TPC Benchmark™ C

Full Disclosure Report for

FUJITSU COMPUTERS
SIEMENS

PRIMERGY N800

Using Microsoft SQL Server 2000
Enterprise Edition

and Microsoft Windows 2000
Datacenter Server

July 5, 2000

First Edition

First Edition July 5, 2000

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Benchmark results are highly dependent upon workload, specific application requirements, 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 contemlated.

All performance data contained in this report were obtained in a rigorously controlled environment. Results obtained in other operating environments may vary significantly. We 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.

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Preface

The Transaction Processing Performance Council (TPC), of which Fujitsu Siemens Computers GmbH is a member, is an organization of computer companies, dedicated to the development of objective, industry-wide performance metrics in the area of transaction processing. Fujitsu Siemens Computers GmbH is involved in this effort, participating on the council and utilizing TPC benchmarks in performance evaluation.

The TPC Benchmark™ C Standard Specification was developed by the Transaction Processing Performance Council. This benchmark exercises the system components necessary to perform tasks associated with that class of on-line transaction processing (OLTP) environments emphasizing a mixture of read-only and update intensive transactions. This is a complex OLTP application environment exercising a breadth of system components associated by such environments characterized by:

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

This benchmark defines four on-line transactions and one deferred transaction, intended to emulate functions that are common to many OLTP applications. However, this benchmark does not reflect the entire range of OLTP requirements. The extent to which a customer can achieve the results reported by a vendor is highly dependent on how closely TPC-C approximates the customer application. The relative performance of systems derived from this benchmark does not necessarily hold for other workloads or environments. Extrapolations to any other environment are not recommended.

Benchmark results are highly dependent upon workload, specific application requirements, system 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 benchmarking when critical capacity planning and/or product evaluation decisions are contemplated.

The performance metric reported by TPC-C is a "business throughput" measuring the number of orders processed per minute. Multiple transactions are used to simulate the business activity of processing an order , and each transaction is subjected 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.

Summary

This report documents the TPC Benchmark™ C results achieved by the Fujitsu Siemens Computers GmbH using Microsoft SQL Server 2000 Enterprise Edition.

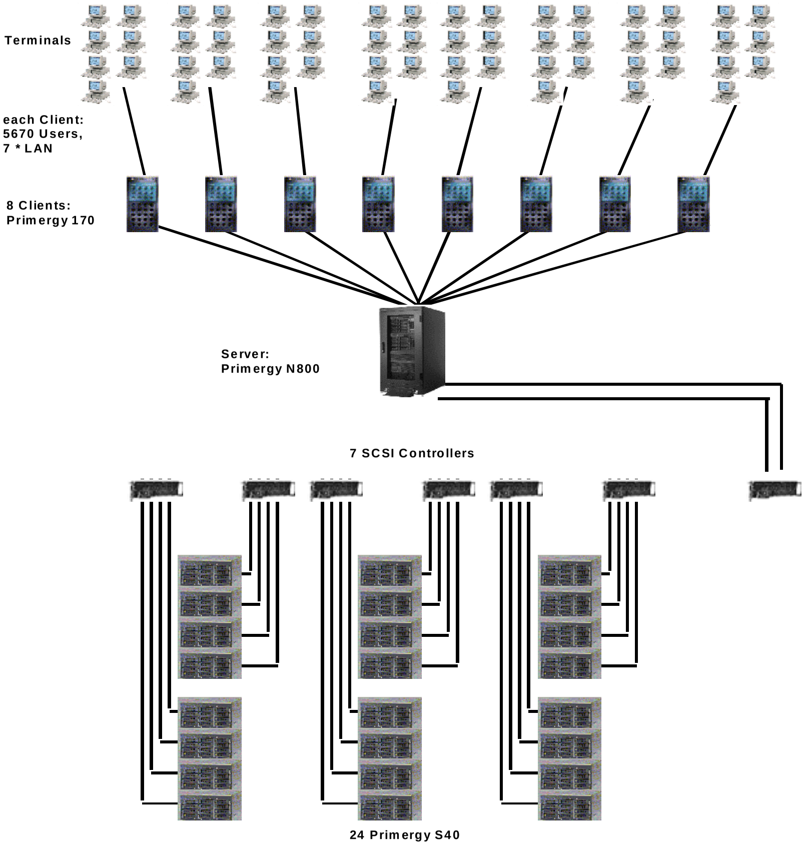
The TPC Benchmark™ C tests were run on a Primergy N800 system using the Windows 2000 Datacenter Server operating system.

The results, summarized below, show the number of TPC Benchmark™ C transactions per minute (tpmC) and the price per tpmC (€/tpmC).

Software	Hardware	tpmC	€/tpmC
Microsoft SQL Server 2000 Enterprise Edition, Windows 2000 Datacenter Server	Fujitsu Siemens Computers GmbH Primergy N800	56,388.50	20.52€

FUJITSU COMPUTERS SIEMENS	**Primergy N800** **C/S with 8 Primergy 170**		**TPC-C REV 3.5** **EXECUTIVE SUMMARY** **Report Date: July 5, 2000**
Total System Cost	**TPC-C Throughput**	**Price/Performance**	**Availability Date**
€ 1,157,002	**56,388.50 tpmC**	**€20.52/tpmC**	**October 1, 2000**

Processors	**Database Manager**	**Operating-System**	**Other Software**	**Number of Users**
8 Intel Pentium® III Xeon 700 MHz	Microsoft SQL Server 2000 Enterprise Edition	Microsoft Windows 2000 Datacenter Server	Windows 2000 Server, IIS 5.0 and COM+	**45,360**



System Components	Qty/Srv.	1 Primergy N800	Qty/Client	8 Primergy 170
Processors	8	Intel Pentium® III Xeon 700 MHz with 2 MB SLC	1	Intel Pentium® III 700 MHz with256 KB SLC
Memory	32	GB	256	MB
Disk Controller	7	SCSI Controllers	1	SCSI Controller
Disk Drives	144	9 GB	1	9 GB
	144	18 GB		
	8	36 GB		
Total GB of Storage	1	3593 GB	1	9 GB

FUJITSU COMPUTERS SIEMENS

Primergy N800

C/S with 8 Primergy 170

TPC-C REV 3.5
EXECUTIVE SUMMARY

Report Date: July 5, 2000

Description	Part Number	Third Party Brand	Pricing	Unit Price	Qty.	Extended Preis	5yr Maint. Price
N800 Base 4x700MHz 2MB w/ MS Windows 2000 DataCente	SNP:SY-K594V100-P		1	63.000 Euro	1	63.000 Euro	
Pentium III Xeon Processor 700MHZ/2MB	SNP:SY-F2176E702-P		1	7.110 Euro	4	28.440 Euro	
2. CPU Board incl. CC board 4x SRAM	SNP:SY-F2172E40-P		1	4.275 Euro	1	4.275 Euro	
Memory Board	SNP:SY-F2173E100-P		1	1.215 Euro	2	2.430 Euro	
Memory 1 GB SDRAM 100MHZ	SNP:SY-F2174E506-P		1	5.600 Euro	32	179.200 Euro	
Gigabit Ethernet PCI 32/64	D:RM6T5-CL18		1	3.452 Euro	1	3.452 Euro	
Primergy S40 BS 1 channel rack	SNP:SY-K538V511-P		1	2.205 Euro	1	2.205 Euro	
S40 3-channel kit	SNP:SY-F2015E3-P		1	414 Euro	1	414 Euro	
Einbaukit 19" DC Rack	SNP:SY-F1331E101-P		1	360 Euro	1	360 Euro	
Tape Drv SLR50 , 25GB	SNP:SY-F1835E3-P		1	1.575 Euro	1	1.575 Euro	
9GB/10K LVD-SCSI, Hot Plug	SNP:SY-F2175E109-P		1	540 Euro	1	540 Euro	
SCSI Cable UHD-HD LVD	SNP:SY-F1947L50-A		1	135 Euro	1	135 Euro	
Data Center Rack	SNP:SY-K614V101-P		1	1.755 Euro	1	1.755 Euro	
Power Supply Module 750W (add)	SNP:PS-F594E1-P		1	855 Euro	1	855 Euro	
Keyboard KBPC	S26381-K271-V320		1	26 Euro	1	26 Euro	
Country Pack	SNP:SY-F2195B401-P		1	36 Euro	1	36 Euro	
Monitor MCM 15P1	S26361-K561-V150		1	256 Euro	1	256 Euro	
	Server Hardware Subtotal		1			288.954 Euro	
RAID-Ctrl, PCI 4-Ch,BBU + 10% Spares	SNP:SY-F2190-E128		1	3.150 Euro	9	28.350 Euro	
36GB/10K LVD, Hot Plug (incl. 10% spare)	SNP:SY-F1899E136-P		1	1.643 Euro	10	16.425 Euro	
APC USV 3000VA (icl. 10% spares)	SNP:PS-E421E800-P		1	2.003 Euro	3	6.008 Euro	
9GB/10K LVD-SCSI, Hot Plug (+10% Spare)	SNP:SY-F1899E109-P		1	540 Euro	159	85.860 Euro	
18GB/10K LVD-SCSI, Hot Plug (+10% spares)	SNP:SY-F1899E118-P		1	945 Euro	159	150.255 Euro	
Primergy S40 BS 1 channel stack (+ 10% spares)	SNP:SY-K538V611-P		1	2.209 Euro	27	59.632 Euro	
S40 BS Country Pack (+10% spares)	SNP:SY-F1699B541-P		1	36 Euro	27	972 Euro	
SCSI Cacble UHD-HD LVD 5m (+10% spares)	SNP:SY-F1947L50-A		1	135 Euro	27	3.645 Euro	
	Storage Subtotal		1			351.147 Euro	
	Maint. Server + Storage						83.698 Euro
PRIMERGY 170 GE F, PIII 700, SCSI	SNP:SY-K549V145-A		1	1.440 Euro	8	11.520 Euro	10.800 Euro
Keyboard KBPC	S26381-K271-V320		1	26 Euro	8	209 Euro	
Country Pack	SNP:SY-F1699B413-A		1	36 Euro	8	288 Euro	
Memory 128 MB SDRAM ECC	S26361-F1840E515		1	360 Euro	16	5.760 Euro	
HD 9GB, U2W	SNP:SY-F2069E9-A		1	428 Euro	8	3.420 Euro	
Gigabit Ethernet PRO/1000 Server PCI 32/64	SNP:SY-F1911E1-P		1	810 Euro	4	3.240 Euro	
Fast Ethernet 2x10/100 Duralink64 PCI	SNP:SY-F2217E1-P		1	405 Euro	32	12.960 Euro	
Monitor MCM 15P1	S26361-K561-V150		1	256 Euro	8	2.048 Euro	110 Euro
	Client Hardware Subtotal		1			37.397 Euro	
MS SQL-Server 2000 Enterprise.Edition, per Proc. Lic.		Microsoft	2	18.363 Euro	8	146.904 Euro	11.320 Euro
	Server Software Subtotal					146.904 Euro	
Microsoft Windows 2000 Server, incl. 5 CALs		Microsoft	2	1.079 Euro	8	8.632 Euro	
Microsoft Visual C++ Professional 6.0		Microsoft	2	593 Euro	1	593 Euro	
	Client Software Subtotal					9.225 Euro	
8xTP, 1xCoax, 10 Mbit Hub incl. 10% spare	DE-809TC		3	34 Euro	6.284	213.656 Euro	
8x10/100Mbit Switch incl. 10% spare	DES-3225G		3	869 Euro	3	2.607 Euro	
Gigabit Uplink incl. 10% spare	DES-3251G		3	395 Euro	3	1.185 Euro	
	User Connectivity Subtotal					217.448 Euro	
	Total					1.051.074 Euro	105.928 Euro

Five-Year Cost of Ownership	1.157.002 Euro
tpmC	56388
Euro/tpmC	20,52

1=Fujitsu Siemens Computers, 2=Microsoft, 3=D-Link

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

Five-Year Cost of Ownership:	€1,157,002
tpmC Rating:	56,388.50
€ / tpmC:	20.52

Note: The benchmark results and test methodology were audited by Bradley J. Askins of InfoSizing

Numerical Quantities Summary

MQTh, computed Maximum Qualified Throughput			56,388.50 tpmC
% throughput difference, reported & reproducibility runs 0.18 %			
Response Times (in seconds)	**90th percentile**	**Average**	**Maximum**
- New-Order	**0.96**	**0.45**	**5.07**
- Payment	**0.90**	**0.40**	**5.12**
- Order-Status	**0.89**	**0.40**	**3.93**
- Delivery (interactive portion)	**0.39**	**0.18**	**2.69**
- Delivery (deferred portion)	**0.38**	**0.24**	**1.43**
- Stock-Level	**1.25**	**0.71**	**5.08**
- Menu	**0.40**	**0.19**	**2.77**
Transaction Mix, in percent of total transactions			
- New-Order			**44.79 %**
- Payment			**43.04 %**
- Order-Status			**4.05 %**
- Delivery			**4.05 %**
- Stock-Level			**4.07 %**
Emulation Delay (in seconds)		**Response Time**	**Menu**
- New-Order		**0.1**	**0.1**
- Payment		**0.1**	**0.1**
- Order-Status		**0.1**	**0.1**
- Delivery (interactive)		**0.1**	**0.1**
- Stock-Level		**0.1**	**0.1**
Keying/Think Times (in seconds)	**Minimum**	**Average**	**Maximum**
- New-Order	**18.00/0.00**	**18.01/12.05**	**18.04/120.51**
- Payment	**3.00/0.00**	**3.01/12.03**	**3.04/120.50**
- Order-Status	**2.00/0.00**	**2.01/10.03**	**2.03/100.50**
- Delivery (interactive)	**2.00/0.00**	**2.01/ 5.07**	**2.03/ 50.50**
- Stock-Level	**2.00/0.00**	**2.01/ 5.01**	**2.03/ 50.50**
Test Duration and Checkpointing			
- Ramp-up time		**34 minutes**	
- Measurement interval		**30 minutes**	
- Number of checkpoints		**1**	
- Checkpoint interval		**30 minutes**	
- Transactions during measurement interval (all types)		**3,929,614**	

Contents

Introduction

This is the Full Disclosure Report for the TPC Benchmark™ C running on the Fujitsu Siemens Computers system Primergy N800. It meets the requirements of the TPC Benchmark™ C Standard Revision 3.5.

System Overview

This report documents the compliance of the Fujitsu Siemens Computers GmbH TPC Benchmark™ C tests using Microsoft SQL Server 2000 Enterprise Edition Relational Database Management System.

The TPC Benchmark™ C tests were carried out on a Primergy N800. The Primergy N800 is a powerful Windows NT Enterprise Server with a motherboard based on the Intel Profusion chipset holds up to 8 Intel Pentium® III Xeon 700 MHz processors with 2 MB L2 cache. The system was equipped with 32 GB of ECC SDRAM memory. 7 of the 10 hot-pluggable 64-bit-PCI-Slots (4 with 66 MHz and 6 with 33 MHz) were used for SCSI RAID controllers, 1 was used for an Alteon Gigabit Ethernet adapter with uplink switch 1GB / 100 MB.
The client machines were 8 Primergy 170 with 1 Intel Pentium® III 700 MHz. They all included 256 MB ECC SDRAM memory and 4 Adaptec ANA 62022 dual-port ethernet adapters.

The server operating system was Windows 2000 Datacenter Server. The client operating system was Windows 2000 Server.

Full Disclosure

From Clause 8.1 of the TPC Benchmark™ C Standard Specification:

> The intent of this disclosure is for a customer to be able to replicate the results of this benchmark given the appropriate documentation and products.

Fujitsu Siemens Computers believes that this full disclosure report meets the stated intention. Fujitsu Siemens Computers has strived to maintain the integrity of the Specification by adhering not only to the letter of the Specification, but also to its spirit.

Report Format

*The format of this document follows Clause 8 of the TPC Benchmark™ C specification (*TPC Benchmark™ C Standard Specification, *Revision 3., Transaction Processing Performance Council) which describes the full disclosure report requirements for the test.*

Each section of this report begins with the specification requirement printed in *italic type*. It is followed by plain type text that explains how the test complies with the requirement. Sections which require extensive listings reference appropriate appendices.

Report organization**:**

- General Items
- Clause 1 Related Items - Logical Database Design
- Clause 2 Related Items - Transaction and Terminal Profiles
- Clause 3 Related Items - Transaction and System Properties
- Clause 4 Related Items - Scaling and Database Population
- Clause 5 Related Items - Performance Metrics and Response Time
- Clause 6 Related Items - SUT, Driver, and Communication Definition
- Clause 7 Related Items - Pricing
- Clause 8 Related Items - Audit
- Appendix A - Application Source Code
- Appendix B - Database Details
- Appendix C - Tunable Parameters and Options
- Appendix D – Space Calculation
- Appendix E - Price Quotations
- Appendix F - Attestation Letter

Additional Copies

Additional copies of this report are available upon request from Fujitsu Siemens Computers GmbH:

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SHV Server DS 5
Primergy Server Performance Lab
Mr. Bathe
Heinz-Nixdorf-Ring 1
33106 Paderborn
Germany

1. General Items

1.1 Application Code

The application program (as defined in Clause 2.1.7) must be disclosed. This includes, but is not limited to, the code implementing the five transactions and the terminal input and output functions. [Clause 8.1.1.4]

The source code of the application program is provided in Appendix A - Application Source Code.

1.2 Benchmark Sponsor

A statement identifying the benchmark sponsor(s) and other participating companies must be provided. [Clause 8.1.1.5]

This benchmark was sponsored and executed by Fujitsu Siemens Computers GmbH.
The benchmark was developed and engineered by Fujitsu Siemens Computers GmbH and Microsoft Corporation. Testing took place at Fujitsu Siemens Computers NT-benchmark laboratories in Paderborn, Germany.

1.3 Parameter Settings

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

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

[Clause 8.1.1.6]

The significant parameters and system configuration files are provided in Appendix C - Tunable Parameters and Options.

1.4 Configuration Diagrams

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

- *Number and type of processors.*
- *Size of allocated memory, and any specific mapping/partitioning of memory unique to the test.*
- *Number and type of disk units (and controllers, if applicable).*
- *Number of channels or bus connections to disk units, including their protocol type.*
- *Number of LAN (e.g., Ethernet) connections, including routers, workstations, terminals, etc., that were physically used in the test or are incorporated into the pricing structure (see Clause 8.1.8).*
- *Type and the run-time execution location of software components (e.g., DBMS, client processes, transaction monitors, software drivers, etc.).*

[Clause 8.1.1.7]

SUT Configuration

The Primergy N800 server system included:

8	Intel Pentium® III Xeon 700 MHz with 2 MB Second Level Cache
32	GB memory
7	SCSI controllers
192	disks 9 GB measured
96	disks 18 GB measured
144	disks 9 GB priced
144	disks 18 GB priced
8	disks 36 GB
1	LAN

Client Configuration

The Primergy 170 client systems included:

1	Intel Pentium® III 700 MHz with 256 KB SLC
256	MB memory
1	SCSI controller
1	disk 9 GB
4	dual port LAN

The benchmarked and priced system configurations are shown in Figure 1 and Figure 2 in accordance with Clause 8.1.1.7.

FIGURE 1: BENCHMARK SYSTEM CONFIGURATION PRIMERGY N800

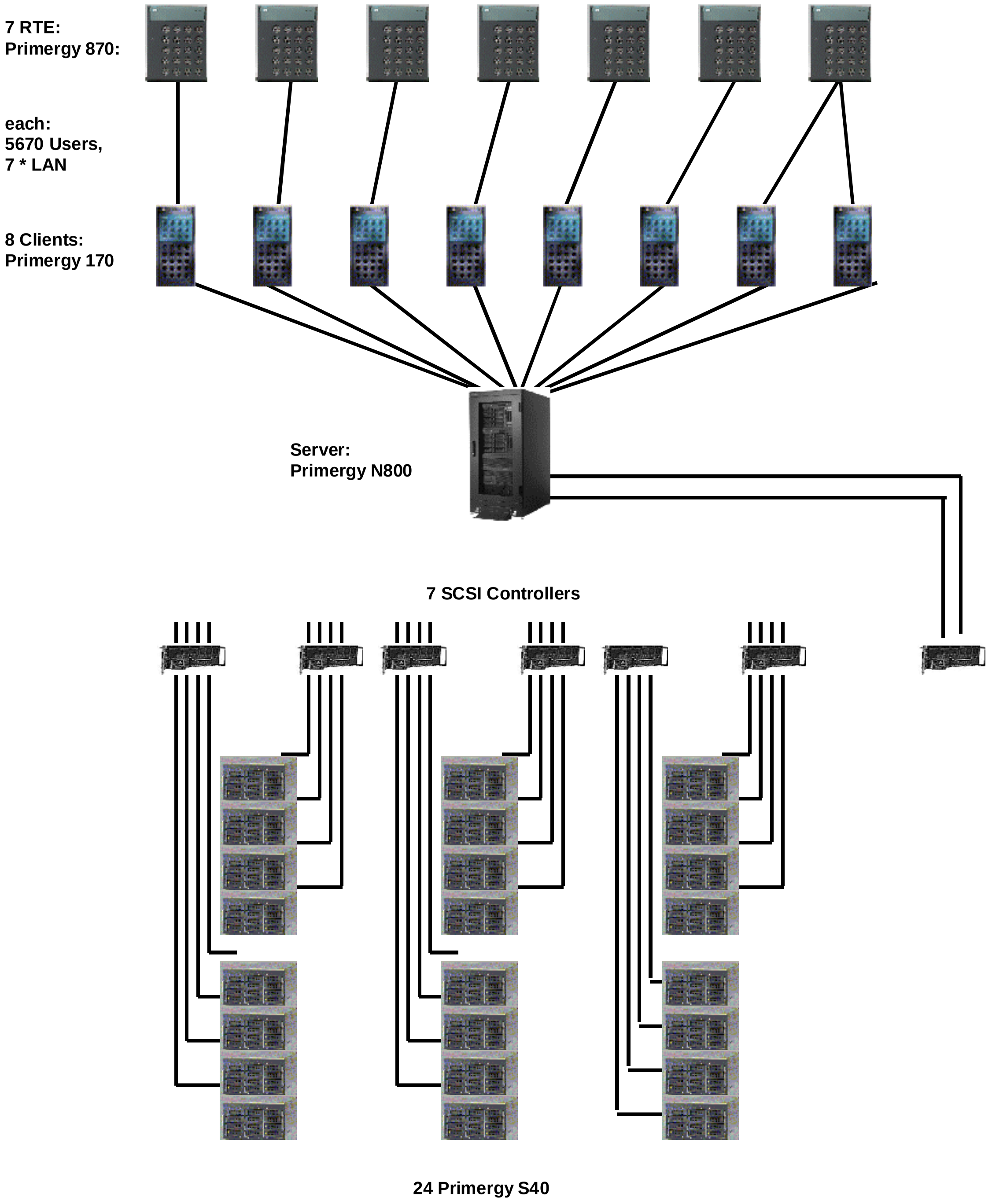
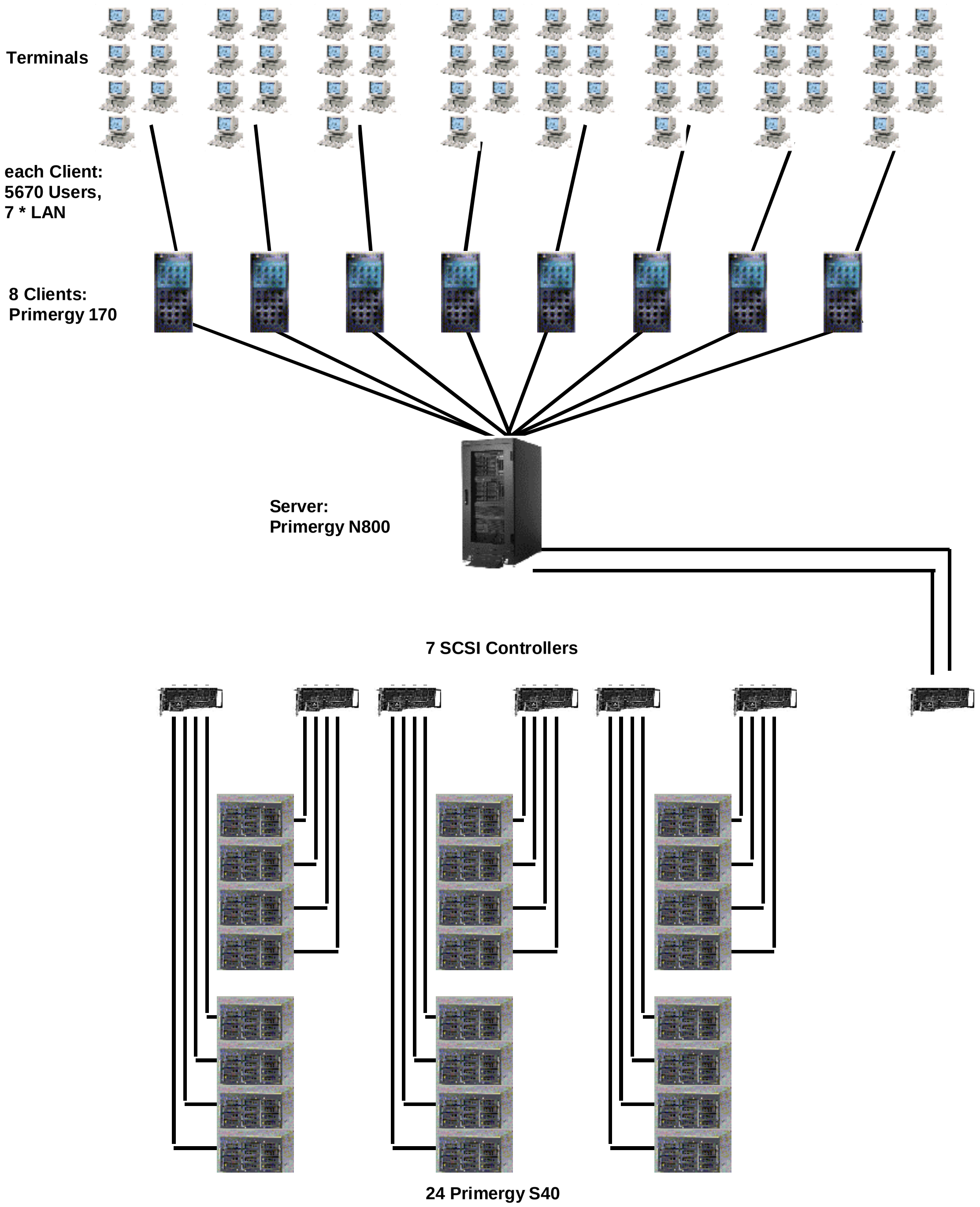


FIGURE 2: PRICED SYSTEM CONFIGURATION PRIMERGY N800



2. Clause 1 Related Items - Logical Database Design

2.1 Table Definitions

Listings must be provided for all table definition statements and all other statements used to set-up the database. [Clause 8.1.2.1]

The programs that defined, created, and populated the Microsoft SQL Server 2000 Enterprise Edition database for this TPC benchmark™ C are listed in Appendix B - Database Details.

2.2 Physical Organization of Database

The physical organization of tables and indices, within the database, must be disclosed. [Clause 8.1.2.2]

FIGURE 3: PHYSICAL ORGANIZATION OF THE DATABASE

Disk #	Controller	Disktype	RAID Configuration	Drive Letter	Size MB	Filegroup or Filesystem
0	Symbios (onboard)	9 GB	-	system C: D:	4000 4500	NTFS NTFS
1	eXtremeRAID 2000 #1	8 x 36GB	RAID 1	L:	80000	log
2	eXtremeRAID 2000 #2	48 x 9 GB	RAID 0	E: N: X:	44000 25500 292000	cs1 misc1 BACKUP 1
3	eXtremeRAID 2000 #3	48 x 9 GB	RAID 0	F: O: Y:	44000 25500 292000	cs2 misc2 BACKUP2
4	eXtremeRAID 2000 #4	48 x 9 GB	RAID 0	G: P:	44000 25500	cs3 misc3
5	eXtremeRAID 2000 #5	48 x 9 GB	RAID 0	H: Q:	44000 25500	cs4 misc4
6	eXtremeRAID 2000 #6	48 x 18 GB	RAID 0	I: R:	44000 25500	cs5 misc5
7	eXtremeRAID 2000 #7	48 x 18 GB	RAID0	J: S:	44000 25500	cs6 misc6

All controllers were configurated with write cache disabled. Write cache was enabled on the log drives and disabled on the data drives.

Space was allocated to Microsoft SQL Server 2000 Enterprise Edition on SUT disks according to the data in section 5.2. The size of the datafile on each disk drive was calculated to provide even distribution on load across the disk drives. The NT Disk Administrator was used to create raw devices for data/log and NTFS partitions for dump devices. For further information see Appendix B (Disk Usage) and Figure 4 in 5.2 (Distribution of Tables and Log). No attempt was made to alter the default physical organization of the database tables and indices chosen by Microsoft SQL Server 2000 Enterprise Edition.

2.3 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 restriction 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 maximum key value for these new rows. [Clause 8.1.2.3]

There were no restrictions on insert and delete operations to any tables.

2.4 Database Partitioning

While there are a few restrictions placed upon horizontal or vertical partitioning of tables and rows in the TPC benchmark™ C (see Clause 1.6), any such partitioning must be disclosed. [Clause 8.1.2.4]

There was no partitioning used in this implementation.

2.5 Replication of Tables

Replication of tables, if used, must be disclosed (see Clause 1.4.6). [Clause 8.1.2.5]

Replication of tables was not used in this implementation.

2.6 Additional and/or Duplicated Attributes

Additional and/or duplicated attributes in any table must be disclosed along with a statement on the impact on performance (see Clause 1.4.7). [Clause 8.1.2.6]

No additional and/or duplicated attributes were used.

3. Clause 2 Related Items - Transaction and Terminal Profiles

3.1 Random Number Generator

The method of verification for the random number generation must be described. [Clause 8.1.3.1]

The random number generation was done in Microsoft BenchCraft, which was audited independently.

3.2 Input/Output Screen Layout

The actual layouts of the terminal input/output screens must be disclosed. [Clause 8.1.3.2]

The screen layout corresponded exactly to those of the TPC-C Standard Specification (specified in Clause 2.4.3, 2.5.3, 2.6.3, 2.7.3, and 2.8.3).

3.3 Configured Terminal Features

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

All of the requirements in clause 2.2.2.4. are supported. This was verified by manually exercising each specification on a Primergy 870-40.

3.4 Presentation Managers or Intelligent Terminals

Any usage of presentation managers or intelligent terminals must be explained. [Clause 8.1.3.4]

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

3.5 Transaction Statistics

The numerical quantities which are required are listed in the following table. [Clause 8.1.3.5 to 8.1.3.11]

	Statistics	Percentage
New-Order	Home order-lines	99.00%
	Remote order-lines	1.00%
	Rolled back transactions	1.00%
	Average items per order	10.00
Payment	Home transactions	85.00%
	Remote transactions	15.00%
	Non-primary key access	60.05%
Order-Status	Non-primary key access	59.87
Delivery	Skipped transactions	0
Transaction Mix	New-Order	44.79 %
	Payment	43.04 %
	Order-Status	4.05 %
	Delivery	4.05 %
	Stock-Level	4.07 %

3.6 Queueing Mechanism

The queuing mechanism used to defer the execution of the Delivery transaction must be disclosed. [Clause 8.1.12]

Deferred deliveries are queued by making an entry in an array within the client application process (tpcc.dll). The queued delivery transactions are processed and logged asynchronously by background threads within the application.
The source code is listed in Appendix A - Application Source Code.

