7/1999 9:00:00 AM


[Loaded Modules]
Name        Version     Size        File Date   ManufacturerPath
provthrd.dll 1.50.1085.0000         68.07 KB (69,708 bytes) 2/16/2000
4:03:56 PM  Microsoft Corporation   c:\winnt\system32\wbem\provthrd.dll
ntevt.dll   1.50.1085.0000          192.06 KB (196,669 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wbem\ntevt.dll
psapi.dll   5.00.2134.1 28.27 KB (28,944 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\psapi.dll
framedyn.dll 1.50.1085.0000         164.05 KB (167,992 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll 1.50.1085.0000         1.03 MB (1,077,306 bytes)12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\wbem\cimwin32.dll
wbemess.dll 1.50.1085.0001          352.05 KB (360,503 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wbem\wbemess.dll
wbemcore.dll            1.50.1085.0001          632.05 KB (647,224 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wbem\wbemcore.dll
winmgmt.exe             1.50.1085.0001          188.05 KB (192,567 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wbem\winmgmt.exe
fastprox.dll 1.50.1085.0001         144.08 KB (147,534 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wbem\fastprox.dll
wbemsvc.dll 1.50.1085.0000          140.07 KB (143,430 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wbem\wbemsvc.dll
wbemcomn.dll            1.50.1085.0001          684.05 KB (700,472 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wbem\wbemcomn.dll
wbemprox.dll            1.50.1085.0001          40.05 KB (41,016 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wbem\wbemprox.dll
mlang.dll   5.00.2920.0000          510.77 KB (523,024 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\mlang.dll
cabinet.dll 5.00.2147.1 54.77 KB (56,080 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\cabinet.dll
msinfo32.dll 5.00.2177.1 312.27 KB (319,760 bytes)          2/16/2000
4:04:05 PM  Microsoft Corporation   c:\program files\common files\microsoft
shared\msinfo\msinfo32.dll
mmcndmgr.dll            5.00.2178.1 815.27 KB (834,832 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\mmcndmgr.dll
msvcp50.dll 5.00.7051   552.50 KB (565,760 bytes)           12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\msvcp50.dll
mfc42u.dll  6.00.8665.0 972.05 KB (995,384 bytes)           12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\mfc42u.dll
mmc.exe     5.00.2153.1 589.27 KB (603,408 bytes)           12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\mmc.exe
cmd.exe     5.00.2144.1 230.77 KB (236,304 bytes)           12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\cmd.exe
sqlmangr.rll 2000.080.0100.00       88.00 KB (90,112 bytes) 5/9/2000
8:26:06 PM  Microsoft Corporation   c:\program files\common files\microsoft
shared\service manager\resources\1033\sqlmangr.rll
resutils.dll 5.00.2191.1 39.77 KB (40,720 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\resutils.dll
clusapi.dll 5.00.2179.1 50.27 KB (51,472 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\clusapi.dll
odbcint.dll 3.520.5215.0 88.00 KB (90,112 bytes) 4/27/2000 10:04:11 AM
            Microsoft Corporation   c:\winnt\system32\odbcint.dll
comdlg32.dll 5.00.2920.0000         236.77 KB (242,448 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\comdlg32.dll
odbc32.dll  3.520.5215.0 216.27 KB (221,456 bytes)          4/27/2000
10:04:09 AM Microsoft Corporation   c:\winnt\system32\odbc32.dll
w95scm.dll  2000.080.0100.00        48.06 KB (49,216 bytes) 5/9/2000
8:26:06 PM  Microsoft Corporation   c:\program files\common files\microsoft
shared\service manager\w95scm.dll
sqlmangr.exe            2000.080.0100.00        60.00 KB (61,440 bytes)
            5/9/2000 8:26:06 PM     Microsoft Corporation   c:\program
files\common files\microsoft shared\service manager\sqlmangr.exe
faxshell.dll 5.00.2134.1 8.27 KB (8,464 bytes)  12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\faxshell.dll
msacm32.dll 5.00.2134.1 65.27 KB (66,832 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\msacm32.dll
avifil32.dll 5.00.2134.1 76.27 KB (78,096 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\avifil32.dll
msvfw32.dll 5.00.2134.1 113.77 KB (116,496 bytes)           12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\msvfw32.dll
docprop2.dll 5.00.2178.1 297.77 KB (304,912 bytes)          12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\docprop2.dll
wininet.dll 5.00.2920.0000          456.77 KB (467,728 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\wininet.dll
urlmon.dll  5.00.2920.0000          426.77 KB (437,008 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\urlmon.dll
browselc.dll 5.00.2920.0000         34.50 KB (35,328 bytes) 12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\browselc.dll
linkinfo.dll 5.00.2134.1 15.77 KB (16,144 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\linkinfo.dll
cfgmgr32.dll 5.00.2134.1 16.77 KB (17,168 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\cfgmgr32.dll
msi.dll     1.10.1029.0 1.71 MB (1,794,320 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\msi.dll
powrprof.dll 5.00.2920.0000         13.27 KB (13,584 bytes) 12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\powrprof.dll
batmeter.dll 5.00.2920.0000         20.27 KB (20,752 bytes) 12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\batmeter.dll
stobject.dll 5.00.2144.1 81.77 KB (83,728 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\stobject.dll
webcheck.dll5.00.2920.0000          251.77 KB (257,808 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\webcheck.dll
netui1.dll  5.00.2134.1 210.27 KB (215,312 bytes)           12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\netui1.dll
netui0.dll  5.00.2134.1 70.27 KB (71,952 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\netui0.dll
ntlanman.dll 5.00.2157.1 35.27 KB (36,112 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\ntlanman.dll
ntshrui.dll 5.00.2134.1 46.77 KB (47,888 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\ntshrui.dll
mydocs.dll  5.00.2920.0000          55.77 KB (57,104 bytes) 12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\mydocs.dll
browseui.dll 5.00.2920.0000         793.27 KB (812,304 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\system32\browseui.dll
shdocvw.dll 5.00.2920.0000          1.05 MB (1,104,144 bytes)12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\shdocvw.dll
explorer.exe 5.00.2920.0000         232.77 KB (238,352 bytes)
            12/7/1999 9:00:00 AM    Microsoft Corporation
            c:\winnt\explorer.exe
rasdlg.dll  5.00.2194.1 514.27 KB (526,608 bytes)           12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\rasdlg.dll
netcfgx.dll 5.00.2175.1 533.77 KB (546,576 bytes)           12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\netcfgx.dll
sens.dll    5.00.2163.1 36.77 KB (37,648 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\sens.dll
rasmans.dll 5.00.2188.1 146.77 KB (150,288 bytes)           12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\rasmans.dll
wmi.dll     5.00.2191.1 6.27 KB (6,416 bytes)   12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\wmi.dll
netshell.dll 5.00.2176.1 456.77 KB (467,728 bytes)          12/7/1999
9:00:00 AM  Microsoft Corporation   c:\winnt\system32\netshell.dll
netman.dll  5.00.2175.1 88.77 KB (90,896 bytes) 12/7/1999 9:00:00 AM
            Microsoft Corporation   c:\winnt\system32\netman.dll
txfaux.dll  1999.9.3422.24          341.27 KB (349,456 bytes)
            2/17/2000 12:57:53 AM   Microsoft Corporation
            c:\winnt\system32\txfaux.dll
```

```
es.dll          1999.9.3422.21          231.77 KB (237,328 bytes)
                12/7/1999 9:00:00 AM    Microsoft Corporation
                c:\winnt\system32\es.dll
locator.exe     5.00.2135.1  70.77 KB (72,464 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\locator.exe
rpcss.dll       5.00.2181.1  229.27 KB (234,768 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\rpcss.dll
svchost.exe     5.00.2134.1  7.77 KB (7,952 bytes)     12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\svchost.exe
scecli.dll      5.00.2191.1  105.27 KB (107,792 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\scecli.dll
atl.dll         3.00.8449    57.56 KB (58,938 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\atl.dll
certcli.dll     5.00.2175.1  132.27 KB (135,440 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\certcli.dll
ntdsatq.dll     5.00.2181.1  31.27 KB (32,016 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\ntdsatq.dll
ntdsa.dll       5.00.2195.1  993.27 KB (1,017,104 bytes)        12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\ntdsa.dll
kdcsvc.dll      5.00.2181.1  133.77 KB (136,976 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\kdcsvc.dll
sfmapi.dll      5.00.2134.1  38.77 KB (39,696 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\sfmapi.dll
rassfm.dll      5.00.2168.1  21.27 KB (21,776 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\rassfm.dll
mpr.dll         5.00.2146.1  53.27 KB (54,544 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\mpr.dll
schannel.dll    5.00.2170.1  139.77 KB (143,120 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\schannel.dll
netlogon.dll    5.00.2182.1  347.77 KB (356,112 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\netlogon.dll
kerberos.dll    5.00.2181.1  196.77 KB (201,488 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\kerberos.dll
msprivs.dll     5.00.2154.1  41.50 KB (42,496 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\msprivs.dll
samsrv.dll      5.00.2192.1  357.77 KB (366,352 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\samsrv.dll
lsasrv.dll      5.00.2184.1  487.77 KB (499,472 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\lsasrv.dll
lsass.exe       5.00.2184.1  32.77 KB (33,552 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\lsass.exe
esent.dll       6.0.3939.6   1.07 MB (1,120,016 bytes) 12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\esent.dll
wmicore.dll     5.00.2178.1  70.77 KB (72,464 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\wmicore.dll
psbase.dll      5.00.2146.1  111.77 KB (114,448 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\psbase.dll
cryptsvc.dll    5.00.2181.1  61.77 KB (63,248 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\cryptsvc.dll
cryptdll.dll    5.00.2135.1  41.27 KB (42,256 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\cryptdll.dll
wkssvc.dll      5.00.2181.1  95.27 KB (97,552 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\wkssvc.dll
eventlog.dll    5.00.2178.1  43.77 KB (44,816 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\eventlog.dll
ntdsapi.dll     5.00.2160.1  56.27 KB (57,616 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\ntdsapi.dll
scesrv.dll      5.00.2188.1  225.77 KB (231,184 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\scesrv.dll
umpnpmgr.dll    5.00.2182.1  86.27 KB (88,336 bytes)   12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\umpnpmgr.dll
services.exe    5.00.2134.1  86.77 KB (88,848 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\services.exe
msv1_0.dll      5.00.2164.1  94.77 KB (97,040 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\msv1_0.dll
cscui.dll       5.00.2172.1  227.27 KB (232,720 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\cscui.dll
sclgntfy.dll    5.00.2191.1  20.27 KB (20,752 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\sclgntfy.dll
cryptnet.dll    5.131.2157.1 41.77 KB (42,768 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\cryptnet.dll
rasadhlp.dll    5.00.2168.1  7.27 KB (7,440 bytes)     12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\rasadhlp.dll
wshnetbs.dll    5.00.2134.1  7.77 KB (7,952 bytes)     12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\wshnetbs.dll
winrnr.dll      5.00.2160.1  18.77 KB (19,216 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\winrnr.dll
clbcatq.dll     1999.9.3422.14          479.27 KB (490,768 bytes)
                2/17/2000 12:57:47 AM   Microsoft Corporation
                c:\winnt\system32\clbcatq.dll
dhcpcsvc.dll    5.00.2153.1  88.77 KB (90,896 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\dhcpcsvc.dll
tapi32.dll      5.00.2182.1  123.27 KB (126,224 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\tapi32.dll
rasman.dll      5.00.2188.1  54.77 KB (56,080 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\rasman.dll
rasapi32.dll    5.00.2188.1  189.77 KB (194,320 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\rasapi32.dll
rtutils.dll     5.00.2168.1  43.77 KB (44,816 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\rtutils.dll
adsldpc.dll     5.00.2172.1  127.77 KB (130,832 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\adsldpc.dll
activeds.dll    5.00.2172.1  172.77 KB (176,912 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\activeds.dll
oleaut32.dll    2.40.4512    600.27 KB (614,672 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\oleaut32.dll
mprapi.dll      5.00.2181.1  79.27 KB (81,168 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\mprapi.dll
icmp.dll        5.00.2134.1  7.27 KB (7,440 bytes)     12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\icmp.dll
iphlpapi.dll    5.00.2173.2  67.77 KB (69,392 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\iphlpapi.dll
rnr20.dll       5.00.2152.1  35.77 KB (36,624 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\rnr20.dll
wshtcpip.dll    5.00.2134.1  17.27 KB (17,680 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\wshtcpip.dll
msafd.dll       5.00.2153.1  54.27 KB (55,568 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\msafd.dll
mswsock.dll     5.00.2152.1  62.27 KB (63,760 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\mswsock.dll
winspool.drv    5.00.2167.1  109.77 KB (112,400 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\winspool.drv
winscard.dll    5.00.2134.1  77.27 KB (79,120 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\winscard.dll
wlnotify.dll    5.00.2164.1  53.27 KB (54,544 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\wlnotify.dll
lz32.dll        5.00.2134.1  9.77 KB (10,000 bytes)    12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\lz32.dll
version.dll     5.00.2134.1  15.77 KB (16,144 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\version.dll
cscdll.dll      5.00.2189.1  98.27 KB (100,624 bytes)  12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\cscdll.dll
rsabase.dll     5.00.2150.1  128.77 KB (131,856 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\rsabase.dll
mscat32.dll     5.131.2134.1 7.77 KB (7,952 bytes)     12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\mscat32.dll
ole32.dll       5.00.2181.1  966.27 KB (989,456 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\ole32.dll
imagehlp.dll    5.00.2195.1  125.27 KB (128,272 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\imagehlp.dll
msasn1.dll      5.00.2134.1  51.27 KB (52,496 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\msasn1.dll
crypt32.dll     5.131.2173.1 465.77 KB (476,944 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\crypt32.dll
wintrust.dll    5.131.2143.1 162.27 KB (166,160 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\wintrust.dll
setupapi.dll    5.00.2183.1  554.27 KB (567,568 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\setupapi.dll
winmm.dll       5.00.2161.1  184.77 KB (189,200 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\winmm.dll
comctl32.dll    5.81         540.27 KB (553,232 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\comctl32.dll
shlwapi.dll     5.00.2920.0000          282.77 KB (289,552 bytes)
                12/7/1999 9:00:00 AM    Microsoft Corporation
                c:\winnt\system32\shlwapi.dll
shell32.dll     5.00.2920.0000          2.24 MB (2,352,400 bytes) 12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\shell32.dll
msgina.dll      5.00.2191.1  309.77 KB (317,200 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\msgina.dll
winsta.dll      5.00.2134.1  36.27 KB (37,136 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\winsta.dll
wsock32.dll     5.00.2152.1  21.27 KB (21,776 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\wsock32.dll
dnsapi.dll      5.00.2181.1  129.77 KB (132,880 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\dnsapi.dll
wldap32.dll     5.00.2168.1  155.77 KB (159,504 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\wldap32.dll
ws2help.dll     5.00.2134.1  17.77 KB (18,192 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\ws2help.dll
ws2_32.dll      5.00.2134.1  69.77 KB (71,440 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\ws2_32.dll
samlib.dll      5.00.2160.1  46.27 KB (47,376 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\samlib.dll
netrap.dll      5.00.2134.1  11.27 KB (11,536 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\netrap.dll
netapi32.dll    5.00.2194.1  302.77 KB (310,032 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\netapi32.dll
profmap.dll     5.00.2181.1  29.27 KB (29,968 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\profmap.dll
secur32.dll     5.00.2154.1  46.77 KB (47,888 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\secur32.dll
sfc.dll         5.00.2164.1  84.27 KB (86,288 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\sfc.dll
nddeapi.dll     5.00.2137.1  15.27 KB (15,632 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\nddeapi.dll
userenv.dll     5.00.2185.1  361.27 KB (369,936 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\userenv.dll
user32.dll      5.00.2180.1  393.27 KB (402,704 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\user32.dll
gdi32.dll       5.00.2180.1  228.77 KB (234,256 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\gdi32.dll
rpcrt4.dll      5.00.2193.1  434.27 KB (444,688 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\rpcrt4.dll
advapi32.dll    5.00.2191.1  349.27 KB (357,648 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\advapi32.dll
kernel32.dll    5.00.2191.1  715.27 KB (732,432 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\kernel32.dll
msvcrt.dll      6.10.8637.0  288.09 KB (295,000 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\msvcrt.dll
winlogon.exe    5.00.2182.1  173.27 KB (177,424 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\winlogon.exe
sfcfiles.dll    5.00.2195.1  973.27 KB (996,624 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\sfcfiles.dll
ntdll.dll       5.00.2163.1  469.77 KB (481,040 bytes)          12/7/1999
9:00:00 AM      Microsoft Corporation   c:\winnt\system32\ntdll.dll
smss.exe        5.00.2170.1  44.27 KB (45,328 bytes)   12/7/1999 9:00:00 AM
                Microsoft Corporation   c:\winnt\system32\smss.exe

