

COMPAQ

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The Compaq, SCO, and Oracle7 Database Server

Compaq TechNote

Includes information on:

- Hardware installation and configuration
- SCO UNIX and Oracle7 installation
- Database backup and restoration

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The Compaq, SCO, and Oracle7 Database Server

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Chapter 1

Overview

This TechNote details the implementation of Oracle⁷ Server software on a Compaq Systempro/XL server with SCO UNIX. The configuration presented is the result of collaboration among Compaq Integration Engineers, SCO Software Engineers, and Oracle Support Personnel.

The following table describes the hardware components for the server:

Base System Includes	Components to Add	Configuration Totals
486/50 System Processor Board	Second 486/50 System Processor Board	2 486/50 system processors
16 Megabytes of Advanced Error Correcting Code (ECC) memory	Compaq 128-Megabyte SIMM Option Kit	144 Megabytes of Advanced ECC memory
2 1.05-Gigabyte Fast-SCSI-2 Hard Drives	5 Compaq 1.05-Gigabyte Fast-SCSI-2 Hard Drives	7 1.05-Gigabyte Fast-SCSI-2 Hard Drives (7.35 GB)
Compaq SMART SCSI Array Controller		
Compaq 32-Bit NetFlex Controller		
Compaq 1.44-Megabyte 3 1/2-Inch Diskette Drive		
525-Megabyte ACA Tape Drive	Compaq 5.0-Gigabyte DAT Drive	

The following table lists the software components for the server:

SCO UNIX Software from Compaq
Compaq Supplement for SCO UNIX
SCO MPX from Compaq
Oracle7 Server

Server Configuration Summary

The server hardware configuration is a dual 486/50 processor system with 144 megabytes of ECC memory and seven gigabytes of Fast-SCSI-2 disk storage. A Compaq SMART SCSI Array Controller provides mirrored fault tolerance that protects against downtime and lost data due to disk failure. The SMART Controller also provides 4 megabytes of disk cache memory for maximum disk I/O performance.

The seven one-gigabyte disk drives are configured as three logical disk drives and one online spare. Each logical disk uses mirrored fault tolerance resulting in one gigabyte of available storage per logical drive. The online spare stands ready to takeover for any failed drive. This online spare capability allows the system to continue functioning at full performance while maintaining the mirrored fault tolerance protection of the data files until the failed drive is replaced.

Logical drive 1 is the primary or "root" disk, and contains the UNIX operating system, memory swap space, the Compaq Systems Partition, and the Oracle7 Server online Redo log files. Logical drive 2 is used for the Oracle7 Server system, index, temp, and rollback table spaces. Logical drive 3 is used entirely for user data. This disk layout was derived with the intent of balancing activity, both operating system and database, across all three drives.

SCO UNIX Software from Compaq, Version 1.3 with Maintenance Supplement (MS) 4.2 and Multiprocessor Extension (MPX) 3.0 is the installed operating system. MPX 3.0 and MS 4.2 were specially developed with enhanced features to provide a very high performance environment for relational database management software. Oracle7 Server takes advantage of these performance enhancements.

Raw devices were used extensively for the Oracle7 Server database files. This automatically increases performance by eliminating the overhead of the UNIX filesystem blocked I/O mechanism. Using raw devices also permitted the use of performance enhanced asynchronous input/output (AIO) driver included in this release of the SCO UNIX operating system.

Although the use of raw devices reduces overhead, it increases the complexity of backup and restoration. To aid in this process, tested scripts are provided in this document for backup, backup verification, and restoration of the database.

Server Configuration Procedures

Implementing the Compaq, SCO, and ORACLE database server configuration includes the following procedures:

- Installing additional hardware components
- Configuring the hardware with the Compaq System Configuration Utility
- Installing the SCO UNIX Software from Compaq operating system and required software options
- Partitioning the hard disk space for applications, database, and log files
- Installing Oracle7 Server files and applications
- Creating the Oracle7 Server user database

These procedures are discussed in following chapters.