4. Clause 3 Related Items - Transaction and System Properties

ACID Tests

The results of the ACID tests must 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. [Clause 8.1.4.1]

All ACID tests were performed successfully. The following sections describe the requirements of each of the tests as described in Clause 3 and the approach used to satisfy them.

All ACID tests were performed on the Primergy N800 system using the fully scaled database, except for the test of durable media failure.
The durability test was performed on a database scaled to 15 warehouses. This test would also pass on a fully scaled database.

4.1 Atomicity

The system under test must guarantee that 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. [Clause 3.2.1]

Commit Transaction

Perform the Payment transaction for a 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. [Clause 3.2.2.1]

The following steps demonstrated atomicity for completed (COMMIT) transactions:

- A row was randomly selected from the warehouse, district and customer table.
- the current balance was noted.
- A payment transaction was executed with the above identifiers and a known amount.
- The transaction was committed.
- It was verified, that the rows contain the correct updated balances.

Rollback Transaction

Perform the Payment transaction for a 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 the records in the CUSTOMER, DISTRICT, and WAREHOUSE tables have NOT been changed. [Clause 3.2.2.2]

The following steps demonstrated atomicity for aborted (ROLLBACK) transactions:

- A row was randomly selected from the warehouse, district and customer table.
- the current balance was noted.
- A payment transaction was executed with the above identifiers and a known amount.
- The transaction was rolled back.
- It was verified, that the rows contain the original balances.

4.2 Consistency

Consistency is the property of the application that requires any execution of a database transaction to take the database from one consistent state to another, assuming that the database is initially in a consistent state. [Clause 3.3.1]

Consistency conditions 1 - 4 were tested by issuing queries to the database. The results of the queries verified that the database was consistent for all these tests. The tests were performed before and after the performance run on the same database that was used for the benchmark.

4.3 Isolation

Operations of concurrent transactions must yield results which are indistinguishable from the results which would be obtained by forcing each transaction to be serially executed to completion in some order.

We ran all of the seven isolation tests as described in clause 3.4.2.1 to 3.4.2.7 and additionally the two phantom protection tests. The tests were executed using shell scripts to issue queries to the database. The results of the queries verified that the required isolation had been met.

4.4 Durability

The tested system must guarantee durability: the ability to preserve the effects of committed transactions and insure database consistency after recovery from any one of the failures listed in Clause 3.5.3. [Clause 3.5]

List of single failures:

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

[Clause 3.5.3]

The intent of these tests is to demonstrate that all transactions whose output messages have been received at the terminal or RTE have in fact been committed in spite of any single failure from the list in Clause 3.5.3 and that all consistency conditions are still met after the database is recovered.

It is required that the system crash test(s) and the loss of memory test(s) described in Clause 3.5.3.2 and 3.5.3.3 be performed under full terminal load and a fully scaled database. The durable media failure test(s) described in Clause 3.5.3.1 may be performed on a subset of the SUT configuration and database. For the SUT subset, all multiple hardware components, such as processors and disk / controllers in the full SUT configuration, must be represented by the greater of 10% of the configuration or two of each of the multiple hardware components. The database must be scaled to at least 10% of the fully scaled database, with a minimum of two warehouses. ... Furthermore, the standard driving mechanism must be used in this test. The test sponsor must state that to the best of their knowledge, a fully scaled test would also pass all durability tests. [Clause 3.5.4]

The failure of all or part of memory test and the system crash test were combined with the loss of log disk and performed under full load and by using a fully scaled database.

The full hardware configuration of the SUT (in accordance with Clause 3.5.4) and the same test procedure was used during all durability tests, except the test for loss of data.

- The current count of the total number of orders was determined by summing up the D_NEXT_O_ID fields of all rows in the DISTRICT table before the test.
- After 6 min in steady state we pulled off one of the log disks. As we use hardware-mirrored diskpairs with the SCSI-controller, execution continued.
- After additional 6 min we powered of the server to emulate the loss of memory. After server system reboot, SQL-Server starts with recovering the database tpcc. After completion, we computed the sum of D_NEXT_O_ID from district. Client and RTE systems were interrupted and evaluation started on the RTE. The difference of all D_NEXT_O_ID between RTE an server was in the permitted scope.

The durable media failure test for loss of data disk was performed with 48 of the 288 data disks and a database scaled to 15 warehouses under the load of 150 users. We used one RTE and one client system. To the best of the test sponsor's knowledge, a fully loaded and fully scaled database would also pass this durability test.

- The database was backed up.
- The current count of the total number of orders was determined by summing up the D_NEXT_O_ID fields of all rows in the DISTRICT table before the test.
- After 5 min in steady state we pulled of one of the data disks.
- SQL-Server recognized the loss of a device. We dumped the transaction log and removed the database with dropdevice. Then we shut down SQL-Server and the system.
- We replaced the disk and made it online.
- We restarted SQL-Server, no tpcc database and none of its devices were present. We recreated the database, loaded dump and load transaction log
- After completion, we computed the sum of D_NEXT_O_ID from district.
- Client and RTE systems were interrupted and evaluation started on the RTE. The difference of all D_NEXT_O_ID between RTE an server was in the permitted scope.

5. Clause 4 Related Items - Scaling and Database Population

5.1 Initial Cardinality of Tables

The cardinality (e.g., the number of rows) of each table, as it existed at the start of the benchmark run (see Clause 4.2), must be disclosed. If the database was over-scaled and inactive rows of the WAREHOUSE table were deleted (see Clause 4.2.2), the cardinality of the WAREHOUSE table as initially configured and the number of rows deleted must be disclosed. [Clause 8.1.5.1]

The database for the Primergy N800 system was scaled for 4592 warehouses. The performance run used 4536 warehouses. In accordance with Clause 4.2, the following number of records were loaded in the specified tables:

Table	Number of Records
Warehouse	4592
District	45,920
Customer	137,760,000
History	137,760,000
Order	137,760,000
New-Order	41,328,000
Order-Line	1,377,603,634
Stock	459,200,000
Item	100,000
Deleted Warehouses	56

The following constant values were used during the database build and benchmark test for the NURand function:

Constant C	Value
C_LAST (build)	123
C_LAST (run)	233

5.2 Distribution of Tables and Log

The distribution of tables and logs across all media must be explicitly depicted for the tested and priced systems. [Clause 8.1.5.2]

FIGURE 4: LOGICAL ORGANIZATION OF THE DATABASE

	device	raw size	use
C:	MSSQL70_tpcc_root	50 MB	root
L:	MSSQL70_tpcc_log	50.000 MB	Log
E:	MSSQL70_cs1	43.500 MB	Stock,Customer
F:	MSSQL70_cs2	43.500 MB	Stock,Customer
G:	MSSQL70_cs3	43.500 MB	Stock,Customer
H:	MSSQL70_cs4	43.500 MB	Stock,Customer
I:	MSSQL70_cs5	43.500 MB	Stock,Customer
J:	MSSQL70_cs6	43.500 MB	Stock,Customer
N:	MSSQL70_misc1	24.000 MB	Warehouse,District,Item,New Order,History,Order,Orderline
O:	MSSQL70_misc2	24.000 MB	Warehouse,District,Item,New Order,History,Order,Orderline
P:	MSSQL70_misc3	24.000 MB	Warehouse,District,Item,New Order,History,Order,Orderline
Q:	MSSQL70_misc4	24.000 MB	Warehouse,District,Item,New Order,History,Order,Orderline
R:	MSSQL70_misc5	24.000 MB	Warehouse,District,Item,New Order,History,Order,Orderline
S:	MSSQL70_misc6	24.000 MB	Warehouse,District,Item,New Order,History,Order,Orderline

5.3 Database Model, Interface, and Access Language

A statement must be provided that describes:

1. The data model implemented by the DBMS used (e.g., relational, network, hierarchical)

2. The database interface (e.g., embedded, call level) and access language (e.g., SQL, DL/1, COBOL read/write) used to implement the TPC-C transactions. 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.

[Clause 8.1.5.3]

Microsoft SQL Server 2000 Enterprise Edition is a Relational DataBase Management System. The interface used was Microsoft SQL Server 2000 Enterprise Edition stored procedures accessed with Remote Procedure Calls embedded in C code.

5.4 Database Partitions/Replications Mapping

The mapping of database partitions/replications must be explicitly described. [Clause 8.1.5.4]

There was no partitioning and/or replication used in this implementation.

5.5 180 day space Calculation

Details of the 180-day space computations along with proof that the database is configured to subtain 8 hours of growth for the dynamic tables (Order, Order-Line, and History) must be disclosed (see Clause 4.2.3). [Clause 8.1.5.5]

Calculations of space requirements in the priced configurations for the 180-day period are provided in Appendix D – Space Calculation.

6. Clause 5 Related Items - Performance Metrics and Response Time

6.1 Measured tpmC

Measured tpmC must be reported. [Clause 8.1.6.1]

During the 30 minutes measurement period on the Primergy N800 the throughput measured was 56,388.50 tpmC.

6.2 Response Times

Ninetieth percentile, maximum and average response times must be reported for all transaction types as well as for the Menu response time. [Clause 8.1.6.2]

Type	Average	Maximum	90 Percentile
New-Order	0.45	5.07	0.96
Payment	0.40	5.12	0.90
Order-Status	0.40	3.93	0.89
Interactive Delivery	0.18	2.69	0.39
Deferred Delivery	0.24	1.43	0.38
Stock-Level	0.71	5.08	1.25
Menu	0.19	2.77	0.40

6.3 Keying and Think Times

The minimum, the average, and the maximum keying and think times must be reported for each transaction type. [Clause 8.1.6.3]

Keying Times			
Type	**Average**	**Maximum**	**Minimum**
New-Order	18.01	18.04	18.00
Payment	3.01	3.04	3.00
Order-Status	2.01	2.03	2.00
Delivery	2.01	2.03	2.00
Stock-Level	2.01	2.03	2.00

Think Times			
Type	**Average**	**Maximum**	**Minimum**
New-Order	12.05	120.51	0.00
Payment	12.03	120.50	0.00
Order-Status	10.03	100.50	0.00
Delivery	5.07	50.50	0.00
Stock-Level	5.01	50.50	0.00

6.4 Graphs

Response Time frequency distribution curves (see Clause 5.6.1) must be reported for each transaction type. [Clause 8.1.6.4]

The performance curve for response times versus throughput (see Clause 5.6.2) must be reported for the New-Order transaction. [Clause 8.1.6.5]

Think Time frequency distribution curves (see Clause 5.6.3) must be reported for each transaction type. [Clause 8.1.6.6]

Keying Time frequency distribution curves (see Clause 5.6.4) must be reported for each transaction type. [Clause 8.1.6.7]

A graph of throughput versus elapsed time (see Clause 5.6.5) must be reported for the New-Order transaction. [Clause 8.1.6.8]

FIGURE 5: NEW-ORDER RESPONSE TIME DISTRIBUTION

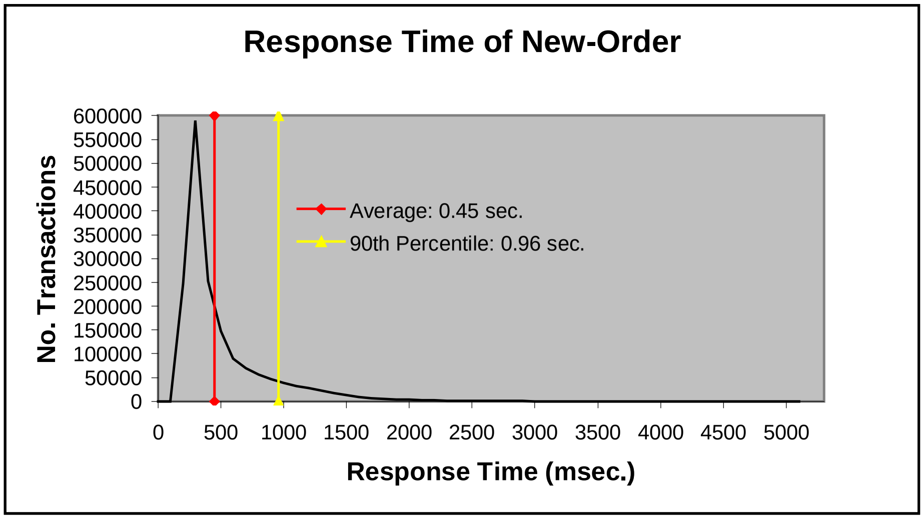


FIGURE 6: PAYMENT RESPONSE TIME DISTRIBUTION

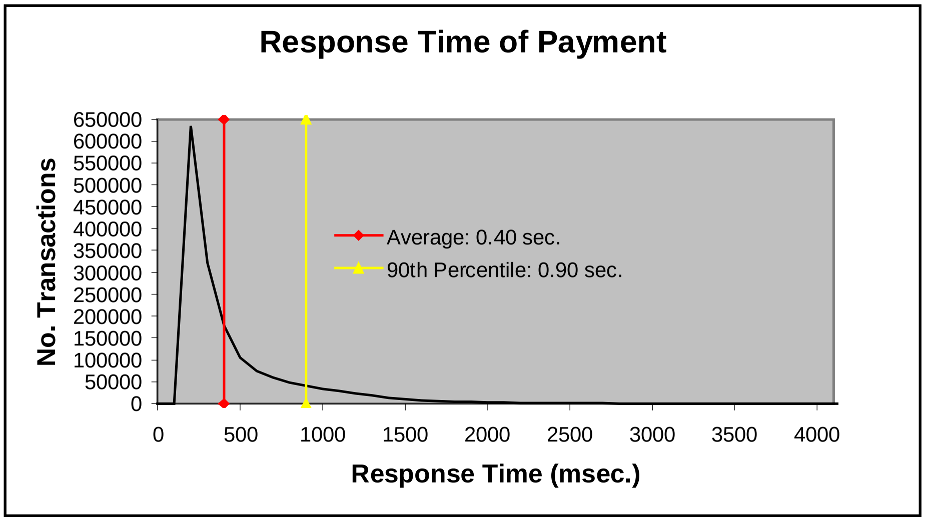


FIGURE 7: ORDER-STATUS RESPONSE TIME DISTRIBUTION

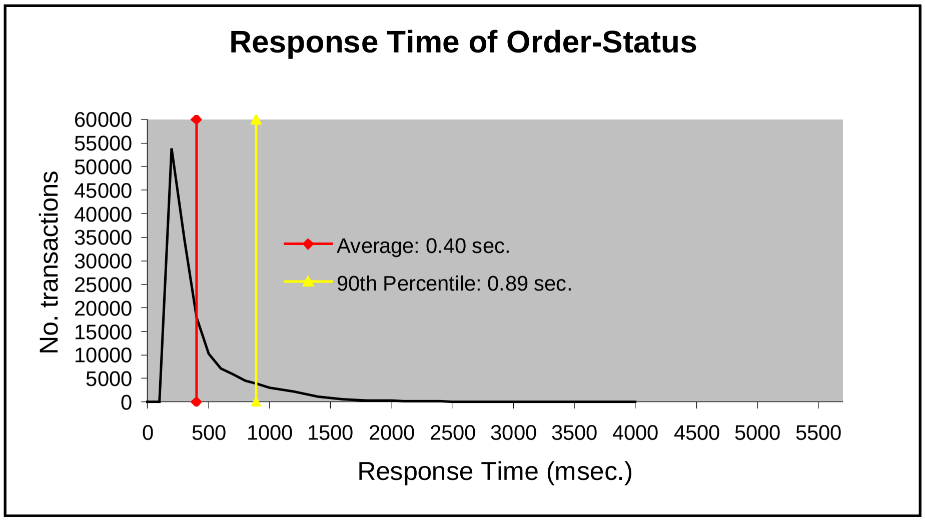


FIGURE 8: DELIVERY RESPONSE TIME DISTRIBUTION

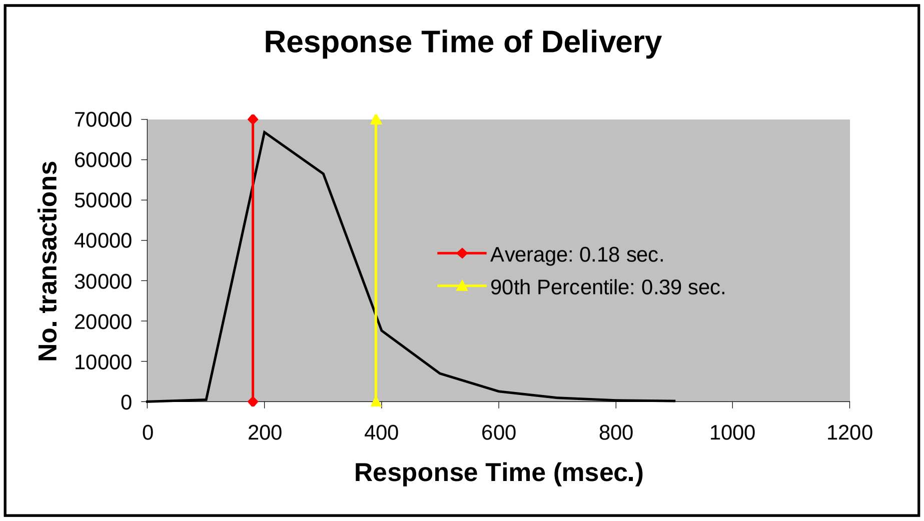


FIGURE 9: STOCK-LEVEL RESPONSE TIME DISTRIBUTION

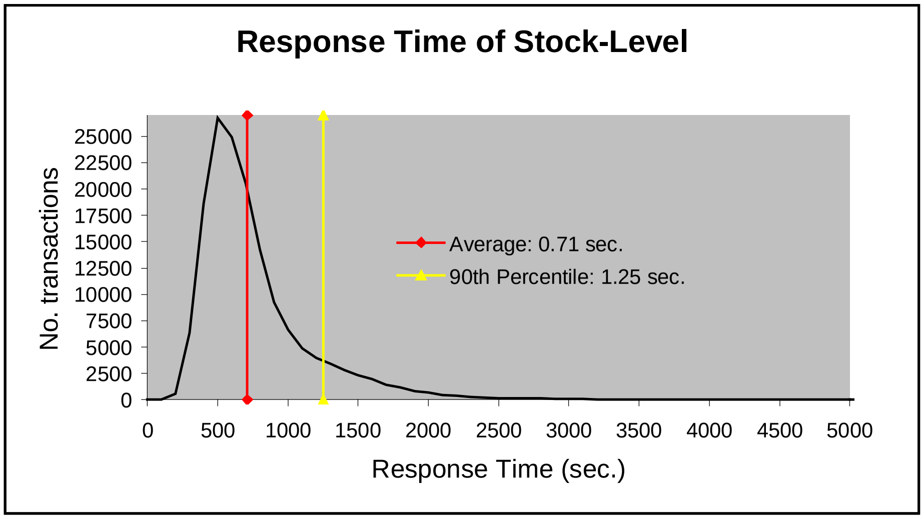


FIGURE 10: RESPONSE TIME VERSUS THROUGHPUT

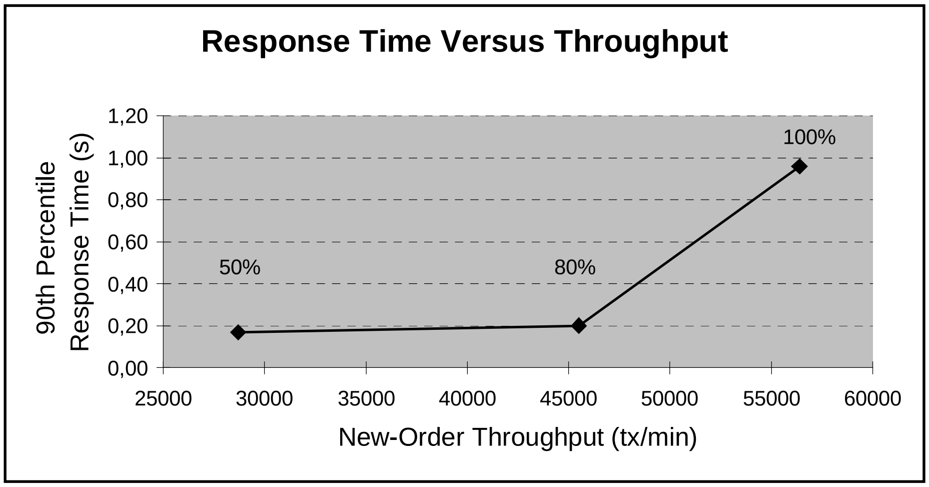


FIGURE 11: NEW-ORDER THINK TIME DISTRIBUTION

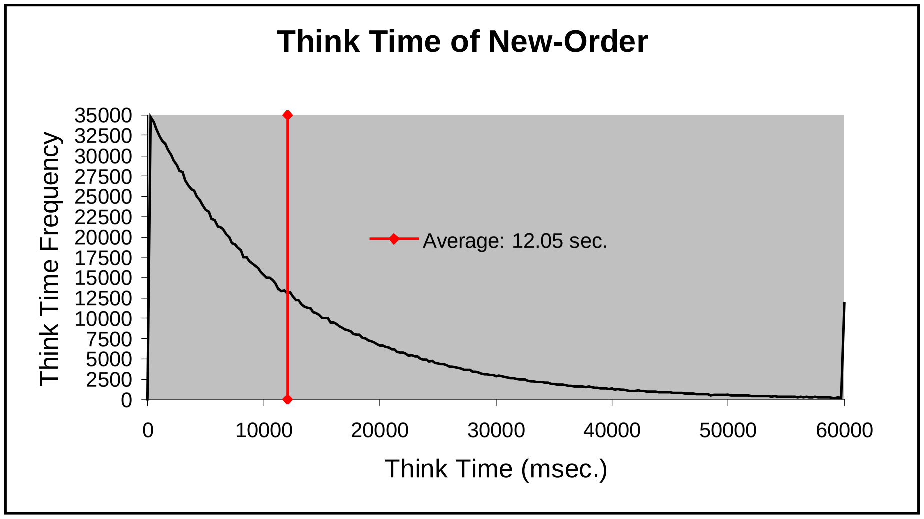
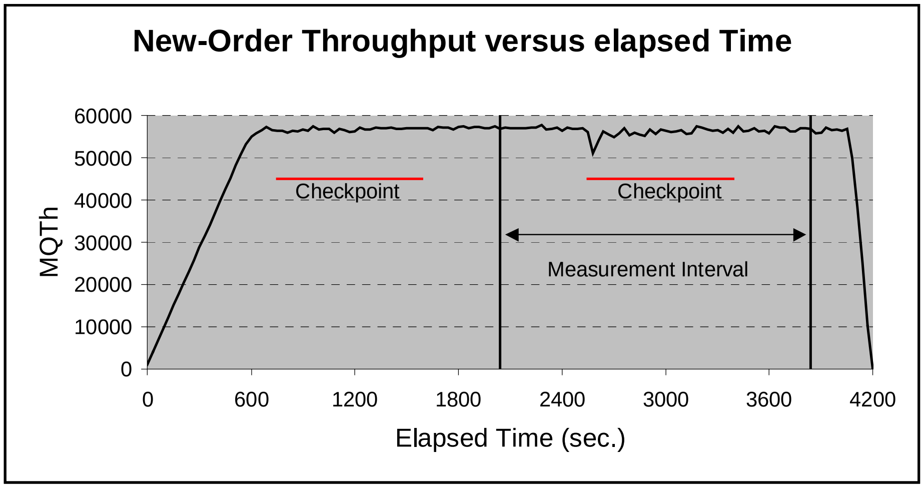


FIGURE 12: THROUGHPUT VERSUS ELAPSED TIME



6.5 Steady State Determination

The method used to determine that the SUT had reached a steady state prior to commencing the measurement interval (see Clause 5.5) must be described. [Clause 8.1.6.9]

In all test runs, steady state was achieved before the measurement period began. Steady state was determined to occur based on a visual inspection of tpmC versus time (see graph in section 6.4).

The graph in section 6.4 illustrates that the measurement period was within the steady state period for the run. One checkpoint occurred during the measurement period.

6.6 Work Performed

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. [Clause 8.1.6.10]

The RTE generated the required input data to choose a transaction from the menu. This data was timestamped and captured in RTE log files before being transmitted. There was one log file for each user. The input screen for the requested transaction was returned and it was also captured and timestamped in the RTE log files. The difference between these two timestamps was the menu response time.

The RTE generated the required input data for the chosen transaction. It waited to complete the minimum required key time before transmitting the input screen. The transmission was timestamped and captured in RTE log files. The return of the screen with the required response data was timestamped and captured in the RTE log files. The difference between these two timestamps was the response time for that transaction.

The RTE then waited the required think time interval before repeating the process starting at selecting a transaction from the menu.

The RTE transmissions were sent to Internet Information Server running on the client machines through Ethernet LANs. Internet Information Server handled all screen I/O as well as all requests to the database on the server. Internet Information Server communicated with the database server over COM+ which was used as transaction monitor.

All database operations like update, select, delete and insert are performed by one of the TPC-C back end programs. The TPC-C backend program commits the transaction after all the corresponding operations are done.

Modified database buffers are migrated to disk a least-recently-used basis independent of transaction commits. In addition, every block modification is protected by log records. Asynchronously the log buffers are flushed to a log file on disk either when the transaction is committed or when the log buffer’s fill state reaches it’s limit. The log buffer’s always flushed by a commit before it become full.

To perform checkpoints at specific intervals, we set SQL server recovery interval to the maximum allowable value and wrote a script to schedule multiple checkpoints at specific intervals. By setting the trace flag #3502, SQL Server logged the checkpoint beginning and ending time in the ERRORLOG file. The script included a wait time between each checkpoint equal to the measurement interval which was 30 minutes. The checkpoint script was started manually after the RTE had all users logged in and sending transactions.

At each checkpoint, Microsoft SQL Server wrote to disk all memory pages that had been updated but not yet physically written to disk. Upon completion of the checkpoint, Microsoft SQL Server wrote a special record to the recovery log to indicate that all disk operations had been satisfied to this point.

6.7 Reproducibility

A description of the method used to determine the reproducibility of the measurement results must be reported. [Clause 8.1.6.11]

The Primergy N800 system test was run twice to ensure the reproducibility of the results. The reproducibility test run under exactly the same conditions as the reported test. All tests conform to the TPC rules.

The tpmC result from the reproducibility test was within 0.18% of the reported tpmC.

In the following, both results are shown to document the reproducibility:

	tpmC
reported test	56,388.50
reproducibility test	56,288.87

6.8 Duration of Measurement

A statement of the duration of the measurement interval for the reported Maximum Qualified Throughput (tpmC) must be included. [Clause 8.1.6.12]

The measurement interval of the Primergy N800 system test was 30 minutes. This measurement interval corresponds to the amount of time from the beginning of one checkpoint to the beginning of the next (which, actually, is less than the amount of time it takes to fill a log file).

6.9 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. [Clause 8.1.6.13]

The transaction mix was regulated by weighted distribution. The chosen weights meet the required minimum percentages of the mix which are described in Clause 5.2.3 of the Standard Specifications. No adjustments were made by the RTE.

6.10 Transaction Mix

The percentage of the total mix for each transaction type must be disclosed. [Clause 8.1.6.14]

	Percentage
New-Order	44.79 %
Payment	43.04 %
Order-Status	4.05 %
Delivery	4.05 %
Stock-Level	4.07 %

6.11 Transaction Statistics

The percentage of New-Order transactions rolled back as a result of invalid item number must be disclosed. [Clause 8.1.6.15]

The average number of order-lines entered per New-Order transaction must be disclosed. [Clause 8.1.6.16]

The percentage of remote order-lines entered per New-Order transaction must be disclosed. [Clause 8.1.6.17]

The percentage of remote Payment transactions must be disclosed. [Clause 8.1.6.18]

The percentage of customer selections by customer last name in the Payment and Order-Status transactions must be disclosed. [Clause 8.1.6.19]

The percentage of Delivery transactions skipped due to there being fewer than necessary orders in the New-Order table must be disclosed. [Clause 8.1.6.20]

The numerical quantities which are required in Clause 8.1.6.15 to 8.1.6.20 are already listed in a table above (see section 3.5).

6.12 Checkpoint Statistics

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. [Clause 8.1.6.21]

There was 1 checkpoints before and one during the measurement interval. The checkpoint occurred 7:32 minutes after the start of the measurement interval. The checkpoint interval was 30 minutes. The duration of the checkpoint during measurement was 14 minutes.

7. Clause 6 Related Items - SUT, Driver, and Communication Definition

7.1 RTE Inputs

If the RTE is commercially available, then its inputs must be specified. Otherwise, a description must be supplied of what inputs (e.g., scripts) to the RTE had been used. [Clause 8.1.7.1]

Microsoft Benchcraft was used as the RTE to emulate the terminals. Its input parameters are shown in Appendix C - Tunable Parameters and Options.

We used COM+ to simulate terminal users, generate random data, record response times and statistical data. Its input parameters are shown in Appendix C - Tunable Parameters and Options.

7.2 Functionality and Performance of Emulated Components

It must be demonstrated that the functionality and performance of the components being emulated in the Driver System are equivalent to that of the priced system. The results of the test described in Clause 6.6.3.4 must be disclosed. [Clause 8.1.7.2]

The Driver System consisted of a Primergy 870-40. This driver was attached to the client machine through an Ethernet LAN. Since this is exactly the same connectivity as configured in the priced system, no component was emulated. Therefore, the test described in Clause 6.6.3.4 was not required.

7.3 Functional Diagrams of the Benchmarked and Proposed Configuration

A complete functional diagram of both the benchmark configuration and the configuration of the proposed (target) system must be disclosed. A detailed list of all software and hardware functionality being performed on the Driver System, and its interface to the SUT must be disclosed (see Clause 6.6.3.6). [Clause 8.1.7.3]

Figure 1 and Figure 2 in section 1.4 show the functional diagrams of the benchmark configuration and the priced configuration.

7.4 Network Configurations of the Tested and Proposed Services

The network configurations of both the tested services and the proposed (target) services which are being represented and a thorough explanation of exactly which parts of the proposed configuration are being replaced with the Driver System must be disclosed (see Clause 6.6.4). [Clause 8.1.7.4]

Figure 1 and Figure 2 in section 1.4 show the network setup of both configurations. The driver replaces the workstations.

In the tested configuration one standard ethernet LAN segment was used to connect the server with the clients and 7 standard ethernet LAN segments were used to connect each of the 8 clients with the 7 RTE systems.

In the priced configuration 56 standard ethernet LAN segments were used to connect 45,360 workstations. Each client has 5670 users connected with 7 ethernet segments.

7.5 Network Bandwidth

The bandwidth of the network(s) used in the tested / priced configuration must be disclosed. [Clause 8.1.7.5]

The Ethernet used in the local area network (LAN) between the emulated user system and the front-end system complies with the IEEE 802.3 standard. Its bandwith is 10 Mbps. Between front-end and SUT the bandwidth is 1 Gbps.

7.6 Operator Intervention

If the configuration requires operator intervention (see Clause 6.6.6), the mechanism and the frequency of this intervention must be disclosed. [Clause 8.1.7.6]

The Primergy N800 requires no operator intervention to sustain the reported throughput.

8. Clause 7 Related Items - Pricing

8.1 System Pricing

A detailed list of hardware and software used in the priced system must be reported. Each separately orderable item must have vendor part number, description, and release/revision level, and either general availability status or committed delivery date. If package-pricing is used, vendor part number of the package and a description uniquely identifying each of the components of the package must be disclosed. Pricing source(s) and effective date(s) of price(s) must also be reported. [Clause 8.1.8.1]

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. [Clause 8..1.8.2]

The details of the hardware and software are reported in the summary in front of this report. The spreadsheet used to determine the 5-year price and the speadsheet used to describe the priced configuration can be found in Appendix D – Space Calculation.