[Services]
Display Name                Name            State       Start Mode  Service Type
                Path                Error Control Start Name  Tag ID
Alerter         Alerter             Stopped     Disabled    Share Process
                c:\winnt\system32\services.exe              Normal      LocalSystem
                0
Application Management      AppMgmt         Stopped     Disabled    Share
Process         c:\winnt\system32\services.exe              Normal      LocalSystem
                0
Computer Browser            Browser         Stopped     Disabled    Share
Process         c:\winnt\system32\services.exe              Normal      LocalSystem
                0
Indexing Service            cisvc           Stopped     Manual      Share
Process         c:\winnt\system32\cisvc.exe                 Normal      LocalSystem
                0
```

```
ClipBook ClipSrv Stopped Manual Own Process
c:\winnt\system32\clipsrv.exe Normal LocalSystem
0
Distributed File System Dfs Stopped Disabled Own
Process c:\winnt\system32\dfssvc.exe Normal LocalSystem
0
DHCP Client Dhcp Stopped Disabled Share Process
c:\winnt\system32\services.exe Normal LocalSystem
0
Logical Disk Manager Administrative Service dmadmin Stopped
Manual Share Process
c:\winnt\system32\dmadmin.exe /com Normal LocalSystem
0
Logical Disk Manager dmserver Stopped Manual Share
Process c:\winnt\system32\services.exe Normal LocalSystem
0
DNS Client Dnscache Stopped Disabled Share Process
c:\winnt\system32\services.exe Normal LocalSystem
0
Event Log Eventlog Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem
0
COM+ Event System EventSystem Running Manual Share
Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Fax Service Fax Stopped Manual Own Process
c:\winnt\system32\faxsvc.exe Normal LocalSystem
0
IIS Admin Service IISADMIN Stopped Disabled Share
Process c:\winnt\system32\inetsrv\inetinfo.exe Normal LocalSystem
0
Intersite Messaging IsmServ Stopped Disabled Own
Process c:\winnt\system32\ismserv.exe Normal LocalSystem
0
Kerberos Key Distribution Center kdc Stopped Disabled
Share Process c:\winnt\system32\lsass.exe
Normal LocalSystem 0
Server lanmanserver Stopped Manual Share
Process c:\winnt\system32\services.exe Normal LocalSystem
0
Workstation lanmanworkstation Running Auto Share
Process c:\winnt\system32\services.exe Normal LocalSystem
0
License Logging Service LicenseService Stopped Disabled
Own Process c:\winnt\system32\llssrv.exe
Normal LocalSystem 0
TCP/IP NetBIOS Helper Service LmHosts Stopped Manual
Share Process c:\winnt\system32\services.exe
Normal LocalSystem 0
Messenger Messenger Stopped Manual Share Process
c:\winnt\system32\services.exe Normal LocalSystem
0
NetMeeting Remote Desktop Sharing mnmsrvc Stopped Manual
Own Process c:\winnt\system32\mnmsrvc.exe
Normal LocalSystem 0
Distributed Transaction Coordinator MSDTC Stopped Disabled
Own Process c:\winnt\system32\msdtc.exe
Normal LocalSystem 0
Windows Installer MSIServer Stopped Manual Share
Process c:\winnt\system32\msiexec.exe /v Normal LocalSystem
0
Microsoft Search MSSEARCH Stopped Disabled Share
Process "c:\program files\common
files\system\mssearch\bin\mssearch.exe" Normal LocalSystem
0
MSSQLSERVER MSSQLSERVER Stopped Manual
Own Process
c:\progra~1\micros~3\mssql\binn\sqlservr.exe Normal
LocalSystem 0
Network DDE NetDDE Stopped Disabled Share
Process c:\winnt\system32\netdde.exe Normal LocalSystem
0
Network DDE DSDM NetDDEdsdm Stopped Disabled
Share Process c:\winnt\system32\netdde.exe
Normal LocalSystem 0
Net Logon Netlogon Stopped Manual Share Process
c:\winnt\system32\lsass.exe Normal LocalSystem
0
Network Connections Netman Running Manual Share
Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
File Replication NtFrs Stopped Manual Own
Process c:\winnt\system32\ntfrs.exe Ignore LocalSystem
0
NT LM Security Support Provider NtLmSsp Stopped Manual
Share Process c:\winnt\system32\lsass.exe
Normal LocalSystem 0
Removable Storage NtmsSvc Stopped Disabled Share
Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Plug and Play PlugPlay Running Auto Share
Process c:\winnt\system32\services.exe Normal LocalSystem
0
IPSEC Policy Agent PolicyAgent Stopped Disabled Share
Process c:\winnt\system32\lsass.exe Normal LocalSystem
0
Protected Storage ProtectedStorage Running Auto
Share Process c:\winnt\system32\services.exe
Normal LocalSystem 0
Remote Access Auto Connection Manager RasAuto Stopped
Disabled Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Remote Access Connection Manager RasMan Stopped Disabled
Share Process c:\winnt\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Routing and Remote Access RemoteAccess Stopped
Disabled Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Remote Registry Service RemoteRegistry Stopped Disabled
Own Process c:\winnt\system32\regsvc.exe
Normal LocalSystem 0
Remote Procedure Call (RPC) Locator RpcLocator Running Auto
Own Process c:\winnt\system32\locator.exe
Normal LocalSystem 0
Remote Procedure Call (RPC) RpcSs Running Auto
Share Process c:\winnt\system32\svchost -k rpcss
Normal LocalSystem 0
QoS RSVP RSVP Stopped Manual Own Process
c:\winnt\system32\rsvp.exe -s Normal LocalSystem
0
Security Accounts Manager SamSs Stopped Manual
Share Process c:\winnt\system32\lsass.exe
Normal LocalSystem 0
Smart Card Helper SCardDrv Stopped Manual Share
Process c:\winnt\system32\scardsvr.exe Ignore LocalSystem
0
Smart Card SCardSvr Stopped Manual Share Process
c:\winnt\system32\scardsvr.exe Ignore LocalSystem
0
Task Scheduler Schedule Stopped Disabled Share
Process c:\winnt\system32\mstask.exe Normal LocalSystem
0
RunAs Service seclogon Stopped Manual Share
Process c:\winnt\system32\services.exe Ignore LocalSystem
0
System Event Notification SENS Stopped Manual Share
Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Internet Connection Sharing SharedAccess Stopped
Manual Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Simple Mail Transport Protocol (SMTP) SMTPSVC Stopped Manual
Share Process c:\winnt\system32\inetsrv\inetinfo.exe
Normal LocalSystem 0
Print Spooler Spooler Stopped Disabled Own Process
c:\winnt\system32\spoolsv.exe Normal LocalSystem
0
SQLSERVERAGENT SQLSERVERAGENT Stopped Manual
Own Process
c:\progra~1\micros~3\mssql\binn\sqlagent.exe Normal
LocalSystem 0
Performance Logs and Alerts SysmonLog Stopped Manual
Own Process c:\winnt\system32\smlogsvc.exe
Normal LocalSystem 0
Telephony TapiSrv Stopped Disabled Share Process
c:\winnt\system32\svchost.exe -k tapisrv Normal
LocalSystem 0
Terminal Services TermService Stopped Manual Own
Process c:\winnt\system32\termsrv.exe Normal LocalSystem
0
Terminal Services Licensing TermServLicensing Stopped
Disabled Own Process
c:\winnt\system32\lserver.exe Normal LocalSystem
0
Telnet TlntSvr Stopped Manual Own Process
c:\winnt\system32\tlntsvr.exe Normal LocalSystem
0
Distributed Link Tracking Server TrkSvr Stopped Manual
Share Process c:\winnt\system32\services.exe
Normal LocalSystem 0
Distributed Link Tracking Client TrkWks Stopped Disabled
Share Process c:\winnt\system32\services.exe
Normal LocalSystem 0
Uninterruptible Power Supply UPS Stopped Manual
Own Process c:\winnt\system32\ups.exe Normal
LocalSystem 0
Utility Manager UtilMan Stopped Manual Own
Process c:\winnt\system32\utilman.exe Normal LocalSystem
0
Windows Time W32Time Stopped Manual Share
Process c:\winnt\system32\services.exe Normal LocalSystem
0
World Wide Web Publishing Service W3SVC Stopped Manual
Share Process c:\winnt\system32\inetsrv\inetinfo.exe
Normal LocalSystem 0
Windows Management Instrumentation WinMgmt Running Manual
Own Process c:\winnt\system32\wbem\winmgmt.exe
Ignore LocalSystem 0
Windows Management Instrumentation Driver Extensions Wmi
Running Manual Share Process
c:\winnt\system32\services.exe Normal LocalSystem
0

[Program Groups]
Group Name Name User Name
Accessories Default User:Accessories Default User
Accessories\Accessibility Default User:Accessories\Accessibility Default User
Accessories\Entertainment Default User:Accessories\Entertainment
Default User
Accessories\System Tools Default User:Accessories\System Tools Default User
Startup Default User:Startup Default User
Accessories All Users:Accessories All Users
Accessories\Accessibility All Users:Accessories\Accessibility All Users
Accessories\Communications All Users:Accessories\Communications
All Users
Accessories\Communications\Fax All
Users:Accessories\Communications\Fax All Users
Accessories\Entertainment All Users:Accessories\Entertainment
All Users
Accessories\Games All Users:Accessories\Games All Users
Accessories\Microsoft Script Debugger All Users:Accessories\Microsoft Script
Debugger All Users
Accessories\System Tools All Users:Accessories\System Tools All Users
```

```
Administrative Tools        All Users:Administrative Tools              All Users
Microsoft SQL Server        All Users:Microsoft SQL Server              All Users
Microsoft SQL Server - Switch              All Users:Microsoft SQL Server - Switch
                All Users
Startup         All Users:Startup           All Users
Accessories  TPC02\Administrator:Accessories        TPC02\Administrator
Accessories\Accessibility  TPC02\Administrator:Accessories\Accessibility
                TPC02\Administrator
Accessories\Communications
                TPC02\Administrator:Accessories\Communications
                TPC02\Administrator
Accessories\Communications\HyperTerminal
                TPC02\Administrator:Accessories\Communications\HyperTerminal
                TPC02\Administrator
Accessories\Entertainment
                TPC02\Administrator:Accessories\Entertainment
                TPC02\Administrator
Accessories\System Tools TPC02\Administrator:Accessories\System Tools
                TPC02\Administrator
Administrative Tools        TPC02\Administrator:Administrative Tools
                TPC02\Administrator
Startup         TPC02\Administrator:Startup             TPC02\Administrator

[Startup Programs]
Program      Command    User Name   Location
Service Manager
                c:\progra~1\common~1\micros~1\servic~1\sqlmangr.exe  /n
                All Users      Common Startup
mdac_runonce                c:\winnt\system32\runonce.exe           All Users
                HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
```

<Client Configuration>

COM+ application Configuration

TPCC.ALLTxns properties

Activation:
  Enable object pooling
    Minimum pool size   42
    Maximum pool size   42
    Creation timeout[ms] 60000
  Enable object construction
  Enable Just In Time Activation

Concurrency:
  Concurrency Required

InetInfo Registry

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\Parameters]
"ListenBackLog"=dword:00001a90
"DispatchEntries"=hex(7):4c,00,44,00,41,00,50,00,53,00,56,00,43,00,00,00,53,00,\
  4d,00,54,00,50,00,53,00,56,00,43,00,00,00,00,00
"PoolThreadLimit"=dword:00000190
"ThreadTimeout"=dword:00015180
"DisableMemoryCache"=dword:00000001
"BandwidthLevel"=dword:ffffffff
"MemoryCacheSize"=dword:00000000
"ObjectCacheTTL"=dword:ffffffff

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\Performance]
"Library"="infoctrs.dll"
"Open"="OpenINFOPerformanceData"
"Close"="CloseINFOPerformanceData"
"Collect"="CollectINFOPerformanceData"
"Last Counter"=dword:00000842
"Last Help"=dword:00000843
"First Counter"=dword:00000802
"First Help"=dword:00000803
"WbemAdapStatus"=dword:00000000
"FileTime"=hex:f8,eb,d8,13,25,cb,bf,01
"FileSize"=dword:00002510
```