Chapter Summary

The following table describes the information found in the remaining chapters of this TechNote:

Table 1-3
TechNote Chapter Summary

Chapter Number and Title	Description
Chapter 2 Hardware Installation	Provides information on the 525-MB ACA tape drive, the DAT drive, and the hard disks that are specific for this configuration.
Chapter 3 System Configuration	Provides instructions for running the Compaq System Configuration Utility to set up your system hardware.
Chapter 4 UNIX Operating System Installation	Provides information on settings specific to the basic operating system installation of this configuration.
Chapter 5 Disk Configuration	Provides instructions for partitioning the logical drives and tuning kernel parameters for improved disk performance.
Chapter 6 Oracle7 Installation	Provides the installation procedure for Oracle7 Server.
Chapter 7 Database Backup and Restoration	Provides information on shell scripts that you can use to back up, restore, and verify the database.

Documentation Conventions

The following table lists the conventions this TechNote uses to distinguish elements of text:

Convention	Use
keys	Keys appear in boldface.
KEY+KEY	When you see a plus sign between two keys, hold down the first key while you press the second key. For example, "Press the CTRL+Z keys" means press and hold down the CTRL key while you press and release the Z key.
<i>filenames, directories, screen selections, variables</i>	These items always appear in italics.
"new terms," "prompts"	The first occurrence of a technical term, prompts, and references to a word rather than a command appear in quotes.
commands, options, programs, utilities	These items always appear in boldface.
user input, screen display	Information you type exactly as it appears and information displayed on the screen appear in a different type face.
! IMPORTANT	Presents clarifying information or specific instructions.
NOTE	Presents commentary, sidelights, or interesting points of information.
ENTER, F1-F12	These items are keys on your keyboard, not a sequence of keys to press.
type	When instructed to type information, do so without pressing ENTER .
enter	When instructed to enter information, type the information and press the ENTER key.
Select <i>item</i> → <i>item</i> → <i>item</i>	Items separated by arrows indicate items you select in a sequence.

Chapter 2

Hardware Installation

This chapter contains information on the 525-Megabyte ACA tape drive, the 5.0-Gigabyte DAT Drive, and the hard disks that are specific for this configuration. For detailed installation instructions for the various hardware components, refer to the following documents:

Table 1-1
Installation Documentation List

System Component	Document Title	Part No.
Memory SIMMS	<i>Compaq Systempro/XL Installation Guide</i>	139989-001
System Processor	<i>Compaq Systempro/XL Server System Processor Installation</i>	
5.0-GB DAT Drive 525-MB ACA Tape Drive	<i>Compaq 5.0-GIGABYTE DAT Compaq 525-MEGABYTE ACA TAPE DRIVE User's Guide</i>	142056-001
1.05-GB Fast-SCSI-2 Hard Drives	<i>Compaq FAST-SCSI-2 Hard Drive Installation; Compaq ProSignia Family and Compaq Systempro/XL Server</i>	142026-003

SCSI Tape Drive Checklist

The Compaq 525-MB tape drive comes installed in the Compaq Systempro/XL. Verify that the following items are completed:

- SCSI bus terminator resistors are installed
- Drive ID is set to 2 (jumper on pin pair 2; no jumper on pairs 1 or 3)
- Drive is connected to the *last* connector of the Integrated SCSI-2 Options Port bus cable

DAT Drive Checklist

Install the 5.0-Gigabyte DAT drive in the quick access area below the 525-MB ACA tape drive. Set up the 5.0-Gigabyte DAT drive as follows:

- Remove the SCSI bus terminator resistors.
- Set the drive ID to 5 (set S1 and S3 to ON; set S2 to OFF).
- Connect the drive to the free connector on the Integrated SCSI-2 Options Port bus cable.

Hard Disk Specifics

We use seven Compaq 1.05-Gigabyte Fast-SCSI-2 Hard Drives in this server configuration. The drive IDs are 0 through 6 and correspond to the drive bay numbers.

Chapter 3

Chapter Title

The Compaq System Configuration Utility provided with the Compaq Systempro/XL helps you set up and test your system hardware. Use this utility the first time you set up the computer and whenever you want to view or change the configuration or run diagnostics.