8.2 Availability Dates

The committed delivery date for general availability (availability date) of products used in the price calculations must be reported. When the priced system includes products with different availability dates, the reported availability date for the priced system must be the date at which all components are committed to be available. [Clause 8.1.8.3]

All hardware and software components used in the price calculations of the Primergy N800 system will be generally available from Fujitsu Siemens Computers GmbH as of October 1, 2000.

8.3 Throughput and Price/Performance

A statement of the measured tpmC, as well as the respective calculations for 5-year pricing, price/performance (price/tpmC), and the availability date must be included. [Clause 8.1.8.4]

Primergy N800 system was measured at 56,388.50 tpmC with Microsoft SQL Server 2000 Enterprise Edition with a 5-year system price of €1,157,002. The respective price/performance for the Primergy N800 is €20.52/tpmC. The priced Primergy N800 will be available as of October 1, 2000.

8.4 Country Specific Pricing

Additional Clause 7 related items may be included in the Full Disclosure Report for each country specific priced configuration. Country specifiv pricing is subject to Clause 7.1.7 [Clause 8.1.8.5]

The system is being priced for Germany.

8.5 Usage Pricing

For any usage pricing, the sponsor must diclose:

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

[Clause 8.1.8.6]

The component pricing based on usage is shown below:

- One Microsoft SQL Server 2000 Enterprise Edition
- One Windows 2000 Datacenter Server
- 8 Microsoft Windows 2000 Server license (includes 5 client access licenses)
- One Microsoft Visual C++ Professional 6.0

9. Clause 8 Related Items - Audit

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.

A review of the pricing model is required to ensure that all components required are priced (see Clause 9.2.8). The auditor is not required to review the final Full Disclosure Report or the final pricing prior to issuing the attestation letter. [Clause 8.1.9]

The benchmark test of the Primergy N800 system with Microsoft SQL Server 2000 Enterprise Edition was independently audited by:

Bradley Askins, a TPC certified auditor of Infosizing.
The attestation letter is included in Appendix F.

Requests for this TPC-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

FUJITSU SIEMENS COMPUTERS
SHV SERVER DS5
Primergy Server Performance Lab
Mr. Bathe
Heinz-Nixdorf-Ring 1
33106 Paderborn
Germany

Appendix A - Application Source Code

```
LIBRARY TPCC.DLL

EXPORTS

       GetExtensionVersion   @1
       HttpExtensionProc     @2
       TerminateExtension    @3


/*     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);

//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
```

```
/*      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 )
                        {
                                // debugging...
                                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 );
                        delete e;

                        // log the error txn
                        txnDeliRec.TxnStatus = e->ErrorType();
                        if (txnDelilog != NULL)
                                txnDelilog->WriteToLog(&txnDeliRec);
                }
                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>TPC-C Web
Client</TITLE></HEAD><BODY>"
                                             "<B><BIG>Microsoft TPC-C 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[Reg.eTxnMon],
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>TPC-C 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>TPC-C 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>TPC-C 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>TPC-C 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> <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>
<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>";

        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>TPC-C 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\">"
                        "</FORM></HTML>"
                        );
        }
        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>TPC-C 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;
}

//{{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

/*      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;
}

/*      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 );

/*      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
};


/*	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_DATA      OL[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;

/*     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;
};

/*      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

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
       printable 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."                            },
              { 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) || (++iTryCount >
iMaxRetries))
                                throw;

                        // hit deadlock; backoff for increasingly longer
period
                        delete e;
                        Sleep(10 * iTryCount);
                }
        }       // while (TRUE)
}


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,
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,
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, pData,
dbdatlen(m_dbproc,1), SQLFLT8, (BYTE *)&m_txn.NewOrder.w_tax, 8);
                        if (pData=dbdata(m_dbproc, 2))

                                dbconvert(m_dbproc, SQLNUMERIC, 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, 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) || (++iTryCount >
iMaxRetries))
                                throw;

                        // hit deadlock; backoff for increasingly longer
period
                        delete e;
                        Sleep(10 * iTryCount);
                }
        }       // while (TRUE)
}


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, pData,
dbdatlen(m_dbproc,24), SQLFLT8, (BYTE *)&m_txn.Payment.c_credit_lim, 8);
                        if(pData=dbdata(m_dbproc, 25))
                                dbconvert(m_dbproc, SQLNUMERIC, pData,
dbdatlen(m_dbproc,25), SQLFLT8, (BYTE *)&m_txn.Payment.c_discount, 8);
                        if(pData=dbdata(m_dbproc, 26))
                                dbconvert(m_dbproc, SQLNUMERIC, 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) || (++iTryCount >
iMaxRetries))
                                throw;

                        // hit deadlock; backoff for increasingly longer
period
                        delete e;
                        Sleep(10 * iTryCount);
                }
        }       // while (TRUE)
}



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,
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, 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) || (++iTryCount >
iMaxRetries))
                                throw;

                        // hit deadlock; backoff for increasingly longer
period
                        delete e;
                        Sleep(10 * iTryCount);
                }
        }       // while (TRUE)
}


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) || (++iTryCount >
iMaxRetries))
                                throw;

                        // hit deadlock; backoff for increasingly longer
period
                        delete e;
                        Sleep(10 * iTryCount);
                }
        }       // while (TRUE)
}

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;
}

/*      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."
                };

                CTPCC_DBLIB_ERR( int iErr ) { m_errno = iErr; };

                int             m_errno;

                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);

/*      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 definations 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 );
}

/*      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(BOOL bSinglePool);
                ~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);

/*      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;}
};


//{{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

/*      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 definations 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+ TPC-C 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.def : Declares the module parameters.

LIBRARY      "tpcc_com_all.dll"

EXPORTS
        DllCanUnloadNow     @1 PRIVATE
        DllGetClassObject   @2 PRIVATE
        DllRegisterServer   @3 PRIVATE
        DllUnregisterServer    @4 PRIVATE


#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 5.02.0235 */
/* at Fri Aug 13 18:56:24 1999
 */
/* 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 CLSID CLSID_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



/*      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;
        };

};

//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


HKCR
{
	TPCC.AllTxns.1 = s 'All Txns Class'
	{
		CLSID = s '{122A3128-2520-11D3-BA71-00C04FBFE08B}'
	}
	TPCC.AllTxns = s 'TPCC Class'
	{
		CurVer = s 'TPCC.AllTxns.1'
	}
	NoRemove CLSID
	{
		ForceRemove {122A3128-2520-11D3-BA71-00C04FBFE08B} = s
'TPCC Class'
		{
			ProgID = s 'TPCC.AllTxns.1'
			VersionIndependentProgID = s 'TPCC.AllTxns'
			InprocServer32 = s '%MODULE%'
			{
				val ThreadingModel = s 'Both'
			}
		}
	}
}


#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 5.02.0235 */
/* at Fri Aug 13 18:56:24 1999
 */
/* 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,0xE0
,0x8B);
```

```
MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC,0x122A3128,0x2520,0x11D3,0xBA,0x71,0x00,0xC0,0x4F,0xBF,0xE0,0x
8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder,0x975BAABF,0x84A7,0x11D2,0xBA,0x47,0x00,0xC0,0x4F,0xBF,0xE
0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_OrderStatus,0x266836AD,0xA50D,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0xBF,
0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_Payment,0xCD02F7EF,0xA4FA,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0xBF,0xE0
,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_StockLevel,0x2668369E,0xA50D,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0xBF,0
xE0,0x8B);

#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 5.02.0235 */
/* at Fri Aug 13 18:56:25 1999
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), 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,0xE0
,0x8B);
```

```

MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC,0x122A3128,0x2520,0x11D3,0xBA,0x71,0x00,0xC0,0x4F,0xBF,0xE0,0x
8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder,0x975BAABF,0x84A7,0x11D2,0xBA,0x47,0x00,0xC0,0x4F,0xBF,0xE
0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_OrderStatus,0x266836AD,0xA50D,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0xBF,
0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_Payment,0xCD02F7EF,0xA4FA,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0xBF,0xE0
,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_StockLevel,0x2668369E,0xA50D,0x11D2,0xBA,0x4E,0x00,0xC0,0x4F,0xBF,0
xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* defined(_M_IA64) || defined(_M_AXP64)*/


HKCR
{
        TPCC.NewOrder.1 = s 'NewOrder Class'
        {
                CLSID = s '{975BAABF-84A7-11D2-BA47-00C04FBFE08B}'
        }
        TPCC.NewOrder = s 'NewOrder Class'
        {
                CurVer = s 'TPCC.NewOrder.1'
        }
        NoRemove CLSID
        {
                ForceRemove {975BAABF-84A7-11D2-BA47-00C04FBFE08B} = s
'NewOrder Class'
                {
                        ProgID = s 'TPCC.NewOrder.1'
                        VersionIndependentProgID = s 'TPCC.NewOrder'
                        InprocServer32 = s '%MODULE%'
                        {
                                val ThreadingModel = s 'Both'
                        }
                }
        }
}

HKCR
{
        TPCC.OrderStatus.1 = s 'OrderStatus Class'
        {
                CLSID = s '{266836AD-A50D-11D2-BA4E-00C04FBFE08B}'
        }
        TPCC.OrderStatus = s 'OrderStatus Class'
        {
                CurVer = s 'TPCC.OrderStatus.1'
        }
        NoRemove CLSID
        {
                ForceRemove {266836AD-A50D-11D2-BA4E-00C04FBFE08B} = s
'OrderStatus Class'
                {
                        ProgID = s 'TPCC.OrderStatus.1'
                        VersionIndependentProgID = s 'TPCC.OrderStatus'
                        InprocServer32 = s '%MODULE%'
                        {
                                val ThreadingModel = s 'Both'
                        }
                }
        }
}

HKCR
{
        TPCC.Payment.1 = s 'Payment Class'
        {
                CLSID = s '{CD02F7EF-A4FA-11D2-BA4E-00C04FBFE08B}'
        }
        TPCC.Payment = s 'Payment Class'
        {
                CurVer = s 'TPCC.Payment.1'
        }
        NoRemove CLSID
        {
                ForceRemove {CD02F7EF-A4FA-11D2-BA4E-00C04FBFE08B} = s
'Payment Class'
                {
                        ProgID = s 'TPCC.Payment.1'
                        VersionIndependentProgID = s 'TPCC.Payment'
                        InprocServer32 = s '%MODULE%'
                        {
```

```
                                val ThreadingModel = s 'Both'
                        }
                }
        }
}


#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 5.02.0235 */
/* at Fri Aug 13 18:56:17 1999
 */
/* 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



HKCR
{
        TPCC.StockLevel.1 = s 'StockLevel Class'
        {
                CLSID = s '{2668369E-A50D-11D2-BA4E-00C04FBFE08B}'
        }
        TPCC.StockLevel = s 'StockLevel Class'
        {
                CurVer = s 'TPCC.StockLevel.1'
        }
        NoRemove CLSID
        {
                ForceRemove {2668369E-A50D-11D2-BA4E-00C04FBFE08B} = s
'StockLevel Class'
                {
                        ProgID = s 'TPCC.StockLevel.1'
                        VersionIndependentProgID = s 'TPCC.StockLevel'
                        InprocServer32 = s '%MODULE%'
                        {
                                val ThreadingModel = s 'Both'
                        }
                }
        }
}

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


LIBRARY      "tpcc_com_ps"
```

```
DESCRIPTION  'Proxy/Stub DLL'

EXPORTS
       DllGetClassObject       @1    PRIVATE
       DllCanUnloadNow         @2    PRIVATE
       GetProxyDllInfo         @3    PRIVATE
       DllRegisterServer             @4      PRIVATE
       DllUnregisterServer           @5      PRIVATE


#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 5.02.0235 */
/* at Fri Aug 13 18:56:17 1999
 */
/* 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



/*      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



#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 5.02.0235 */
/* at Fri Aug 13 18:56:17 1999
 */
/* 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,0xE0,0x8
B);

#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 5.02.0235 */
/* at Fri Aug 13 18:56:18 1999
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), 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,0xE0,0x8
B);

#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 proxy stub code */


 /* File created by MIDL compiler version 5.02.0235 */
/* at Fri Aug 13 18:56:17 1999
 */
/* 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,0xE0,0x8B}}
*/


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,
    0x50200eb, /* MIDL Version 5.2.235 */
    0,
    0,
    0,  /* notify & notify_flag routine table */
    1,  /* Flags */
    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( 0xfffffff0 ),       /* 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 5.02.0235 */
/* at Fri Aug 13 18:56:18 1999
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), 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,0xE0,0x8B}}
*/


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,
    0x50200eb, /* MIDL Version 5.2.235 */
    0,
    0,
    0,  /* notify & notify_flag routine table */
    1,  /* Flags */
    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 */       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, */
/* 18 */       NdrFcShort( 0x8 ),      /* ia64, axp64 Stack size/offset = 8
*/
/* 20 */       0x8,            /* FC_LONG */
                       0x0,            /* 0 */

        /* Parameter txn */

/* 22 */       NdrFcShort( 0x201b ),   /* Flags:  must size, must free, in,
out, srv alloc size=8 */
/* 24 */       NdrFcShort( 0x10 ),     /* ia64, axp64 Stack size/offset =
16 */
/* 26 */       NdrFcShort( 0x6 ),      /* Type Offset=6 */

        /* Return value */

/* 28 */       NdrFcShort( 0x70 ),     /* Flags:  out, return, base type,
*/
/* 30 */       NdrFcShort( 0x18 ),     /* ia64, axp64 Stack size/offset =
24 */
/* 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 */
/* 42 */       NdrFcShort( 0x20 ),     /* ia64, axp64 Stack size/offset =
32 */
```

```
/* 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, */
/* 52 */        NdrFcShort( 0x8 ),      /* ia64, axp64 Stack size/offset = 8
*/
/* 54 */        0x8,            /* FC_LONG */
                        0x0,            /* 0 */

        /* Parameter txn */

/* 56 */        NdrFcShort( 0x201b ),   /* Flags:  must size, must free, in,
out, srv alloc size=8 */
/* 58 */        NdrFcShort( 0x10 ),     /* ia64, axp64 Stack size/offset =
16 */
/* 60 */        NdrFcShort( 0x6 ),      /* Type Offset=6 */

        /* Return value */

/* 62 */        NdrFcShort( 0x70 ),     /* Flags:  out, return, base type,
*/
/* 64 */        NdrFcShort( 0x18 ),     /* ia64, axp64 Stack size/offset =
24 */
/* 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 */
/* 76 */        NdrFcShort( 0x20 ),     /* ia64, axp64 Stack size/offset =
32 */
/* 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, */
/* 86 */        NdrFcShort( 0x8 ),      /* ia64, axp64 Stack size/offset = 8
*/
/* 88 */        0x8,            /* FC_LONG */
```

```
                        0x0,            /* 0 */

        /* Parameter txn */

/* 90 */        NdrFcShort( 0x200b ),   /* Flags:  must size, must free, in,
srv alloc size=8 */
/* 92 */        NdrFcShort( 0x10 ),     /* ia64, axp64 Stack size/offset =
16 */
/* 94 */        NdrFcShort( 0x18 ),     /* Type Offset=24 */

        /* Return value */

/* 96 */        NdrFcShort( 0x70 ),     /* Flags:  out, return, base type,
*/
/* 98 */        NdrFcShort( 0x18 ),     /* ia64, axp64 Stack size/offset =
24 */
/* 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 */
/* 110 */       NdrFcShort( 0x20 ),     /* ia64, axp64 Stack size/offset =
32 */
/* 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, */
/* 120 */       NdrFcShort( 0x8 ),      /* ia64, axp64 Stack size/offset = 8
*/
/* 122 */       0x8,            /* FC_LONG */
                        0x0,            /* 0 */

        /* Parameter txn */

/* 124 */       NdrFcShort( 0x201b ),   /* Flags:  must size, must free, in,
out, srv alloc size=8 */
/* 126 */       NdrFcShort( 0x10 ),     /* ia64, axp64 Stack size/offset =
16 */
/* 128 */       NdrFcShort( 0x6 ),      /* Type Offset=6 */

        /* Return value */
/* 130 */      NdrFcShort( 0x70 ),    /* Flags:  out, return, base type,
*/
/* 132 */      NdrFcShort( 0x18 ),    /* ia64, axp64 Stack size/offset =
24 */
/* 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 */
/* 144 */      NdrFcShort( 0x20 ),    /* ia64, axp64 Stack size/offset =
32 */
/* 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, */
/* 154 */      NdrFcShort( 0x8 ),     /* ia64, axp64 Stack size/offset = 8
*/
/* 156 */      0x8,            /* FC_LONG */
                       0x0,           /* 0 */

        /* Parameter txn */

/* 158 */      NdrFcShort( 0x201b ),  /* Flags:  must size, must free, in,
out, srv alloc size=8 */
/* 160 */      NdrFcShort( 0x10 ),    /* ia64, axp64 Stack size/offset =
16 */
/* 162 */      NdrFcShort( 0x6 ),     /* Type Offset=6 */

        /* Return value */

/* 164 */      NdrFcShort( 0x70 ),    /* Flags:  out, return, base type,
*/
/* 166 */      NdrFcShort( 0x18 ),    /* ia64, axp64 Stack size/offset =
24 */
/* 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 */
```

```
/* 178 */      NdrFcShort( 0x10 ),    /* ia64, axp64 Stack size/offset =
16 */
/* 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,
*/
/* 188 */      NdrFcShort( 0x8 ),     /* ia64, axp64 Stack size/offset = 8
*/
/* 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 */
/* 20 */       NdrFcShort( 0x8 ),     /* ia64, axp64 Stack size/offset = 8
*/
/* 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( 0xfffffff0 ),      /* 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)*/
```

Appendix B - Database Details

BACKUP.SQL

```
--  File:     BACKUP.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.20
--            Copyright Microsoft, 1999
--  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 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. 4.20
--            Copyright Microsoft, 1999
--  Purpose:  Creates tpcc database Backup Devices


use master
go

--  create backup devices

exec sp_addumpdevice 'disk','tpccback1','X:\tpccback1.dmp'
exec sp_addumpdevice 'disk','tpccback2','Y:\tpccback2.dmp'
go
```

CREATEDB.SQL

```
--  File:     CREATEDB.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.20
--            Copyright Microsoft, 1999
--  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            = MSSQL_tpcc_root,
        FILENAME        = "C:\tpcc_root.mdf",
        SIZE            = 50MB,
        FILEGROWTH      =0),
FILEGROUP      MSSQL70_cs_fg
(       NAME            = MSSQL_cs1,
        FILENAME        = "E:",
        SIZE            = 43500MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_cs2,
        FILENAME        = "F:",
        SIZE            = 43500MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_cs3,
        FILENAME        = "G:",
        SIZE            = 43500MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_cs4,
        FILENAME        = "H:",
        SIZE            = 43500MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_cs5,
        FILENAME        = "I:",
        SIZE            = 43500MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_cs6,
        FILENAME        = "J:",
        SIZE            = 43500MB,
        FILEGROWTH      = 0),
FILEGROUP       MSSQL70_misc_fg
(       NAME            = MSSQL_misc1,
        FILENAME        = "N:",
        SIZE            = 24000MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_misc2,
        FILENAME        = "O:",
        SIZE            = 24000MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_misc3,
        FILENAME        = "P:",
        SIZE            = 24000MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_misc4,
        FILENAME        = "Q:",
        SIZE            = 24000MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_misc5,
        FILENAME        = "R:",
        SIZE            = 24000MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_misc6,
        FILENAME        = "S:",
        SIZE            = 24000MB,
        FILEGROWTH      = 0)
LOG ON
(       NAME            =MSSQL_tpcc_log,
        FILENAME        ="L:",
        SIZE            =80000MB,
        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),1,26))) = '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
```

REMOVEDB.SQL

```
--  File:     REMOVEDB.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.20
--            Copyright Microsoft, 1999
--  Purpose:  Removes tpcc database and backup files


use master
go

--  remove any existing database and backup files

exec sp_dbremove tpcc, dropdev
go

exec sp_dropdevice 'tpccback1'
exec sp_dropdevice 'tpccback2'
go
```

RESTORE.SQL

```
--  File:     RESTORE.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.20
--            Copyright Microsoft, 1999
--  Purpose:  Loads database backup from backup files


declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

load database tpcc from tpccback1, tpccback2, with stats = 1

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate,
@enddate)

go
```

VERIFYTPCCLOAD.SQL

```
--  File:     VERIFYTPCCLOAD.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.21
--            Copyright Microsoft, 1999, 2000
--  Purpose:  Performs series of TPCC database checks to verify
--           that database load completed correctly

print   " "
select  convert(char(30), getdate(),9)
print   " "

use tpcc
go

--      ***********************************
--
--      Check rows per table from SYSINDEXES
--
--      ***********************************

print   'WAREHOUSE TABLE'

select  rows
from    sysindexes
where   id      = object_id("warehouse")
go

print   'DISTRICT TABLE = (10 * No of warehouses)'

select  rows
from    sysindexes
where   id      =object_id("district")
go

print   'ITEM TABLE = 100,000'

select  rows
from    sysindexes
where   id      =object_id("item")
go

print   'CUSTOMER TABLE = (30,000 * No of warehouses)'

select  rows
from    sysindexes
```

```
where   id      =object_id("customer")
go

print 'ORDERS TABLE = (30,000 * No of warehouses)'

select  rows
from    sysindexes
where   id      =object_id("orders")
go

print   'HISTORY TABLE = (30,000 * No of warehouses)'

select  rows
from    sysindexes
where   id      =object_id("history")
go

print   'STOCK TABLE = (100,000 * No of warehouses)'

select  rows
from    sysindexes
where   id      =object_id("stock")
go

print   'ORDER_LINE TABLE = (300,000 * No of warehouses + some change)'

select  rows
from    sysindexes
where   id      =object_id("order_line")
go

print   'NEW_ORDER TABLE = (9000 * No of warehouses)'

select  rows
from    sysindexes
where   id      =object_id("new_order")
go

--      *************
--
--      Check indices
--
--      *************

print '**************Index Check****************'

use tpcc
go

sp_helpindex   customer
go
```

```
sp_helpindex   stock
go

sp_helpindex   district
go

sp_helpindex   item
go

sp_helpindex   new_order
go

sp_helpindex   orders
go

sp_helpindex   order_line
go

sp_helpindex   warehouse
go
```

IDXCUSCL.SQL

```
--  File:     IDXCUSCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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. 4.20
--            Copyright Microsoft, 1999
--  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
```

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     = 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
```

VERSION.SQL

```
--  File:     VERSION.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.21.000
--            Copyright Microsoft, 1999, 2000
--  Purpose:  Returns version level of TPC-C stored procs
--  Note:     Always update the return value of this proc for
--            any interface changes or "must have" bug fixes.
--
--  The value returned by this SP defines the "interface level",
--  which must match between the stored procs and the client code.
--  The interface level may be down rev from the current kit.  This
--  indicates that the interface hasn't changed since that version.

use tpcc
go

if exists ( select name from sysobjects where name = "tpcc_version" )
       drop procedure tpcc_version
go
```

```
create proc tpcc_version
as
declare @version       char(8)

begin
       select @version = "4.10.000"
       select @version as "Version"
end

go
```

GETARGS.C

```
//      File:          GETARGS.C
//                             Microsoft TPC-C Kit Ver. 4.20
//                             Copyright Microsoft, 1996, 1997, 1998, 1999
//      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. 4.20
//                            Copyright Microsoft, 1996, 1997, 1998, 1999
//      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. 4.20
//                              Copyright Microsoft, 1996, 1997, 1998, 1999
//      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[] =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";
       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. 4.20
//                              Copyright Microsoft, 1996, 1997, 1998, 1999
//      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. 4.20
//                              Copyright Microsoft, 1996, 1997, 1998, 1999
//      Purpose:        Header file for TPC-C database loader


// Build number of TPC Benchmark Kit
#define TPCKIT_VER      "4.20"

// 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. 4.20
//                            Copyright Microsoft, 1996, 1997, 1998, 1999
//      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 correct SQL Server version in use
        // you must be using SQL Server 7.00.623 or better to load

        CheckSQL();

        // 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   : CheckSQL
//
//=======================================================================

void CheckSQL()
{

	RETCODE		rc;

	char			szDriverString[300];
	char			szDriverStringOut[1024];
	int				SQLBuildFlag;

	SQLSMALLINT		cbDriverStringOut;
	SQLCHAR			SQLVersion[19];
	SQLINTEGER		SQLVersionInd;



	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" ,
						aptr->server,
						aptr->user,
						aptr->password );

	if ( SQLSetConnectAttr( v_hdbc, SQL_ATTR_PACKET_SIZE,
(SQLPOINTER)aptr->pack_size, SQL_IS_UINTEGER ) != 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 ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
		HandleErrorDBC(v_hdbc);

	if ( SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt) !=
SQL_SUCCESS )
		HandleErrorSTMT(v_hstmt);

	rc = SQLBindCol(v_hstmt, 4, SQL_C_CHAR, &SQLVersion,
sizeof(SQLVersion), &SQLVersionInd);

	// issue SQL Server extended stored procedure (xp_msver) to
determine installed version
	rc = SQLExecDirect(v_hstmt, "EXECUTE xp_msver ProductVersion",
SQL_NTS);

	if ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
		HandleErrorSTMT(v_hstmt);

	rc = SQLFetch(v_hstmt);

	if (rc != SQL_SUCCESS)
		HandleErrorDBC(v_hdbc);

	// Check build number to ensure 7.00.623 or higher

	SQLBuildFlag = 1;

	if ( SQLVersion[0] == 55 )
	{
		if ( SQLVersion[2] == 48 )
		{
			if ( SQLVersion[5] == 56 )
			{
				if ( (SQLVersion[6] >= 48) &  (SQLVersion[7]
>= 53) )
				{
					SQLBuildFlag = 0;
					printf("You are using SQL Server
version = %9s\n\n", SQLVersion);
				}
				else
				{
					SQLBuildFlag = 1;
				}
			}
			else
			{
				if ( SQLVersion[5] >= 54 )
				{
					if ( (SQLVersion[6] >= 50) &
(SQLVersion[7] >= 51) )
					{
						SQLBuildFlag = 0;
						printf("You are using SQL
Server version = %9s\n\n", SQLVersion);
					}
					else
					{
						SQLBuildFlag = 1;
					}
				}
				else
				{
					if ( SQLVersion[5] >= 55 )
					{
```

```
                                                if ( (SQLVersion[6] >= 48) &
(SQLVersion[7] >= 48) )
                                                {
                                                        SQLBuildFlag = 0;
                                                        printf("You are using
SQL Server version = %9s\n\n", SQLVersion);
                                                }
                                                else
                                                {
                                                        SQLBuildFlag = 1;
                                                }
                                        }
                                }

                        }
                }
                else
                {
                        if ( SQLVersion[5] >= 49 )
                        {
                                if ( (SQLVersion[6] >= 52) & (SQLVersion[7]
>= 48) )
                                {
                                        SQLBuildFlag = 0;
                                        printf("You are using SQL Server
version = %9s\n\n", SQLVersion);
                                }
                                else
                                {
                                        SQLBuildFlag = 1;
                                }
                        }
                        else
                        {
                                SQLBuildFlag = 1;
                        }
                }
        }
        else
        {
                SQLBuildFlag = 1;
        }


        if ( SQLBuildFlag == 1 )
        {
                printf("ERROR.  The SQL Server version you are using is not
supported\n");
                printf("for TPC-C benchmarking.  You currently have SQL
Server version %9s\n",SQLVersion);
                printf("installed.  Please upgrade to Microsoft SQL Server
7.00.623 or better.\n");
```

```
                printf("and re-run the SETUP program.\n\n");
                exit(1);
        }

        SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
        SQLDisconnect(v_hdbc);
        SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