TPC-C application registry

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\TPCC]
"Path"="c:\\inetpub\\wwwroot\\"
"NumberOfDeliveryThreads"=dword:00000004
"MaxConnections"=dword:00001b58
"MaxPendingDeliveries"=dword:00000328
"DB_Protocol"="DBLIB"
"TxnMonitor"="COM"
"DbServer"="tpc02"
"DbName"="tpcc"
"DbUser"="sa"
"DbPassword"=""
"COM_SinglePool"="YES"
```

WWW Service Registry

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC]
"Type"=dword:00000020
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"ImagePath"=hex(2):43,00,3a,00,5c,00,57,00,49,00,4e,00,4e,00,54,00,5c,00,53,00,\

79,00,73,00,74,00,65,00,6d,00,33,00,32,00,5c,00,69,00,6e,00,65,00,74,00,73,\

00,72,00,76,00,5c,00,69,00,6e,00,65,00,74,00,69,00,6e,00,66,00,6f,00,2e,00,\
  65,00,78,00,65,00,00,00
"DisplayName"="World Wide Web Publishing Service"
"DependOnService"=hex(7):49,00,49,00,53,00,41,00,44,00,4d,00,49,00,4e,00,00,00,\
  00,00
"DependOnGroup"=hex(7):00,00
"ObjectName"="LocalSystem"
"Description"="Provides Web connectivity and administration through the Internet Information Services snap-in."

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\ASP]
"NOTE"="This is for backward compatibility only."

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\ASP\Parameters]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters]
"MajorVersion"=dword:00000005
"MinorVersion"=dword:00000000
"InstallPath"="C:\\WINNT\\System32\\inetsrv"
"CertMapList"="C:\\WINNT\\System32\\inetsrv\\iiscrmap.dll"
"AccessDeniedMessage"="Error: Access is Denied."
"Filter DLLs"=""
"LogFileDirectory"="C:\\WINNT\\System32\\LogFiles"
"AcceptExOutstanding"=dword:00001a2c

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch\AdvancedDataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch\RDSServer.DataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Script Map]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Virtual Roots]
"/"="c:\\inetpub\\wwwroot,,205"
"/Scripts"="c:\\inetpub\\scripts,,204"
"/IISAdmin"="C:\\WINNT\\System32\\inetsrv\\iisadmin,,201"
"/IISSamples"="c:\\inetpub\\iissamples,,201"
"/MSADC"="c:\\program files\\common files\\system\\msadc,,205"
"/IISHelp"="c:\\winnt\\help\\iishelp,,201"
"/_vti_bin"="C:\\Program Files\\Common Files\\Microsoft Shared\\Web Server Extensions\\40\\isapi,,205"
"/Printers"="C:\\WINNT\\web\\printers,,201"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Performance]
"Library"="w3ctrs.dll"
"Open"="OpenW3PerformanceData"
"Close"="CloseW3PerformanceData"
"Collect"="CollectW3PerformanceData"
"Last Counter"=dword:000008f2
"Last Help"=dword:000008f3
"First Counter"=dword:00000850
"First Help"=dword:00000851
"WbemAdapStatus"=dword:00000000
"FileTime"=hex:4e,67,be,16,25,cb,bf,01
"FileSize"=dword:00003d10

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00,00,00,00,00,01,
```

00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00,01,01,00,00,0
0,00,00,\

05,12,00,00,00,74,00,6f,00,00,00,1c,00,ff,01,0f,00,01,02,00,00,00,00,0
0,05,\

20,00,00,00,20,02,00,00,72,00,73,00,00,00,18,00,8d,01,02,00,01,01,0
0,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02,00,01,02,00,0
0,00,00,\

00,05,20,00,00,00,23,02,00,00,72,00,73,00,01,01,00,00,00,00,00,05,1
2,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3S
VC\Enum]
"0"="Root\\LEGACY_W3SVC\\0000"
"Count"=dword:00000001
"NextInstance"=dword:00000001

Microsoft Windows 2000 Server Configuration Parameters

[system Infomation]

Item	Value
OS Name	Microsoft Windows 2000 Server
Version	5.0.2128 Build 2128
OS Manufacturer	Microsoft Corporation
System Name	ACL01
System Manufacturer	NEC
System Model	Express5800/120Ld
System Type	X86-based PC
Processor	x86 Family 6 Model 8 Stepping 3 GenuineIntel ~866 Mhz
Processor	x86 Family 6 Model 8 Stepping 3 GenuineIntel ~866 Mhz
BIOS Version	PhoenixBIOS 4.0 Release 6.0.2538
Windows Directory	C:\WINNT
Locale	United States
Total Physical Memory	523,756 KB
Available Physical Memory	422,988 KB
Total Virtual Memory	1,802,076 KB
Available Virtual Memory	1,634,084 KB
Page File Space	1,278,320 KB

[Software Environment]

[Drivers]

Name	Description	Type	State	Status
abiosdsk	Abiosdsk	Kernel Driver	Stopped	OK
abp480n5	abp480n5	Kernel Driver	Stopped	OK
acpi	Microsoft ACPI Driver	Kernel Driver	Running	OK
acpiec	Microsoft Embedded Controller Driver		Kernel	Driver Running OK
adptsf	Adaptec DuraLAN PCI Ethernet/Fast Ethernet driver for Windows NT	Kernel Driver	Running	OK
adpu160m	adpu160m	Kernel Driver	Running	OK
afd	AFD Networking Support Environment		Kernel	Driver Running OK
aha154x	Aha154x	Kernel Driver	Stopped	OK
aic116x	aic116x	Kernel Driver	Stopped	OK
aic78u2	aic78u2	Kernel Driver	Stopped	OK
aic78xx	aic78xx	Kernel Driver	Stopped	OK
ami0nt	ami0nt	Kernel Driver	Stopped	OK
amsint	amsint	Kernel Driver	Stopped	OK
arp1394	1394 ARP Client Protocol	Kernel Driver	Stopped	OK
asc	asc	Kernel Driver	Stopped	OK
asc3350p	asc3350p	Kernel Driver	Stopped	OK
asc3550	asc3550	Kernel Driver	Stopped	OK
asyncmac	RAS Asynchronous Media Driver	Kernel Driver	Stopped	OK
atapi	Standard IDE/ESDI Hard Disk Controller		Kernel	Driver Running OK
atdisk	Atdisk	Kernel Driver	Stopped	OK
atirage	atirage	Kernel Driver	Running	OK
atmarpc	ATM ARP Client Protocol	Kernel Driver	Stopped	OK
audstub	Audio Stub Driver	Kernel Driver	Running	OK
beep	Beep	Kernel Driver	Running	OK
buslogic	BusLogic	Kernel Driver	Stopped	OK
cd20xrnt	cd20xrnt	Kernel Driver	Stopped	OK
cdaudio	Cdaudio	Kernel Driver	Stopped	OK
cdfs	Cdfs	File System Driver	Running	OK
cdrom	CD-ROM Driver	Kernel Driver	Running	OK
changer	Changer	Kernel Driver	Stopped	OK
cpqarray	Cpqarray	Kernel Driver	Stopped	OK
cpqfcalm	cpqfcalm	Kernel Driver	Stopped	OK
cpqfws2e	cpqfws2e	Kernel Driver	Stopped	OK
dac960nt	dac960nt	Kernel Driver	Stopped	OK
deckzpsx	deckzpsx	Kernel Driver	Stopped	OK
dfsdriver	DfsDriver	File System Driver	Running	OK
disk	Disk Driver	Kernel Driver	Running	OK
diskperf	Diskperf	Kernel Driver	Running	OK
dmboot	dmboot	Kernel Driver	Stopped	OK
dmio	Logical Disk Manager Driver	Kernel Driver	Running	OK
dmload	dmload	Kernel Driver	Running	OK
e100b	Intel PRO Adapter Driver	Kernel Driver	Running	OK
efs	EFS	File System Driver	Running	OK
fastfat	Fastfat	File System Driver	Running	OK
fd16_700	Fd16_700	Kernel Driver	Stopped	OK
fdc	Floppy Disk Controller Driver	Kernel Driver	Running	OK
fireport	fireport	Kernel Driver	Stopped	OK
flashpnt	flashpnt	Kernel Driver	Stopped	OK
flpydisk	Floppy Disk Driver	Kernel Driver	Running	OK
ftdisk	Volume Manager Driver	Kernel Driver	Running	OK
gpc	Generic Packet Classifier	Kernel Driver	Running	OK
i8042prt	i8042 Keyboard and PS/2 Mouse Port Driver		Kernel	Driver Running OK
ini910u	ini910u	Kernel Driver	Stopped	OK
intelide	Intelide	Kernel Driver	Stopped	OK
ipfilterdriver	IP Traffic Filter Driver	Kernel Driver	Stopped	OK
ipinip	IP in IP Tunnel Driver	Kernel Driver	Stopped	OK
ipnat	IP Network Address Translator	Kernel Driver	Stopped	OK
ipsec	IPSEC driver	Kernel Driver	Running	OK
ipsraidn	ipsraidn	Kernel Driver	Stopped	OK
isapnp	PnP ISA/EISA Bus Driver	Kernel Driver	Running	OK
kbdclass	Keyboard Class Driver	Kernel Driver	Running	OK
ksecdd	KSecDD	Kernel Driver	Running	OK
lbrtfdc	lbrtfdc	Kernel Driver	Stopped	OK
lp6nds35	lp6nds35	Kernel Driver	Stopped	OK
mnmdd	mnmdd	Kernel Driver	Running	OK
modem	Modem	Kernel Driver	Stopped	OK
mouclass	Mouse Class Driver	Kernel Driver	Running	OK
mountmgr	MountMgr	Kernel Driver	Running	OK
mraid35x	mraid35x	Kernel Driver	Stopped	OK
mrxsmb	MRXSMB	File System Driver	Running	OK
msfs	Msfs	File System Driver	Running	OK
mskssrv	Microsoft Streaming Service Proxy	Kernel Driver	Stopped	OK
mspclock	Microsoft Streaming Clock Proxy	Kernel Driver	Stopped	OK
mspqm	Microsoft Streaming Quality Manager Proxy		Kernel	Driver Stopped OK
mup	Mup	File System Driver	Running	OK
ncrc710	Ncrc710	Kernel Driver	Stopped	OK
ndis	NDIS System Driver	Kernel Driver	Running	OK
ndistapi	Remote Access NDIS TAPI Driver	Kernel Driver	Running	OK
ndiswan	Remote Access NDIS WAN Driver	Kernel Driver	Running	OK
ndproxy	NDIS Proxy	Kernel Driver	Running	OK
netbios	NetBIOS Interface	File System Driver	Running	OK
netbt	NetBios over Tcpip	Kernel Driver	Running	OK
netdetect	NetDetect	Kernel Driver	Stopped	OK
npfs	Npfs	File System Driver	Running	OK
ntfs	Ntfs	File System Driver	Running	OK
null	Null	Kernel Driver	Running	OK
nwlnkflt	IPX Traffic Filter Driver	Kernel Driver	Stopped	OK
nwlnkfwd	IPX Traffic Forwarder Driver	Kernel Driver	Stopped	OK
parallel	Parallel class driver	Kernel Driver	Running	OK
parport	Parallel port driver	Kernel Driver	Running	OK

```
partmgr PartMgr Kernel Driver Running OK
parvdm ParVdm Kernel Driver Running OK
pci PCI Bus Driver Kernel Driver Running
OK
pcidump PCIDump Kernel Driver Stopped OK
pciide PCIIde Kernel Driver Running OK
pcmcia Pcmcia Kernel Driver Stopped OK
pdcomp PDCOMP Kernel Driver Stopped OK
pdframe PDFRAME Kernel Driver Stopped OK
pdreli PDRELI Kernel Driver Stopped OK
pdrframe PDRFRAME Kernel Driver Stopped
OK
pptpminiport WAN Miniport (PPTP) Kernel Driver
Running OK
ptilink Direct Parallel Link Driver Kernel Driver
Running OK
ql1080 ql1080 Kernel Driver Stopped OK
ql10wnt Ql10wnt Kernel Driver Stopped OK
ql1240 ql1240 Kernel Driver Stopped OK
ql2100 ql2100 Kernel Driver Stopped OK
rasacd Remote Access Auto Connection Driver Kernel
Driver Running OK
rasl2tp WAN Miniport (L2TP) Kernel Driver Running
OK
raspti Direct Parallel Kernel Driver Running
OK
rca Microsoft Streaming Network Raw Channel Access
Kernel Driver Stopped OK
rdbss Rdbss File System Driver Running OK
rdpwd RDPWD Kernel Driver Stopped OK
redbook Digital CD Audio Playback Filter Driver Kernel
Driver Stopped OK
serenum Serenum Filter Driver Kernel Driver Running
OK
serial Serial port driver Kernel Driver Running
OK
sfloppy Sfloppy Kernel Driver Stopped OK
sglfb sglfb Kernel Driver Stopped OK
simbad Simbad Kernel Driver Stopped OK
sparrow Sparrow Kernel Driver Stopped OK
spud Special Purpose Utility Driver Kernel Driver
Running OK
srv Srv File System Driver Running OK
swenum Software Bus Driver Kernel Driver Running
OK
symc810 symc810 Kernel Driver Stopped OK
symc8xx symc8xx Kernel Driver Stopped OK
sym_hi sym_hi Kernel Driver Stopped OK
tcpip TCP/IP Protocol Driver Kernel Driver Running
OK
tdasync TDASYNC Kernel Driver Stopped OK
tdipx TDIPX Kernel Driver Stopped OK
tdnetb TDNETB Kernel Driver Stopped OK
tdpipe TDPIPE Kernel Driver Stopped OK
tdspx TDSPX Kernel Driver Stopped OK
tdtcp TDTCP Kernel Driver Stopped OK
termdd Terminal Device Driver Kernel Driver Stopped
OK
tga tga Kernel Driver Stopped OK
udfs Udfs File System Driver Stopped OK
ultra66 ultra66 Kernel Driver Stopped OK
update Microcode Update Driver Kernel Driver
Running OK
vgasave VgaSave Kernel Driver Running OK
wanarp Remote Access IP ARP Driver Kernel Driver
Running OK
wdica WDICA Kernel Driver Stopped OK
```