The system configuration process consists of:

- Identifying the installed expansion boards.
- Loading an EISA configuration file (.CFG) from diskette for each board.
- Storing configuration information in nonvolatile memory on the system board.

These .CFG files provide information about the resources used by the expansion boards (IRQ, memory, and so forth). The most common EISA configuration files (.CFG files) are supplied on the Compaq System Configuration diskette. Compaq also provides a diskette containing configuration files for many third-party options that are often used in Compaq systems. Also, each EISA option board vendor supplies an EISA configuration file diskette with their product.

The System Configuration Utility first looks for .CFG files on the Compaq System Configuration diskette. If the utility fails to find the .CFG file there, it requests that you insert the diskette containing that file. That diskette may be the non-Compaq Options diskette or the diskette supplied by the option board vendor.

Starting the Configuration Utility

To start the EISA configuration process, complete these steps:

NOTE: These steps are for a Compaq Systempro/XL that has *not* been previously configured. If your system was previously configured, the displays might not match those shown here.

1. Turn on the power to the Compaq Systempro/XL.

The system executes the ROM-based Power-On Self Test (POST). When booting the system for the first time, the following messages display on the screen:

```
172-EISA Configuration Nonvolatile Memory Invalid
      Initialization Aborted
1785-Slot 1 Drive Array not Configured

      Run System Configuration Utility

(RESUME= "F1" KEY)
```

2. If you know you have a systems partition, run the Compaq System Configuration utility from hard disk. (The procedure runs much faster from the systems partition.)

If you do not have a systems partition or do not know if you have one, insert the System Configuration diskette that came with the Compaq Systempro/XL into the diskette drive, and press **F1**.

3. Once started, the configuration utility displays the Compaq Welcome screen. Press **ENTER** to continue.
4. The configuration utility detects the need for hardware configuration and offers to configure the hardware automatically. Allow automatic configuration by pressing **ENTER**.
5. When prompted for the primary operating system, select *UNIX/XENIX* by highlighting it and then pressing **ENTER**.

Configuring the SMART Controller

The configuration utility probes the EISA bus. For every EISA board the utility finds, a configuration file (.CFG) is copied from the diskette into EISA non-volatile memory (NVM). When the utility detects the Compaq SMART Array Controller, configure the controller with the following procedure:

1. When prompted for the primary operating system for the controller, select *UNIX/XENIX*.

NOTE: The controller uses this information to select the best-performing disk striping methods.

2. The Drive Selection - Logical Drive 1 screen lists the seven SCSI drives connected to the controller. From this screen, you pick the drives that make up Logical Drive 1 and select the fault tolerance for the logical drive.
3. *No Fault Tolerance* is highlighted (default). Press **ENTER** to open the fault tolerance selection menu.
4. Use the arrow keys to highlight *(.)RAID 1 - Drive Mirroring*.
5. Press **ENTER** to complete the selection and return to the previous menu.
6. Under the Port 1 list, highlight the line: *SCSI ID 0*
7. Press **ENTER** to complete the selection. Note that the drive status changes from *Available* to *Logical Drive 1*.
8. Select drive 1 to make it part of logical drive 1.
9. The setup of Logical Drive 1 is now complete. Press **F6** to continue.

3-4 System Configuration

10. The Drive Selection - Logical Drive 2 screen appears. Repeat steps 2 through 9 to create Logical Drive 2.

Logical Drive 2 should have mirroring fault tolerance and be made up of drives 2 and 3.

11. When Logical Drive 2 is complete, press **F6** and create Logical Drive 3. Logical Drive 3 should have mirroring fault tolerance and be made up of drives 4 and 5.
12. When Logical Drive 3 is complete, press **F10** to update and exit the SMART Array configuration section.

NOTE: You will configure Drive 6 later.

13. The following message appears:

The IDA driver which is included in the base SCO UNIX 3.2v4 Operating System provides limited functionality for this controller. To fully support this controller, you must install the IDA driver located on the Maintenance Supplement 4.2 which is provided by SCO.

Press **ENTER** to continue.

The configuration utility finishes the loading of the configuration files and displays the Configuration Complete screen.