        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 and Options

This section discloses hardware information and the Windows 2000 Datacenter Server registry parameters used on the Primergy N800 server system.

```
[System Summary]

Item    Value
OS Name Microsoft Windows 2000 Datacenter Server
Version 5.0.2195 Service Pack 1, RC 1.59 Build 2195
OS Manufacturer        Microsoft Corporation
System Name    SPIDER
System Manufacturer    Intel
System Model   OCPRF100
System Type    X86-based PC
Processor      x86 Family 6 Model 10 Stepping 1 GenuineIntel ~700 Mhz
Processor      x86 Family 6 Model 10 Stepping 1 GenuineIntel ~700 Mhz
Processor      x86 Family 6 Model 10 Stepping 1 GenuineIntel ~700 Mhz
Processor      x86 Family 6 Model 10 Stepping 1 GenuineIntel ~700 Mhz
Processor      x86 Family 6 Model 10 Stepping 1 GenuineIntel ~700 Mhz
Processor      x86 Family 6 Model 10 Stepping 1 GenuineIntel ~700 Mhz
Processor      x86 Family 6 Model 10 Stepping 1 GenuineIntel ~700 Mhz
Processor      x86 Family 6 Model 10 Stepping 1 GenuineIntel ~700 Mhz
BIOS Version   OCPRF100- PhoenixBIOS 4.0 Release 6.0
Windows Directory      C:\WINNT
System Directory       C:\WINNT\System32
Boot Device    \Device\Harddisk0\Partition1
Locale  United States
User Name      SPIDER\Administrator
Time Zone      W. Europe Daylight Time
Total Physical Memory  32,505,148 KB
Available Physical Memory      32,090,112 KB
Total Virtual Memory   66,737,656 KB
Available Virtual Memory       66,270,500 KB
Page File Space        34,232,508 KB
Page File      C:\pagefile.sys


[Hardware Resources]

[ Following are sub-categories of this main category ]

[Conflicts/Sharing]

Resource       Device
IRQ 10  Compaq PCI Hotplug Controller
IRQ 10  Compaq PCI Hotplug Controller
IRQ 10  Compaq PCI Hotplug Controller
IRQ 10  Compaq PCI Hotplug Controller

[DMA]

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

[Forced Hardware]

Device  PNP Device ID
No Forced Hardware

[I/O]

Address Range  Device  Status
0x0000-0x0CF7  PCI bus OK
0x0000-0x0CF7  Direct memory access controller      OK
0x0000-0x0CF7  PCI bus OK
0x0D00-0x4000  PCI bus OK
0x9000-0xFFFF  PCI bus OK
0x2000-0x2FFF  DEC 21154 PCI to PCI bridge   OK
0x2000-0x2FFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0x3000-0x3FFF  DEC 21154 PCI to PCI bridge   OK
0x3000-0x3FFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0x1000-0x10FF  Symbios Logic 896, 22910 PCI SCSI Adapter    OK
0x1400-0x14FF  Symbios Logic 896, 22910 PCI SCSI Adapter    OK
0x03B0-0x03BB  Cirrus Logic 5446 Compatible Graphics Adapter       OK
0x03C0-0x03DF  Cirrus Logic 5446 Compatible Graphics Adapter       OK
0x0A79-0x0A79  ISAPNP Read Data Port  OK
0x0279-0x0279  ISAPNP Read Data Port  OK
0x0274-0x0277  ISAPNP Read Data Port  OK
0x00B3-0x00B3  Motherboard resources  OK
0x0C10-0x0C3F  Motherboard resources  OK
0x0CA8-0x0CAF  Motherboard resources  OK
0x0CC0-0x0CCF  Motherboard resources  OK
0x0010-0x001F  Direct memory access controller      OK
0x0080-0x009F  Direct memory access controller      OK
0x00C0-0x00DF  Direct memory access controller      OK
0x0070-0x0077  System CMOS/real time clock   OK
0x0020-0x0021  Programmable interrupt controller     OK
0x0024-0x0025  Programmable interrupt controller     OK
0x0028-0x0029  Programmable interrupt controller     OK
```

```
0x002C-0x002D  Programmable interrupt controller    OK
0x0030-0x0031  Programmable interrupt controller    OK
0x0034-0x0035  Programmable interrupt controller    OK
0x0038-0x0039  Programmable interrupt controller    OK
0x003C-0x003D  Programmable interrupt controller    OK
0x00A0-0x00A1  Programmable interrupt controller    OK
0x00A4-0x00A5  Programmable interrupt controller    OK
0x00A8-0x00A9  Programmable interrupt controller    OK
0x00AC-0x00AD  Programmable interrupt controller    OK
0x00B0-0x00B1  Programmable interrupt controller    OK
0x00B4-0x00B5  Programmable interrupt controller    OK
0x00B8-0x00B9  Programmable interrupt controller    OK
0x00BC-0x00BD  Programmable interrupt controller    OK
0x04D0-0x04D1  Programmable interrupt controller    OK
0x00F0-0x00FF  Numeric data processor OK
0x0040-0x0043  System timer   OK
0x0050-0x0053  System timer   OK
0x0061-0x0061  System speaker OK
0x0060-0x0060  Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
       OK
0x0064-0x0064  Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
       OK
0x03F2-0x03F5  Standard floppy disk controller      OK
0x03F7-0x03F7  Standard floppy disk controller      OK
0xFFF0-0xFFFF  Intel(r) 82371AB/EB PCI Bus Master IDE Controller   OK
0x4000-0x5FFF  PCI bus OK
0x4000-0x5FFF  DEC 21154 PCI to PCI bridge   OK
0x4000-0x5FFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0x5000-0x5FFF  DEC 21154 PCI to PCI bridge   OK
0x5000-0x5FFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0x6000-0x7FFF  PCI bus OK
0x6000-0x7FFF  DEC 21154 PCI to PCI bridge   OK
0x6000-0x7FFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0x7000-0x7FFF  DEC 21154 PCI to PCI bridge   OK
0x7000-0x7FFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0x8000-0x8FFF  PCI bus OK
0x8000-0x8FFF  DEC 21154 PCI to PCI bridge   OK
0x8000-0x8FFF  Mylex eXtremeRAID 2000 Disk Array Controller OK

[IRQs]

IRQ Number     Device
9      Microsoft ACPI-Compliant System
10     Compaq PCI Hotplug Controller
10     Compaq PCI Hotplug Controller
10     Compaq PCI Hotplug Controller
10     Compaq PCI Hotplug Controller
61     Mylex eXtremeRAID 2000 Disk Array Controller
54     Mylex eXtremeRAID 2000 Disk Array Controller
58     Symbios Logic 896, 22910 PCI SCSI Adapter
18     Symbios Logic 896, 22910 PCI SCSI Adapter
8      System CMOS/real time clock
13     Numeric data processor
1      Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
12     Microsoft PS/2 Mouse
6      Standard floppy disk controller
50     Mylex eXtremeRAID 2000 Disk Array Controller
44     Mylex eXtremeRAID 2000 Disk Array Controller
32     Mylex eXtremeRAID 2000 Disk Array Controller
28     Mylex eXtremeRAID 2000 Disk Array Controller
24     Mylex eXtremeRAID 2000 Disk Array Controller
20     Alteon WebSystems PCI Gigabit Ethernet Adapter

[Memory]

Range  Device  Status
0xA0000-0xBFFFF       PCI bus OK
0xA0000-0xBFFFF       Cirrus Logic 5446 Compatible Graphics Adapter
       OK
0xC8000-0xDFFFF       PCI bus OK
0xE0000-0xFFFFF       PCI bus OK
0xC0000000-0xE3FFFFFF  PCI bus OK
0xFFF00000-0xFFFFFFFF  PCI bus OK
0xD8005000-0xD80050FF  Compaq PCI Hotplug Controller OK
0xDA000000-0xDBFFFFFF  DEC 21154 PCI to PCI bridge   OK
0xDA000000-0xDBFFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0xE0000000-0xE1FFFFFF  DEC 21154 PCI to PCI bridge   OK
0xE0000000-0xE1FFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0xDC000000-0xDDFFFFFF  DEC 21154 PCI to PCI bridge   OK
0xDC000000-0xDDFFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0xE2000000-0xE3FFFFFF  DEC 21154 PCI to PCI bridge   OK
0xE2000000-0xE3FFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0xD8005400-0xD80057FF  Symbios Logic 896, 22910 PCI SCSI Adapter    OK
0xD8000000-0xD8001FFF  Symbios Logic 896, 22910 PCI SCSI Adapter    OK
0xD8005800-0xD8005BFF  Symbios Logic 896, 22910 PCI SCSI Adapter    OK
0xD8002000-0xD8003FFF  Symbios Logic 896, 22910 PCI SCSI Adapter    OK
0xDE000000-0xDFFFFFFF  Cirrus Logic 5446 Compatible Graphics Adapter
       OK
0xD8004000-0xD8004FFF  Cirrus Logic 5446 Compatible Graphics Adapter
       OK
0xE4000000-0xEDFFFFFF  PCI bus OK
0xE4000000-0xEDFFFFFF  Compaq PCI Hotplug Controller OK
0xE6000000-0xE7FFFFFF  DEC 21154 PCI to PCI bridge   OK
0xE6000000-0xE7FFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0xEA000000-0xEBFFFFFF  DEC 21154 PCI to PCI bridge   OK
0xEA000000-0xEBFFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0xE8000000-0xE9FFFFFF  DEC 21154 PCI to PCI bridge   OK
0xE8000000-0xE9FFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0xEC000000-0xEDFFFFFF  DEC 21154 PCI to PCI bridge   OK
0xEC000000-0xEDFFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0xEE000000-0xF7FFFFFF  PCI bus OK
0xEE000000-0xF7FFFFFF  Compaq PCI Hotplug Controller OK
0xF0000000-0xF1FFFFFF  DEC 21154 PCI to PCI bridge   OK
0xF0000000-0xF1FFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
0xF4000000-0xF5FFFFFF  DEC 21154 PCI to PCI bridge   OK
0xF4000000-0xF5FFFFFF  Mylex eXtremeRAID 2000 Disk Array Controller OK
```

```
0xF2000000-0xF3FFFFFF DEC 21154 PCI to PCI bridge   OK
0xF2000000-0xF3FFFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0xF6000000-0xF7FFFFFF DEC 21154 PCI to PCI bridge   OK
0xF6000000-0xF7FFFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0xF8000000-0xFDFFFFFF PCI bus OK
0xF8000000-0xFDFFFFFF Alteon WebSystems PCI Gigabit Ethernet Adapter
        OK
0xF8004000-0xF80040FF Compaq PCI Hotplug Controller OK
0xFA000000-0xFBFFFFFF DEC 21154 PCI to PCI bridge   OK
0xFA000000-0xFBFFFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0xFC000000-0xFDFFFFFF DEC 21154 PCI to PCI bridge   OK
0xFC000000-0xFDFFFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK


[Network]

[ Following are sub-categories of this main category ]

[Adapter]

Item    Value
Name    [00000000] Alteon WebSystems PCI Gigabit Ethernet Adapter
Adapter Type    Ethernet 802.3
Product Name    Alteon WebSystems PCI Gigabit Ethernet Adapter
Installed       True
PNP Device ID
        PCI\VEN_12AE&DEV_0001&SUBSYS_00000000&REV_01\3&29E81982&0&28
Last Reset      6/21/2000 11:29:39 AM
Index   0
Service Name    altnd5
IP Address      129.103.181.189
IP Subnet       255.255.255.0
Default IP Gateway      Not Available
DHCP Enabled    False
DHCP Server     Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address     00:60:CF:20:07:0D
Service Name    altnd5
IRQ Number      20
Driver  c:\winnt\system32\drivers\altnd5.sys (559888, 1.17.1)


[SCSI]

Item    Value
Name    Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver  dac2w2k
Status  OK
PNP Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&2FCD2E6D&0&4020
Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&2FCD2E6D&0&4020
Device Map      Not Available
Index   Not Available
Max Number Controlled  Not Available
IRQ Number      61
I/O Port        0x2000-0x2FFF
Driver  c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name    Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver  dac2w2k
Status  OK
PNP Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&3A654C6B&0&4028
Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&3A654C6B&0&4028
Device Map      Not Available
Index   Not Available
Max Number Controlled  Not Available
IRQ Number      54
I/O Port        0x3000-0x3FFF
Driver  c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name    Symbios Logic 896, 22910 PCI SCSI Adapter
Caption Symbios Logic 896, 22910 PCI SCSI Adapter
Driver  sym_hi
Status  OK
PNP Device ID
        PCI\VEN_1000&DEV_000B&SUBSYS_10001000&REV_05\3&267A616A&0&50
Device ID
        PCI\VEN_1000&DEV_000B&SUBSYS_10001000&REV_05\3&267A616A&0&50
Device Map      Not Available
Index   Not Available
Max Number Controlled  Not Available
IRQ Number      58
I/O Port        0x1000-0x10FF
Driver  c:\winnt\system32\drivers\sym_hi.sys (21136, 5.00.2134.1)

Name    Symbios Logic 896, 22910 PCI SCSI Adapter
Caption Symbios Logic 896, 22910 PCI SCSI Adapter
Driver  sym_hi
Status  OK
PNP Device ID
        PCI\VEN_1000&DEV_000B&SUBSYS_10001000&REV_05\3&267A616A&0&51
Device ID
        PCI\VEN_1000&DEV_000B&SUBSYS_10001000&REV_05\3&267A616A&0&51
Device Map      Not Available
Index   Not Available
Max Number Controlled  Not Available
IRQ Number      18
I/O Port        0x1400-0x14FF
Driver  c:\winnt\system32\drivers\sym_hi.sys (21136, 5.00.2134.1)
```

```
Name    Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver  dac2w2k
Status  OK
PNP Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&20B2DAF0&0&4020
Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&20B2DAF0&0&4020
Device Map      Not Available
Index   Not Available
Max Number Controlled  Not Available
IRQ Number      50
I/O Port        0x4000-0x5FFF
Driver  c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name    Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver  dac2w2k
Status  OK
PNP Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&DE4D5E1&0&4028
Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&DE4D5E1&0&4028
Device Map      Not Available
Index   Not Available
Max Number Controlled  Not Available
IRQ Number      44
I/O Port        0x5000-0x5FFF
Driver  c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name    Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver  dac2w2k
Status  OK
PNP Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&8C49857&0&4020
Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&8C49857&0&4020
Device Map      Not Available
Index   Not Available
Max Number Controlled  Not Available
IRQ Number      32
I/O Port        0x6000-0x7FFF
Driver  c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name    Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver  dac2w2k
Status  OK
PNP Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&375C4928&0&4028
Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&375C4928&0&4028
Device Map      Not Available
Index   Not Available
Max Number Controlled  Not Available
IRQ Number      28
I/O Port        0x7000-0x7FFF
Driver  c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name    Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver  dac2w2k
Status  OK
PNP Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&1B89A02&0&4020
Device ID
        PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&1B89A02&0&4020
Device Map      Not Available
Index   Not Available
Max Number Controlled  Not Available
IRQ Number      24
I/O Port        0x8000-0x8FFF
Driver  c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)


============== disk configuration controller 0 ==============
Begin
 BeginGroup
        PhysicalDevice0 = Channel=0, Target=0, Size=34712mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice1 = Channel=1, Target=0, Size=34712mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice2 = Channel=0, Target=1, Size=34712mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice3 = Channel=1, Target=1, Size=34712mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice4 = Channel=0, Target=2, Size=34712mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice5 = Channel=1, Target=2, Size=34712mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice6 = Channel=0, Target=3, Size=34712mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice7 = Channel=1, Target=3, Size=34712mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        IntermediateDevice0 = StripeSize=64kb, Raid=1, WriteThrough=1,
Size=34712mb,
                (PhysicalDevice0, StartAddress=0mb, Size=34712mb),
                (PhysicalDevice1, StartAddress=0mb, Size=34712mb);
        IntermediateDevice1 = StripeSize=64kb, Raid=1, WriteThrough=1,
Size=34712mb,
                (PhysicalDevice2, StartAddress=0mb, Size=34712mb),
                (PhysicalDevice3, StartAddress=0mb, Size=34712mb);
```

```
       IntermediateDevice2 = StripeSize=64kb, Raid=1, WriteThrough=1,
Size=34712mb,
               (PhysicalDevice4, StartAddress=0mb, Size=34712mb),
               (PhysicalDevice5, StartAddress=0mb, Size=34712mb);
       IntermediateDevice3 = StripeSize=64kb, Raid=1, WriteThrough=1,
Size=34712mb,
               (PhysicalDevice6, StartAddress=0mb, Size=34712mb),
               (PhysicalDevice7, StartAddress=0mb, Size=34712mb);
       LogicalDevice0 = StripeSize=64kb, Raid=12, WriteThrough=1,
Size=138848mb, BIOSGeometry=2GB,
               (IntermediateDevice0, StartAddress=0mb, Size=69424mb),
               (IntermediateDevice1, StartAddress=0mb, Size=69424mb),
               (IntermediateDevice2, StartAddress=0mb, Size=69424mb),
               (IntermediateDevice3, StartAddress=0mb, Size=69424mb);
 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 = 0;
       EnableOFM = 0;
       OEMCode = 0;
       StartupOption = 0;
 EndControllerParameter
End
Begin
============== disk configuration controller 1,2,3,4 ==============
 BeginGroup
       PhysicalDevice0 = Channel=0, Target=0, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice1 = Channel=0, Target=1, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice2 = Channel=0, Target=2, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice3 = Channel=0, Target=3, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice4 = Channel=0, Target=4, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice5 = Channel=0, Target=5, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice6 = Channel=0, Target=10, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice7 = Channel=0, Target=11, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice8 = Channel=0, Target=12, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice9 = Channel=0, Target=13, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice10 = Channel=0, Target=14, Size=8392mb,
State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice11 = Channel=0, Target=15, Size=8392mb,
State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice12 = Channel=1, Target=0, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice13 = Channel=1, Target=1, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice14 = Channel=1, Target=2, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice15 = Channel=1, Target=3, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice16 = Channel=1, Target=4, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice17 = Channel=1, Target=5, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice18 = Channel=1, Target=10, Size=8392mb,
State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice19 = Channel=1, Target=11, Size=8392mb,
State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice20 = Channel=1, Target=12, Size=8392mb,
State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice21 = Channel=1, Target=13, Size=8392mb,
State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice22 = Channel=1, Target=14, Size=8392mb,
State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice23 = Channel=1, Target=15, Size=8392mb,
State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice24 = Channel=2, Target=0, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
       PhysicalDevice25 = Channel=2, Target=1, Size=8392mb, State=Online,
               TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
```

```
        PhysicalDevice26 = Channel=2, Target=2, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice27 = Channel=2, Target=3, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice28 = Channel=2, Target=4, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice29 = Channel=2, Target=5, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice30 = Channel=2, Target=10, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice31 = Channel=2, Target=11, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice32 = Channel=2, Target=12, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice33 = Channel=2, Target=13, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice34 = Channel=2, Target=14, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice35 = Channel=2, Target=15, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice36 = Channel=3, Target=0, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice37 = Channel=3, Target=1, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice38 = Channel=3, Target=2, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice39 = Channel=3, Target=3, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice40 = Channel=3, Target=4, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice41 = Channel=3, Target=5, Size=8392mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice42 = Channel=3, Target=10, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice43 = Channel=3, Target=11, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice44 = Channel=3, Target=12, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice45 = Channel=3, Target=13, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice46 = Channel=3, Target=14, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
```

```
        PhysicalDevice47 = Channel=3, Target=15, Size=8392mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        IntermediateDevice0 = StripeSize=64kb, Raid=0, WriteThrough=1,
Size=100704mb,
                (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);
        IntermediateDevice1 = StripeSize=64kb, Raid=0, WriteThrough=1,
Size=100704mb,
                (PhysicalDevice12, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice13, StartAddress=0mb, Size=8392mb),
                (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);
        IntermediateDevice2 = StripeSize=64kb, Raid=0, WriteThrough=1,
Size=100704mb,
                (PhysicalDevice24, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice25, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice26, StartAddress=0mb, Size=8392mb),
                (PhysicalDevice27, StartAddress=0mb, Size=8392mb),
                (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);
        IntermediateDevice3 = StripeSize=64kb, Raid=0, WriteThrough=1,
Size=100704mb,
                (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),
                (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);
        LogicalDevice0 = StripeSize=64kb, Raid=12, WriteThrough=1,
Size=402816mb, BIOSGeometry=2GB,
                (IntermediateDevice0, StartAddress=0mb, Size=100704mb),
                (IntermediateDevice1, StartAddress=0mb, Size=100704mb),
                (IntermediateDevice2, StartAddress=0mb, Size=100704mb),
                (IntermediateDevice3, StartAddress=0mb, Size=100704mb);
 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 = 0;
        EnableOFM = 0;
        OEMCode = 0;
        StartupOption = 0;
 EndControllerParameter
End
============== disk configuration controller 5,6 ==============
Begin
 BeginGroup
        PhysicalDevice0 = Channel=0, Target=0, Size=17160mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice1 = Channel=0, Target=1, Size=17160mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice2 = Channel=0, Target=2, Size=17160mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice3 = Channel=0, Target=3, Size=17160mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice4 = Channel=0, Target=4, Size=17160mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice5 = Channel=0, Target=5, Size=17160mb, State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice6 = Channel=0, Target=10, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice7 = Channel=0, Target=11, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice8 = Channel=0, Target=12, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice9 = Channel=0, Target=13, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice10 = Channel=0, Target=14, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice11 = Channel=0, Target=15, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice12 = Channel=1, Target=0, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice13 = Channel=1, Target=1, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice14 = Channel=1, Target=2, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice15 = Channel=1, Target=3, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice16 = Channel=1, Target=4, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice17 = Channel=1, Target=5, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice18 = Channel=1, Target=10, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice19 = Channel=1, Target=11, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice20 = Channel=1, Target=12, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice21 = Channel=1, Target=13, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice22 = Channel=1, Target=14, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice23 = Channel=1, Target=15, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice24 = Channel=2, Target=0, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice25 = Channel=2, Target=1, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice26 = Channel=2, Target=2, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice27 = Channel=2, Target=3, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice28 = Channel=2, Target=4, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice29 = Channel=2, Target=5, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice30 = Channel=2, Target=10, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice31 = Channel=2, Target=11, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice32 = Channel=2, Target=12, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice33 = Channel=2, Target=13, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice34 = Channel=2, Target=14, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice35 = Channel=2, Target=15, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice36 = Channel=3, Target=0, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice37 = Channel=3, Target=1, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice38 = Channel=3, Target=2, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice39 = Channel=3, Target=3, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice40 = Channel=3, Target=4, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice41 = Channel=3, Target=5, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice42 = Channel=3, Target=10, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice43 = Channel=3, Target=11, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice44 = Channel=3, Target=12, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice45 = Channel=3, Target=13, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice46 = Channel=3, Target=14, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        PhysicalDevice47 = Channel=3, Target=15, Size=17160mb,
State=Online,
                TransferSpeed=40MHz, TransferWidth=16Bit, MaxTag=16;
        IntermediateDevice0 = StripeSize=64kb, Raid=0, WriteThrough=1,
Size=205920mb,
                (PhysicalDevice0, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice1, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice2, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice3, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice4, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice5, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice6, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice7, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice8, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice9, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice10, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice11, StartAddress=0mb, Size=17160mb);
        IntermediateDevice1 = StripeSize=64kb, Raid=0, WriteThrough=1,
Size=205920mb,
                (PhysicalDevice12, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice13, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice14, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice15, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice16, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice17, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice18, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice19, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice20, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice21, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice22, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice23, StartAddress=0mb, Size=17160mb);
        IntermediateDevice2 = StripeSize=64kb, Raid=0, WriteThrough=1,
Size=205920mb,
                (PhysicalDevice24, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice25, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice26, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice27, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice28, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice29, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice30, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice31, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice32, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice33, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice34, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice35, StartAddress=0mb, Size=17160mb);
        IntermediateDevice3 = StripeSize=64kb, Raid=0, WriteThrough=1,
Size=205920mb,
                (PhysicalDevice36, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice37, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice38, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice39, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice40, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice41, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice42, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice43, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice44, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice45, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice46, StartAddress=0mb, Size=17160mb),
                (PhysicalDevice47, StartAddress=0mb, Size=17160mb);
        LogicalDevice0 = StripeSize=64kb, Raid=12, WriteThrough=1,
Size=823680mb, BIOSGeometry=2GB,
                (IntermediateDevice0, StartAddress=0mb, Size=205920mb),
                (IntermediateDevice1, StartAddress=0mb, Size=205920mb),
                (IntermediateDevice2, StartAddress=0mb, Size=205920mb),
                (IntermediateDevice3, StartAddress=0mb, Size=205920mb);
 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 = 0;
        EnableOFM = 0;
        OEMCode = 0;
        StartupOption = 0;
 EndControllerParameter

End

[Software Environment]

[ Following are sub-categories of this main category ]

[Drivers]

Name    Description     File    Type    Started Start Mode      State   Status
        Error Control   Accept  Pause   Accept  Stop
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    Microsoft ACPI Driver   c:\winnt\system32\drivers\acpi.sys    Kernel
Driver  True    Boot    Running OK      Normal  False   True
acpiec  ACPIEC  c:\winnt\system32\drivers\acpiec.sys    Kernel Driver   False
        Disabled        Stopped OK      Normal  False   False
adptsf  Adaptec DuraLAN PCI Ethernet/Fast Ethernet driver for Windows NT
        c:\winnt\system32\drivers\adptsf50.sys        Kernel Driver   False
        Manual  Stopped OK      Normal  False   False
adpu160m        adpu160m        Not Available   Kernel Driver   False
        Disabled        Stopped OK      Normal  False   False
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 Not Available   Kernel Driver   False   Disabled
        Stopped OK      Normal  False   False
altnd5  Alteon WebSystems PCI Gigabit Ethernet Adapter
        c:\winnt\system32\drivers\altnd5.sys    Kernel Driver   True    Manual
        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
```

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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   atapi   c:\winnt\system32\drivers\atapi.sys   Kernel Driver  False
        Disabled       Stopped OK      Normal  False   False
atdisk  Atdisk  Not Available  Kernel Driver  False   Disabled
        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
cirrus  cirrus  c:\winnt\system32\drivers\cirrus.sys  Kernel Driver  True
        Manual  Running OK      Ignore  False   True
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
dspcicfg       DsPciCfg       \??\c:\winnt\system32\drivers\dspcicfg.sys
        Kernel Driver  True    Auto    Running OK      Normal  False   True
e1000   Intel(R) PRO/1000 Gigabit Server Adapter Driver
        c:\winnt\system32\drivers\e1000nt5.sys       Kernel Driver  False
        Manual  Stopped OK      Normal  False   False
e100b   Intel(R) PRO Adapter Driver
        c:\winnt\system32\drivers\e100bnt5.sys       Kernel Driver  False
        Manual  Stopped OK      Normal  False   False
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  False
        Disabled       Stopped OK      Normal  False   False
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       IntelIde       c:\winnt\system32\drivers\intelide.sys
        Kernel Driver  True    Boot    Running OK      Normal  False   True
interruptaffinityfilter       Interrupt Affinity Filter
        c:\winnt\system32\drivers\intfiltr.sys       Kernel Driver  True
        Boot    Running OK      Normal  False   True
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  False
        Manual  Stopped OK      Normal  False   False
```

```
ndiswan Remote Access NDIS WAN Driver
        c:\winnt\system32\drivers\ndiswan.sys Kernel Driver  False   Manual
        Stopped OK      Normal  False   False
ndproxy NDIS Proxy     c:\winnt\system32\drivers\ndproxy.sys Kernel Driver
        False   Manual  Stopped OK      Normal  False   False
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       c:\winnt\system32\drivers\parallel.sys
        Kernel Driver  False   Auto    Stopped OK      Ignore  False   False
parport Parport c:\winnt\system32\drivers\parport.sys Kernel Driver  False
        Auto    Stopped OK      Ignore  False   False
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  False
        Auto    Stopped OK      Ignore  False   False
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  Not Available  Kernel Driver  False   Disabled
        Stopped OK      Normal  False   False
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  False   Manual
        Stopped OK      Normal  False   False
ptilink Direct Parallel Link Driver
        c:\winnt\system32\drivers\ptilink.sys Kernel Driver  False   Manual
        Stopped OK      Normal  False   False
```

```
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  False  Manual  Stopped OK     Normal  False  False
raspti  Direct Parallel       c:\winnt\system32\drivers\raspti.sys  Kernel
Driver  False  Manual  Stopped OK     Normal  False  False
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  False  Manual  Stopped OK     Normal  False  False
serial  Serial port driver    c:\winnt\system32\drivers\serial.sys  Kernel
Driver  False  System  Stopped OK     Ignore  False  False
sfloppy Sfloppy c:\winnt\system32\drivers\sfloppy.sys Kernel Driver  False
        System  Stopped OK     Ignore  False  False
sglfb   sglfb   c:\winnt\system32\drivers\sglfb.sys   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
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  c:\winnt\system32\drivers\sym_hi.sys  Kernel Driver  True
        Boot    Running OK     Normal  False  True
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  False  Disabled       Stopped OK     Normal  False  False
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
uhcd    Microsoft USB Universal Host Controller Driver
        c:\winnt\system32\drivers\uhcd.sys    Kernel Driver  False  Manual
        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
usbhub  Microsoft USB Standard Hub Driver
        c:\winnt\system32\drivers\usbhub.sys  Kernel Driver  False  Manual
        Stopped OK     Normal  False  False
vgasave VgaSave c:\winnt\system32\drivers\vga.sys     Kernel Driver  False
        System  Stopped OK     Ignore  False  False
wanarp  Remote Access IP ARP Driver   c:\winnt\system32\drivers\wanarp.sys
        Kernel Driver  False  Manual  Stopped OK     Normal  False  False
wdica   WDICA   Not Available  Kernel Driver  False  Manual  Stopped OK
        Ignore  False  False

[Running Tasks]

Name    Path    Process ID     Priority       Min Working Set        Max
Working Set    Start Time     Version Size   File Date
system idle process    Not Available  0      0      Not Available  Not
Available      Not Available  Unknown Unknown Unknown
system  Not Available  8      8      0      1413120 Not Available
        Unknown Unknown Unknown
smss.exe       c:\winnt\system32\smss.exe    148    11     204800
        1413120 6/21/2000 9:30:24 AM   5.00.2195.31    44.27 KB (45,328
bytes)  4/25/2000 2:00:00 PM
csrss.exe      Not Available  176    13     Not Available  Not Available
        6/21/2000 9:30:31 AM   Unknown Unknown Unknown
winlogon.exe   c:\winnt\system32\winlogon.exe        196    13     204800
        1413120 6/21/2000 9:30:33 AM   5.00.2195.1600 173.27 KB (177,424
bytes)  4/25/2000 2:00:00 PM
services.exe   c:\winnt\system32\services.exe        224    9      204800
        1413120 6/21/2000 9:30:35 AM   5.00.2134.1    86.77 KB (88,848
bytes)  4/25/2000 2:00:00 PM
lsass.exe      c:\winnt\system32\lsass.exe   236    13     204800
        1413120 6/21/2000 9:30:35 AM   5.00.2195.1284 32.77 KB (33,552
bytes)  4/25/2000 2:00:00 PM
```

```
svchost.exe    c:\winnt\system32\svchost.exe 388     8       204800
        1413120 6/21/2000 9:30:38 AM  5.00.2134.1    7.77 KB (7,952 bytes)
        4/25/2000 2:00:00 PM
winmgmt.exe    c:\winnt\system32\wbem\winmgmt.exe    424     8       204800
        1413120 6/21/2000 9:30:40 AM  1.50.1085.0009 192.08 KB (196,685
bytes)  4/25/2000 2:00:00 PM
svchost.exe    c:\winnt\system32\svchost.exe 656     8       204800
        1413120 6/21/2000 9:31:10 AM  5.00.2134.1    7.77 KB (7,952 bytes)
        4/25/2000 2:00:00 PM
explorer.exe   c:\winnt\explorer.exe 628     8       204800  1413120
        6/21/2000 9:31:10 AM  5.00.3103.1000 231.77 KB (237,328 bytes)
        4/25/2000 2:00:00 PM
cmd.exe c:\winnt\system32\cmd.exe     620     8       204800  1413120
        6/21/2000 9:32:41 AM  5.00.2195.1235 230.77 KB (236,304 bytes)
        4/25/2000 2:00:00 PM
sqlservr.exe   c:\program files\microsoft sql
server\mssql\binn\sqlservr.exe        592     13      204800  1413120
        6/21/2000 9:32:42 AM  2000.080.0145.01       7.04 MB (7,385,149
bytes)  6/20/2000 2:30:51 PM
mmc.exe c:\winnt\system32\mmc.exe     536     8       204800  1413120
        6/21/2000 12:44:50 PM 5.00.2153.1    589.27 KB (603,408 bytes)
        4/25/2000 2:00:00 PM
rsvp.exe       c:\winnt\system32\rsvp.exe    892     8       204800
        1413120 6/21/2000 12:46:02 PM 5.00.2167.1    172.77 KB (176,912
bytes)  4/25/2000 2:00:00 PM

[Loaded Modules]