[Environment Variables]

```
Variable Value User Name
ComSpec %SystemRoot%\system32\cmd.exe <SYSTEM>
Os2LibPath %SystemRoot%\system32\os2\dll; <SYSTEM>
Path
%SystemRoot%\system32;%SystemRoot%;%SystemRoot
%\System32\Wbem;C:\Program Files\Microsoft SQL
Server\80\Tools\BINN <SYSTEM>
windir %SystemRoot% <SYSTEM>
OS Windows_NT <SYSTEM>
PROCESSOR_ARCHITECTURE x86 <SYSTEM>
PROCESSOR_LEVEL6 <SYSTEM>
PROCESSOR_IDENTIFIER x86 Family 6 Model 8 Stepping 3,
GenuineIntel <SYSTEM>
PROCESSOR_REVISION 0803 <SYSTEM>
NUMBER_OF_PROCESSORS 2 <SYSTEM>
PATHEXT .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH
<SYSTEM>
TEMP %SystemRoot%\TEMP <SYSTEM>
TMP %SystemRoot%\TEMP <SYSTEM>
TEMP %USERPROFILE%Local Settings\Temp
ACL01\Administrator
TMP %USERPROFILE%Local Settings\Temp
ACL01\Administrator
```

[Network Connections]

```
Local Name Remote Name Type Status
No network connections information
```

[Running Tasks]

```
Name Path Version Size File Date
system idle process Not Available Unknown Unknown
Unknown
system Not Available Unknown Unknown Unknown
smss.exe c:\winnt\system32\smss.exe 5.00.2090.1
42.77 KB (43,792 bytes) Not Available
csrss.exe Not Available Unknown Unknown Unknown
winlogon.exe c:\winnt\system32\winlogon.exe
5.00.2116.1 171.27 KB (175,376 bytes)
Not Available
services.exe c:\winnt\system32\services.exe
5.00.2106.1 87.27 KB (89,360 bytes)
Not Available
lsass.exe c:\winnt\system32\lsass.exe 5.00.2121.1
32.77 KB (33,552 bytes) Not Available
svchost.exe c:\winnt\system32\svchost.exe 5.00.2090.1
7.77 KB (7,952 bytes) Not Available
msdtc.exe c:\winnt\system32\msdtc.exe 1999.8.3413.3
6.77 KB (6,928 bytes) Not Available
svchost.exe c:\winnt\system32\svchost.exe 5.00.2090.1
7.77 KB (7,952 bytes) Not Available
llssrv.exe c:\winnt\system32\llssrv.exe 5.00.2090.1
113.77 KB (116,496 bytes) Not Available
regsvc.exe c:\winnt\system32\regsvc.exe 5.00.2091.1
63.77 KB (65,296 bytes) Not Available
mstask.exe c:\winnt\system32\mstask.exe 4.71.2113.1
114.77 KB (117,520 bytes) Not Available
inetinfo.exe c:\winnt\system32\inetsrv\inetinfo.exe 5.00.0984
14.27 KB (14,608 bytes) Not Available
explorer.exe c:\winnt\explorer.exe 5.00.2919.3800
232.77 KB (238,352 bytes) Not Available
dfssvc.exe c:\winnt\system32\dfssvc.exe 5.00.2124.1
95.77 KB (98,064 bytes) Not Available
dllhost.exe Not Available Unknown Unknown Unknown
svchost.exe c:\winnt\system32\svchost.exe 5.00.2090.1
7.77 KB (7,952 bytes) Not Available
cmd.exe c:\winnt\system32\cmd.exe 5.00.2100.1
230.77 KB (236,304 bytes) Not Available
notepad.exe c:\winnt\system32\notepad.exe
5.00.2103.1 49.77 KB (50,960 bytes)
Not Available
mmc.exe c:\winnt\system32\mmc.exe 5.00.2115.1
589.27 KB (603,408 bytes) Not Available
winmgmt.exe c:\winnt\system32\wbem\winmgmt.exe
1.50.1025.0015 164.05 KB (167,991 bytes)
Not Available
```

[Loaded Modules]

```
Name Version Size File Date Manufacturer
Path
provthrd.dll 1.50.1025.0001 68.08 KB (69,713 bytes)
5/31/2000 5:29:26 PM Microsoft Corporation
c:\winnt\system32\wbem\provthrd.dll
ntevt.dll 1.50.1025.0002 176.06 KB (180,290 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wbem\ntevt.dll
perfos.dll 5.0 21.27 KB (21,776 bytes) 9/10/1999
9:00:00 AMMicrosoft Corporation c:\winnt\system32\perfos.dll
psapi.dll 5.00.2090.1 28.27 KB (28,944 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\psapi.dll
framedyn.dll 1.50.1025.0002 164.05 KB (167,988
bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll 1.50.1025.0016 1.02 MB (1,065,018
bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wbem\cimwin32.dll
wbemess.dll 1.50.1025.0009 324.05 KB (331,827
bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wbem\wbemess.dll
wbemcore.dll 1.50.1025.0012 592.05 KB (606,260
bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wbem\wbemcore.dll
winmgmt.exe 1.50.1025.0015 164.05 KB (167,991
bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wbem\winmgmt.exe
fastprox.dll 1.50.1025.0009 144.08 KB (147,536 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wbem\fastprox.dll
wbemsvc.dll 1.50.1025.0009 136.07 KB (139,339
```

bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\wbem\wbemsvc.dll
wbemcomn.dll 1.50.1025.0009 688.05 KB (704,564 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\wbem\wbemcomn.dll
wbemprox.dll 1.50.1025.0009 40.05 KB (41,012 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\wbem\wbemprox.dll
mlang.dll 5.00.2919.3800 509.77 KB (522,000 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mlang.dll
cabinet.dll 5.00.2090.1 54.77 KB (56,080 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\cabinet.dll
msinfo32.dll 5.00.2121.1 306.27 KB (313,616 bytes) 5/31/2000 5:29:34 PM Microsoft Corporation c:\program files\common files\microsoft shared\msinfo\msinfo32.dll
mmcndmgr.dll 5.00.2108.1 815.27 KB (834,832 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mmcndmgr.dll
mmc.exe 5.00.2115.1 589.27 KB (603,408 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mmc.exe
notepad.exe 5.00.2103.1 49.77 KB (50,960 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\notepad.exe
cmd.exe 5.00.2100.1 230.77 KB (236,304 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\cmd.exe
tapisrv.dll 5.00.2114.1 170.77 KB (174,864 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\tapisrv.dll
dfssvc.exe 5.00.2124.1 95.77 KB (98,064 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\dfssvc.exe
netplwiz.dll 5.00.2116.1 167.27 KB (171,280 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\netplwiz.dll
netmsg.dll 5.00.2090.1 152.50 KB (156,160 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\netmsg.dll
netui2.dll 5.00.2107.1 280.27 KB (286,992 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\netui2.dll
mprui.dll 5.00.2090.1 54.77 KB (56,080 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mprui.dll
hhsetup.dll 4.74.8576 66.27 KB (67,856 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\hhsetup.dll
mmcshext.dll 5.00.2108.1 24.27 KB (24,848 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mmcshext.dll
shdoclc.dll 5.00.2919.3800 324.50 KB (332,288 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\shdoclc.dll
netui1.dll 5.00.2107.1 209.77 KB (214,800 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\netui1.dll
netui0.dll 5.00.2107.1 70.27 KB (71,952 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\netui0.dll
ntlanman.dll 5.00.2109.1 35.27 KB (36,112 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\ntlanman.dll
urlmon.dll 5.00.2919.3800 426.77 KB (437,008 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\urlmon.dll
faxshell.dll 5.00.2101.1 8.27 KB (8,464 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\faxshell.dll
msacm32.dll 5.00.2113.1 65.27 KB (66,832 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\msacm32.dll
avifil32.dll 5.00.2113.1 76.27 KB (78,096 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\avifil32.dll
msvfw32.dll 5.00.2113.1 113.77 KB (116,496 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\msvfw32.dll
docprop2.dll 5.00.2115.1 297.77 KB (304,912 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\docprop2.dll
browselc.dll 5.00.2919.3800 34.50 KB (35,328 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\browselc.dll
wininet.dll 5.00.2919.3800 456.77 KB (467,728 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\wininet.dll
linkinfo.dll 5.00.2091.1 15.77 KB (16,144 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\linkinfo.dll
powrprof.dll 5.00.2919.3800 13.27 KB (13,584 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\powrprof.dll
batmeter.dll 5.00.2919.3800 20.27 KB (20,752 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\batmeter.dll
stobject.dll 5.00.2120.1 81.27 KB (83,216 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\stobject.dll
webcheck.dll 5.00.2919.3800 251.77 KB (257,808 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\webcheck.dll
ntshrui.dll 5.00.2090.1 46.77 KB (47,888 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\ntshrui.dll
mydocs.dll 5.00.2919.3800 55.77 KB (57,104 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mydocs.dll
browseui.dll 5.00.2919.3800 791.77 KB (810,768 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\browseui.dll
shdocvw.dll 5.00.2919.3800 1.05 MB (1,103,632 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\shdocvw.dll
explorer.exe 5.00.2919.3800 232.77 KB (238,352 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\explorer.exe
dbghelp.dll 5.00.2128.1 77.27 KB (79,120 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\dbghelp.dll
tpcc_com_ps.dll Not Available 24.00 KB (24,576 bytes) 5/31/2000 6:57:36 PM Not Available c:\inetpub\wwwroot\tpcc_com_ps.dll
tpcc_com_all.dll 1, 0, 0, 1 80.00 KB (81,920 bytes) 5/31/2000 6:57:36 PM c:\inetpub\wwwroot\tpcc_com_all.dll
dbmssocn.dll 1999.05.27 28.27 KB (28,944 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\dbmssocn.dll
ntwdblib.dll 2000.080.0100.00 268.06 KB (274,489 bytes) 5/31/2000 6:38:53 PM Microsoft Corporation c:\winnt\system32\ntwdblib.dll
tpcc_dblib.dll Not Available 28.00 KB (28,672 bytes) 5/31/2000 6:57:35 PM Not Available c:\inetpub\wwwroot\tpcc_dblib.dll
mfc42.dll 6.00.8576.0 972.05 KB (995,383 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mfc42.dll
wam.dll 5.00.0984 69.77 KB (71,440 bytes) 6/1/2000 2:24:37 AM Microsoft Corporation c:\winnt\system32\inetsrv\wam.dll
odbcint.dll 3.520.5215.0 88.00 KB (90,112 bytes) 5/31/2000 6:38:21 PM Microsoft Corporation c:\winnt\system32\odbcint.dll
comdlg32.dll 5.00.2919.3800 235.27 KB (240,912 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\comdlg32.dll
odbc32.dll 3.520.5215.0 216.27 KB (221,456 bytes) 5/31/2000 6:38:20 PM Microsoft Corporation c:\winnt\system32\odbc32.dll
comsvcs.dll 1999.8.3413.5 1.17 MB (1,224,976 bytes) 6/1/2000 2:23:45 AM Microsoft Corporation c:\winnt\system32\comsvcs.dll
iislog.dll 5.00.0984 75.77 KB (77,584 bytes) 6/1/2000 2:24:30 AM Microsoft Corporation c:\winnt\system32\inetsrv\iislog.dll
wshnetbs.dll 5.00.2090.1 7.77 KB (7,952 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\wshnetbs.dll
inetsloc.dll 5.00.0984 20.27 KB (20,752 bytes) 6/1/2000 2:24:32 AM Microsoft Corporation c:\winnt\system32\inetsloc.dll
isatq.dll 5.00.0984 60.27 KB (61,712 bytes) 6/1/2000 2:24:32 AM Microsoft Corporation c:\winnt\system32\inetsrv\isatq.dll
security.dll 5.00.2112.1 5.77 KB (5,904 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\security.dll
svcext.dll 5.00.0984 39.27 KB (40,208 bytes) 6/1/2000 2:24:31 AM Microsoft Corporation c:\winnt\system32\inetsrv\svcext.dll
admexs.dll 5.00.0984 27.77 KB (28,432 bytes) 6/1/2000 2:24:29 AM Microsoft Corporation c:\winnt\system32\inetsrv\admexs.dll
wamreg.dll 5.00.0984 44.77 KB (45,840 bytes) 6/1/2000 2:24:37 AM Microsoft Corporation c:\winnt\system32\inetsrv\wamreg.dll
metadata.dll 5.00.0984 68.27 KB (69,904 bytes) 6/1/2000 2:24:31 AM Microsoft Corporation c:\winnt\system32\inetsrv\metadata.dll
iismap.dll 5.00.0984 56.27 KB (57,616 bytes) 6/1/2000 2:24:32 AM Microsoft Corporation c:\winnt\system32\iismap.dll
nsepm.dll 5.00.0984 43.27 KB (44,304 bytes) 6/1/2000 2:24:31 AM Microsoft Corporation c:\winnt\system32\inetsrv\nsepm.dll
admwprox.dll 5.00.0984 31.27 KB (32,016 bytes) 6/1/2000 2:24:31 AM Microsoft Corporation c:\winnt\system32\admwprox.dll
coadmin.dll 5.00.0984 39.27 KB (40,208 bytes) 6/1/2000 2:24:32 AM Microsoft Corporation c:\winnt\system32\inetsrv\coadmin.dll
iisadmin.dll 5.00.0984 14.77 KB (15,120 bytes) 6/1/2000 2:24:30 AM Microsoft Corporation