Modifying the Configuration

The next step is to verify configuration settings and modify the Compaq SMART Array Controller configuration, assigning drive 6 as the online spare.

1. From the Configuration Complete screen, select *View or modify configuration*.
2. Select *Step 3: View or edit details*.
3. The View or Edit Details screen appears. Scroll to the Primary Operating System section:

```
System - Compaq Systempro/XL PC Server
Primary Operating system.....UNIX/XENIX
```

4. Verify that the settings on the screen match those listed here. To modify a setting, first select the incorrect setting, then select the correct setting from the list of options displayed.
5. Scroll to the System Memory section:

```
Compaq MEMORY
Base Memory.....640 Kbytes, Linear
Extended Memory.....Extended Memory Installed
Total Memory.....147456 Kbytes
```

6. Verify that the settings on the screen match those listed here.

NOTE: The values here are "detected" values. That is, the memory that the POST ROM code found in the system. If the total memory listed here is not what you know it should be, then either a SIMM has not been installed, or a SIMM is not correctly installed. Refer to the SIMM installation document provided with the SIMM option kit to verify the installation.

.....

3-6 System Configuration

7. Scroll to the Diskette Drive section:

```
Integrated Diskette Controller
Standard Interface .....Primary Address
Drive A .....1.44-Megabyte (3.5 inch)
Drive B .....Not Installed
Drive A/B Swap .....Not Swapped
```

8. Verify that the settings on the screen match those listed here. A mismatch indicates an installation problem.

9. Scroll to the Compaq SMART Array Controller section:

```
Slot 1 - Compaq SMART Array Controller
Controller Characteristics
Operating system .....UNIX/XENIX
Bus Master Interface .....IRQ 10
Controller Order .....First
Transfer Mode .....Automatic Detection
Firmware Revision .....x.xx

Drive Characteristics
Logical Drive 1 .....Two 1.0-GB Drives
                               Drive Mirroring (1.0-GB)
Logical Drive 2 .....Two 1.0-GB Drives
                               Drive Mirroring (1.0-GB)
Logical Drive 3 .....Two 1.0-GB Drives
                               Drive Mirroring (1.0-GB)
Logical Drive 4 .....Not Configured

On-line Spare Drive(s) .....Disabled
Unused Drives .....One 1.0-GB Drive

Array Accelerator Status
Logical Drive 1 .....Enabled
Logical Drive 2 .....Enabled
Logical Drive 3 .....Enabled
Logical Drive 4 .....Disabled
```

10. Assign the online spare by following these steps:
 - a. Select On-line Spare Drive(s)...Disabled.
 - b. Select drive 6.
 - c. Select each logical drive to be spared (1 through 3) in turn.
 - d. After selecting logical drives 1-3, press **F10**. The status of drive 6 is now "On-line Spare 1."
 - e. Press **F10** again. The Disabled setting is now "Spare 1 (1.0-GB)" and each of the Logical drive lines show the addition, "+ Spare 1."
11. Scroll to the Network Interface Controller section:

```

Slot 8 - Compaq 32-Bit NetFlex Controller
Ethernet / Token Ring Network
Controller
Network Type .....Ethernet
Interrupt.....IRQ11, Level Triggered
Interrupt Sharing.....Disabled
Network Speed ..... 10 Mbps
Network Media Connector ..... 10 Base-T (RJ-45)
Network Address.....00 00 00 00 00 00

```

If you are using a different media connector, make the necessary corrections. To do so, first *select* the incorrect setting, and press **ENTER**. Then select the correct setting from the list of options displayed on the screen.

12. Scroll to the Primary Processor section:

```

Proc - Compaq 486/50 System Processor Board Used as Primary
System Processor .....486/50 MHz
387 Numeric Coprocessor.....Integrated

```

13. Scroll to the Secondary System Processor section:

```
Proc - Compaq 486/50 System Processor Board Used as
Secondary
System Processor.....486/50 MHz
387 Numeric Coprocessor.....Integrated
```

14. 1Scroll to the Integrated SCSI-2 Options Port section:

```
Embedded - Compaq Integrated SCSI-2 Options Port
Controller order.....Second
Host Adapter Number.....0
Controller.....Resources Enabled
SCSI ID.....# 7
Bus Speed.....Asynchronous

Attached Devices
SCSI ID 2.....Compaq 320-/525-MB Tape Drive
SCSI ID 5.....Compaq 5.0-GB DAT Drive
```

15. Verify that the settings on the screen match those listed here. To modify setting, first select the incorrect setting. Then select the correct setting from the list of options displayed.