Name    Version Size    File Date      Manufacturer   Path
traffic.dll    5.00.2139.1    30.77 KB (31,504 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\traffic.dll
rsvp.exe       5.00.2167.1    172.77 KB (176,912 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\rsvp.exe
mfc42.dll      6.00.8665.0    972.05 KB (995,383 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\mfc42.dll
sendcmsg.dll   5.00.1636.1    23.77 KB (24,336 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\sendcmsg.dll
dtswiz.rll     2000.080.0145.01       324.00 KB (331,776 bytes)
        6/20/2000 2:31:13 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\dtswiz.rll
dtswiz.dll     2000.080.0145.01       612.06 KB (626,752 bytes)
        6/20/2000 2:31:31 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\dtswiz.dll
sqlftwiz.rll   2000.080.0145.01       124.00 KB (126,976 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\sqlftwiz.rll
sqlftwiz.dll   2000.080.0145.01       232.06 KB (237,634 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\sqlftwiz.dll
semnt.rll      2000.080.0145.01       24.00 KB (24,576 bytes)
        6/20/2000 2:31:26 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\resources\1033\semnt.rll
```

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semnt.dll      2000.080.0145.01       52.06 KB (53,311 bytes)
        6/20/2000 2:31:26 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\semnt.dll
semdll.rll     2000.080.0145.01       60.00 KB (61,440 bytes)
        6/20/2000 2:31:13 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semdll.rll
semrepl.rll    2000.080.0145.01       944.00 KB (966,656 bytes)
        6/20/2000 2:31:14 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semrepl.rll
semobj.rll     2000.080.0145.01       168.00 KB (172,032 bytes)
        6/20/2000 2:31:14 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semobj.rll
semwebwz.rll   2000.080.0145.01       480.00 KB (491,520 bytes)
        6/20/2000 2:31:14 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semwebwz.rll
semwiz.rll     2000.080.0145.01       1.40 MB (1,470,464 bytes)
        6/20/2000 2:31:13 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semwiz.rll
semsys.rll     2000.080.0145.01       152.00 KB (155,648 bytes)
        6/20/2000 2:31:14 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semsys.rll
semexec.rll    2000.080.0145.01       256.00 KB (262,144 bytes)
        6/20/2000 2:31:13 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semexec.rll
semcros.rll    2000.080.0145.01       72.00 KB (73,728 bytes)
        6/20/2000 2:31:14 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semcros.rll
mapi32.dll     1.0.2536.0     128.00 KB (131,072 bytes)     5/3/2000
1:50:38 PM     Microsoft Corporation  c:\winnt\system32\mapi32.dll
semmap.rll     2000.080.0145.01       32.00 KB (32,768 bytes)
        6/20/2000 2:31:26 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\resources\1033\semmap.rll
semrepl.dll    2000.080.0145.01       1.23 MB (1,290,305 bytes)
        6/20/2000 2:31:10 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semrepl.dll
semobj.dll     2000.080.0145.01       476.06 KB (487,488 bytes)
        6/20/2000 2:31:10 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semobj.dll
semwebwz.dll   2000.080.0145.01       120.06 KB (122,946 bytes)
        6/20/2000 2:31:10 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semwebwz.dll
semsys.dll     2000.080.0145.01       484.06 KB (495,680 bytes)
        6/20/2000 2:31:10 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semsys.dll
semwiz.dll     2000.080.0145.01       444.06 KB (454,720 bytes)
        6/20/2000 2:31:10 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semwiz.dll
semexec.dll    2000.080.0145.01       788.06 KB (806,977 bytes)
        6/20/2000 2:31:10 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semexec.dll
semmap.dll     2000.080.0145.01       60.06 KB (61,504 bytes)
        6/20/2000 2:31:26 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\semmap.dll
```

```
semcros.dll    2000.080.0145.01      164.06 KB (168,001 bytes)
        6/20/2000 2:31:10 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semcros.dll
semdll.dll     2000.080.0145.01      120.06 KB (122,944 bytes)
        6/20/2000 2:31:10 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semdll.dll
query.dll      5.00.2195.1163 1.35 MB (1,411,344 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\query.dll
ciadmin.dll    5.00.2195.22   153.27 KB (156,944 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\ciadmin.dll
proccon.dll    1, 0, 1, 16    342.77 KB (350,992 bytes)     6/5/2000
12:58:08 PM    Sequent Computer Systems, Inc.
        c:\winnt\system32\proccon.dll
tapisnap.dll   5.00.2138.1    301.77 KB (309,008 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\tapisnap.dll
wbemcntl.dll   1.50.1085.0000 248.06 KB (254,016 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\wbem\wbemcntl.dll
sqlsrv32.rll    2000.080.0153.03     88.00 KB (90,112 bytes)
        6/20/2000 2:15:58 PM  Microsoft Corporation
        c:\winnt\system32\sqlsrv32.rll
sqlsrv32.dll    2000.080.0153.03     460.08 KB (471,119 bytes)
        6/20/2000 2:15:58 PM  Microsoft Corporation
        c:\winnt\system32\sqlsrv32.dll
hhctrl.ocx     4.74.8793      493.27 KB (505,104 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\hhctrl.ocx
sqldmo.rll     2000.080.0145.01      584.00 KB (598,016 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\sqldmo.rll
sqldmo.dll     2000.080.0153.03      4.00 MB (4,194,368 bytes)
        5/3/2000 12:43:32 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\sqldmo.dll
sqlns.rll      2000.080.0145.01      660.00 KB (675,840 bytes)
        6/20/2000 2:31:30 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\sqlns.rll
semcomn.rll    2000.080.0145.01      28.00 KB (28,672 bytes)
        6/20/2000 2:31:30 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semcomn.rll
semsfc.rll     2000.080.0145.01      24.00 KB (24,576 bytes)
        6/20/2000 2:31:30 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\semsfc.rll
sqlgui.rll     2000.080.0145.01      56.00 KB (57,344 bytes)
        6/20/2000 2:31:30 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\sqlgui.rll
sqlsvc.rll     2000.080.0145.01      24.00 KB (24,576 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\sqlsvc.rll
odbcint.dll    3.520.6408.0   88.00 KB (90,112 bytes)       6/20/2000
2:15:56 PM     Microsoft Corporation  c:\winnt\system32\odbcint.dll
semcomn.dll    2000.080.0145.01      112.06 KB (114,753 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semcomn.dll
```

```
semsfc.dll     2000.080.0145.01      224.06 KB (229,440 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\semsfc.dll
odbcbcp.dll     2000.080.0153.03     28.07 KB (28,742 bytes)
        6/20/2000 2:15:58 PM  Microsoft Corporation
        c:\winnt\system32\odbcbcp.dll
sqlsvc.dll     2000.080.0145.01      92.06 KB (94,272 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\sqlsvc.dll
odbc32.dll     3.520.6408.0   216.27 KB (221,456 bytes)     6/20/2000
2:15:55 PM     Microsoft Corporation  c:\winnt\system32\odbc32.dll
w95scm.dll     2000.080.0145.01      48.06 KB (49,216 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\w95scm.dll
sqlgui.dll     2000.080.0145.01      440.06 KB (450,624 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\sqlgui.dll
sqlns.dll      2000.080.0145.01      860.06 KB (880,703 bytes)
        6/20/2000 2:31:30 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\sqlns.dll
sqlmmc.rll     2000.080.0145.01      552.00 KB (565,248 bytes)
        6/20/2000 2:31:15 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\resources\1033\sqlmmc.rll
sqlresld.dll   2000.080.0145.01      28.06 KB (28,738 bytes)
        6/20/2000 2:31:28 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\sqlresld.dll
sqlunirl.dll   2000.080.0153.03      172.06 KB (176,194 bytes)
        6/20/2000 2:15:57 PM  Microsoft Corporation
        c:\winnt\system32\sqlunirl.dll
sqlmmc.dll     2000.080.0145.01      188.06 KB (192,576 bytes)
        6/20/2000 2:31:14 PM  Microsoft Corporation  c:\program
files\microsoft sql server\80\tools\binn\sqlmmc.dll
wbemprox.dll   1.50.1085.0015 40.08 KB (41,040 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\wbem\wbemprox.dll
mlang.dll      5.00.3103.1000 510.77 KB (523,024 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\mlang.dll
rassapi.dll    5.00.2188.1    14.27 KB (14,608 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\rassapi.dll
adsnt.dll      5.00.2191.1    194.27 KB (198,928 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\adsnt.dll
dbghelp.dll    5.00.2195.1600 159.27 KB (163,088 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\dbghelp.dll
localsec.dll   5.00.2195.1340 227.27 KB (232,720 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\localsec.dll
devmgr.dll     5.00.2166.1    215.77 KB (220,944 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\devmgr.dll
filemgmt.dll   5.00.2134.1    287.27 KB (294,160 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\filemgmt.dll
pdh.dll 5.00.2195.1163 143.27 KB (146,704 bytes)     4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\pdh.dll
smlogcfg.dll   5.00.2163.1    273.27 KB (279,824 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\smlogcfg.dll
```

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cabinet.dll    5.00.2147.1    54.77 KB (56,080 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\cabinet.dll
msinfo32.dll   5.00.2177.1    312.27 KB (319,760 bytes)     6/20/2000
2:11:58 PM     Microsoft Corporation  c:\program files\common
files\microsoft shared\msinfo\msinfo32.dll
riched20.dll   5.30.23.1203   402.27 KB (411,920 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\riched20.dll
riched32.dll   5.00.2134.1    3.77 KB (3,856 bytes)  4/25/2000 2:00:00 PM
       Microsoft Corporation  c:\winnt\system32\riched32.dll
els.dll 5.00.2175.1    151.27 KB (154,896 bytes)     4/25/2000 2:00:00 PM
       Microsoft Corporation  c:\winnt\system32\els.dll
ntmsmgr.dll    1,0,0,1 427.77 KB (438,032 bytes)     4/25/2000 2:00:00 PM
       Microsoft Corporation and HighGround Systems, Inc.
       c:\winnt\system32\ntmsmgr.dll
mmfutil.dll    1.50.1085.0000 32.06 KB (32,829 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\mmfutil.dll
logdrive.dll   1.50.1085.0000 200.06 KB (204,863 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\logdrive.dll
dfrgres.dll    5.00.2150.1    27.50 KB (28,160 bytes)       4/25/2000
2:00:00 PM     Executive Software International, Inc.
       c:\winnt\system32\dfrgres.dll
dfrgsnap.dll   5.00.2195.31   41.77 KB (42,768 bytes)       4/25/2000
2:00:00 PM     Executive Software International, Inc.
       c:\winnt\system32\dfrgsnap.dll
dmdskres.dll   2195.1600.297.3       119.50 KB (122,368 bytes)
       4/25/2000 2:00:00 PM  Microsoft Corp., VERITAS Software
       c:\winnt\system32\dmdskres.dll
dmutil.dll     2195.23.297.2  42.27 KB (43,280 bytes)       4/25/2000
2:00:00 PM     VERITAS Software Corp. c:\winnt\system32\dmutil.dll
ntmsapi.dll    5.00.1948.1    50.27 KB (51,472 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\ntmsapi.dll
dmdskmgr.dll   2195.1600.297.3       160.27 KB (164,112 bytes)
       4/25/2000 2:00:00 PM  Microsoft Corp., VERITAS Software
       c:\winnt\system32\dmdskmgr.dll
mycomput.dll   5.00.2134.1    107.77 KB (110,352 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\mycomput.dll
mmcndmgr.dll   5.00.2178.1    815.27 KB (834,832 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\mmcndmgr.dll
mmc.exe 5.00.2153.1    589.27 KB (603,408 bytes)     4/25/2000 2:00:00 PM
       Microsoft Corporation  c:\winnt\system32\mmc.exe
oledb32r.dll   2.60.6408.0    68.27 KB (69,904 bytes)       6/20/2000
2:15:56 PM     Microsoft Corporation  c:\program files\common
files\system\ole db\oledb32r.dll
oledb32.dll    2.60.6408.0    444.27 KB (454,928 bytes)     6/20/2000
2:15:56 PM     Microsoft Corporation  c:\program files\common
files\system\ole db\oledb32.dll
msdatl3.dll    2.60.6408.0    92.27 KB (94,480 bytes)       6/20/2000
2:15:54 PM     Microsoft Corporation  c:\program files\common
files\system\ole db\msdatl3.dll
comdlg32.dll   5.00.3103.1000 220.27 KB (225,552 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\comdlg32.dll
msdart32.dll   2.60.6408.0    140.27 KB (143,632 bytes)     6/20/2000
2:15:54 PM     Microsoft Corporation  c:\winnt\system32\msdart32.dll
```

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sqloledb.dll   2000.080.0153.03      480.06 KB (491,584 bytes)
       6/20/2000 2:15:58 PM  Microsoft Corporation  c:\program
files\common files\system\ole db\sqloledb.dll
sqlftqry.dll   2000.080.0145.01      108.07 KB (110,668 bytes)
       6/20/2000 2:31:04 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\sqlftqry.dll
ssmslpcn.dll   2000.080.0145.01      40.06 KB (41,022 bytes)
       6/20/2000 2:30:54 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\ssmslpcn.dll
security.dll   5.00.2154.1    5.77 KB (5,904 bytes)  4/25/2000 2:00:00 PM
       Microsoft Corporation  c:\winnt\system32\security.dll
ssnmpn70.dll   2000.080.0145.01      24.06 KB (24,638 bytes)
       6/20/2000 2:30:54 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\ssnmpn70.dll
ssnetlib.dll   2000.080.0145.01      104.06 KB (106,558 bytes)
       6/20/2000 2:30:53 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\ssnetlib.dll
resutils.dll   5.00.2195.1600 39.77 KB (40,720 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\resutils.dll
clusapi.dll    5.00.2195.1600 54.27 KB (55,568 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\clusapi.dll
mtxclu.dll     1999.9.3421.3  50.27 KB (51,472 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\mtxclu.dll
msdtcprx.dll   2000.2.3444.0  625.77 KB (640,784 bytes)     6/5/2000
12:58:02 PM    Microsoft Corporation  c:\winnt\system32\msdtcprx.dll
xolehlp.dll    1999.9.3421.3  17.27 KB (17,680 bytes)       6/5/2000
12:58:02 PM    Microsoft Corporation  c:\winnt\system32\xolehlp.dll
sqlevn70.rll   2000.080.0145.01      28.00 KB (28,672 bytes)
       6/20/2000 2:30:54 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\resources\1033\sqlevn70.rll
msvcirt.dll    6.10.8637.0    76.05 KB (77,878 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\msvcirt.dll
sqlsort.dll    4.00.3321.0    580.06 KB (593,977 bytes)     6/20/2000
2:30:54 PM     Microsoft Corporation  c:\program files\microsoft sql
server\mssql\binn\sqlsort.dll
ums.dll 2000.080.0145.01      48.06 KB (49,210 bytes)       6/20/2000
2:30:53 PM     Microsoft Corporation  c:\program files\microsoft sql
server\mssql\binn\ums.dll
opends60.dll   2000.080.0145.01      24.06 KB (24,639 bytes)
       6/20/2000 2:30:53 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\opends60.dll
sqlservr.exe   2000.080.0145.01      7.04 MB (7,385,149 bytes)
       6/20/2000 2:30:51 PM  Microsoft Corporation  c:\program
files\microsoft sql server\mssql\binn\sqlservr.exe
cmd.exe 5.00.2195.1235 230.77 KB (236,304 bytes)     4/25/2000 2:00:00 PM
       Microsoft Corporation  c:\winnt\system32\cmd.exe
wininet.dll    5.00.3103.1000 433.27 KB (443,664 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\wininet.dll
diskcopy.dll   5.00.2195.1387 15.77 KB (16,144 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\diskcopy.dll
shdoclc.dll    5.00.3103.1000 324.50 KB (332,288 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\shdoclc.dll
```

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urlmon.dll      5.00.3103.800  397.77 KB (407,312 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\urlmon.dll
browselc.dll    5.00.3103.1000 34.50 KB (35,328 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\browselc.dll
faxshell.dll    5.00.2134.1    8.27 KB (8,464 bytes)  4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\faxshell.dll
msacm32.dll     5.00.2134.1    65.27 KB (66,832 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\msacm32.dll
avifil32.dll    5.00.2134.1    76.27 KB (78,096 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\avifil32.dll
msvfw32.dll     5.00.2134.1    113.77 KB (116,496 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\msvfw32.dll
docprop2.dll    5.00.2195.1387 308.77 KB (316,176 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\docprop2.dll
hhsetup.dll     4.74.8702      66.27 KB (67,856 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\hhsetup.dll
msvcp50.dll     5.00.7051      552.50 KB (565,760 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\msvcp50.dll
mfc42u.dll      6.00.8665.0    972.05 KB (995,384 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\mfc42u.dll
mmcshext.dll    5.00.2153.1    24.27 KB (24,848 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\mmcshext.dll
cfgmgr32.dll    5.00.2195.1600 16.77 KB (17,168 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\cfgmgr32.dll
imm32.dll       5.00.2195.1387 94.77 KB (97,040 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\imm32.dll
linkinfo.dll    5.00.2195.1387 16.77 KB (17,168 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\linkinfo.dll
powrprof.dll    5.00.2920.0000 13.27 KB (13,584 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\powrprof.dll
batmeter.dll    5.00.2920.0000 20.27 KB (20,752 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\batmeter.dll
stobject.dll    5.00.2195.1387 78.77 KB (80,656 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\stobject.dll
msi.dll 1.11.1314.0     2.82 MB (2,962,119 bytes)     4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\msi.dll
webcheck.dll    5.00.3103.1000 252.77 KB (258,832 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\webcheck.dll
ntshrui.dll     5.00.2134.1    46.77 KB (47,888 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\ntshrui.dll
mydocs.dll      5.00.3103.1000 57.77 KB (59,152 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\mydocs.dll
browseui.dll    5.00.3103.1000 774.27 KB (792,848 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\browseui.dll
shdocvw.dll     5.00.3103.1000 1.05 MB (1,095,952 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\shdocvw.dll
explorer.exe    5.00.3103.1000 231.77 KB (237,328 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\explorer.exe
wmi.dll 5.00.2195.1600 6.27 KB (6,416 bytes)  4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\wmi.dll
netshell.dll    5.00.2195.1340 454.77 KB (465,680 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\netshell.dll
```

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netman.dll      5.00.2195.21   93.77 KB (96,016 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\netman.dll
txfaux.dll      1999.9.3422.24 341.27 KB (349,456 bytes)     6/5/2000
12:58:01 PM     Microsoft Corporation  c:\winnt\system32\txfaux.dll
es.dll  1999.9.3422.21 231.77 KB (237,328 bytes)     4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\es.dll
netui1.dll      5.00.2134.1    210.27 KB (215,312 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\netui1.dll
netui0.dll      5.00.2134.1    70.27 KB (71,952 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\netui0.dll
ntlanman.dll    5.00.2157.1    35.27 KB (36,112 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\ntlanman.dll
psapi.dll       5.00.2134.1    28.27 KB (28,944 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\psapi.dll
wshnetbs.dll    5.00.2134.1    7.77 KB (7,952 bytes)  4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\wshnetbs.dll
rapilib.dll     5.00.2167.1    25.27 KB (25,872 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\rapilib.dll
rsvpsp.dll      5.00.2167.1    74.77 KB (76,560 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\rsvpsp.dll
provthrd.dll    1.50.1085.0000 68.07 KB (69,708 bytes)       6/20/2000
2:11:48 PM      Microsoft Corporation  c:\winnt\system32\wbem\provthrd.dll
ntevt.dll       1.50.1085.0000 192.06 KB (196,669 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wbem\ntevt.dll
perfos.dll      5.00.2155.1    21.27 KB (21,776 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\perfos.dll
ntmarta.dll     5.00.2158.1    98.77 KB (101,136 bytes)      4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\ntmarta.dll
framedyn.dll    1.50.1085.0000 164.05 KB (167,992 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll    1.50.1085.0016 1.02 MB (1,073,232 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll     1.50.1085.0007 40.07 KB (41,036 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll     1.50.1085.0007 364.07 KB (372,804 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wbem\wbemess.dll
fastprox.dll    1.50.1085.0007 144.08 KB (147,536 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wbem\fastprox.dll
wbemcore.dll    1.50.1085.0008 628.07 KB (643,140 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll    1.50.1085.0007 692.07 KB (708,675 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe     1.50.1085.0009 192.08 KB (196,685 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wbem\winmgmt.exe
rpcss.dll       5.00.2195.1600 178.77 KB (183,056 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\rpcss.dll
svchost.exe     5.00.2134.1    7.77 KB (7,952 bytes)  4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\svchost.exe
scecli.dll      5.00.2191.1    105.27 KB (107,792 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\scecli.dll
atl.dll 3.00.8449      57.56 KB (58,938 bytes)       4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\atl.dll
```

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certcli.dll    5.00.2175.1    132.27 KB (135,440 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\certcli.dll
ntdsatq.dll    5.00.2195.1284 30.77 KB (31,504 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\ntdsatq.dll
ntdsa.dll      5.00.2195.1600 886.77 KB (908,048 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\ntdsa.dll
kdcsvc.dll     5.00.2195.1284 133.77 KB (136,976 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\kdcsvc.dll
sfmapi.dll     5.00.2134.1    38.77 KB (39,696 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\sfmapi.dll
rassfm.dll     5.00.2195.1179 21.27 KB (21,776 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\rassfm.dll
mpr.dll 5.00.2195.1340 52.77 KB (54,032 bytes)       4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\mpr.dll
schannel.dll   5.00.2195.1163 140.77 KB (144,144 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\schannel.dll
netlogon.dll   5.00.2195.1600 337.77 KB (345,872 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\netlogon.dll
msv1_0.dll     5.00.2195.1378 89.27 KB (91,408 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\msv1_0.dll
kerberos.dll   5.00.2195.1378 193.27 KB (197,904 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\kerberos.dll
msprivs.dll    5.00.2154.1    41.50 KB (42,496 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\msprivs.dll
samsrv.dll     5.00.2195.1175 342.77 KB (350,992 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\samsrv.dll
lsasrv.dll     5.00.2195.1284 469.27 KB (480,528 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\lsasrv.dll
lsass.exe      5.00.2195.1284 32.77 KB (33,552 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\lsass.exe
rasadhlp.dll   5.00.2168.1    7.27 KB (7,440 bytes)  4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\rasadhlp.dll
winrnr.dll     5.00.2195.1175 19.27 KB (19,728 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\winrnr.dll
rnr20.dll      5.00.2195.1207 34.77 KB (35,600 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\rnr20.dll
wshtcpip.dll   5.00.2134.1    17.27 KB (17,680 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\wshtcpip.dll
wmicore.dll    5.00.2178.1    70.77 KB (72,464 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\wmicore.dll
dhcpcsvc.dll   5.00.2195.1378 85.27 KB (87,312 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\dhcpcsvc.dll
tapi32.dll     5.00.2195.1371 124.27 KB (127,248 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\tapi32.dll
rasman.dll     5.00.2188.1    54.77 KB (56,080 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\rasman.dll
rasapi32.dll   5.00.2188.1    189.77 KB (194,320 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\rasapi32.dll
rtutils.dll    5.00.2168.1    43.77 KB (44,816 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\rtutils.dll
adsldpc.dll    5.00.2195.1383 125.27 KB (128,272 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\adsldpc.dll
```

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activeds.dll   5.00.2172.1    172.77 KB (176,912 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\activeds.dll
mprapi.dll     5.00.2181.1    79.27 KB (81,168 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\mprapi.dll
iphlpapi.dll   5.00.2173.2    67.77 KB (69,392 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\iphlpapi.dll
msafd.dll      5.00.2195.1340 101.77 KB (104,208 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\msafd.dll
mswsock.dll    5.00.2195.1207 62.27 KB (63,760 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\mswsock.dll
esent.dll      6.0.3940.4     1.06 MB (1,109,264 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\esent.dll
msgsvc.dll     5.00.2181.1    33.77 KB (34,576 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\msgsvc.dll
cryptsvc.dll   5.00.2181.1    61.77 KB (63,248 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\cryptsvc.dll
cryptdll.dll   5.00.2135.1    40.77 KB (41,744 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\cryptdll.dll
wkssvc.dll     5.00.2195.1175 95.27 KB (97,552 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\wkssvc.dll
srvsvc.dll     5.00.2178.1    79.27 KB (81,168 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\srvsvc.dll
winsta.dll     5.00.2195.32   36.27 KB (37,136 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\winsta.dll
icmp.dll       5.00.2134.1    7.27 KB (7,440 bytes)  4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\icmp.dll
lmhsvc.dll     5.00.2134.1    9.27 KB (9,488 bytes)  4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\lmhsvc.dll
eventlog.dll   5.00.2178.1    43.77 KB (44,816 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\eventlog.dll
ntdsapi.dll    5.00.2195.1175 55.77 KB (57,104 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\ntdsapi.dll
scesrv.dll     5.00.2188.1    225.77 KB (231,184 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\scesrv.dll
umpnpmgr.dll   5.00.2182.1    86.27 KB (88,336 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\umpnpmgr.dll
services.exe   5.00.2134.1    86.77 KB (88,848 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\services.exe
clbcatq.dll    2000.2.3444.0  496.27 KB (508,176 bytes)     6/5/2000
12:57:58 PM    Microsoft Corporation  c:\winnt\system32\clbcatq.dll
oleaut32.dll   2.40.4514      600.27 KB (614,672 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\oleaut32.dll
cscui.dll      5.00.2195.1387 226.77 KB (232,208 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\cscui.dll
winspool.drv   5.00.2195.1340 110.27 KB (112,912 bytes)     4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\winspool.drv
winscard.dll   5.00.2134.1    77.27 KB (79,120 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\winscard.dll
wlnotify.dll   5.00.2195.1163 52.27 KB (53,520 bytes)       4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\wlnotify.dll
cscdll.dll     5.00.2195.1284 98.27 KB (100,624 bytes)      4/25/2000
2:00:00 PM     Microsoft Corporation  c:\winnt\system32\cscdll.dll
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lz32.dll        5.00.2134.1     9.77 KB (10,000 bytes) 4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\lz32.dll
version.dll     5.00.2134.1     15.77 KB (16,144 bytes)      4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\version.dll
rsabase.dll     5.00.2195.1391 129.27 KB (132,368 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\rsabase.dll
mscat32.dll     5.131.2134.1    7.77 KB (7,952 bytes)  4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\mscat32.dll
ole32.dll       5.00.2195.1179 913.77 KB (935,696 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\ole32.dll
imagehlp.dll    5.00.2195.1600 120.77 KB (123,664 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\imagehlp.dll
msasn1.dll      5.00.2134.1     50.77 KB (51,984 bytes)      4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\msasn1.dll
crypt32.dll     5.131.2195.1340        450.77 KB (461,584 bytes)
        4/25/2000 2:00:00 PM  Microsoft Corporation
        c:\winnt\system32\crypt32.dll
wintrust.dll    5.131.2143.1    162.27 KB (166,160 bytes)    4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wintrust.dll
setupapi.dll    5.00.2195.1600 577.77 KB (591,632 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\setupapi.dll
winmm.dll       5.00.2161.1     184.77 KB (189,200 bytes)    4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\winmm.dll
comctl32.dll    5.81    517.27 KB (529,680 bytes)     4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\comctl32.dll
shlwapi.dll     5.00.3103.1000 272.27 KB (278,800 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\shlwapi.dll
shell32.dll     5.00.3103.1000 2.21 MB (2,321,168 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\shell32.dll
msgina.dll      5.00.2191.1     309.77 KB (317,200 bytes)    4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\msgina.dll
wsock32.dll     5.00.2195.1207 21.77 KB (22,288 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wsock32.dll
dnsapi.dll      5.00.2195.1378 132.27 KB (135,440 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\dnsapi.dll
wldap32.dll     5.00.2195.1175 124.27 KB (127,248 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\wldap32.dll
ws2help.dll     5.00.2134.1     17.77 KB (18,192 bytes)      4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\ws2help.dll
ws2_32.dll      5.00.2195.1340 66.77 KB (68,368 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\ws2_32.dll
samlib.dll      5.00.2195.1175 46.27 KB (47,376 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\samlib.dll
netrap.dll      5.00.2134.1     11.27 KB (11,536 bytes)      4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\netrap.dll
netapi32.dll    5.00.2195.1600 298.77 KB (305,936 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\netapi32.dll
profmap.dll     5.00.2181.1     29.27 KB (29,968 bytes)      4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\profmap.dll
secur32.dll     5.00.2195.1340 46.27 KB (47,376 bytes)       4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\secur32.dll
sfc.dll 5.00.2195.1340 85.27 KB (87,312 bytes)       4/25/2000 2:00:00 PM
        Microsoft Corporation  c:\winnt\system32\sfc.dll
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nddeapi.dll     5.00.2137.1     15.27 KB (15,632 bytes)      4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\nddeapi.dll
userenv.dll     5.00.2185.1     361.27 KB (369,936 bytes)    4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\userenv.dll
user32.dll      5.00.2195.1387 370.27 KB (379,152 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\user32.dll
gdi32.dll       5.00.2195.1340 216.77 KB (221,968 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\gdi32.dll
rpcrt4.dll      5.00.2195.1600 415.27 KB (425,232 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\rpcrt4.dll
advapi32.dll    5.00.2195.1600 340.27 KB (348,432 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\advapi32.dll
kernel32.dll    5.00.2195.1284 690.77 KB (707,344 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\kernel32.dll
msvcrt.dll      6.10.8637.0     288.09 KB (295,000 bytes)    4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\msvcrt.dll
winlogon.exe    5.00.2195.1600 173.27 KB (177,424 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\winlogon.exe
sfcfiles.dll    5.00.2195.1600 878.77 KB (899,856 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\sfcfiles.dll
ntdll.dll       5.00.2195.1387 462.27 KB (473,360 bytes)     4/25/2000
2:00:00 PM      Microsoft Corporation  c:\winnt\system32\ntdll.dll
smss.exe        5.00.2195.31    44.27 KB (45,328 bytes)      4/25/2000
2:00:00 PM      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 Manual  Share Process
        c:\winnt\system32\services.exe          Normal  LocalSystem     0
Application Management AppMgmt Stopped Manual  Share Process
        c:\winnt\system32\services.exe          Normal  LocalSystem     0
Computer Browser        Browser Stopped Manual  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 Manual  Own Process
        c:\winnt\system32\dfssvc.exe    Normal  LocalSystem     0
DHCP Client     Dhcp    Stopped Manual  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 Manual  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
```

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COM+ Event System      EventSystem    Stopped Manual  Share Process
        c:\winnt\system32\svchost.exe -k netsvcs     Normal  LocalSystem
        0
Fax Service    Fax     Stopped Disabled       Own Process
        c:\winnt\system32\faxsvc.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 Auto    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 Manual  Own Process
        c:\winnt\system32\llssrv.exe  Normal  LocalSystem    0
TCP/IP NetBIOS Helper Service LmHosts Running Auto    Share Process
        c:\winnt\system32\services.exe       Normal  LocalSystem    0
Messenger      Messenger      Running Auto    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 Manual  Own Process
        c:\winnt\system32\msdtc.exe   Normal  LocalSystem    1
Windows Installer      MSIServer      Stopped Manual  Share Process
        c:\winnt\system32\msiexec.exe /v      Normal  LocalSystem    0
Microsoft Search       MSSEARCH       Stopped Manual  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~4\mssql\binn\sqlservr.exe Normal  LocalSystem
        0
Network DDE    NetDDE  Stopped Manual  Share Process
        c:\winnt\system32\netdde.exe  Normal  LocalSystem    0
Network DDE DSDM       NetDDEdsdm     Stopped Manual  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 Manual  Share Process
        c:\winnt\system32\lsass.exe   Normal  LocalSystem    0
Process Control Service       ProcCon Stopped Manual  Own Process
        c:\winnt\system32\procconsvc.exe     Normal  LocalSystem    0
```

```
Protected Storage      ProtectedStorage      Stopped Auto    Share Process
        c:\winnt\system32\services.exe       Normal  LocalSystem    0
Remote Access Auto Connection Manager RasAuto Stopped Manual  Share Process
        c:\winnt\system32\svchost.exe -k netsvcs     Normal  LocalSystem
        0
Remote Access Connection Manager      RasMan  Stopped Manual  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 Manual  Own Process
        c:\winnt\system32\regsvc.exe  Normal  LocalSystem    0
Remote Procedure Call (RPC) Locator   RpcLocator     Stopped Manual  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    Running 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 Manual  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
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~4\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 Disabled       Own Process
        c:\winnt\system32\termsrv.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 Manual  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
Windows Management Instrumentation   WinMgmt Running Auto    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




Key Name:          SYSTEM\CurrentControlSet\Services\NDIS
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM
Value 0
  Name:            DisplayName
  Type:            REG_SZ
  Data:            NDIS System Driver

Value 1
  Name:            ErrorControl
  Type:            REG_DWORD
  Data:            0x1

Value 2
  Name:            Group
  Type:            REG_SZ
  Data:            NDIS Wrapper

Value 3
  Name:            Start
  Type:            REG_DWORD
  Data:            0

Value 4
  Name:            Type
  Type:            REG_DWORD
  Data:            0x1


Key Name:          SYSTEM\CurrentControlSet\Services\NDIS\Enum
Class Name:        <NO CLASS>
Last Write Time:   6/19/2000 - 11:17 AM
Value 0
  Name:            0
  Type:            REG_SZ
  Data:            Root\LEGACY_NDIS\0000

Value 1
```

```
  Name:            Count
  Type:            REG_DWORD
  Data:            0x1

Value 2
  Name:            NextInstance
  Type:            REG_DWORD
  Data:            0x1


Key Name:          SYSTEM\CurrentControlSet\Services\NDIS\MediaTypes
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM

Key Name:          SYSTEM\CurrentControlSet\Services\NDIS\Parameters
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM
Value 0
  Name:            ProcessorAffinityMask
  Type:            REG_DWORD
  Data:            0


Key Name:          SYSTEM\CurrentControlSet\Control\Session
Manager\Memory Management
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM
Value 0
  Name:            ClearPageFileAtShutdown
  Type:            REG_DWORD
  Data:            0

Value 1
  Name:            DisablePagingExecutive
  Type:            REG_DWORD
  Data:            0

Value 2
  Name:            DontVerifyRandomDrivers
  Type:            REG_DWORD
  Data:            0x1

Value 3
  Name:            IoPageLockLimit
  Type:            REG_DWORD
  Data:            0

Value 4
  Name:            LargeSystemCache
  Type:            REG_DWORD
  Data:            0

Value 5
```

```
  Name:            NonPagedPoolQuota
  Type:            REG_DWORD
  Data:            0

Value 6
  Name:            NonPagedPoolSize
  Type:            REG_DWORD
  Data:            0

Value 7
  Name:            PagedPoolQuota
  Type:            REG_DWORD
  Data:            0

Value 8
  Name:            PagedPoolSize
  Type:            REG_DWORD
  Data:            0

Value 9
  Name:            PagingFiles
  Type:            REG_MULTI_SZ
  Data:            C:\pagefile.sys 2046 3158


Value 10
  Name:            PhysicalAddressExtension
  Type:            REG_DWORD
  Data:            0x1

Value 11
  Name:            SecondLevelDataCache
  Type:            REG_DWORD
  Data:            0

Value 12
  Name:            SystemPages
  Type:            REG_DWORD
  Data:            0


Key Name:          SYSTEM\CurrentControlSet\Control\Session Manager\I/O
System
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM
Value 0
  Name:            CountOperations
  Type:            REG_DWORD
  Data:            0

Value 1
  Name:            LargeIrpStackLocations
  Type:            REG_DWORD
```

```
  Data:            0x7

Key Name:          SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000
Class Name:        <NO CLASS>
Last Write Time:   6/20/2000 - 2:58 PM
Value 0
  Name:            BusType
  Type:            REG_SZ
  Data:            5

Value 1
  Name:            Characteristics
  Type:            REG_DWORD
  Data:            0x84

Value 2
  Name:            CksumOffload
  Type:            REG_SZ
  Data:            1

Value 3
  Name:            ComponentId
  Type:            REG_SZ
  Data:            pci\ven_12ae&dev_0001&subsys_00000000

Value 4
  Name:            DebugPci
  Type:            REG_SZ
  Data:            0

Value 5
  Name:            DriverDate
  Type:            REG_SZ
  Data:            3-16-2000

Value 6
  Name:            DriverDateData
  Type:            REG_BINARY
  Data:
00000000   00 80 68 92 da 8e bf 01 -                          ..h.Ú.¿.