c:\winnt\system32\inetsrv\iisadmin.dll
rpcref.dll 5.00.0984 4.27 KB (4,368 bytes) 6/1/2000 2:24:31 AM Microsoft Corporation c:\winnt\system32\inetsrv\rpcref.dll
iisrtl.dll 5.00.0984 119.27 KB (122,128 bytes) 6/1/2000 2:24:31 AM Microsoft Corporation c:\winnt\system32\iisrtl.dll
inetinfo.exe 5.00.0984 14.27 KB (14,608 bytes) 6/1/2000 2:24:30 AM Microsoft Corporation c:\winnt\system32\inetsrv\inetinfo.exe
msidle.dll 5.00.2919.3800 6.27 KB (6,416 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\msidle.dll
mstask.exe 4.71.2113.1 114.77 KB (117,520 bytes) 5/31/2000 5:29:26 PM Microsoft Corporation c:\winnt\system32\mstask.exe
regsvc.exe 5.00.2091.1 63.77 KB (65,296 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\regsvc.exe
llsrpc.dll 5.00.2107.1 45.77 KB (46,864 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\llsrpc.dll
llssrv.exe 5.00.2090.1 113.77 KB (116,496 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\llssrv.exe
rasdlg.dll 5.00.2120.1 512.77 KB (525,072 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\rasdlg.dll
netcfgx.dll 5.00.2120.1 532.27 KB (545,040 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\netcfgx.dll
rasmans.dll 5.00.2119.1 150.27 KB (153,872 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\rasmans.dll
wmi.dll 5.00.2112.1 6.27 KB (6,416 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\wmi.dll
netshell.dll 5.00.2120.1 453.77 KB (464,656 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\netshell.dll
netman.dll 5.00.2120.1 88.77 KB (90,896 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\netman.dll
ntmsdba.dll 5.00.2108.1 167.27 KB (171,280 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\ntmsdba.dll
sens.dll 5.00.2090.1 35.77 KB (36,624 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\sens.dll
ntmssvc.dll 5.00.2108.1 390.27 KB (399,632 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\ntmssvc.dll
es.dll 1999.8.3413.3 220.77 KB (226,064 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\es.dll
mtxoci.dll 1999.8.3413.3 101.77 KB (104,208 bytes) 6/1/2000 2:23:52 AM Microsoft Corporation c:\winnt\system32\mtxoci.dll
resutils.dll 5.00.2123.1 39.77 KB (40,720 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\resutils.dll
clusapi.dll 5.00.2123.1 49.27 KB (50,448 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\clusapi.dll
msvcp50.dll 5.00.7051 552.50 KB (565,760 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\msvcp50.dll
xolehlp.dll 1999.8.3413.3 18.27 KB (18,704 bytes) 6/1/2000 2:23:51 AM Microsoft Corporation c:\winnt\system32\xolehlp.dll
msdtclog.dll 1999.8.3413.3 85.27 KB (87,312 bytes) 6/1/2000 2:23:51 AM Microsoft Corporation c:\winnt\system32\msdtclog.dll
mtxclu.dll 1999.8.3413.3 50.77 KB (51,984 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mtxclu.dll
msdtcprx.dll 1999.8.3413.7 625.77 KB (640,784 bytes) 6/1/2000 2:23:52 AM Microsoft Corporation c:\winnt\system32\msdtcprx.dll
txfaux.dll 1999.8.3413.7 370.77 KB (379,664 bytes) 6/1/2000 2:23:51 AM Microsoft Corporation c:\winnt\system32\txfaux.dll
msdtctm.dll 1999.8.3413.7 1.07 MB (1,120,528 bytes) 6/1/2000 2:23:52 AM Microsoft Corporation c:\winnt\system32\msdtctm.dll
msdtc.exe 1999.8.3413.3 6.77 KB (6,928 bytes) 6/1/2000 2:23:51 AM Microsoft Corporation c:\winnt\system32\msdtc.exe
rasadhlp.dll 5.00.2109.1 7.27 KB (7,440 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\rasadhlp.dll
winrnr.dll 5.00.2110.1 18.77 KB (19,216 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\winrnr.dll
rpcss.dll 5.00.2119.1 225.27 KB (230,672 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\rpcss.dll
svchost.exe 5.00.2090.1 7.77 KB (7,952 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\svchost.exe
iissuba.dll 5.00.0984 9.77 KB (10,000 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\iissuba.dll
dssbase.dll 5.00.2120.1 140.27 KB (143,632 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\dssbase.dll
wshtcpip.dll 5.00.2090.1 17.27 KB (17,680 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\wshtcpip.dll
msafd.dll 5.00.2095.1 52.27 KB (53,520 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\msafd.dll
oakley.dll 5.00.2115.1 420.27 KB (430,352 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\oakley.dll
mfc42u.dll 6.00.8576.0 972.05 KB (995,384 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mfc42u.dll
polagent.dll 5.00.2110.1 102.27 KB (104,720 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\polagent.dll
scecli.dll 5.00.2112.1 101.77 KB (104,208 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\scecli.dll
esent.dll 6.0.3938.7 848.77 KB (869,136 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\esent.dll
mswsock.dll 5.00.2120.1 62.77 KB (64,272 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mswsock.dll
ntdsatq.dll 5.00.2122.1 30.77 KB (31,504 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\ntdsatq.dll
ntdsa.dll 5.00.2127.1 984.77 KB (1,008,400 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\ntdsa.dll
kdcsvc.dll 5.00.2121.1 138.77 KB (142,096 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\kdcsvc.dll
sfmapi.dll 5.00.2090.1 38.77 KB (39,696 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\sfmapi.dll
rassfm.dll 5.00.2109.1 21.27 KB (21,776 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\rassfm.dll
mpr.dll 5.00.2111.1 53.27 KB (54,544 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mpr.dll
schannel.dll 5.00.2118.1 136.77 KB (140,048 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\schannel.dll
netlogon.dll 5.00.2119.1 344.77 KB (353,040 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\netlogon.dll
msv1_0.dll 5.00.2113.1 93.77 KB (96,016 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\msv1_0.dll
kerberos.dll 5.00.2121.1 190.27 KB (194,832 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\kerberos.dll
msprivs.dll 5.00.2112.1 41.50 KB (42,496 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\msprivs.dll
samsrv.dll 5.00.2124.1 352.27 KB (360,720 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\samsrv.dll
cryptdll.dll 5.00.2112.1 40.27 KB (41,232 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\cryptdll.dll
lsasrv.dll 5.00.2121.1 483.77 KB (495,376 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\lsasrv.dll
lsass.exe 5.00.2121.1 32.77 KB (33,552 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\lsass.exe
dhcpcsvc.dll 5.00.2107.1 88.77 KB (90,896 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\dhcpcsvc.dll
tapi32.dll 5.00.2090.1 122.27 KB (125,200 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\tapi32.dll
rasman.dll 5.00.2114.1 59.77 KB (61,200 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\rasman.dll
rasapi32.dll 5.00.2116.1 187.27 KB (191,760 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\rasapi32.dll
rtutils.dll 5.00.2109.1 43.27 KB (44,304 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\rtutils.dll
activeds.dll 5.00.2118.1 171.77 KB (175,888 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\activeds.dll
mprapi.dll 5.00.2112.1 90.77 KB (92,944 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation

c:\winnt\system32\mprapi.dll
iphlpapi.dll 5.00.2095.2 67.27 KB (68,880 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\iphlpapi.dll
rnr20.dll 5.00.2120.1 35.27 KB (36,112 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\rnr20.dll
msi.dll 1.10.0816.3 1.64 MB (1,715,984 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\msi.dll
adsldpc.dll 5.00.2120.1 125.77 KB (128,784 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\adsldpc.dll
appmgmts.dll 5.00.2109.1 115.77 KB (118,544 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\appmgmts.dll
ntlsapi.dll 5.00.2090.1 6.77 KB (6,928 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\ntlsapi.dll
wmicore.dll 5.00.2119.1 70.27 KB (71,952 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wmicore.dll
alrsvc.dll 5.00.2090.1 17.77 KB (18,192 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\alrsvc.dll
trkwks.dll 5.00.2110.1 87.77 KB (89,872 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\trkwks.dll
seclogon.dll 5.00.2122.1 15.27 KB (15,632 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\seclogon.dll
psbase.dll 5.00.2090.1 110.77 KB (113,424 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\psbase.dll
cryptsvc.dll 5.00.2090.1 66.77 KB (68,368 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\cryptsvc.dll
wkssvc.dll 5.00.2120.1 91.27 KB (93,456 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wkssvc.dll
srvsvc.dll 5.00.2117.1 79.27 KB (81,168 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\srvsvc.dll
cfgmgr32.dll 5.00.2098.1 16.77 KB (17,168 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\cfgmgr32.dll
dmserver.dll 2121.1.286.1 11.77 KB (12,048 bytes) 9/10/1999 9:00:00 AM VERITAS Software Corp.
c:\winnt\system32\dmserver.dll
winsta.dll 5.00.2100.1 36.27 KB (37,136 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\winsta.dll
icmp.dll 5.00.2090.1 7.27 KB (7,440 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\icmp.dll
lmhsvc.dll 5.00.2102.1 9.27 KB (9,488 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\lmhsvc.dll
eventlog.dll 5.00.2090.1 43.77 KB (44,816 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\eventlog.dll
ntdsapi.dll 5.00.2120.1 55.27 KB (56,592 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\ntdsapi.dll
scesrv.dll 5.00.2112.1 220.27 KB (225,552 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\scesrv.dll
umpnpmgr.dll 5.00.2109.1 116.77 KB (119,568 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\umpnpmgr.dll
services.exe 5.00.2106.1 87.27 KB (89,360 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\services.exe
atl.dll 3.00.8449 57.56 KB (58,938 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\atl.dll
certcli.dll 5.00.2120.1 131.27 KB (134,416 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\certcli.dll
clbcatq.dll 1999.8.3413.3 494.27 KB (506,128 bytes)
6/1/2000 2:23:44 AM Microsoft Corporation
c:\winnt\system32\clbcatq.dll
oleaut32.dll 2.40.4505 596.27 KB (610,576 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\oleaut32.dll
cscui.dll 5.00.2116.1 225.77 KB (231,184 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\cscui.dll
winspool.drv 5.00.2110.1 109.77 KB (112,400 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\winspool.drv
winscard.dll 5.00.2108.1 77.27 KB (79,120 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\winscard.dll
wlnotify.dll 5.00.2090.1 52.77 KB (54,032 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wlnotify.dll
cscdll.dll 5.00.2122.1 97.77 KB (100,112 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\cscdll.dll
winmm.dll 5.00.2114.1 184.27 KB (188,688 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\winmm.dll
lz32.dll 5.00.2090.1 9.77 KB (10,000 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\lz32.dll
version.dll 5.00.2090.1 15.77 KB (16,144 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\version.dll
rsabase.dll 5.00.2120.1 127.77 KB (130,832 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\rsabase.dll
setupapi.dll 5.00.2126.1 551.27 KB (564,496 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\setupapi.dll
mscat32.dll 5.131.2090.1 7.77 KB (7,952 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\mscat32.dll
ole32.dll 5.00.2120.1 961.27 KB (984,336 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\ole32.dll
imagehlp.dll 5.00.2128.1 40.77 KB (41,744 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\imagehlp.dll
msasn1.dll 5.00.2090.1 50.27 KB (51,472 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\msasn1.dll
crypt32.dll 5.131.2118.1 454.77 KB (465,680 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\crypt32.dll
wintrust.dll 5.131.2090.1 161.27 KB (165,136 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wintrust.dll
comctl32.dll 5.81 539.77 KB (552,720 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\comctl32.dll
shlwapi.dll 5.00.2919.3800 281.77 KB (288,528 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\shlwapi.dll
shell32.dll 5.00.2919.3800 2.24 MB (2,344,208 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\shell32.dll
msgina.dll 5.00.2115.1 308.27 KB (315,664 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\msgina.dll
wsock32.dll 5.00.2120.1 21.27 KB (21,776 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wsock32.dll
dnsapi.dll 5.00.2120.1 133.77 KB (136,976 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\dnsapi.dll
wldap32.dll 5.00.2117.1 153.77 KB (157,456 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\wldap32.dll
ws2help.dll 5.00.2095.1 17.77 KB (18,192 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\ws2help.dll
ws2_32.dll 5.00.2104.1 67.77 KB (69,392 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\ws2_32.dll
samlib.dll 5.00.2124.1 46.27 KB (47,376 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\samlib.dll
netrap.dll 5.00.2090.1 11.27 KB (11,536 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\netrap.dll
netapi32.dll 5.00.2120.1 295.77 KB (302,864 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\netapi32.dll
profmap.dll 5.00.2112.1 27.27 KB (27,920 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\profmap.dll
secur32.dll 5.00.2119.1 44.77 KB (45,840 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\secur32.dll
sfc.dll 5.00.2124.1 83.27 KB (85,264 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\sfc.dll
nddeapi.dll 5.00.2090.1 15.27 KB (15,632 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\nddeapi.dll
userenv.dll 5.00.2127.1 343.27 KB (351,504 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\userenv.dll
user32.dll 5.00.2120.1 392.27 KB (401,680 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\user32.dll
gdi32.dll 5.00.2115.1 228.27 KB (233,744 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\gdi32.dll
rpcrt4.dll 5.00.2128.1 440.27 KB (450,832 bytes)
9/10/1999 9:00:00 AM Microsoft Corporation
c:\winnt\system32\rpcrt4.dll

advapi32.dll 5.00.2120.1 337.77 KB (345,872 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\advapi32.dll
kernel32.dll 5.00.2122.1 711.77 KB (728,848 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\kernel32.dll
msvcrt.dll 6.10.8581.0 284.05 KB (290,869 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\msvcrt.dll
winlogon.exe 5.00.2116.1 171.27 KB (175,376 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\winlogon.exe
sfcfiles.dll 5.00.2128.1 366.77 KB (375,568 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\sfcfiles.dll
ntdll.dll 5.00.2121.1 469.27 KB (480,528 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\ntdll.dll
smss.exe 5.00.2090.1 42.77 KB (43,792 bytes) 9/10/1999 9:00:00 AM Microsoft Corporation c:\winnt\system32\smss.exe

[Services]

Display Name State Start Mode Service Type
Alerter Running Auto Start Share Process
Application Management Running Demand Start Share Process
Computer Browser Stopped Demand Start Share Process
Indexing Service Stopped Demand Start Share Process
ClipBook Stopped Demand Start Own Process
Distributed File System Running Auto Start Own Process
DHCP Client Stopped Demand Start Share Process
Logical Disk Manager Administrative Service Stopped Demand Start Share Process
Logical Disk Manager Running Auto Start Share Process
DNS Client Stopped Demand Start Share Process
Event Log Running Auto Start Share Process
COM+ Event System Running Demand Start Share Process
Fax Service Stopped Demand Start Own Process
IIS Admin Service Running Auto Start Share Process
IMDB Server Stopped Disabled Own Process
Intersite Messaging Stopped Disabled Own Process
Kerberos Key Distribution Center Stopped Disabled Share Process
Server Running Auto Start Share Process
Workstation Running Auto Start Share Process
License Logging Service Running Auto Start Own Process
TCP/IP NetBIOS Helper Service Running Auto Start Share Process
Messenger Stopped Demand Start Share Process
NetMeeting Remote Desktop Sharing Stopped Demand Start Own Process
Distributed Transaction Coordinator Running Auto Start Own Process
FTP Publishing Service Stopped Disabled Share Process
Windows Installer Stopped Demand Start Share Process
Network DDE Stopped Demand Start Share Process
Network DDE DSDM Stopped Demand Start Share Process
Net Logon Stopped Demand Start Share Process
Network Connections Running Demand Start Share Process
File Replication Stopped Demand Start Own Process
NT LM Security Support Provider Stopped Demand Start Share Process
Removable Storage Running Auto Start Share Process
Plug and Play Running Auto Start Share Process
IPSEC Policy Agent Running Auto Start Share Process
Protected Storage Running Auto Start Share Process
Remote Access Auto Connection Manager Stopped Demand Start Share Process
Remote Access Connection Manager Stopped Demand Start Share Process
Routing and Remote Access Stopped Disabled Share Process
Remote Registry Service Running Auto Start Own Process
Remote Procedure Call (RPC) Locator Stopped Demand Start Own Process
Remote Procedure Call (RPC) Running Auto Start Share Process
QoS RSVP Stopped Demand Start Own Process
Security Accounts Manager Running Auto Start Share Process
Smart Card Helper Stopped Demand Start Share Process
Smart Card Stopped Demand Start Share Process
Task Scheduler Running Auto Start Share Process
RunAs Service Running Auto Start Share Process
System Event Notification Running Auto Start Share Process
Internet Connection Sharing Stopped Demand Start Share Process
Simple Mail Transport Protocol (SMTP) Stopped Disabled Share Process
Print Spooler Stopped Demand Start Own Process
Performance Logs and Alerts Stopped Demand Start Own Process
Telephony Running Demand Start Share Process
Terminal Services Stopped Disabled Own Process
Telnet Stopped Demand Start Own Process
Distributed Link Tracking Server Stopped Demand Start Share Process
Distributed Link Tracking Client Running Auto Start Share Process
Uninterruptible Power Supply Stopped Demand Start Own Process
Utility Manager Stopped Demand Start Own Process
Windows Time Stopped Demand Start Share Process
World Wide Web Publishing Service Stopped Auto Start Share Process
Windows Management Instrumentation Running Demand Start Own Process
Windows Management Instrumentation Driver Extensions Running Demand Start Share Process

[Program Groups]

Group Name Name User Name
Accessories Default User:Accessories Default User
Accessories\Accessibility Default User:Accessories\Accessibility Default User
Accessories\Entertainment Default User:Accessories\Entertainment Default User
Accessories\System Tools Default User:Accessories\System Tools Default User
Startup Default User:Startup Default User
Accessories All Users:Accessories All Users
Accessories\Accessibility All Users:Accessories\Accessibility All Users
Accessories\Communications All Users:Accessories\Communications All Users
Accessories\Entertainment All Users:Accessories\Entertainment All Users
Accessories\Games All Users:Accessories\Games All Users
Accessories\Microsoft Script Debugger All Users:Accessories\Microsoft Script Debugger All Users
Accessories\System Tools All Users:Accessories\System Tools All Users
Administrative Tools All Users:Administrative Tools All Users
Microsoft SQL Server All Users:Microsoft SQL Server All Users
Startup All Users:Startup All Users
Accessories ACL01\Administrator:Accessories ACL01\Administrator
Accessories\Accessibility ACL01\Administrator:Accessories\Accessibility ACL01\Administrator
Accessories\Entertainment ACL01\Administrator:Accessories\Entertainment ACL01\Administrator
Accessories\System Tools ACL01\Administrator:Accessories\System Tools ACL01\Administrator
Administrative Tools ACL01\Administrator:Administrative Tools ACL01\Administrator
Startup ACL01\Administrator:Startup ACL01\Administrator

[Startup Programs]

Program Command User Name
mdac_runonce c:\winnt\system32\runonce.exe All Users

<Microsoft SQL Server 2000 setting>

Startup Parameters

sqlservr -c -x -t3502

-c	Sart SQL Server independently of the Microsoft Windows NT Service Control Manager.
-x	Disable the keeping of CPU time and cache-hit ration statistics.
-t3502	Prints a message to the log at the beginning and end of each checkpoint.
-g100	Reserve 100 MB for non-buffer pool allocations

Microsoft SQL Server Stack Size

The default stack size of Microsoft SQL Server 2000 was changed using the EDITBIN utility. The EDITBIN utility ships with Microsoft Visual C++ .
The command used was to chage the stack size is:

editbin /stack: 131072 sqlservr.exe.

Microsoft SQL Server 2000 Configuration Parameters

```
1> 2> 3> 4> 5> 6> 7> 8> 9> 10> 11>
-- File:     VERSION.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.21
--           Copyright Microsoft, 1999, 2000
-- Purpose:  Returns SQL Server version string


print " "
select convert(char(30), getdate(),9)
print " "

 ------------------------------
 Jun  5 2000 11:00:23:327AM

(1 row affected)

1> 2> 3>
select @@version

 -------------------------------------------------------------------------------
             ----------------------------------------------------------------------
             ----------------------------------------------------------------------
             ------------------------------------
 Microsoft SQL Server  2000 - 8.00.100 (Intel X86)
             Apr 18 2000 01:19:00
             Cop
             yright (c) 1988-2000 Microsoft Corporation
             Enterprise Edition on Windo
             ws NT 5.0 (Build 2195: )


(1 row affected)
1> 2>
1> 2> 3> 4> 5> 6> 7> 8> 9> 10>
-- File:     CONFIG.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.21
--           Copyright Microsoft, 1999, 2000
-- Purpose:  Collects SQL Server configuration parameters


print " "
select convert(char(30), getdate(),9)
print " "

 ------------------------------
 Jun  5 2000 11:00:24:420AM

(1 row affected)

1> 2> 3> DBCC execution completed. If DBCC printed error messages, contact your system administrator.
Configuration option 'show advanced options' changed from 1 to 1. Run the RECONFIGURE statement to install.

sp_configure "show advanced",1
1> 2> reconfigure with override
1> 2> sp_configure
 name                                  minimum     maximum     config_value run_value
 ------------------------------------- ----------- ----------- ------------ -----------
 affinity mask                                   0  2147483647           15          15
 allow updates                                   0           1            0           0
 awe enabled                                     0           1            1           1
 c2 audit mode                                   0           1            0           0
 cost threshold for parallelism                  0       32767            5           5
 cursor threshold                               -1  2147483647           -1          -1
 default full-text language                      0  2147483647         1033        1033
 default language                                0        9999            0           0
 fill factor (%)                                 0         100            0           0
 index create memory (KB)                      704  2147483647          704         704
 lightweight pooling                             0           1            1           1
```

```
locks                                   5000  2147483647          0         0
max degree of parallelism                    0        32          1         1
max server memory (MB)                       4  2147483647   2147483647
2147483647
max text repl size (B)                       0  2147483647       65536     65536
max worker threads                          10       32767         190       190
media retention                              0         365           0         0
min memory per query (KB)                  512  2147483647         512       512
min server memory (MB)                       0  2147483647           0         0
nested triggers                              0           1           1         1
network packet size (B)                    512       65536        4096      4096
open objects                                 0  2147483647           0         0
priority boost                               0           1           1         1
query governor cost limit                    0  2147483647           0         0
query wait (s)                              -1  2147483647          -1        -1
recovery interval (min)                      0       32767       32767     32767
remote access                                0           1           1         1
remote login timeout (s)                     0  2147483647          20        20
remote proc trans                            0           1           0         0
remote query timeout (s)                     0  2147483647           0         0
scan for startup procs                       0           1           0         0
set working set size                         0           1           0         0
show advanced options                        0           1           1         1
two digit year cutoff                     1753        9999        2049      2049
user connections                             0       32767           0         0
user options                                 0       16383           0         0

1>
```

<Disk Array configuration>

```
########## Controller 0 ##########
Begin

 BeginGroup

        PhysicalDevice0 = Channel=0, Target=0, Size=86592mb, State=Online,

                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;

        PhysicalDevice1 = Channel=2, Target=0, Size=86592mb, State=Online,

                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;

        LogicalDevice0 = StripeSize=64kb, Raid=1, WriteThrough=1, Size=86592mb, BIOSGeometry=8GB,

                (PhysicalDevice0, StartAddress=0mb, Size=86592mb),

                (PhysicalDevice1, StartAddress=0mb, Size=86592mb);

 EndGroup

 BeginControllerParameter

        ControllerName = eXtremeRAID 2000;

        ControllerType = 28;

        FirmwareVersion = 5.60;

        CacheLineSize = 8KB;

        BackgroundTaskRate = 50;

        InitiatorID = 7;

        DiskStartupMode = AutoSpin;

        DevicesPerSpin = 2;

        InitialDelay = 6S;

        SequentialDelay = 0S;

        EnableDriveSizing = 1;

        EnableClustering = 0;

        EnableBGInit = 1;

        EnableReadAhead = 1;

        EnableBiosLoadDelay = 0;

        EnableForcedUnitAccess = 1;

        DisableBios = 1;

        EnableCDROMBoot = 0;

        EnableStorageWorks = 0;

        EnableSAFTE = 1;

        EnableSES = 1;

        EnableARM = 0;

        EnableOFM = 0;

        OEMCode = 0;

        StartupOption = 0;

 EndControllerParameter

End
########## Controller 1 ##########
Begin

 BeginGroup

        PhysicalDevice0 = Channel=0, Target=0, Size=8392mb, State=Online,

                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;

        PhysicalDevice1 = Channel=0, Target=1, Size=8392mb, State=Online,

                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;

        PhysicalDevice2 = Channel=0, Target=2, Size=8392mb, State=Online,

                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;

        PhysicalDevice3 = Channel=0, Target=3, Size=8392mb, State=Online,

                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;

        PhysicalDevice4 = Channel=0, Target=4, Size=8392mb, State=Online,

                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
```

PhysicalDevice5 = Channel=0, Target=5, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice6 = Channel=0, Target=8, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice7 = Channel=0, Target=9, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice8 = Channel=0, Target=10, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice9 = Channel=0, Target=11, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice10 = Channel=0, Target=12, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice11 = Channel=0, Target=13, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice12 = Channel=0, Target=14, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice13 = Channel=0, Target=15, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice14 = Channel=1, Target=0, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice15 = Channel=1, Target=1, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice16 = Channel=1, Target=2, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice17 = Channel=1, Target=3, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice18 = Channel=1, Target=4, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice19 = Channel=1, Target=5, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice20 = Channel=1, Target=8, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice21 = Channel=1, Target=9, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice22 = Channel=1, Target=10, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice23 = Channel=1, Target=11, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice24 = Channel=1, Target=12, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice25 = Channel=1, Target=13, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice26 = Channel=1, Target=14, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice27 = Channel=1, Target=15, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice28 = Channel=2, Target=0, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice29 = Channel=2, Target=1, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice30 = Channel=2, Target=2, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice31 = Channel=2, Target=3, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice32 = Channel=2, Target=4, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice33 = Channel=2, Target=5, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice34 = Channel=2, Target=8, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice35 = Channel=2, Target=9, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice36 = Channel=2, Target=10, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice37 = Channel=2, Target=11, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice38 = Channel=2, Target=12, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice39 = Channel=2, Target=13, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice40 = Channel=2, Target=14, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;