Value 7
  Name:            DriverDesc
  Type:            REG_SZ
  Data:            Alteon WebSystems PCI Gigabit Ethernet Adapter

Value 8
  Name:            DriverVersion
  Type:            REG_SZ
  Data:            1.17.1.0
```

```
Value 9
  Name:            FdrFilter
  Type:            REG_SZ
  Data:            0

Value 10
  Name:            Fix450GX
  Type:            REG_SZ
  Data:            0

Value 11
  Name:            HostTracing
  Type:            REG_SZ
  Data:            1

Value 12
  Name:            InfPath
  Type:            REG_SZ
  Data:            netalt.inf

Value 13
  Name:            InfSection
  Type:            REG_SZ
  Data:            acenic.ndi

Value 14
  Name:            InfSectionExt
  Type:            REG_SZ
  Data:            .NT

Value 15
  Name:            IntCount
  Type:            REG_SZ
  Data:            2000

Value 16
  Name:            JumboFrames
  Type:            REG_SZ
  Data:            0

Value 17
  Name:            JumboMtu
  Type:            REG_SZ
  Data:            1500

Value 18
  Name:            LargeSend
  Type:            REG_SZ
  Data:            1

Value 19
  Name:            LinkNegotiation
  Type:            REG_SZ
  Data:            1

Value 20
  Name:            MatchingDeviceId
  Type:            REG_SZ
  Data:            pci\ven_12ae&dev_0001&subsys_00000000

Value 21
  Name:            NetCfgInstanceId
  Type:            REG_SZ
  Data:            {9A21C6FC-CAA0-40DE-9FDD-4F501892A1BF}

Value 22
  Name:            NicTracing
  Type:            REG_SZ
  Data:            0

Value 23
  Name:            PciLatencyTimer
  Type:            REG_SZ
  Data:            40

Value 24
  Name:            PciMemInvalidate
  Type:            REG_SZ
  Data:            1

Value 25
  Name:            PciReadMax
  Type:            REG_SZ
  Data:            ffffffff

Value 26
  Name:            PciWriteMax
  Type:            REG_SZ
  Data:            ffffffff

Value 27
  Name:            ProviderName
  Type:            REG_SZ
  Data:            Microsoft

Value 28
  Name:            RecvCoalMax
  Type:            REG_SZ
  Data:            80

Value 29
  Name:            RecvCoalTicks
  Type:            REG_SZ
  Data:            10000

Value 30
```

```
  Name:             RxFlowControl
  Type:             REG_SZ
  Data:             0

Value 31
  Name:             SendCoalMax
  Type:             REG_SZ
  Data:             80

Value 32
  Name:             SendCoalTicks
  Type:             REG_SZ
  Data:             10000

Value 33
  Name:             StatTicks
  Type:             REG_SZ
  Data:             100000

Value 34
  Name:             TxFlowControl
  Type:             REG_SZ
  Data:             0


Key Name:           SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Linkage
Class Name:         <NO CLASS>
Last Write Time:    6/15/2000 - 11:14 AM
Value 0
  Name:             Export
  Type:             REG_MULTI_SZ
  Data:             \Device\{9A21C6FC-CAA0-40DE-9FDD-4F501892A1BF}


Value 1
  Name:             RootDevice
  Type:             REG_MULTI_SZ
  Data:             {9A21C6FC-CAA0-40DE-9FDD-4F501892A1BF}


Value 2
  Name:             UpperBind
  Type:             REG_MULTI_SZ
  Data:             Tcpip



Key Name:           SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi
Class Name:         <NO CLASS>
Last Write Time:    6/15/2000 - 11:14 AM
Value 0
  Name:             Service
  Type:             REG_SZ
  Data:             altnd5


Key Name:           SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\Interfaces
Class Name:         <NO CLASS>
Last Write Time:    6/15/2000 - 11:14 AM
Value 0
  Name:             LowerRange
  Type:             REG_SZ
  Data:             ethernet

Value 1
  Name:             UpperRange
  Type:             REG_SZ
  Data:             ndis5


Key Name:           SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params
Class Name:         <NO CLASS>
Last Write Time:    6/15/2000 - 11:14 AM

Key Name:           SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\JumboFrames
Class Name:         <NO CLASS>
Last Write Time:    6/15/2000 - 11:14 AM
Value 0
  Name:             default
  Type:             REG_SZ
  Data:             0

Value 1
  Name:             ParamDesc
  Type:             REG_SZ
  Data:             JumboFrames

Value 2
  Name:             type
  Type:             REG_SZ
  Data:             enum


Key Name:           SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\JumboFrames\enum
Class Name:         <NO CLASS>
Last Write Time:    6/15/2000 - 11:14 AM
Value 0
  Name:             0
  Type:             REG_SZ
  Data:             Off
```

```
Value 1
  Name:            1
  Type:            REG_SZ
  Data:            On


Key Name:          SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\JumboMtu
Class Name:        <NO CLASS>
Last Write Time:   6/15/2000 - 11:14 AM
Value 0
  Name:            base
  Type:            REG_SZ
  Data:            10

Value 1
  Name:            default
  Type:            REG_SZ
  Data:            1500

Value 2
  Name:            max
  Type:            REG_SZ
  Data:            9000

Value 3
  Name:            min
  Type:            REG_SZ
  Data:            1500

Value 4
  Name:            ParamDesc
  Type:            REG_SZ
  Data:            JumboMtu

Value 5
  Name:            step
  Type:            REG_SZ
  Data:            100

Value 6
  Name:            type
  Type:            REG_SZ
  Data:            dword


Key Name:          SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\LinkNegotiation
Class Name:        <NO CLASS>
Last Write Time:   6/15/2000 - 11:14 AM
Value 0
  Name:            default
```

```
  Type:            REG_SZ
  Data:            1

Value 1
  Name:            ParamDesc
  Type:            REG_SZ
  Data:            LinkNegotiation

Value 2
  Name:            type
  Type:            REG_SZ
  Data:            enum


Key Name:          SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\LinkNegotiation\enum
Class Name:        <NO CLASS>
Last Write Time:   6/15/2000 - 11:14 AM
Value 0
  Name:            0
  Type:            REG_SZ
  Data:            Off

Value 1
  Name:            1
  Type:            REG_SZ
  Data:            On


Key Name:          SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\NetworkAddress
Class Name:        <NO CLASS>
Last Write Time:   6/15/2000 - 11:14 AM
Value 0
  Name:            default
  Type:            REG_SZ
  Data:            0060CF000000

Value 1
  Name:            optional
  Type:            REG_SZ
  Data:            1

Value 2
  Name:            ParamDesc
  Type:            REG_SZ
  Data:            NetworkAddress

Value 3
  Name:            type
  Type:            REG_SZ
  Data:            edit
```

```
Key Name:          SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\RxFlowControl
Class Name:        <NO CLASS>
Last Write Time:   6/15/2000 - 11:14 AM
Value 0
  Name:            default
  Type:            REG_SZ
  Data:            1

Value 1
  Name:            ParamDesc
  Type:            REG_SZ
  Data:            RxFlowControl

Value 2
  Name:            type
  Type:            REG_SZ
  Data:            enum


Key Name:          SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\RxFlowControl\enum
Class Name:        <NO CLASS>
Last Write Time:   6/15/2000 - 11:14 AM
Value 0
  Name:            0
  Type:            REG_SZ
  Data:            Off

Value 1
  Name:            1
  Type:            REG_SZ
  Data:            On


Key Name:          SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\TxFlowControl
Class Name:        <NO CLASS>
Last Write Time:   6/15/2000 - 11:14 AM
Value 0
  Name:            default
  Type:            REG_SZ
  Data:            0

Value 1
  Name:            ParamDesc
  Type:            REG_SZ
  Data:            TxFlowControl

Value 2
  Name:            type
  Type:            REG_SZ
  Data:            enum


Key Name:          SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}\0000\Ndi\params\TxFlowControl\enum
Class Name:        <NO CLASS>
Last Write Time:   6/15/2000 - 11:14 AM
Value 0
  Name:            0
  Type:            REG_SZ
  Data:            Off

Value 1
  Name:            1
  Type:            REG_SZ
  Data:            On


Key Name:          SYSTEM\CurrentControlSet\Services\dac2w2k
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM
Value 0
  Name:            ErrorControl
  Type:            REG_DWORD
  Data:            0x1

Value 1
  Name:            Group
  Type:            REG_SZ
  Data:            SCSI Miniport

Value 2
  Name:            ImagePath
  Type:            REG_EXPAND_SZ
  Data:            System32\DRIVERS\dac2w2k.sys

Value 3
  Name:            Start
  Type:            REG_DWORD
  Data:            0

Value 4
  Name:            Tag
  Type:            REG_DWORD
  Data:            0x21

Value 5
  Name:            Type
  Type:            REG_DWORD
  Data:            0x1


Key Name:          SYSTEM\CurrentControlSet\Services\dac2w2k\Enum
```

```
Class Name:        <NO CLASS>
Last Write Time:   6/19/2000 - 11:17 AM
Value 0
  Name:            0
  Type:            REG_SZ
  Data:
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&2fcd2e6d&0&4020

Value 1
  Name:            1
  Type:            REG_SZ
  Data:
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&3a654c6b&0&4028

Value 2
  Name:            2
  Type:            REG_SZ
  Data:
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&20b2daf0&0&4020

Value 3
  Name:            3
  Type:            REG_SZ
  Data:
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&de4d5e1&0&4028

Value 4
  Name:            4
  Type:            REG_SZ
  Data:
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&8c49857&0&4020

Value 5
  Name:            5
  Type:            REG_SZ
  Data:
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&375c4928&0&4028

Value 6
  Name:            6
  Type:            REG_SZ
  Data:
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&1b89a02&0&4020

Value 7
  Name:            Count
  Type:            REG_DWORD
  Data:            0x7

Value 8
  Name:            NextInstance
  Type:            REG_DWORD
  Data:            0x7
```

```
Key Name:          SYSTEM\CurrentControlSet\Services\dac2w2k\Parameters
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM

Key Name:
SYSTEM\CurrentControlSet\Services\dac2w2k\Parameters\Device
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM
Value 0
  Name:            DriverParameter
  Type:            REG_SZ
  Data:            ConfigureSIR=16


Key Name:
SYSTEM\CurrentControlSet\Services\dac2w2k\Parameters\PnpInterface
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM
Value 0
  Name:            5
  Type:            REG_DWORD
  Data:            0x1


Key Name:          SYSTEM\CurrentControlSet\Services\dac2w2k\Security
Class Name:        <NO CLASS>
Last Write Time:   6/7/2000 - 1:21 PM
Value 0
  Name:            Security
  Type:            REG_BINARY
  Data:
00000000   01 00 14 80 a0 00 00 00 - ac 00 00 00 14 00 00 00
.... ...¬.......
00000010   30 00 00 00 02 00 1c 00 - 01 00 00 00 02 80 14 00
0...............
00000020   ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
ÿ...............
00000030   02 00 70 00 04 00 00 00 - 00 00 18 00 fd 01 02 00
..p.........ý...
00000040   01 01 00 00 00 00 00 05 - 12 00 00 00 50 00 5f 00
.............P._.
00000050   00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05
....ÿ...........
00000060   20 00 00 00 20 02 00 00 - 31 00 64 00 00 00 18 00   ...
...1.d.....
00000070   8d 01 02 00 01 01 00 00 - 00 00 00 05 0b 00 00 00
................
00000080   20 02 00 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
.......ý.......
00000090   00 00 00 05 20 00 00 00 - 23 02 00 00 31 00 64 00  ....
...#...1.d.
```

```
000000a0   01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
................
000000b0   00 00 00 05 12 00 00 00 -                         ........
```

This section discloses hardware information and the Windows 2000 registry parameters used on the Primergy 170 client systems.

```
[System Summary]

Item    Value
OS Name Microsoft Windows 2000 Server
Version 5.0.2195  Build 2195
OS Manufacturer       Microsoft Corporation
System Name    HELLBLAU
System Manufacturer   FUJITSU SIEMENS
System Model   Pentium II
System Type    X86-based PC
Processor      x86 Family 6 Model 8 Stepping 1 GenuineIntel ~700 Mhz
BIOS Version   PhoenixBIOS Version 4.06  Rev. 1.10.1107
Windows Directory     C:\WINNT
System Directory      C:\WINNT\System32
Boot Device    \Device\Harddisk0\Partition1
Locale  United States
User Name      HELLBLAU\Administrator
Time Zone      W. Europe Daylight Time
Total Physical Memory 261,668 KB
Available Physical Memory     195,168 KB
Total Virtual Memory  894,812 KB
Available Virtual Memory      773,768 KB
Page File Space       633,144 KB
Page File      C:\pagefile.sys

[Hardware Resources]

[ Following are sub-categories of this main category ]

[Conflicts/Sharing]

Resource       Device
IRQ 9  Microsoft ACPI-Compliant System
IRQ 9  Intel 82371AB/EB PCI to USB Universal Host Controller
IRQ 9  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #7
IRQ 9  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #8
IRQ 9  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #5
IRQ 9  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #6
IRQ 9  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
IRQ 9  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #2
IRQ 9  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #3
IRQ 9  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #4
IRQ 9  Adaptec AHA-2940U2/U2W PCI SCSI Controller

[DMA]

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

[Forced Hardware]

Device  PNP Device ID
No Forced Hardware

[I/O]

Address Range  Device  Status
0x0000-0x0CF7  PCI bus OK
0x0000-0x0CF7  Direct memory access controller      OK
0x0D00-0xFFFF  PCI bus OK
0x03B0-0x03BB  Intel 82443BX Pentium(r) II Processor to AGP Controller
       OK
0x03B0-0x03BB  Matrox Graphics MGA-G100 AGP  OK
0x03C0-0x03DF  Intel 82443BX Pentium(r) II Processor to AGP Controller
       OK
0x03C0-0x03DF  Matrox Graphics MGA-G100 AGP  OK
0x0A79-0x0A79  ISAPNP Read Data Port  OK
0x0279-0x0279  ISAPNP Read Data Port  OK
0x0274-0x0277  ISAPNP Read Data Port  OK
0x0010-0x001F  Motherboard resources  OK
0x0022-0x003F  Motherboard resources  OK
0x0050-0x0053  Motherboard resources  OK
0x0062-0x0063  Motherboard resources  OK
0x0065-0x006F  Motherboard resources  OK
0x0074-0x007F  Motherboard resources  OK
0x0090-0x0091  Motherboard resources  OK
0x0093-0x009F  Motherboard resources  OK
0x00A2-0x00B1  Motherboard resources  OK
0x00B4-0x00BF  Motherboard resources  OK
0x00E0-0x00EF  Motherboard resources  OK
0x0072-0x0073  Motherboard resources  OK
0x0370-0x0371  Motherboard resources  OK
0x04D0-0x04D1  Motherboard resources  OK
0xF0B0-0xF0BF  Motherboard resources  OK
0xF0C0-0xF0CF  Motherboard resources  OK
0xF0D0-0xF0FF  Motherboard resources  OK
0x0080-0x008F  Direct memory access controller      OK
0x00C0-0x00DF  Direct memory access controller      OK
0x0020-0x0021  Programmable interrupt controller    OK
0x00A0-0x00A1  Programmable interrupt controller    OK
0x0070-0x0071  System CMOS/real time clock   OK
0x0040-0x0043  System timer   OK
0x00F0-0x00FE  Numeric data processor OK
0x0061-0x0061  System speaker OK
```

```
0x0060-0x0060  Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
       OK
0x0064-0x0064  Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
       OK
0x03F0-0x03F5  Standard floppy disk controller      OK
0x03F7-0x03F7  Standard floppy disk controller      OK
0x0378-0x037B  Printer Port (LPT1)   OK
0x03F8-0x03FF  Communications Port (COM1)    OK
0x02F8-0x02FF  Communications Port (COM2)    OK
0xFCF0-0xFCFF  Intel(r) 82371AB/EB PCI Bus Master IDE Controller   OK
0x01F0-0x01F7  Primary IDE Channel   OK
0x03F6-0x03F6  Primary IDE Channel   OK
0x0170-0x0177  Secondary IDE Channel  OK
0x0376-0x0376  Secondary IDE Channel  OK
0xFFE0-0xFFFF  Intel 82371AB/EB PCI to USB Universal Host Controller
       OK
0xE000-0xEFFF  DEC 21154 PCI to PCI bridge   OK
0xEC00-0xECFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
#7     OK
0xE800-0xE8FF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
#8     OK
0xD000-0xDFFF  DEC 21154 PCI to PCI bridge   OK
0xDC00-0xDCFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
#5     OK
0xD800-0xD8FF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
#6     OK
0xC000-0xCFFF  DEC 21154 PCI to PCI bridge   OK
0xC800-0xC8FF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
       OK
0xCC00-0xCCFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
#2     OK
0xB000-0xBFFF  DEC 21154 PCI to PCI bridge   OK
0xB800-0xB8FF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
#3     OK
0xBC00-0xBCFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
#4     OK
0xF400-0xF4FF  Adaptec AHA-2940U2/U2W PCI SCSI Controller   OK

[IRQs]

IRQ Number     Device
9       Microsoft ACPI-Compliant System
9       Intel 82371AB/EB PCI to USB Universal Host Controller
9       Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #7
9       Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #8
9       Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #5
9       Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #6
9       Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
9       Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #2
9       Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #3
9       Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter #4
9       Adaptec AHA-2940U2/U2W PCI SCSI Controller
8       System CMOS/real time clock
13      Numeric data processor
1       Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
12      PS/2 Compatible Mouse
6       Standard floppy disk controller
4       Communications Port (COM1)
3       Communications Port (COM2)
14      Primary IDE Channel
15      Secondary IDE Channel

[Memory]

Range   Device  Status
0xA0000-0xBFFFF        PCI bus OK
0xA0000-0xBFFFF        Intel 82443BX Pentium(r) II Processor to AGP
Controller     OK
0xA0000-0xBFFFF        Matrox Graphics MGA-G100 AGP  OK
0xC8000-0xDFFFF        PCI bus OK
0x10000000-0xFFFDFFFF  PCI bus OK
0xFE000000-0xFECFFFFF  Intel 82443BX Pentium(r) II Processor to AGP
Controller     OK
0xFE000000-0xFECFFFFF  Matrox Graphics MGA-G100 AGP  OK
0xF6000000-0xF6FFFFFF  Intel 82443BX Pentium(r) II Processor to AGP
Controller     OK
0xF6000000-0xF6FFFFFF  Matrox Graphics MGA-G100 AGP  OK
0xF8000000-0xFBFFFFFF  Intel 82443BX Pentium(r) II Processor to AGP
Controller     OK
0xFECF8000-0xFECFBFFF  Matrox Graphics MGA-G100 AGP  OK
0xFFC00000-0xFFDFFFFF  DEC 21154 PCI to PCI bridge   OK
0xFFD80000-0xFFDFFFFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter #7     OK
0xFFD00000-0xFFD7FFFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter #8     OK
0xFFA00000-0xFFBFFFFF  DEC 21154 PCI to PCI bridge   OK
0xFFB80000-0xFFBFFFFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter #5     OK
0xFFB00000-0xFFB7FFFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter #6     OK
0xFF800000-0xFF9FFFFF  DEC 21154 PCI to PCI bridge   OK
0xFF900000-0xFF97FFFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter OK
0xFF980000-0xFF9FFFFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter #2     OK
0xFF600000-0xFF7FFFFF  DEC 21154 PCI to PCI bridge   OK
0xFF700000-0xFF77FFFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter #3     OK
0xFF780000-0xFF7FFFFF  Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter #4     OK
0xFEDFF000-0xFEDFFFFF  Adaptec AHA-2940U2/U2W PCI SCSI Controller   OK

[Storage]