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PhysicalDevice41 = Channel=2, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice42 = Channel=3, Target=0, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice43 = Channel=3, Target=1, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice44 = Channel=3, Target=2, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice45 = Channel=3, Target=3, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice46 = Channel=3, Target=4, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice47 = Channel=3, Target=5, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice48 = Channel=3, Target=8, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice49 = Channel=3, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice50 = Channel=3, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice51 = Channel=3, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice52 = Channel=3, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice53 = Channel=3, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice54 = Channel=3, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice55 = Channel=3, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
IntermediateDevice0 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice0, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice1, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice2, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice3, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice4, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice5, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice6, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice7, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice8, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice9, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice10, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice11, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice12, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice13, StartAddress=0mb, Size=8392mb);
IntermediateDevice1 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice14, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice15, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice16, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice17, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice18, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice19, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice20, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice21, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice22, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice23, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice24, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice25, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice26, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice27, StartAddress=0mb, Size=8392mb);
IntermediateDevice2 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice28, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice29, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice30, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice31, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice32, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice33, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice34, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice35, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice36, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice37, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice38, StartAddress=0mb, Size=8392mb),
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                (PhysicalDevice39, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice40, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice41, StartAddress=0mb, Size=8392mb);
        IntermediateDevice3 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
                (PhysicalDevice42, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice43, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice44, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice45, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice46, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice47, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice48, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice49, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice50, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice51, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice52, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice53, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice54, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice55, StartAddress=0mb, Size=8392mb);
        LogicalDevice0 = StripeSize=64kb, Raid=12, WriteThrough=1, Size=469952mb, BIOSGeometry=2GB,
                (IntermediateDevice0, StartAddress=0mb, Size=117488mb),
                (IntermediateDevice1, StartAddress=0mb, Size=117488mb),
                (IntermediateDevice2, StartAddress=0mb, Size=117488mb),
                (IntermediateDevice3, StartAddress=0mb, Size=117488mb);
EndGroup
BeginControllerParameter
        ControllerName = eXtremeRAID 2000;
        ControllerType = 28;
        FirmwareVersion = 5.60;
        CacheLineSize = 8KB;
        BackgroundTaskRate = 50;
        InitiatorID = 7;
        DiskStartupMode = AutoSpin;
        DevicesPerSpin = 2;
        InitialDelay = 6S;
        SequentialDelay = 240S;
        EnableDriveSizing = 1;
        EnableClustering = 0;
        EnableBGInit = 1;
        EnableReadAhead = 1;
        EnableBiosLoadDelay = 0;
        EnableForcedUnitAccess = 1;
        DisableBios = 1;
        EnableCDROMBoot = 0;
        EnableStorageWorks = 0;
        EnableSAFTE = 1;
        EnableSES = 1;
        EnableARM = 1;
        EnableOFM = 1;
        OEMCode = 0;
        StartupOption = 0;
EndControllerParameter
End
########## Controller 2 ##########
Begin
BeginGroup
        PhysicalDevice0 = Channel=0, Target=0, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice1 = Channel=0, Target=1, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice2 = Channel=0, Target=2, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice3 = Channel=0, Target=3, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice4 = Channel=0, Target=4, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice5 = Channel=0, Target=5, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice6 = Channel=0, Target=8, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice7 = Channel=0, Target=9, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice8 = Channel=0, Target=10, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
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PhysicalDevice9 = Channel=0, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice10 = Channel=0, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice11 = Channel=0, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice12 = Channel=0, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice13 = Channel=0, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice14 = Channel=1, Target=0, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice15 = Channel=1, Target=1, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice16 = Channel=1, Target=2, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice17 = Channel=1, Target=3, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice18 = Channel=1, Target=4, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice19 = Channel=1, Target=5, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice20 = Channel=1, Target=8, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice21 = Channel=1, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice22 = Channel=1, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice23 = Channel=1, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice24 = Channel=1, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice25 = Channel=1, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice26 = Channel=1, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice27 = Channel=1, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice28 = Channel=2, Target=0, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice29 = Channel=2, Target=1, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice30 = Channel=2, Target=2, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice31 = Channel=2, Target=3, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice32 = Channel=2, Target=4, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice33 = Channel=2, Target=5, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice34 = Channel=2, Target=8, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice35 = Channel=2, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice36 = Channel=2, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice37 = Channel=2, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice38 = Channel=2, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice39 = Channel=2, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice40 = Channel=2, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice41 = Channel=2, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice42 = Channel=3, Target=0, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice43 = Channel=3, Target=1, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice44 = Channel=3, Target=2, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
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PhysicalDevice45 = Channel=3, Target=3, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice46 = Channel=3, Target=4, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice47 = Channel=3, Target=5, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice48 = Channel=3, Target=8, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice49 = Channel=3, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice50 = Channel=3, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice51 = Channel=3, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice52 = Channel=3, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice53 = Channel=3, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice54 = Channel=3, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice55 = Channel=3, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
IntermediateDevice0 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice0, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice1, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice2, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice3, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice4, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice5, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice6, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice7, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice8, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice9, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice10, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice11, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice12, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice13, StartAddress=0mb, Size=8392mb);
IntermediateDevice1 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice14, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice15, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice16, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice17, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice18, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice19, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice20, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice21, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice22, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice23, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice24, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice25, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice26, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice27, StartAddress=0mb, Size=8392mb);
IntermediateDevice2 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice28, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice29, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice30, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice31, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice32, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice33, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice34, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice35, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice36, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice37, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice38, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice39, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice40, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice41, StartAddress=0mb, Size=8392mb);
IntermediateDevice3 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice42, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice43, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice44, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice45, StartAddress=0mb, Size=8392mb),
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                (PhysicalDevice46, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice47, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice48, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice49, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice50, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice51, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice52, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice53, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice54, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice55, StartAddress=0mb, Size=8392mb);
        LogicalDevice0 = StripeSize=64kb, Raid=12, WriteThrough=1, Size=469952mb, BIOSGeometry=8GB,
                (IntermediateDevice0, StartAddress=0mb, Size=117488mb),
                (IntermediateDevice1, StartAddress=0mb, Size=117488mb),
                (IntermediateDevice2, StartAddress=0mb, Size=117488mb),
                (IntermediateDevice3, StartAddress=0mb, Size=117488mb);
EndGroup
BeginControllerParameter
        ControllerName = eXtremeRAID 2000;
        ControllerType = 28;
        FirmwareVersion = 5.60;
        CacheLineSize = 8KB;
        BackgroundTaskRate = 50;
        InitiatorID = 7;
        DiskStartupMode = AutoSpin;
        DevicesPerSpin = 2;
        InitialDelay = 6S;
        SequentialDelay = 0S;
        EnableDriveSizing = 1;
        EnableClustering = 0;
        EnableBGInit = 1;
        EnableReadAhead = 0;
        EnableBiosLoadDelay = 0;
        EnableForcedUnitAccess = 0;
        DisableBios = 1;
        EnableCDROMBoot = 0;
        EnableStorageWorks = 0;
        EnableSAFTE = 1;
        EnableSES = 1;
        EnableARM = 1;
        EnableOFM = 1;
        OEMCode = 0;
        StartupOption = 0;
EndControllerParameter
End
########## Controller 3 ##########
Begin
BeginGroup
        PhysicalDevice0 = Channel=0, Target=0, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice1 = Channel=0, Target=1, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice2 = Channel=0, Target=2, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice3 = Channel=0, Target=3, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice4 = Channel=0, Target=4, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice5 = Channel=0, Target=5, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice6 = Channel=0, Target=8, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice7 = Channel=0, Target=9, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice8 = Channel=0, Target=10, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice9 = Channel=0, Target=11, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice10 = Channel=0, Target=12, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice11 = Channel=0, Target=13, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice12 = Channel=0, Target=14, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
```

PhysicalDevice13 = Channel=0, Target=15, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice14 = Channel=1, Target=0, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice15 = Channel=1, Target=1, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice16 = Channel=1, Target=2, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice17 = Channel=1, Target=3, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice18 = Channel=1, Target=4, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice19 = Channel=1, Target=5, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice20 = Channel=1, Target=8, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice21 = Channel=1, Target=9, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice22 = Channel=1, Target=10, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice23 = Channel=1, Target=11, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice24 = Channel=1, Target=12, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice25 = Channel=1, Target=13, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice26 = Channel=1, Target=14, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice27 = Channel=1, Target=15, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice28 = Channel=2, Target=0, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice29 = Channel=2, Target=1, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice30 = Channel=2, Target=2, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice31 = Channel=2, Target=3, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice32 = Channel=2, Target=4, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice33 = Channel=2, Target=5, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice34 = Channel=2, Target=8, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice35 = Channel=2, Target=9, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice36 = Channel=2, Target=10, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice37 = Channel=2, Target=11, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice38 = Channel=2, Target=12, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice39 = Channel=2, Target=13, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice40 = Channel=2, Target=14, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice41 = Channel=2, Target=15, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice42 = Channel=3, Target=0, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice43 = Channel=3, Target=1, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice44 = Channel=3, Target=2, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice45 = Channel=3, Target=3, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice46 = Channel=3, Target=4, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice47 = Channel=3, Target=5, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice48 = Channel=3, Target=8, Size=8392mb, State=Online,
TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;

```
PhysicalDevice49 = Channel=3, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice50 = Channel=3, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice51 = Channel=3, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice52 = Channel=3, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice53 = Channel=3, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice54 = Channel=3, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice55 = Channel=3, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
IntermediateDevice0 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice0, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice1, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice2, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice3, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice4, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice5, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice6, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice7, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice8, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice9, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice10, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice11, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice12, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice13, StartAddress=0mb, Size=8392mb);
IntermediateDevice1 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice14, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice15, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice16, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice17, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice18, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice19, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice20, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice21, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice22, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice23, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice24, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice25, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice26, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice27, StartAddress=0mb, Size=8392mb);
IntermediateDevice2 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice28, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice29, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice30, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice31, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice32, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice33, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice34, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice35, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice36, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice37, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice38, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice39, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice40, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice41, StartAddress=0mb, Size=8392mb);
IntermediateDevice3 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice42, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice43, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice44, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice45, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice46, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice47, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice48, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice49, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice50, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice51, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice52, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice53, StartAddress=0mb, Size=8392mb),
```

```
                    (PhysicalDevice54, StartAddress=0mb, Size=8392mb),
                    (PhysicalDevice55, StartAddress=0mb, Size=8392mb);
          LogicalDevice0 = StripeSize=64kb, Raid=12, WriteThrough=1, Size=469952mb, BIOSGeometry=2GB,
                    (IntermediateDevice0, StartAddress=0mb, Size=117488mb),
                    (IntermediateDevice1, StartAddress=0mb, Size=117488mb),
                    (IntermediateDevice2, StartAddress=0mb, Size=117488mb),
                    (IntermediateDevice3, StartAddress=0mb, Size=117488mb);
EndGroup
BeginControllerParameter
          ControllerName = eXtremeRAID 2000;
          ControllerType = 28;
          FirmwareVersion = 5.60;
          CacheLineSize = 8KB;
          BackgroundTaskRate = 50;
          InitiatorID = 7;
          DiskStartupMode = AutoSpin;
          DevicesPerSpin = 2;
          InitialDelay = 6S;
          SequentialDelay = 0S;
          EnableDriveSizing = 1;
          EnableClustering = 0;
          EnableBGInit = 1;
          EnableReadAhead = 0;
          EnableBiosLoadDelay = 0;
          EnableForcedUnitAccess = 0;
          DisableBios = 1;
          EnableCDROMBoot = 0;
          EnableStorageWorks = 0;
          EnableSAFTE = 1;
          EnableSES = 1;
          EnableARM = 1;
          EnableOFM = 1;
          OEMCode = 0;
          StartupOption = 0;
EndControllerParameter
End
```

```
########## Controller 4 ##########
Begin
BeginGroup
          PhysicalDevice0 = Channel=0, Target=0, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice1 = Channel=0, Target=1, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice2 = Channel=0, Target=2, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice3 = Channel=0, Target=3, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice4 = Channel=0, Target=4, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice5 = Channel=0, Target=5, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice6 = Channel=0, Target=8, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice7 = Channel=0, Target=9, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice8 = Channel=0, Target=10, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice9 = Channel=0, Target=11, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice10 = Channel=0, Target=12, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice11 = Channel=0, Target=13, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice12 = Channel=0, Target=14, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice13 = Channel=0, Target=15, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice14 = Channel=1, Target=0, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice15 = Channel=1, Target=1, Size=8392mb, State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
          PhysicalDevice16 = Channel=1, Target=2, Size=8392mb,State=Online,
                    TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
```

```
PhysicalDevice17 = Channel=1, Target=3, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice18 = Channel=1, Target=4, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice19 = Channel=1, Target=5, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice20 = Channel=1, Target=8, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice21 = Channel=1, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice22 = Channel=1, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice23 = Channel=1, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice24 = Channel=1, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice25 = Channel=1, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice26 = Channel=1, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice27 = Channel=1, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice28 = Channel=2, Target=0, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice29 = Channel=2, Target=1, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice30 = Channel=2, Target=2, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice31 = Channel=2, Target=3, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice32 = Channel=2, Target=4, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice33 = Channel=2, Target=5, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice34 = Channel=2, Target=8, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice35 = Channel=2, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice36 = Channel=2, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice37 = Channel=2, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice38 = Channel=2, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice39 = Channel=2, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice40 = Channel=2, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice41 = Channel=2, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice42 = Channel=3, Target=0, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice43 = Channel=3, Target=1, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice44 = Channel=3, Target=2, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice45 = Channel=3, Target=3, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice46 = Channel=3, Target=4, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice47 = Channel=3, Target=5, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice48 = Channel=3, Target=8, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice49 = Channel=3, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice50 = Channel=3, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice51 = Channel=3, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice52 = Channel=3, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
```

```
PhysicalDevice53 = Channel=3, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice54 = Channel=3, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice55 = Channel=3, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
IntermediateDevice0 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice0, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice1, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice2, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice3, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice4, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice5, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice6, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice7, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice8, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice9, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice10, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice11, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice12, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice13, StartAddress=0mb, Size=8392mb);
IntermediateDevice1 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice14, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice15, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice16, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice17, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice18, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice19, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice20, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice21, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice22, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice23, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice24, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice25, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice26, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice27, StartAddress=0mb, Size=8392mb);
IntermediateDevice2 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice28, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice29, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice30, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice31, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice32, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice33, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice34, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice35, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice36, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice37, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice38, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice39, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice40, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice41, StartAddress=0mb, Size=8392mb);
IntermediateDevice3 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice42, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice43, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice44, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice45, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice46, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice47, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice48, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice49, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice50, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice51, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice52, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice53, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice54, StartAddress=0mb, Size=8392mb),
        (PhysicalDevice55, StartAddress=0mb, Size=8392mb);
LogicalDevice0 = StripeSize=64kb, Raid=12, WriteThrough=1, Size=469952mb, BIOSGeometry=2GB,
        (IntermediateDevice0, StartAddress=0mb, Size=117488mb),
        (IntermediateDevice1, StartAddress=0mb, Size=117488mb),
        (IntermediateDevice2, StartAddress=0mb, Size=117488mb),
        (IntermediateDevice3, StartAddress=0mb, Size=117488mb);
EndGroup
```