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

```
[Drives]

Item	Value
Drive	A:
Description	3 1/2 Inch Floppy Drive

Drive	C:
Description	Local Fixed Disk
Compressed	False
File System	NTFS
Size	4.23 GB (4,540,321,792 bytes)
Free Space	2.30 GB (2,465,079,296 bytes)
Volume Name
Volume Serial Number	2C01718B
Partition	Disk #0, Partition #0
Partition Size	4.23 GB (4,540,322,304 bytes)
Starting Offset	32256 bytes
Drive Description	Disk drive
Drive Manufacturer	(Standard disk drives)
Drive Model	FUJITSU MAB3045SC SCSI Disk Device
Drive BytesPerSector	512
Drive MediaLoaded	True
Drive MediaType	Fixed hard disk media
Drive Partitions	1
Drive SCSIBus	0
Drive SCSILogicalUnit	0
Drive SCSIPort	2
Drive SCSITargetId	1
Drive SectorsPerTrack	63
Drive Size	4548579840 bytes
Drive TotalCylinders	553
Drive TotalSectors	8883945
Drive TotalTracks	141015
Drive TracksPerCylinder	255


[SCSI]

Item	Value
Name	Adaptec AHA-2940U2/U2W PCI SCSI Controller
Caption	Adaptec AHA-2940U2/U2W PCI SCSI Controller
Driver	aic78u2
Status	OK
PNP Device ID
	PCI\VEN_9005&DEV_0010&SUBSYS_A1809005&REV_00\3&61AAA01&0&90
Device ID
	PCI\VEN_9005&DEV_0010&SUBSYS_A1809005&REV_00\3&61AAA01&0&90
Device Map	Not Available
Index	Not Available
Max Number Controlled	Not Available
IRQ Number	9
I/O Port	0xF400-0xF4FF
Driver	c:\winnt\system32\drivers\aic78u2.sys (65168, v3.00a)
```

```
[Network]

[ Following are sub-categories of this main category ]

[Adapter]

Item	Value
Name	[00000000] Intel 8255x-based PCI Ethernet Adapter (10/100)
Adapter Type	Not Available
Product Name	Intel 8255x-based PCI Ethernet Adapter (10/100)
Installed	True
PNP Device ID	Not Available
Last Reset	6/19/2000 5:28:50 PM
Index	0
Service Name	E100B
IP Address	Not Available
IP Subnet	Not Available
Default IP Gateway	Not Available
DHCP Enabled	True
DHCP Server	Not Available
DHCP Lease Expires	Not Available
DHCP Lease Obtained	Not Available
MAC Address	Not Available
Service Name	Not Available

Name	[00000001] RAS Async Adapter
Adapter Type	Not Available
Product Name	RAS Async Adapter
Installed	True
PNP Device ID	Not Available
Last Reset	6/19/2000 5:28:50 PM
Index	1
Service Name	AsyncMac
IP Address	Not Available
IP Subnet	Not Available
Default IP Gateway	Not Available
DHCP Enabled	False
DHCP Server	Not Available
DHCP Lease Expires	Not Available
DHCP Lease Obtained	Not Available
MAC Address	Not Available
Service Name	Not Available

Name	[00000002] WAN Miniport (L2TP)
Adapter Type	Not Available
Product Name	WAN Miniport (L2TP)
Installed	True
PNP Device ID	ROOT\MS_L2TPMINIPORT\0000
Last Reset	6/19/2000 5:28:50 PM
Index	2
Service Name	Rasl2tp
```

```
IP Address     Not Available
IP Subnet      Not Available
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    Not Available
Service Name   Rasl2tp
Driver  c:\winnt\system32\drivers\rasl2tp.sys (50800, 5.00.2179.1)

Name    [00000003] WAN Miniport (PPTP)
Adapter Type   Wide Area Network (WAN)
Product Name   WAN Miniport (PPTP)
Installed      True
PNP Device ID  ROOT\MS_PPTPMINIPORT\0000
Last Reset     6/19/2000 5:28:50 PM
Index   3
Service Name   PptpMiniport
IP Address     Not Available
IP Subnet      Not Available
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    50:50:54:50:30:30
Service Name   PptpMiniport
Driver  c:\winnt\system32\drivers\raspptp.sys (47856, 5.00.2160.1)

Name    [00000004] Direct Parallel
Adapter Type   Not Available
Product Name   Direct Parallel
Installed      True
PNP Device ID  ROOT\MS_PTIMINIPORT\0000
Last Reset     6/19/2000 5:28:50 PM
Index   4
Service Name   Raspti
IP Address     Not Available
IP Subnet      Not Available
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    Not Available
Service Name   Raspti
Driver  c:\winnt\system32\drivers\raspti.sys (16880, 5.00.2146.1)

Name    [00000005] WAN Miniport (IP)
Adapter Type   Not Available
Product Name   WAN Miniport (IP)
Installed      True
```

```
PNP Device ID  ROOT\MS_NDISWANIP\0000
Last Reset     6/19/2000 5:28:50 PM
Index   5
Service Name   NdisWan
IP Address     Not Available
IP Subnet      Not Available
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    Not Available
Service Name   NdisWan
Driver  c:\winnt\system32\drivers\ndiswan.sys (90768, 5.00.2184.1)

Name    [00000006] Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter
Adapter Type   Ethernet 802.3
Product Name   Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
Installed      True
PNP Device ID
       PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&171F2C55&0&2070
Last Reset     6/19/2000 5:28:50 PM
Index   6
Service Name   ADPTSF
IP Address     129.103.181.133
IP Subnet      255.255.255.0
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    00:00:D1:D9:AC:8F
Service Name   ADPTSF
IRQ Number     9
I/O Port       0xC800-0xC8FF
Driver  c:\winnt\system32\drivers\adptsf50.sys (49120, V5.10.06)

Name    [00000007] Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter
Adapter Type   Ethernet 802.3
Product Name   Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
Installed      True
PNP Device ID
       PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&171F2C55&0&2870
Last Reset     6/19/2000 5:28:50 PM
Index   7
Service Name   ADPTSF
IP Address     129.103.170.2
IP Subnet      255.255.255.0
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    00:00:D1:D9:AC:90
Service Name   ADPTSF
IRQ Number     9
I/O Port       0xCC00-0xCCFF
Driver  c:\winnt\system32\drivers\adptsf50.sys (49120, V5.10.06)

Name    [00000008] Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter
Adapter Type   Ethernet 802.3
Product Name   Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
Installed      True
PNP Device ID
        PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&2681C776&0&2080
Last Reset     6/19/2000 5:28:50 PM
Index   8
Service Name   ADPTSF
IP Address     129.103.171.2
IP Subnet      255.255.255.0
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    00:00:D1:D9:AB:D5
Service Name   ADPTSF
IRQ Number     9
I/O Port       0xB800-0xB8FF
Driver  c:\winnt\system32\drivers\adptsf50.sys (49120, V5.10.06)

Name    [00000009] Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter
Adapter Type   Ethernet 802.3
Product Name   Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
Installed      True
PNP Device ID
        PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&2681C776&0&2880
Last Reset     6/19/2000 5:28:50 PM
Index   9
Service Name   ADPTSF
IP Address     129.103.172.2
IP Subnet      255.255.255.0
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    00:00:D1:D9:AB:D6
Service Name   ADPTSF
IRQ Number     9
I/O Port       0xBC00-0xBCFF
Driver  c:\winnt\system32\drivers\adptsf50.sys (49120, V5.10.06)
```

```
Name    [00000010] Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter
Adapter Type   Ethernet 802.3
Product Name   Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
Installed      True
PNP Device ID
        PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&7907E35&0&2060
Last Reset     6/19/2000 5:28:50 PM
Index   10
Service Name   ADPTSF
IP Address     129.103.173.2
IP Subnet      255.255.255.0
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    00:00:D1:DD:52:E1
Service Name   ADPTSF
IRQ Number     9
I/O Port       0xDC00-0xDCFF
Driver  c:\winnt\system32\drivers\adptsf50.sys (49120, V5.10.06)

Name    [00000011] Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter
Adapter Type   Ethernet 802.3
Product Name   Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
Installed      True
PNP Device ID
        PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&7907E35&0&2860
Last Reset     6/19/2000 5:28:50 PM
Index   11
Service Name   ADPTSF
IP Address     129.103.174.2
IP Subnet      255.255.255.0
Default IP Gateway     Not Available
DHCP Enabled   False
DHCP Server    Not Available
DHCP Lease Expires     Not Available
DHCP Lease Obtained    Not Available
MAC Address    00:00:D1:DD:52:E2
Service Name   ADPTSF
IRQ Number     9
I/O Port       0xD800-0xD8FF
Driver  c:\winnt\system32\drivers\adptsf50.sys (49120, V5.10.06)

Name    [00000012] Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter
Adapter Type   Ethernet 802.3
Product Name   Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
Installed      True
```

```
PNP Device ID
        PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&7FE2FEB&0&2050
Last Reset      6/19/2000 5:28:50 PM
Index   12
Service Name    ADPTSF
IP Address      129.103.175.2
IP Subnet       255.255.255.0
Default IP Gateway      Not Available
DHCP Enabled    False
DHCP Server     Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address     00:00:D1:D9:AB:DF
Service Name    ADPTSF
IRQ Number      9
I/O Port        0xEC00-0xECFF
Driver  c:\winnt\system32\drivers\adptsf50.sys (49120, V5.10.06)

Name    [00000013] Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet
Adapter
Adapter Type    Ethernet 802.3
Product Name    Adaptec ANA62022 64-bit 2 port PCI Fast Ethernet Adapter
Installed       True
PNP Device ID
        PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&7FE2FEB&0&2850
Last Reset      6/19/2000 5:28:50 PM
Index   13
Service Name    ADPTSF
IP Address      129.103.176.2
IP Subnet       255.255.255.0
Default IP Gateway      Not Available
DHCP Enabled    False
DHCP Server     Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address     00:00:D1:D9:AB:E0
Service Name    ADPTSF
IRQ Number      9
I/O Port        0xE800-0xE8FF
Driver  c:\winnt\system32\drivers\adptsf50.sys (49120, V5.10.06)

[System Summary]

Item    Value
OS Name Microsoft Windows 2000 Server
Version 5.0.2195  Build 2195
OS Manufacturer         Microsoft Corporation
System Name     HELLBLAU
System Manufacturer     FUJITSU SIEMENS
System Model    Pentium II
System Type     X86-based PC
Processor       x86 Family 6 Model 8 Stepping 1 GenuineIntel ~700 Mhz
BIOS Version    PhoenixBIOS Version 4.06  Rev. 1.10.1107
Windows Directory       C:\WINNT
System Directory        C:\WINNT\System32
Boot Device     \Device\Harddisk0\Partition1
Locale  United States
User Name       HELLBLAU\Administrator
Time Zone       W. Europe Daylight Time
Total Physical Memory 261,668 KB
Available Physical Memory       195,168 KB
Total Virtual Memory  894,812 KB
Available Virtual Memory        773,768 KB
Page File Space         633,144 KB
Page File       C:\pagefile.sys


[Services]

Display Name    Name    State   Start Mode      Service Type    Path    Error
Control Start Name      Tag ID
Alerter Alerter Running Auto    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 Manual  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 Manual  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 Disabled        Own Process
        c:\winnt\system32\faxsvc.exe    Normal  LocalSystem     0
IIS Admin Service       IISADMIN        Running Auto    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   Running Auto    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 Manual  Own Process
        c:\winnt\system32\llssrv.exe  Normal  LocalSystem    0
TCP/IP NetBIOS Helper Service LmHosts Running Auto    Share Process
        c:\winnt\system32\services.exe        Normal  LocalSystem    0
Messenger      Messenger      Running Auto    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    1
Windows Installer     MSIServer      Stopped Manual  Share Process
        c:\winnt\system32\msiexec.exe /v      Normal  LocalSystem    0
Message Queuing       MSMQ    Stopped Disabled        Own Process
        c:\winnt\system32\mqsvc.exe   Normal  LocalSystem    0
Network DDE    NetDDE  Stopped Manual  Share Process
        c:\winnt\system32\netdde.exe  Normal  LocalSystem    0
Network DDE DSDM      NetDDEdsdm     Stopped Manual  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 Manual  Share Process
        c:\winnt\system32\lsass.exe   Normal  LocalSystem    0
Protected Storage     ProtectedStorage       Running Manual  Share Process
        c:\winnt\system32\services.exe        Normal  LocalSystem    0
Remote Access Auto Connection Manager RasAuto Stopped Manual  Share Process
        c:\winnt\system32\svchost.exe -k netsvcs     Normal  LocalSystem
        0
Remote Access Connection Manager      RasMan  Stopped Manual  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 Manual  Own Process
        c:\winnt\system32\regsvc.exe  Normal  LocalSystem    0
Remote Command Service RMSYS   Stopped Disabled        Own Process
        c:\benchcrf\rsys.exe   Normal  LocalSystem    0
```

```
Remote Procedure Call (RPC) Locator   RpcLocator     Stopped Manual  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    Running Manual  Own Process
        c:\winnt\system32\rsvp.exe -s Normal  LocalSystem    0
Security Accounts Manager     SamSs   Running Auto    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 Manual  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    Running Auto    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 Disabled        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
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 Disabled        Own Process
        c:\winnt\system32\termsrv.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 Manual  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   Running Auto    Share Process
        c:\winnt\system32\inetsrv\inetinfo.exe       Normal  LocalSystem
        0
Windows Management Instrumentation    WinMgmt Running Auto    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

Key Name:           SYSTEM\CurrentControlSet\Services\ADPTSF
Class Name:         <NO CLASS>
Last Write Time:    2/25/2000 - 1:49 PM
Value 0
  Name:             DisplayName
  Type:             REG_SZ
  Data:             Adaptec DuraLAN PCI Ethernet/Fast Ethernet driver for
Windows NT

Value 1
  Name:             ErrorControl
  Type:             REG_DWORD
  Data:             0x1

Value 2
  Name:             Group
  Type:             REG_SZ
  Data:             NDIS

Value 3
  Name:             ImagePath
  Type:             REG_EXPAND_SZ
  Data:             System32\DRIVERS\adptsf50.sys

Value 4
  Name:             Start
  Type:             REG_DWORD
  Data:             0x3

Value 5
  Name:             Tag
  Type:             REG_DWORD
  Data:             0xd

Value 6
  Name:             Type
  Type:             REG_DWORD
  Data:             0x1


Key Name:           SYSTEM\CurrentControlSet\Services\ADPTSF\Enum
Class Name:         <NO CLASS>
Last Write Time:    6/19/2000 - 3:28 PM
Value 0
  Name:             0
  Type:             REG_SZ
  Data:
PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&7fe2feb&0&2050
```

```
Value 1
  Name:             1
  Type:             REG_SZ
  Data:
PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&7fe2feb&0&2850

Value 2
  Name:             2
  Type:             REG_SZ
  Data:
PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&7907e35&0&2060

Value 3
  Name:             3
  Type:             REG_SZ
  Data:
PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&7907e35&0&2860

Value 4
  Name:             4
  Type:             REG_SZ
  Data:
PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&171f2c55&0&2070

Value 5
  Name:             5
  Type:             REG_SZ
  Data:
PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&171f2c55&0&2870

Value 6
  Name:             6
  Type:             REG_SZ
  Data:
PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&2681c776&0&2080

Value 7
  Name:             7
  Type:             REG_SZ
  Data:
PCI\VEN_9004&DEV_6915&SUBSYS_00109004&REV_03\4&2681c776&0&2880

Value 8
  Name:             Count
  Type:             REG_DWORD
  Data:             0x8

Value 9
  Name:             NextInstance
  Type:             REG_DWORD
  Data:             0x8
```

```
Key Name:          SYSTEM\CurrentControlSet\Services\ADPTSF\Security
Class Name:        <NO CLASS>
Last Write Time:   2/25/2000 - 1:49 PM
Value 0
  Name:            Security
  Type:            REG_BINARY
  Data:
00000000   01 00 14 80 a0 00 00 00 - ac 00 00 00 14 00 00 00
.... ...¬.......
00000010   30 00 00 00 02 00 1c 00 - 01 00 00 00 02 80 14 00
0...............
00000020   ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
ÿ...............
00000030   02 00 70 00 04 00 00 00 - 00 00 18 00 fd 01 02 00
..p.........ý...
00000040   01 01 00 00 00 00 00 05 - 12 00 00 00 74 00 6c 00
............t.l.
00000050   00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05
....ÿ...........
00000060   20 00 00 00 20 02 00 00 - 00 00 00 00 00 00 18 00   ...
...........
00000070   8d 01 02 00 01 01 00 00 - 00 00 00 05 0b 00 00 00
................
00000080   20 02 00 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
.......ý.......
00000090   00 00 00 05 20 00 00 00 - 23 02 00 00 00 00 00 00  ....
...#.......
000000a0   01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
................
000000b0   00 00 00 05 12 00 00 00 -                          ........


Key Name:          SOFTWARE\Microsoft\MSSQLServer\Client
Class Name:        <NO CLASS>
Last Write Time:   5/19/2000 - 10:07 AM
Value 0
  Name:            SharedMemoryOn
  Type:            REG_DWORD
  Data:            0


Key Name:          SOFTWARE\Microsoft\MSSQLServer\Client\ConnectTo
Class Name:        <NO CLASS>
Last Write Time:   2/25/2000 - 1:49 PM
Value 0
  Name:            DSQUERY
  Type:            REG_SZ
  Data:            DBMSSOCN


Key Name:          SOFTWARE\Microsoft\MSSQLServer\Client\DB-Lib
Class Name:        <NO CLASS>
Last Write Time:   2/25/2000 - 1:49 PM
```

```
Value 0
  Name:            AutoAnsiToOem
  Type:            REG_SZ
  Data:            ON

Value 1
  Name:            UseIntlSettings
  Type:            REG_SZ
  Data:            ON


Key Name:
SOFTWARE\Microsoft\MSSQLServer\Client\SuperSocketNetLib
Class Name:        <NO CLASS>
Last Write Time:   5/19/2000 - 10:07 AM
Value 0
  Name:            Encrypt
  Type:            REG_DWORD
  Data:            0

Value 1
  Name:            ProtocolOrder
  Type:            REG_MULTI_SZ
  Data:            tcp
                   np



Key Name:
SOFTWARE\Microsoft\MSSQLServer\Client\SuperSocketNetLib\LastConnect
Class Name:        <NO CLASS>
Last Write Time:   6/8/2000 - 12:19 PM
Value 0
  Name:            spider
  Type:            REG_SZ
  Data:            -1862270968:tcp:spider,1433


Key Name:
SOFTWARE\Microsoft\MSSQLServer\Client\SuperSocketNetLib\Np
Class Name:        <NO CLASS>
Last Write Time:   5/19/2000 - 10:06 AM
Value 0
  Name:            DefaultPipe
  Type:            REG_SZ
  Data:            sql\query


Key Name:
SOFTWARE\Microsoft\MSSQLServer\Client\SuperSocketNetLib\Tcp
Class Name:        <NO CLASS>
Last Write Time:   5/19/2000 - 10:06 AM
Value 0
```

```
  Name:             DefaultPort
  Type:             REG_DWORD
  Data:             0x599


Key Name:
SOFTWARE\Microsoft\MSSQLServer\Client\SuperSocketNetLib\VIA
Class Name:         <NO CLASS>
Last Write Time:    6/8/2000 - 11:36 AM
Value 0
  Name:             DefaultClientNIC
  Type:             REG_SZ
  Data:             0

Value 1
  Name:             DefaultServerPort
  Type:             REG_SZ
  Data:             0:1433

Value 2
  Name:             RecognizedVendors
  Type:             REG_SZ
  Data:             Giganet, ServerNet II

Value 3
  Name:             Vendor
  Type:             REG_SZ
  Data:



Component Services Configuration:
COM+ Component TPCC.AllTXns Settings:

Transactions not supported
Enable object pooling
Minimum pool size 24
Maximum pool size 24
Creation timeout 60,000
Enable object construction
Enable just in time activation
Concurrency required


Key Name:           SOFTWARE\Microsoft\TPCC
Class Name:         <NO CLASS>
Last Write Time:    6/15/2000 - 7:41 AM
Value 0
  Name:             COM_SinglePool
  Type:             REG_SZ
  Data:             YES

Value 1
  Name:             DB_Protocol
  Type:             REG_SZ
  Data:             DBLIB

Value 2
  Name:             DbName
  Type:             REG_SZ
  Data:             tpcc

Value 3
  Name:             DbPassword
  Type:             REG_SZ
  Data:

Value 4
  Name:             DbServer
  Type:             REG_SZ
  Data:             spider

Value 5
  Name:             DbUser
  Type:             REG_SZ
  Data:             sa

Value 6
  Name:             MaxConnections
  Type:             REG_DWORD
  Data:             0x1b58

Value 7
  Name:             MaxPendingDeliveries
  Type:             REG_DWORD
  Data:             0x3e8

Value 8
  Name:             NumberOfDeliveryThreads
  Type:             REG_DWORD
  Data:             0x3

Value 9
  Name:             Path
  Type:             REG_SZ
  Data:             c:\inetpub\wwwroot\

Value 10
  Name:             TxnMonitor
  Type:             REG_SZ
  Data:             COM


Key Name:           SYSTEM\CurrentControlSet\Services\W3SVC
Class Name:         <NO CLASS>
Last Write Time:    2/25/2000 - 1:49 PM
```

```
Value 0
  Name:            DependOnGroup
  Type:            REG_MULTI_SZ
  Data:

Value 1
  Name:            DependOnService
  Type:            REG_MULTI_SZ
  Data:            IISADMIN


Value 2
  Name:            Description
  Type:            REG_SZ
  Data:            Provides Web connectivity and administration through
the Internet Information Services snap-in.

Value 3
  Name:            DisplayName
  Type:            REG_SZ
  Data:            World Wide Web Publishing Service

Value 4
  Name:            ErrorControl
  Type:            REG_DWORD
  Data:            0x1

Value 5
  Name:            ImagePath
  Type:            REG_EXPAND_SZ
  Data:            C:\WINNT\System32\inetsrv\inetinfo.exe

Value 6
  Name:            ObjectName
  Type:            REG_SZ
  Data:            LocalSystem

Value 7
  Name:            Start
  Type:            REG_DWORD
  Data:            0x2

Value 8
  Name:            Type
  Type:            REG_DWORD
  Data:            0x20


Key Name:          SYSTEM\CurrentControlSet\Services\W3SVC\ASP
Class Name:        <NO CLASS>
Last Write Time:   2/25/2000 - 2:03 PM
Value 0
  Name:            NOTE
```

```
  Type:            REG_SZ
  Data:            This is for backward compatibility only.


Key Name:          SYSTEM\CurrentControlSet\Services\W3SVC\ASP\Parameters
Class Name:        <NO CLASS>
Last Write Time:   2/25/2000 - 2:02 PM

Key Name:          SYSTEM\CurrentControlSet\Services\W3SVC\Enum
Class Name:        <NO CLASS>
Last Write Time:   6/19/2000 - 3:28 PM
Value 0
  Name:            0
  Type:            REG_SZ
  Data:            Root\LEGACY_W3SVC\0000

Value 1
  Name:            Count
  Type:            REG_DWORD
  Data:            0x1

Value 2
  Name:            NextInstance
  Type:            REG_DWORD
  Data:            0x1


Key Name:          SYSTEM\CurrentControlSet\Services\W3SVC\Parameters
Class Name:        <NO CLASS>
Last Write Time:   6/13/2000 - 11:32 AM
Value 0
  Name:            AcceptExOutstanding
  Type:            REG_DWORD
  Data:            0x28

Value 1
  Name:            AccessDeniedMessage
  Type:            REG_SZ
  Data:            Error: Access is Denied.

Value 2
  Name:            CertMapList
  Type:            REG_SZ
  Data:            C:\WINNT\System32\inetsrv\iiscrmap.dll

Value 3
  Name:            Filter DLLs
  Type:            REG_SZ
  Data:

Value 4
  Name:            InstallPath
  Type:            REG_SZ
  Data:            C:\WINNT\System32\inetsrv

Value 5
  Name:            LogFileDirectory
  Type:            REG_SZ
  Data:            C:\WINNT\System32\LogFiles

Value 6
  Name:            MajorVersion
  Type:            REG_DWORD
  Data:            0x5

Value 7
  Name:            MinorVersion
  Type:            REG_DWORD
  Data:            0


Key Name:
SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch
Class Name:        <NO CLASS>
Last Write Time:   2/25/2000 - 1:49 PM

Key Name:
SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch\AdvancedData
Factory
Class Name:        <NO CLASS>
Last Write Time:   2/25/2000 - 1:49 PM

Key Name:
SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch\RDSServer.Da
taFactory
Class Name:        <NO CLASS>
Last Write Time:   2/25/2000 - 1:49 PM

Key Name:
SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Script Map
Class Name:        <NO CLASS>
Last Write Time:   2/25/2000 - 2:19 PM

Key Name:
SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Virtual Roots
Class Name:        <NO CLASS>
Last Write Time:   4/12/2000 - 1:14 PM
Value 0
  Name:            /
  Type:            REG_SZ
  Data:            c:\inetpub\wwwroot,,205

Value 1
  Name:            /IISAdmin
  Type:            REG_SZ
  Data:            C:\WINNT\System32\inetsrv\iisadmin,,201
```

```
Value 2
  Name:            /IISHelp
  Type:            REG_SZ
  Data:            c:\winnt\help\iishelp,,201

Value 3
  Name:            /IISSamples
  Type:            REG_SZ
  Data:            c:\inetpub\iissamples,,201

Value 4
  Name:            /MSADC
  Type:            REG_SZ
  Data:            c:\program files\common files\system\msadc,,205

Value 5
  Name:            /Printers
  Type:            REG_SZ
  Data:            C:\WINNT\web\printers,,201

Value 6
  Name:            /Scripts
  Type:            REG_SZ
  Data:            c:\inetpub\scripts,,204


Key Name:          SYSTEM\CurrentControlSet\Services\W3SVC\Performance
Class Name:        <NO CLASS>
Last Write Time:   6/19/2000 - 3:31 PM
Value 0
  Name:            Close
  Type:            REG_SZ
  Data:            CloseW3PerformanceData

Value 1
  Name:            Collect
  Type:            REG_SZ
  Data:            CollectW3PerformanceData

Value 2
  Name:            FileSize
  Type:            REG_DWORD
  Data:            0x3d10

Value 3
  Name:            FileTime
  Type:            REG_BINARY
  Data:
00000000   a0 f3 09 46 41 3b bf 01 -                           ó   FA;¿.

Value 4
  Name:            First Counter
  Type:             REG_DWORD
  Data:             0xbf4

Value 5
  Name:             First Help
  Type:             REG_DWORD
  Data:             0xbf5

Value 6
  Name:             Last Counter
  Type:             REG_DWORD
  Data:             0xc96

Value 7
  Name:             Last Help
  Type:             REG_DWORD
  Data:             0xc97

Value 8
  Name:             Library
  Type:             REG_SZ
  Data:             w3ctrs.dll

Value 9
  Name:             Library Validation Code
  Type:             REG_BINARY
  Data:
00000000   d0 2e 5c 74 87 7f bf 01 - 10 3d 00 00 00 00 00 00
Ð.\t..¿..=......

Value 10
  Name:             Open
  Type:             REG_SZ
  Data:             OpenW3PerformanceData

Value 11
  Name:             WbemAdapFileSize
  Type:             REG_DWORD
  Data:             0x3d10

Value 12
  Name:             WbemAdapFileTime
  Type:             REG_BINARY
  Data:
00000000   00 60 4e 96 aa 40 bf 01 -                          .`N.ª@¿.

Value 13
  Name:             WbemAdapStatus
  Type:             REG_DWORD
  Data:             0


Key Name:           SYSTEM\CurrentControlSet\Services\W3SVC\Security
```

```
Class Name:         <NO CLASS>
Last Write Time:    2/25/2000 - 1:49 PM
Value 0
  Name:             Security
  Type:             REG_BINARY
  Data:
00000000   01 00 14 80 a0 00 00 00 - ac 00 00 00 14 00 00 00
.... ...¬.......
00000010   30 00 00 00 02 00 1c 00 - 01 00 00 00 02 80 14 00
0...............
00000020   ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
ÿ...............
00000030   02 00 70 00 04 00 00 00 - 00 00 18 00 fd 01 02 00
..p.........ý...
00000040   01 01 00 00 00 00 00 05 - 12 00 00 00 74 00 6f 00
............t.o.
00000050   00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05
....ÿ...........
00000060   20 00 00 00 20 02 00 00 - 72 00 73 00 00 00 18 00   ...
...r.s.....
00000070   8d 01 02 00 01 01 00 00 - 00 00 00 05 0b 00 00 00
................
00000080   20 02 00 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
.......ý.......
00000090   00 00 00 05 20 00 00 00 - 23 02 00 00 72 00 73 00  ....
...#...r.s.
000000a0   01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
................
000000b0   00 00 00 05 12 00 00 00 -                          ........


Key Name:           SYSTEM\CurrentControlSet\Services\Tcpip
Class Name:         Class
Last Write Time:    2/25/2000 - 1:49 PM
Value 0
  Name:             Description
  Type:             REG_SZ
  Data:             TCP/IP Protocol Driver

Value 1
  Name:             DisplayName
  Type:             REG_SZ
  Data:             TCP/IP Protocol Driver

Value 2
  Name:             ErrorControl
  Type:             REG_DWORD
  Data:             0x1

Value 3
  Name:             Group
  Type:             REG_SZ
  Data:             PNP_TDI
```

```
Value 4
  Name:            ImagePath
  Type:            REG_EXPAND_SZ
  Data:            System32\DRIVERS\tcpip.sys

Value 5
  Name:            Start
  Type:            REG_DWORD
  Data:            0x1

Value 6
  Name:            Tag
  Type:            REG_DWORD
  Data:            0x4

Value 7
  Name:            Type
  Type:            REG_DWORD
  Data:            0x1


Key Name:          SYSTEM\CurrentControlSet\Services\Tcpip\Enum
Class Name:        <NO CLASS>
Last Write Time:   6/19/2000 - 3:28 PM
Value 0
  Name:            0
  Type:            REG_SZ
  Data:            Root\LEGACY_TCPIP\0000

Value 1
  Name:            Count
  Type:            REG_DWORD
  Data:            0x1

Value 2
  Name:            NextInstance
  Type:            REG_DWORD
  Data:            0x1


Key Name:          SYSTEM\CurrentControlSet\Services\Tcpip\Linkage
Class Name:        <NO CLASS>
Last Write Time:   5/10/2000 - 9:40 AM
Value 0
  Name:            Bind
  Type:            REG_MULTI_SZ
  Data:            \Device\{24BF2DA1-6F4A-4EF8-82F7-2C8DB7817F52}
                   \Device\{9539A88F-6D41-446C-91D7-3E5A18407CA6}
                   \Device\{83865ADC-A313-40AE-8435-69B3878E6994}
                   \Device\{FAEE3419-626D-4AB7-828D-EE0929036888}
                   \Device\{AD95CD3F-D209-4F78-8AD3-167D84FE9B25}
                   \Device\{AED5412A-08F2-459B-BC77-DD710DC51898}
                   \Device\{22952CD6-289C-4091-AD4A-EE1380D61F22}
                   \Device\{7629D0B4-AE77-42EF-AA30-02FE94958788}
                   \Device\{8C0E0FA5-A0E9-44B8-9574-56CB00B61622}
                   \Device\NdisWanIp


Value 1
  Name:            Export
  Type:            REG_MULTI_SZ
  Data:            \Device\Tcpip_{24BF2DA1-6F4A-4EF8-82F7-2C8DB7817F52}
                   \Device\Tcpip_{9539A88F-6D41-446C-91D7-3E5A18407CA6}
                   \Device\Tcpip_{83865ADC-A313-40AE-8435-69B3878E6994}
                   \Device\Tcpip_{FAEE3419-626D-4AB7-828D-EE0929036888}
                   \Device\Tcpip_{AD95CD3F-D209-4F78-8AD3-167D84FE9B25}
                   \Device\Tcpip_{AED5412A-08F2-459B-BC77-DD710DC51898}
                   \Device\Tcpip_{22952CD6-289C-4091-AD4A-EE1380D61F22}
                   \Device\Tcpip_{7629D0B4-AE77-42EF-AA30-02FE94958788}
                   \Device\Tcpip_{8C0E0FA5-A0E9-44B8-9574-56CB00B61622}
                   \Device\Tcpip_{43107499-2A1C-4CD0-ACA2-0A98B1575075}
                   \Device\Tcpip_{3CBACB77-DB9E-4FBC-AF47-B6534495A056}


Value 2
  Name:            Route
  Type:            REG_MULTI_SZ
  Data:            "{24BF2DA1-6F4A-4EF8-82F7-2C8DB7817F52}"
                   "{9539A88F-6D41-446C-91D7-3E5A18407CA6}"
                   "{83865ADC-A313-40AE-8435-69B3878E6994}"
                   "{FAEE3419-626D-4AB7-828D-EE0929036888}"
                   "{AD95CD3F-D209-4F78-8AD3-167D84FE9B25}"
                   "{AED5412A-08F2-459B-BC77-DD710DC51898}"
                   "{22952CD6-289C-4091-AD4A-EE1380D61F22}"
                   "{7629D0B4-AE77-42EF-AA30-02FE94958788}"
                   "{8C0E0FA5-A0E9-44B8-9574-56CB00B61622}"
                   "NdisWanIp"



Key Name:          SYSTEM\CurrentControlSet\Services\Tcpip\Parameters
Class Name:        Class
Last Write Time:   5/10/2000 - 9:45 AM
Value 0
  Name:            AllowUnqualifiedQuery
  Type:            REG_DWORD
  Data:            0

Value 1
  Name:            DataBasePath
  Type:            REG_EXPAND_SZ
  Data:            %SystemRoot%\System32\drivers\etc

Value 2
  Name:            DeadGWDetectDefault
  Type:             REG_DWORD
  Data:             0x1

Value 3
  Name:             Domain
  Type:             REG_SZ
  Data:

Value 4
  Name:             DontAddDefaultGatewayDefault
  Type:             REG_DWORD
  Data:             0

Value 5
  Name:             EnableICMPRedirect
  Type:             REG_DWORD
  Data:             0x1

Value 6
  Name:             EnableSecurityFilters
  Type:             REG_DWORD
  Data:             0

Value 7
  Name:             ForwardBroadcasts
  Type:             REG_DWORD
  Data:             0

Value 8
  Name:             Hostname
  Type:             REG_SZ
  Data:             HELLBLAU

Value 9
  Name:             IPEnableRouter
  Type:             REG_DWORD
  Data:             0

Value 10
  Name:             MaxUserPort
  Type:             REG_DWORD
  Data:             0xfffe

Value 11
  Name:             NameServer
  Type:             REG_SZ
  Data:

Value 12
  Name:             NV Hostname
  Type:             REG_SZ
  Data:             HELLBLAU
```

```
Value 13
  Name:             PrioritizeRecordData
  Type:             REG_DWORD
  Data:             0x1

Value 14
  Name:             SearchList
  Type:             REG_SZ
  Data:

Value 15
  Name:             UseDomainNameDevolution
  Type:             REG_DWORD
  Data:             0


Key Name:           SYSTEM\CurrentControlSet\Services\InetInfo
Class Name:         <NO CLASS>
Last Write Time:    2/25/2000 - 1:49 PM

Key Name:           SYSTEM\CurrentControlSet\Services\InetInfo\Parameters
Class Name:         <NO CLASS>
Last Write Time:    6/13/2000 - 11:32 AM
Value 0
  Name:             DispatchEntries
  Type:             REG_MULTI_SZ
  Data:             LDAPSVC
                    SMTPSVC


Value 1
  Name:             ListenBackLog
  Type:             REG_DWORD
  Data:             0x19

Value 2
  Name:             PoolThreadLimit
  Type:             REG_DWORD
  Data:             0x80

Value 3
  Name:             ThreadTimeout
  Type:             REG_DWORD
  Data:             0x15180


Key Name:           SYSTEM\CurrentControlSet\Services\InetInfo\Performance
Class Name:         <NO CLASS>
Last Write Time:    6/19/2000 - 3:30 PM
Value 0
  Name:             Close
  Type:             REG_SZ
  Data:             CloseINFOPerformanceData
```

```
Value 1
  Name:            Collect
  Type:            REG_SZ
  Data:            CollectINFOPerformanceData

Value 2
  Name:            FileSize
  Type:            REG_DWORD
  Data:            0x2510

Value 3
  Name:            FileTime
  Type:            REG_BINARY
  Data:
00000000   10 a5 ad 42 41 3b bf 01 -                          .¥-BA;¿.

Value 4
  Name:            First Counter
  Type:            REG_DWORD
  Data:            0xbb2

Value 5
  Name:            First Help
  Type:            REG_DWORD
  Data:            0xbb3

Value 6
  Name:            Last Counter
  Type:            REG_DWORD
  Data:            0xbf2

Value 7
  Name:            Last Help
  Type:            REG_DWORD
  Data:            0xbf3

Value 8
  Name:            Library
  Type:            REG_SZ
  Data:            infoctrs.dll

Value 9
  Name:            Library Validation Code
  Type:            REG_BINARY
  Data:
00000000   50 ee 8a 71 87 7f bf 01 - 10 25 00 00 00 00 00 00
Pî.q..¿..%......

Value 10
  Name:            Open
  Type:            REG_SZ
  Data:            OpenINFOPerformanceData
```

```
Value 11
  Name:            WbemAdapFileSize
  Type:            REG_DWORD
  Data:            0x2510

Value 12
  Name:            WbemAdapFileTime
  Type:            REG_BINARY
  Data:
00000000   00 60 4e 96 aa 40 bf 01 -                          .`N.ª@¿.

Value 13
  Name:            WbemAdapStatus
  Type:            REG_DWORD
  Data:            0
```

This section discloses the RTE parameters used on the Primergy 870-40 system.

```
Profile:       HTML_32x1620_810_fast
File Path:     D:\benchcrf\Spider\HTML_32x1620_810_fast.pro
Version:       1.0.1

       Number of Engines: 32

               Name: DRIVER01
               Description: Gelb0
               Directory: d:\log_gelb0.log
               Machine: oliv
               Parameter Set: All_Times
               Index: 0
               Seed: 39578
               Configured Users: 1620
               Pipe Name: DRIVER1237993953
               Connect Rate: 170
               Start Rate: 170
               CLIENT_NURAND: 233
               CPU: 0

               Name: DRIVER02
               Description: Gelb1
               Directory: d:\log_gelb1.log
               Machine: oliv
               Parameter Set: All_Times
               Index: 50000000
               Seed: 39578
```

```
Configured Users: 1620
Pipe Name: DRIVER2238057937
Connect Rate: 160
Start Rate: 160
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER03
Description: Gelb2
Directory: d:\log_gelb2.log
Machine: oliv
Parameter Set: All_Times
Index: 100000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER3238254921
Connect Rate: 150
Start Rate: 150
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER04
Description: Gelb3
Directory: d:\log_gelb3.log
Machine: oliv
Parameter Set: All_Times
Index: 150000000
Seed: 39578
Configured Users: 810
Pipe Name: DRIVER4238280718
Connect Rate: 70
Start Rate: 70
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER08
Description: Gruen0
Directory: c:\log_gruen0.log
Machine: tuerkis
Parameter Set: All_Times
Index: 200000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER8239451921
Connect Rate: 170
Start Rate: 170
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER09
Description: Gruen1
Directory: c:\log_gruen1.log
Machine: tuerkis
Parameter Set: All_Times
Index: 250000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER9239491625
Connect Rate: 160
Start Rate: 160
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER10
Description: Gruen2
Directory: c:\log_gruen2.log
Machine: tuerkis
Parameter Set: All_Times
Index: 300000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER10239525000
Connect Rate: 150
Start Rate: 150
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER11
Description: Gruen3
Directory: c:\log_gruen3.log
Machine: tuerkis
Parameter Set: All_Times
Index: 350000000
Seed: 39578
Configured Users: 810
Pipe Name: DRIVER11239552546
Connect Rate: 70
Start Rate: 70
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER15
Description: Weiss0
Directory: d:\log_weiss0.log
Machine: rosa
Parameter Set: All_Times
Index: 400000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER15239943046
Connect Rate: 170
Start Rate: 170
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER16
```

```
Description: Weiss1
Directory: d:\log_weiss1.log
Machine: rosa
Parameter Set: All_Times
Index: 450000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER16239970640
Connect Rate: 160
Start Rate: 160
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER17
Description: Weiss2
Directory: d:\log_weiss2.log
Machine: rosa
Parameter Set: All_Times
Index: 500000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER17239998515
Connect Rate: 150
Start Rate: 150
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER18
Description: Weiss3
Directory: d:\log_weiss3.log
Machine: rosa
Parameter Set: All_Times
Index: 550000000
Seed: 39578
Configured Users: 810
Pipe Name: DRIVER18240035296
Connect Rate: 70
Start Rate: 70
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER22
Description: Braun0
Directory: d:\log_braun0.log
Machine: blau
Parameter Set: All_Times
Index: 600000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER22240457328
Connect Rate: 170
Start Rate: 170
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER23
Description: Braun1
Directory: d:\log_braun1.log
Machine: blau
Parameter Set: All_Times
Index: 650000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER23240489875
Connect Rate: 160
Start Rate: 160
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER24
Description: Braun2
Directory: d:\log_braun2.log
Machine: blau
Parameter Set: All_Times
Index: 700000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER24240557281
Connect Rate: 150
Start Rate: 150
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER25
Description: Braun3
Directory: d:\log_braun3.log
Machine: blau
Parameter Set: All_Times
Index: 750000000
Seed: 39578
Configured Users: 810
Pipe Name: DRIVER25240609234
Connect Rate: 70
Start Rate: 70
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER29
Description: Grau0
Directory: d:\log_grau0.log
Machine: schwarz
Parameter Set: All_Times
Index: 800000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER29241052125
```

```
Connect Rate: 170
Start Rate: 170
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER30
Description: Grau1
Directory: d:\log_grau1.log
Machine: schwarz
Parameter Set: All_Times
Index: 850000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER30241091984
Connect Rate: 160
Start Rate: 160
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER31
Description: Grau2
Directory: d:\log_grau2.log
Machine: schwarz
Parameter Set: All_Times
Index: 900000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER31241125500
Connect Rate: 150
Start Rate: 150
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER32
Description: Grau3
Directory: d:\log_grau3.log
Machine: schwarz
Parameter Set: All_Times
Index: 950000000
Seed: 39578
Configured Users: 810
Pipe Name: DRIVER32241158296
Connect Rate: 70
Start Rate: 70
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER36
Description: Weinrot0
Directory: c:\log_weinrot0.log
Machine: raccon
Parameter Set: All_Times
Index: 1000000000
```

```
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER3632791734
Connect Rate: 170
Start Rate: 170
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER37
Description: Weinrot1
Directory: c:\log_weinrot1.log
Machine: raccon
Parameter Set: All_Times
Index: 1050000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER3733118687
Connect Rate: 160
Start Rate: 160
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER38
Description: Weinrot2
Directory: c:\log_weinrot2.log
Machine: raccon
Parameter Set: All_Times
Index: 1100000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER3833156671
Connect Rate: 150
Start Rate: 150
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER39
Description: Weinrot3
Directory: c:\log_weinrot3.log
Machine: raccon
Parameter Set: All_Times
Index: 1150000000
Seed: 39578
Configured Users: 810
Pipe Name: DRIVER3933195937
Connect Rate: 70
Start Rate: 70
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER43
Description: Rot0
Directory: c:\log_rot0.log
```

```
Machine: raccon
Parameter Set: All_Times
Index: 1200000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER4333451828
Connect Rate: 170
Start Rate: 170
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER44
Description: Rot1
Directory: c:\log_rot1.log
Machine: raccon
Parameter Set: All_Times
Index: 1250000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER4433532421
Connect Rate: 160
Start Rate: 160
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER45
Description: Rot2
Directory: c:\log_rot2.log
Machine: raccon
Parameter Set: All_Times
Index: 1300000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER4533559046
Connect Rate: 150
Start Rate: 150
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER46
Description: Rot3
Directory: c:\log_log3.log
Machine: raccon
Parameter Set: All_Times
Index: 1350000000
Seed: 39578
Configured Users: 810
Pipe Name: DRIVER4633591437
Connect Rate: 70
Start Rate: 70
CLIENT_NURAND: 233
CPU: 2
```

```
Name: DRIVER50
Description: Hellblau0
Directory: c:\log_hellblau0.log
Machine: P870
Parameter Set: All_Times
Index: 1400000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER5035901359
Connect Rate: 170
Start Rate: 170
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER51
Description: Hellblau1
Directory: c:\log_hellblau1.log
Machine: P870
Parameter Set: All_Times
Index: 1450000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER5135970250
Connect Rate: 160
Start Rate: 160
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER52
Description: Hellblau2
Directory: c:\log_hellblau2.log
Machine: P870
Parameter Set: All_Times
Index: 1500000000
Seed: 39578
Configured Users: 1620
Pipe Name: DRIVER5236011546
Connect Rate: 150
Start Rate: 150
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER53
Description: Hellblau3
Directory: c:\log_hellblau3.log
Machine: P870
Parameter Set: All_Times
Index: 1550000000
Seed: 39578
Configured Users: 810
Pipe Name: DRIVER5336051578
Connect Rate: 70
Start Rate: 70
```

```
            CLIENT_NURAND: 233
            CPU: 3

    Number of User groups: 56

            Driver Engine: DRIVER01
            IIS Server: gelb0
            SQL Server: spider
            User: sa
            Protocol: Html
            w_id Range: 1 - 81
            w_id Max Warehouse: 4536
            Scale: Normal
            User Count: 810
            District id: 1
            Scale Down: No

            Driver Engine: DRIVER01
            IIS Server: gelb1
            SQL Server: spider
            User: sa
            Protocol: Html
            w_id Range: 82 - 162
            w_id Max Warehouse: 4536
            Scale: Normal
            User Count: 810
            District id: 1
            Scale Down: No

            Driver Engine: DRIVER02
            IIS Server: gelb2
            SQL Server: spider
            User: sa
            Protocol: Html
            w_id Range: 163 - 243
            w_id Max Warehouse: 4536
            Scale: Normal
            User Count: 810
            District id: 1
            Scale Down: No

            Driver Engine: DRIVER02
            IIS Server: gelb3
            SQL Server: spider
            User: sa
            Protocol: Html
            w_id Range: 244 - 324
            w_id Max Warehouse: 4536
            Scale: Normal
            User Count: 810
            District id: 1
            Scale Down: No

            Driver Engine: DRIVER03
            IIS Server: gelb4
            SQL Server: spider
            User: sa
            Protocol: Html
            w_id Range: 325 - 405
            w_id Max Warehouse: 4536
            Scale: Normal
            User Count: 810
            District id: 1
            Scale Down: No

            Driver Engine: DRIVER03
            IIS Server: gelb5
            SQL Server: spider
            User: sa
            Protocol: Html
            w_id Range: 406 - 486
            w_id Max Warehouse: 4536
            Scale: Normal
            User Count: 810
            District id: 1
            Scale Down: No

            Driver Engine: DRIVER04
            IIS Server: gelb6
            SQL Server: spider
            User: sa
            Protocol: Html
            w_id Range: 487 - 567
            w_id Max Warehouse: 4536
            Scale: Normal
            User Count: 810
            District id: 1
            Scale Down: No

            Driver Engine: DRIVER08
            IIS Server: gruen0
            SQL Server: spider
            User: sa
            Protocol: Html
            w_id Range: 568 - 648
            w_id Max Warehouse: 4536
            Scale: Normal
            User Count: 810
            District id: 1
            Scale Down: No

            Driver Engine: DRIVER08
            IIS Server: gruen1
            SQL Server: spider
            User: sa
            Protocol: Html
```

```
w_id Range: 649 - 729
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER09
IIS Server: gruen2
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 730 - 810
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER09
IIS Server: gruen3
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 811 - 891
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER10
IIS Server: gruen4
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 892 - 972
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER10
IIS Server: gruen5
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 973 - 1053
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER11
IIS Server: gruen6
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1054 - 1134
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER15
IIS Server: weiss0
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1135 - 1215
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER15
IIS Server: weiss1
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1216 - 1296
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER16
IIS Server: weiss3
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1297 - 1377
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER16
IIS Server: weiss2
SQL Server: spider
```

```
User: sa
Protocol: Html
w_id Range: 1378 - 1458
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER17
IIS Server: weiss4
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1459 - 1539
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER17
IIS Server: weiss5
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1540 - 1620
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER18
IIS Server: weiss6
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1621 - 1701
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER22
IIS Server: braun0
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1702 - 1782
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER22
IIS Server: braun1
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1783 - 1863
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER23
IIS Server: braun2
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1864 - 1944
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER23
IIS Server: braun3
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 1945 - 2025
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER24
IIS Server: braun4
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2026 - 2106
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER24
```

```
IIS Server: braun5
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2107 - 2187
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER25
IIS Server: braun6
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2188 - 2268
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER29
IIS Server: grau0
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2269 - 2349
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER29
IIS Server: grau1
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2350 - 2430
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER30
IIS Server: grau2
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2431 - 2511
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER30
IIS Server: grau3
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2512 - 2592
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER31
IIS Server: grau4
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2593 - 2673
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER31
IIS Server: grau5
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2674 - 2754
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER32
IIS Server: grau6
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2755 - 2835
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No
```

```
Driver Engine: DRIVER36
IIS Server: weinrot0
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2836 - 2916
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER36
IIS Server: weinrot1
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2917 - 2997
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER37
IIS Server: weinrot2
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 2998 - 3078
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER37
IIS Server: weinrot3
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3079 - 3159
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER38
IIS Server: weinrot4
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3160 - 3240
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER38
IIS Server: weinrot5
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3241 - 3321
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER39
IIS Server: weinrot6
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3322 - 3402
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER43
IIS Server: rot0
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3403 - 3483
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER43
IIS Server: rot1
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3484 - 3564
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
```

```
District id: 1
Scale Down: No

Driver Engine: DRIVER44
IIS Server: rot2
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3565 - 3645
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER44
IIS Server: rot3
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3646 - 3726
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER45
IIS Server: rot4
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3727 - 3807
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER45
IIS Server: rot5
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3808 - 3888
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER46
IIS Server: rot6
```

```
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3889 - 3969
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER50
IIS Server: hellblau0
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 3970 - 4050
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER50
IIS Server: hellblau1
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 4051 - 4131
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER51
IIS Server: hellblau2
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 4132 - 4212
w_id Max Warehouse: 4536
Scale: Normal
User Count: 810
District id: 1
Scale Down: No

Driver Engine: DRIVER51
IIS Server: hellblau3
SQL Server: spider
User: sa
Protocol: Html
w_id Range: 4213 - 4293
w_id Max Warehouse: 4536
```

```
               Scale: Normal
               User Count: 810
               District id: 1
               Scale Down: No

               Driver Engine: DRIVER52
               IIS Server: hellblau4
               SQL Server: spider
               User: sa
               Protocol: Html
               w_id Range: 4294 - 4374
               w_id Max Warehouse: 4536
               Scale: Normal
               User Count: 810
               District id: 1
               Scale Down: No

               Driver Engine: DRIVER52
               IIS Server: hellblau5
               SQL Server: spider
               User: sa
               Protocol: Html
               w_id Range: 4375 - 4455
               w_id Max Warehouse: 4536
               Scale: Normal
               User Count: 810
               District id: 1
               Scale Down: No

               Driver Engine: DRIVER53
               IIS Server: hellblau6
               SQL Server: spider
               User: sa
               Protocol: Html
               w_id Range: 4456 - 4536
               w_id Max Warehouse: 4536
               Scale: Normal
               User Count: 810
               District id: 1
               Scale Down: No

       Number of Parameter Sets: 2


               ~Default
               Default Parameter Set
                               Txn     Think   Key     RT      RT
Menu
                               Weight  Time    Time    Delay   Fence
Delay
               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

               All_Times
               HTML Param. Set
                               Txn     Think   Key     RT      RT
Menu
                               Weight  Time    Time    Delay   Fence
Delay
               New Order         44.79         12.05   18.01   0.10
5.00      0.10
               Payment           43.06         12.05    3.01   0.10
5.00      0.10
               Delivery           4.05          5.05    2.01   0.10
5.00      0.10
               Stock Level        4.05          5.05    2.01   0.10
20.00     0.10
               Order Status       4.05         10.05    2.01   0.10
5.00      0.10
```

This section discloses the Microsoft SQL Server 2000 Enterprise Edition parameters used on the Primergy N800 server system.

```
Microsoft SQL Server Startup Parameters:

sqlservr -c -x -T3502 -g100

where:
-c Start SQL Server independently of the Windows NT Service Control Manager
-x Disables the keeping of CPU time and cache-hit ratio statistics
-T3502 Prints a message to the SQL Server log at start and end of each checkpoint
-g100 memory in MB reserved for memory requests outside the buffer pool

Microsoft SQL Server Stack Size:

The default stack size for Microsoft SQL Server 2000 was changed using the EDITBIN utility:
editbin /STACK:131072

Microsoft SQL Server 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 21 2000  9:34:48:657AM

(1 row affected)

1> 2> 3>
select @@version
 ------------------------------------------------------------------------------
 Microsoft SQL Server  2000 - 8.00.145 (Intel X86)
        Jun  3 2000 15:03:12
        Cop
        yright (c) 1988-2000 Microsoft Corporation
        Enterprise Edition on Windo
        ws NT 5.0 (Build 2195: Service Pack 1, RC 1.59)


(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 21 2000  9:34:49:483AM

(1 row affected)

1> 2> 3> DBCC execution completed. If DBCC printed error messages, contact your system administrator.
```

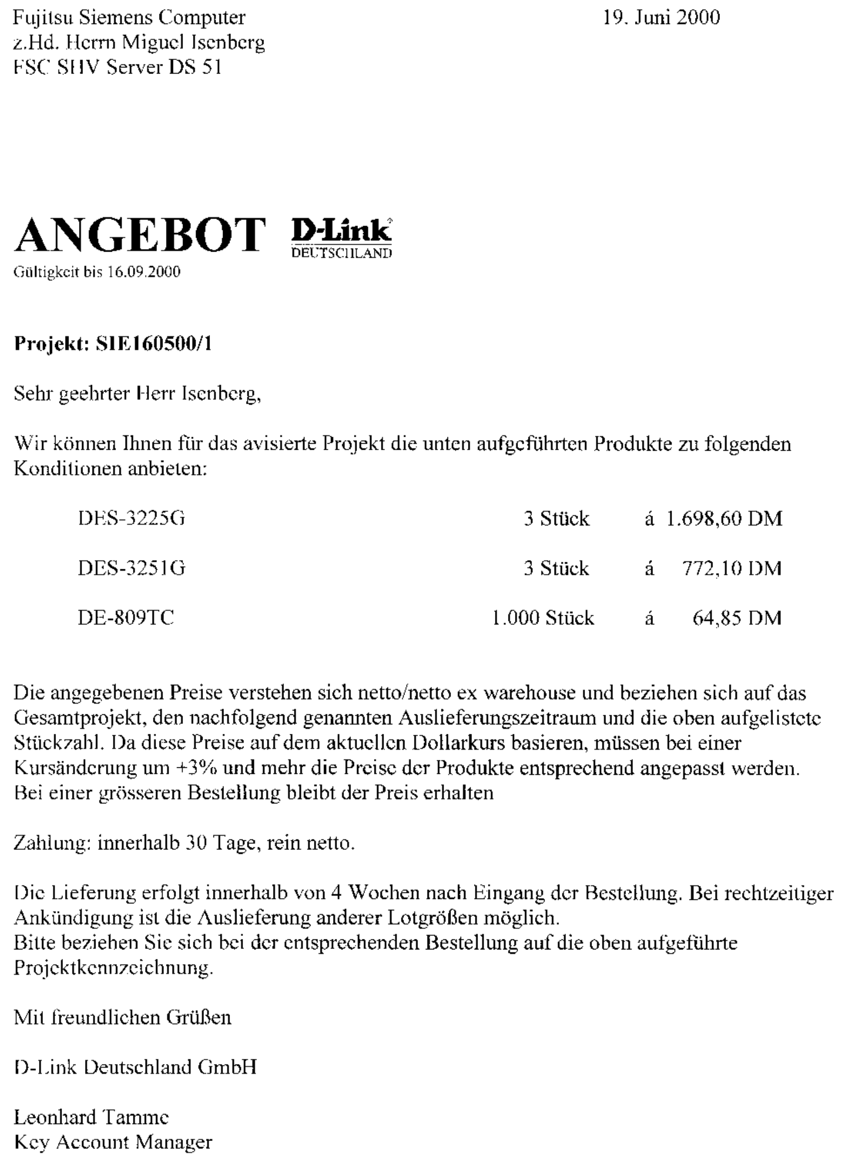
```
Configuration option 'show advanced options' changed from 1 to 1. Run the RECONFIGURE statement to
install.

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          255         255
 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            0           0
 lightweight pooling                              0           1            1           1
 locks                                         5000  2147483647        12000       12000
 max degree of parallelism                        0          32            1           1
 max server memory (MB)                           4  2147483647        31040       31040
 max text repl size (B)                           0  2147483647        65536       65536
 max worker threads                              32       32767          188         188
 media retention                                  0         365            0           0
 min memory per query (KB)                      512  2147483647         1024        1024
 min server memory (MB)                           0  2147483647        31040       31040
 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           56          56
 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       32767            0           0
```

Appendix D – Space Calculation

				Microsoft SQL Server		
Note : Numbers are in KBytes unless otherwise specified				Updated for Version 7 (FR)		
Warehouses	4536	**tpmC**	56388	**tpmC/W**	12,43	
Table	**Rows**	**Data**	**Index**	**5% Space**	**8H Space**	**Total Space**
Warehouse	4.592	496	48	27		571
District	45.920	5.104	56	258		5.418
Item	100.000	9.528	72	480		10.080
New-order	41.328.000	653.408	1.552		367.360	1.022.320
History	137.760.000	7.653.344	144		1.503.710	9.157.198
Orders	137.760.000	4.222.536	1.920.184		1.206.884	7.349.604
Customer	137.760.000	100.189.096	5.974.280	5.308.169		111.471.545
Order-line	1.377.603.634	86.100.232	182.280		16.952.259	103.234.771
Stock	459.200.000	146.944.000	274.688	7.360.934		154.579.622
Totals		345.777.744	8.353.304	12.669.868	20.030.213	386.831.130
Segment	**LogDev Cnt.**	**Seg. Size**	**Needed**	**Overhead**		**Not Needed**
misc	6	147.456.000	121.987.762	1.219.878		24.248.360
customer/stock	6	267.264.000	268.711.679	2.687.117		-4.134.796
Totals		414.720.000	390.699.441	3.906.994		20.113.565
Dynamic space	97.976.112	Sum of Data for Order, Order-Line and History				
Static space	272.731.799	Data + Index + 5% Space + Overhead - Dynamic space				
Free space	23.898.524	Total Seg. Size - Dynamic Space - Static Space - Not Needed				
Daily growth	19.249.746	(Dynamic space/W * 62.5)* tpmC				
Daily spread	-4.976.094	Free space - 1.5 * Daily growth (zero if negative)				
180 day (KB)	3.737.686.017	Static space + 180 (daily growth + daily spread)				
180 day (GB)	3564,54	180-day space in GB (excludes OS, Paging and RDBMS Logs)				
Log size (MB)	80.000	Total size of log file				
% Log used	21,8523	% of log file used during entire run				
Total N-O Txn	3591291	Total count of N-O transactions during entire run				
Log per N-O txn	4,9847	KB of log per New-Order transaction				
8 Hour Log (GB)	128,67	8 hours of log in GB (excluding space for redundancy)				
Disk Capacity	**MB**	**GB**	**disks needed**	**disks priced**	**GB priced**	
9 GB 10000 rpm	8392	8,20		144	1.180,13	
18 GB 10000 rpm	17160	16,76		144	2.413,13	
180 day (GB)		3.564,54		384	3.593,25	
Disk Capacity	**MB**	**GB**	**disks needed**	**disks priced**		
36 GB 10000 rpm	34712	33,90				
8 Hour Log (RAID 1)		128,67	3,80	4+4		

Appendix E - Price Quotations



Fujitsu Siemens Computer
z.Hd. Herrn Miguel Isenberg
FSC SHV Server DS 51

19. Juni 2000

ANGEBOT D-Link DEUTSCHLAND
Gültigkeit bis 16.09.2000

Projekt: SIE160500/1

Sehr geehrter Herr Isenberg,

Wir können Ihnen für das avisierte Projekt die unten aufgeführten Produkte zu folgenden Konditionen anbieten:

DES-3225G	3 Stück	á	1.698,60 DM
DES-3251G	3 Stück	á	772,10 DM
DE-809TC	1.000 Stück	á	64,85 DM

Die angegebenen Preise verstehen sich netto/netto ex warehouse und beziehen sich auf das Gesamtprojekt, den nachfolgend genannten Auslieferungszeitraum und die oben aufgelistete Stückzahl. Da diese Preise auf dem aktuellen Dollarkurs basieren, müssen bei einer Kursänderung um +3% und mehr die Preise der Produkte entsprechend angepasst werden. Bei einer grösseren Bestellung bleibt der Preis erhalten

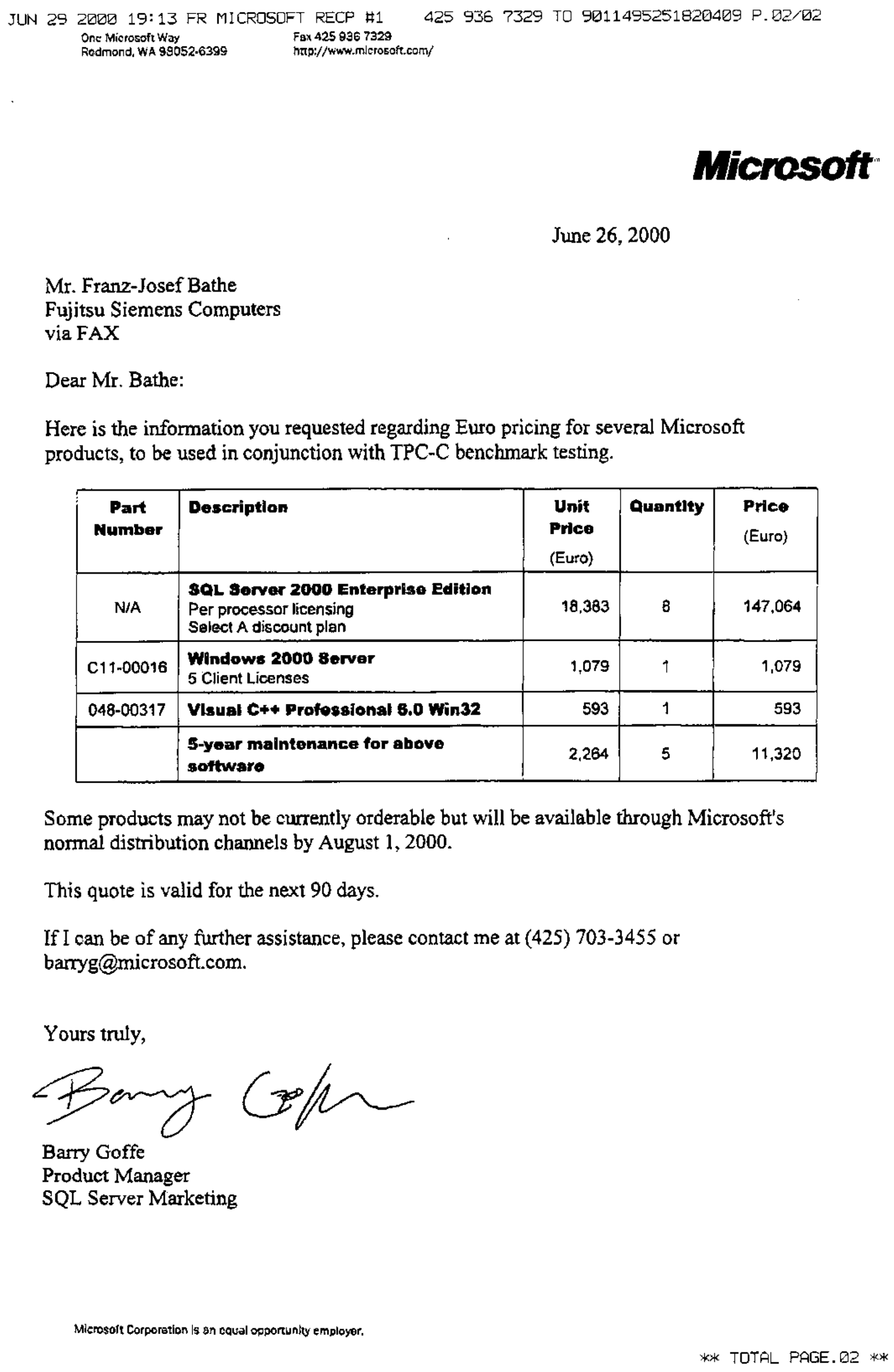
Zahlung: innerhalb 30 Tage, rein netto.

Die Lieferung erfolgt innerhalb von 4 Wochen nach Eingang der Bestellung. Bei rechtzeitiger Ankündigung ist die Auslieferung anderer Lotgrößen möglich.
Bitte beziehen Sie sich bei der entsprechenden Bestellung auf die oben aufgeführte Projektkennzeichnung.

Mit freundlichen Grüßen

D-Link Deutschland GmbH

Leonhard Tamme
Key Account Manager



JUN 29 2000 19:13 FR MICROSOFT RECP #1 425 936 7329 TO 9011495251820409 P.02/02

One Microsoft Way
Redmond, WA 98052-6399

Fax 425 936 7329
http://www.microsoft.com/

Microsoft

June 26, 2000

Mr. Franz-Josef Bathe
Fujitsu Siemens Computers
via FAX

Dear Mr. Bathe:

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

Part Number	**Description**	**Unit Price** (Euro)	**Quantity**	**Price** (Euro)
N/A	**SQL Server 2000 Enterprise Edition** Per processor licensing Select A discount plan	18,383	8	147,064
C11-00016	**Windows 2000 Server** 5 Client Licenses	1,079	1	1,079
048-00317	**Visual C++ Professional 6.0 Win32**	593	1	593
	5-year maintenance for above software	2,264	5	11,320

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.

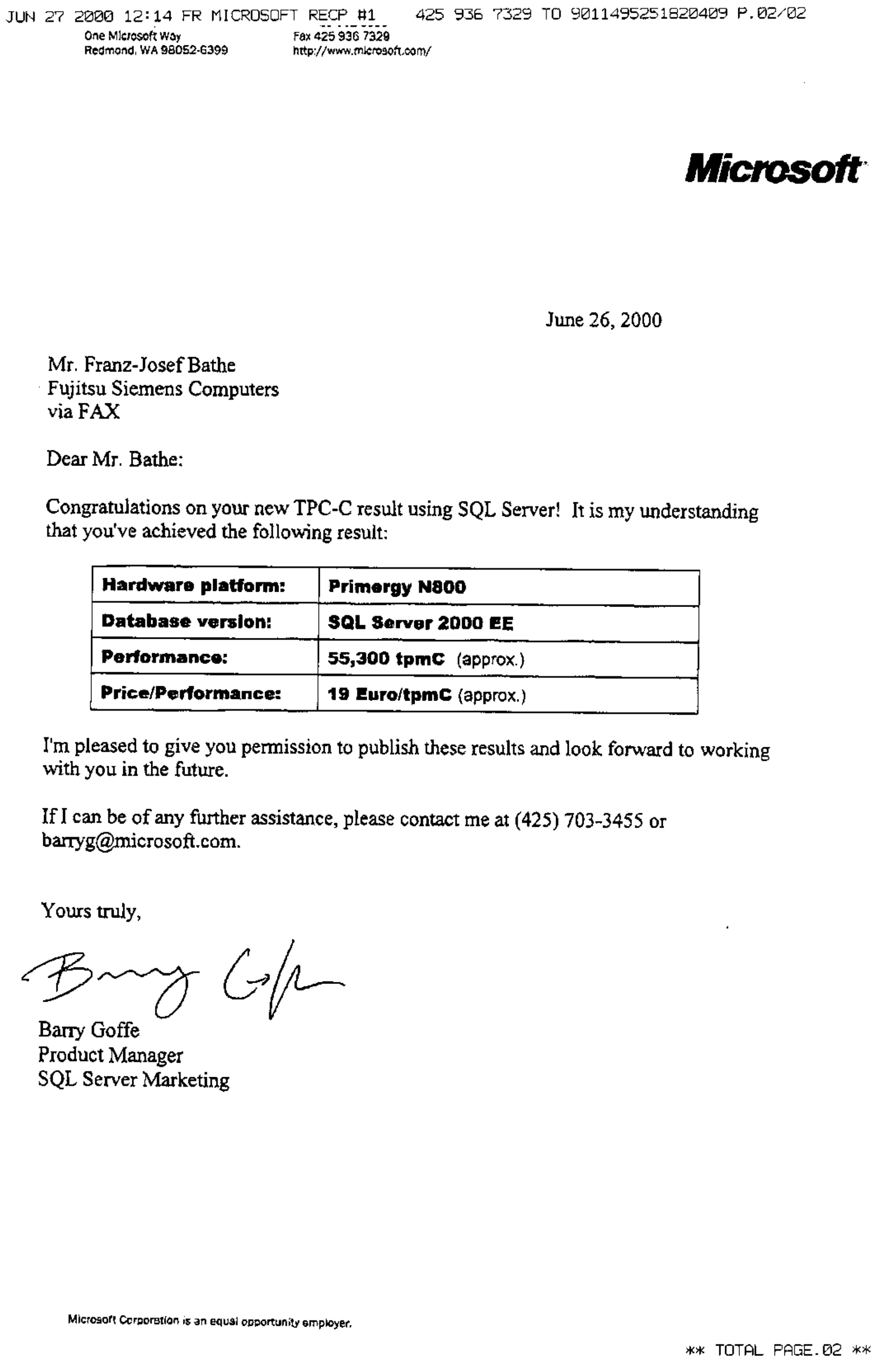
If I can be of any further assistance, please contact me at (425) 703-3455 or barryg@microsoft.com.

Yours truly,

Barry Goffe
Product Manager
SQL Server Marketing

Microsoft Corporation is an equal opportunity employer.

** TOTAL PAGE.02 **



JUN 27 2000 12:14 FR MICROSOFT RECP #1 425 936 7329 TO 9011495251820409 P.02/02

One Microsoft Way
Redmond, WA 98052-6399

Fax 425 936 7329
http://www.microsoft.com/

Microsoft

June 26, 2000

Mr. Franz-Josef Bathe
Fujitsu Siemens Computers
via FAX

Dear Mr. Bathe:

Congratulations on your new TPC-C result using SQL Server! It is my understanding that you've achieved the following result:

Hardware platform:	**Primergy N800**
Database version:	**SQL Server 2000 EE**
Performance:	**55,300 tpmC** (approx.)
Price/Performance:	**19 Euro/tpmC** (approx.)

I'm pleased to give you permission to publish these results and look forward to working with you in the future.

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.

** TOTAL PAGE.02 **

Appendix F - Attestation Letter

Benchmark Sponsor: Franz-Josef Bathe
Fujitsu Siemens Computers
Heinz-Nixdorf-Ring 1
D-33106 Paderborn, Germany

July 4, 2000

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

Platform: **Siemens Primergy N800**
Operating system: **Microsoft Windows 2000 Datacenter Server**
Database Manager: **Microsoft SQL Server 8.0 Enterprise Edition**
Transaction Manager: **Microsoft COM+ (Included in Windows 2000)**

The results were:

CPU's Speed	Memory	Disks	NewOrder 90% Response Time	**tpmC**
Server: Siemens Primergy N800				
8 x Pentium III Xeon (700 MHz)	32 GB Main (2MB L2 Cache per processor)	144 x 9 GB 144 x 18 GB 8 x 36 GB	0.96 Seconds	**56388.50**
Eight (8) Clients: Primergy 170 (Specification for each)				
1 x Pentium III (700 MHz)	256 MB Main Cache: 512 KB	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
- 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:

The measured system included 48 9.1GB Fujitsu Enterprise 10K hard disk drives (MAG3091) that were substituted by 48 18GB Fujitsu Enterprise 10K hard disk drives (MAG3182) in the priced configuration. Based on the specifications of these disks and on additional performance data collected on these disks, it is our opinion that this substitution does not have a material effect on the reported performance.

Respectfully Yours,

François Raab, President

Bradley J. Askins, Auditor