```
BeginControllerParameter
        ControllerName = eXtremeRAID 2000;
        ControllerType = 28;
        FirmwareVersion = 5.60;
        CacheLineSize = 8KB;
        BackgroundTaskRate = 50;
        InitiatorID = 7;
        DiskStartupMode = AutoSpin;
        DevicesPerSpin = 2;
        InitialDelay = 6S;
        SequentialDelay = 0S;
        EnableDriveSizing = 1;
        EnableClustering = 0;
        EnableBGInit = 1;
        EnableReadAhead = 0;
        EnableBiosLoadDelay = 0;
        EnableForcedUnitAccess = 0;
        DisableBios = 1;
        EnableCDROMBoot = 0;
        EnableStorageWorks = 0;
        EnableSAFTE = 1;
        EnableSES = 1;
        EnableARM = 1;
        EnableOFM = 1;
        OEMCode = 0;
        StartupOption = 0;
EndControllerParameter

End
########## Controller 5 ##########
Begin
BeginGroup
        PhysicalDevice0 = Channel=0, Target=0, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice1 = Channel=0, Target=1, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice2 = Channel=0, Target=2, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice3 = Channel=0, Target=3, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice4 = Channel=0, Target=4, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice5 = Channel=0, Target=5, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice6 = Channel=0, Target=8, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice7 = Channel=0, Target=9, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice8 = Channel=0, Target=10, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice9 = Channel=0, Target=11, Size=8392mb,State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice10 = Channel=0, Target=12, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice11 = Channel=0, Target=13, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice12 = Channel=0, Target=14, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice13 = Channel=0, Target=15, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice14 = Channel=1, Target=0, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice15 = Channel=1, Target=1, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice16 = Channel=1, Target=2, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice17 = Channel=1, Target=3, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice18 = Channel=1, Target=4, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice19 = Channel=1, Target=5, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
        PhysicalDevice20 = Channel=1, Target=8, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
```

```
PhysicalDevice21 = Channel=1, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice22 = Channel=1, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice23 = Channel=1, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice24 = Channel=1, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice25 = Channel=1, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice26 = Channel=1, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice27 = Channel=1, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice28 = Channel=2, Target=0, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice29 = Channel=2, Target=1, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice30 = Channel=2, Target=2, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice31 = Channel=2, Target=3, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice32 = Channel=2, Target=4, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice33 = Channel=2, Target=5, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice34 = Channel=2, Target=8, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice35 = Channel=2, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice36 = Channel=2, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice37 = Channel=2, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice38 = Channel=2, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice39 = Channel=2, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice40 = Channel=2, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice41 = Channel=2, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice42 = Channel=3, Target=0, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice43 = Channel=3, Target=1, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice44 = Channel=3, Target=2, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice45 = Channel=3, Target=3, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice46 = Channel=3, Target=4, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice47 = Channel=3, Target=5, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice48 = Channel=3, Target=8, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice49 = Channel=3, Target=9, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice50 = Channel=3, Target=10, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice51 = Channel=3, Target=11, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice52 = Channel=3, Target=12, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice53 = Channel=3, Target=13, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice54 = Channel=3, Target=14, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
PhysicalDevice55 = Channel=3, Target=15, Size=8392mb, State=Online,
        TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=32;
IntermediateDevice0 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
        (PhysicalDevice0, StartAddress=0mb, Size=8392mb),
```

```
                (PhysicalDevice1, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice2, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice3, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice4, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice5, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice6, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice7, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice8, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice9, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice10, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice11, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice12, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice13, StartAddress=0mb, Size=8392mb);
        IntermediateDevice1 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
                (PhysicalDevice14, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice15, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice16, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice17, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice18, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice19, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice20, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice21, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice22, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice23, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice24, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice25, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice26, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice27, StartAddress=0mb, Size=8392mb);
        IntermediateDevice2 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
                (PhysicalDevice28, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice29, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice30, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice31, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice32, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice33, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice34, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice35, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice36, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice37, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice38, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice39, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice40, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice41, StartAddress=0mb, Size=8392mb);
        IntermediateDevice3 = StripeSize=64kb, Raid=0, WriteThrough=1, Size=117488mb,
                (PhysicalDevice42, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice43, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice44, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice45, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice46, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice47, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice48, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice49, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice50, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice51, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice52, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice53, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice54, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice55, StartAddress=0mb, Size=8392mb);
        LogicalDevice0 = StripeSize=64kb, Raid=12, WriteThrough=1, Size=469952mb, BIOSGeometry=2GB,
                (IntermediateDevice0, StartAddress=0mb, Size=117488mb),
                (IntermediateDevice1, StartAddress=0mb, Size=117488mb),
                (IntermediateDevice2, StartAddress=0mb, Size=117488mb),
                (IntermediateDevice3, StartAddress=0mb, Size=117488mb);
EndGroup
BeginControllerParameter
        ControllerName = eXtremeRAID 2000;
        ControllerType = 28;
        FirmwareVersion = 5.60;
        CacheLineSize = 8KB;
        BackgroundTaskRate = 50;
        InitiatorID = 7;
        DiskStartupMode = AutoSpin;
```

```
                DevicesPerSpin = 2;

                InitialDelay = 6S;

                SequentialDelay = 0S;

                EnableDriveSizing = 1;

                EnableClustering = 0;

                EnableBGInit = 1;

                EnableReadAhead = 0;

                EnableBiosLoadDelay = 0;

                EnableForcedUnitAccess = 0;

                DisableBios = 1;

                EnableCDROMBoot = 0;

                EnableStorageWorks = 0;

                EnableSAFTE = 1;

                EnableSES = 1;

                EnableARM = 1;

                EnableOFM = 1;

                OEMCode = 0;

                StartupOption = 0;

 EndControllerParameter

End


-- disk(SCSI to SCSI controller) configuration

 SCSI to SCSI controller #1

  ============================
  view and edit Logical drives
  ============================
 LG  RAID   Size(MB)   Status   O #LN #SB #FL     NAME
 P0  RAID0  86830      GOOD     S   5   -   0

   ================
   View scsi drives
   ================
    Slot Chl  ID Size(MB) Speed LG_DRV  Status
         1   0   17366  80MB      0  ON-LINE
         1   1   17366  80MB      0  ON-LINE
         1   2   17366  80MB      0  ON-LINE
         1   3   17366  80MB      0  ON-LINE
         1   4   17366  80MB      0  ON-LINE


 SCSI to SCSI controller #2

  ============================
  view and edit Logical drives
  ============================
 LG  RAID   Size(MB)   Status   O #LN #SB #FL     NAME
 P0  RAID0  86830      GOOD     S   5   -   0

================
View scsi drives
================
 Slot Chl  ID Size(MB) Speed LG_DRV  Status
      1   0   17366  80MB      0  ON-LINE
      1   1   17366  80MB      0  ON-LINE
      1   2   17366  80MB      0  ON-LINE
      1   3   17366  80MB      0  ON-LINE
      1   4   17366  80MB      0  ON-LINE
```

Appendix D : Space Calculation

180 Day Space

Note : Numbers are in KBytes unless otherwise specified

Warehouses	2520	**tpmC**	31764.37	**tpmC/W**	12.60

Table	**Rows**	**Data**	**Index**	**5% Space**	**8H Space**	**Total Space**
Warehouse	2,520	272	48	16		336
District	25,200	2,808	48	143		2,999
Item	100,000	9,528	64	221		9,813
New-order	22,680,000	358,584	840		50,400	409,824
History	75,600,000	4,200,008	80		710,794	4,910,882
Orders	75,600,000	2,317,248	1,053,760		570,487	3,941,495
Customer	75,600,000	54,981,824	3,278,576	1,339,989		59,600,389
Order-line	756,002,500	47,250,160	100,032		8,013,225	55,363,417
Stock	252,000,000	80,640,008	150,736	1,858,187		82,648,931
Totals		189,760,440	4,584,184	3,198,556	9,344,906	206,888,086

DB File Group	**Count**	**Size**	**Needed**	**Overhead**	**Not Needed**
MSSQL70_misc_fg	5	84,480,000	65,285,153	652,852	18,541,995
MSSQL70_cs_fg	5	153,600,000	143,671,814	1,436,718	8,491,468
Totals		238,080,000	208,956,967	2,089,570	27,033,463

Dynamic space	52,315,696	Sum of Data for Order, Order-Line and History (excluding free extents)
Static space	147,317,054	Data + Index + 5% Space + Overhead - Dynamic space
Free space	11,413,787	Total Seg. Size - Dynamic Space - Static Space - Not Needed
Daily growth	10,550,953	(Dynamic space/W * 62.5)* tpmC
Daily spread	-4,412,642	Free space - 1.5 * Daily growth (zero if negative)
180 day (KB)	2,046,488,616	Static space + 180 (daily growth + daily spread)
180 day (GB)	1951.68	Excludes OS, Paging and RDBMS Logs
Log size (MB)	30000	Total size of log file
% Log used	64.01	% of log file used during entire run
Total N-O Txn	3840684	Total count of N-O transactions during entire run
Log per N-O txn	5.12	Number of Kbytes per New-Order transaction
8 Hour Log (GB)	74.45	need double for mirroring
os, file sys, swap	8.00	

	Disks	**Qty**	**Total**	**Needed**	**Extra**
Database, Sys	8.195	280	2294.60	1,959.68	343.38
	8.463	1	8.46		
Mirrored Log	16.958	10	169.58	148.90	20.68

Appendix E : Price Quotation

Microsoft

June 15, 2000

Mr. Eiichi Kennai
NEC Corp.
via FAX

Dear Mr. Kennai:

Here is the information you requested regarding U.S. pricing for several Microsoft products, to be used in conjunction with TPC-C benchmark testing.

Part Number	Description	Unit Price	Quantity	Price
N/A	**SQL Server 2000 Enterprise Edition** Per processor licensing	$19,999	4	$79,996
C10-00010	**Windows 2000 Advanced Server** 25 Client Licenses	$3,919	1	$3,919
C11-00016	**Windows 2000 Server** 5 Client Licenses	$999	1	$999
048-00317	**Visual C++ Professional 6.0 Win32**	$549	1	$549
	5-year maintenance for above software	$2,095	5	$10,475

Some products may not be currently orderable but will be available through Microsoft's normal distribution channels by August 1, 2000.

This quote is valid for the next 90 days.

If I can be of any further assistance, please contact me at (425) 703-3455 or barryg@microsoft.com.

Yours truly,

Barry Goffe
Product Manager
SQL Server Marketing

Microsoft Corporation is an equal opportunity employer.

MYLEX
MOVING DATA SMARTER

June 9th, 2000

NEC Corporation
Server Hardware Engineering Group

Attn: Mr. Robin Gomi

RE: Quotation for eXtremeRAID2000

Dear Mr. Gomi;

Mylex is please to submit the following quotation to you for eXtremeRAID2000.

P/N	Description	Unit Price
E2000-4-64NB	4 chnl Ultra 160 SCSI RAID controller 64MB without BBU	US$2,050-

Note:
1. Above price is valid for 60 days
2. Based on F.O.B. ex-factory Fremont, CA
3. Warranty period 5 years
4. Lead time: 30 days

Sincerely

Ben Taniguchi
Vice President
Asia/Pacific Sales

Mylex Corporation
34551 Ardenwood Blvd.
Fremont, CA 94555-3607
Phone: 510-796-6100
www.mylex.com

ADS A Vangard Technology Company

Applied Digital Systems, Inc.
30 Liftbridge Lane East
Fairport, New York 14450

phone: 716.377.7000
fax: 716.377.5544
web: www.adsys.com

30 Liftbri[redacted]
Fairpo[redacted]
Phone[redacted]
Fax (716)[redacted]
E-Mail:heather@adsys.com

Quotation:0601
Date:June 1, 2000
Terms:N30
FOB:Fairpor, NYt
Quote Valid For 30 Days

TO:

Robin Gomi
NEC
978-635-6267 fax

QTY.	DESCRIPTION	UNIT PRICE
04	IFT-3102U2G:SCSI U2 4 channel controller.	$2092.00each
04	IFT-9070B:Integrated Batt. Module.	$ 170.00each

Thank you for the opportunity to work with you. If you have any questions please feel free to call.

Sincerely,

Heather

Heather Visconti

Seneca Data Distributors, Inc
7401 ROUND POND ROAD
NORTH SYRACUSE, NY 13212 (315)433-1160

QUOTATION
TERMS: COD CASH
PAGE# 1

BILL TO	SHIP TO
NEC TECHNOLOGIES, INCORPORATION 1300 MASSACHUSETTS AVENUE BOXBOURUGH, MA 01719 (508)264-8974	NEC TECHNOLOGIES, INCORPORATION 1300 MASSACHUSETTS AVENUE BOXBOURUGH, MA 01719 (508)264-8974

OUR ORDER#: 838638 JSD
ORDER DATE: 06/13/00 13:55:10
F.O.B. : ORIGIN
SHIP VIA: UPSA GROUND ALBANY NY
SHIP DATE: 06/13/00

ACCOUNT#: 009873
YOUR P/O#: quote
PLACED BY: ROBIN
CONTRACT#:
JOB#/NAME:

QUANTITY	UNIT	ITEM NUMBER	UNIT PRICE	EXT PRICE
1	Ea	TP1016C COMPEX, 16PORT, 10BASET, RJ45&BNC/AUI, RACKMOUNT, CASCADABLE ETHERNET, MICROHUB	80.0000	80.00

1 LINE

SUBTOTAL	80.00
TAX	4.00
TOTAL	84.00