16. Once you are satisfied with the settings, return to the main menu by pressing **F10**.

17. Select *Step 5:Save and exit*.

18. Press **ENTER** to select the highlighted option: *Save the Configuration and restart the computer*

The configuration is saved and the Reboot message displays.

Creating the Systems Partition

This procedure creates a systems partition on the system disk and copies the configuration utility programs and support files to it. Once complete, you can boot the configuration utility directly from the system disk.

NOTE: If a systems partition already exists, skip this section and continue with the next chapter, "UNIX Operating System Installation."

1. With the configuration utility diskette in the diskette drive and the Reboot message displayed on the screen, press **ENTER**.
2. Press **ENTER** at both the Compaq Logo and Welcome screens.
3. At the main menu, sequentially select:
Maintain Compaq Utilities → *Manage System Partition* → *Create System Partition*.
4. Reboot the system as directed. Once the system boots, the programs and files are copied to the system disk automatically.
5. When asked whether to run the configuration utility from the system partition or diskette, press **ENTER** to select the highlighted *System Partition* option.
6. Again press **ENTER** at both the Compaq Logo and Welcome screens.
7. From the main menu, select *Exit from this utility*.

The EISA configuration process is now complete. Remove the system configuration diskette, power off the system, and continue with the next chapter, "UNIX Operating System Installation."

Chapter 4

Chapter Title

This chapter provides specific configuration settings used during the basic operating system installation and focuses on configuring only the hardware and software required to boot the operating system from the system disk. The remaining installation is covered in later chapters.

The components for the UNIX operating system software used for this configuration include:

- SCO UNIX V/386 Release 3.2v412
- SCO UNIX Development System 3.2.4d
- SCO MPX Multiprocessing 3.0.0j
- SCO LLI Driver Disk 3.1.0j
- SCO TCP/IP Runtime System 1.2.0i
- SCO TCP/IP Development System 1.2.0i
- SCO UNIX Support Software from Compaq (Compaq EFS) 1.6.0c
- SCO UNIX Maintenance Supplement 4.2.0j

The SCO UNIX Software from Compaq product provides all these components on a single cartridge tape or CD-ROM. These components are also available from SCO as separately packaged products.



IMPORTANT: If you purchase the products from SCO, be sure to specify all of the items listed above. If you purchase from Compaq, be sure to purchase a serial number/activation key set for each of the licensed products you will be using.

Use the documentation provided with your operating system software release as the primary source of installation instructions. This TechNote provides specific parameter values to use in the installation. These values relate to the database server being configured. Follow the installation instructions in the operating system installation document up to a screen title documented in this TechNote. Then complete the instructions provided in this TechNote for that screen and switch back to the operating system document.

System V Hard Disk Initialization Screen

When you reach the System V Hard Disk Initialization screen, select *1. Fully Configurable Initialization* and continue.

Hard Disk Drive 0 Configuration Menu

Quit this screen when you reach it.

FDISK Menu

The **fdisk** main menu displays:

```
1. Display Partition Table
2. Use Entire Disk for UNIX
3. Use Rest of Disk for UNIX
4. Create UNIX Partition
5. Activate Partition
6. Delete Partition
Enter your choice or q to quit: _
```

When you reach the **fdisk** main menu, complete these steps:

1. Enter option 1 to display the current partition table.

The table should contain only one entry, which is the Compaq systems partition. This partition has a type of "UNKNOWN" and will start on track 1. Note and record the ending track number. Create the primary UNIX partition by following these steps:

- a. Select *Option 4*.
 - b. When you are asked for the starting track number, enter the ending track number of the systems partition (above), *plus 1*.
 - c. When asked for the size in tracks, enter
40982
(This is the ending track number of the systems partition.)
2. Create a secondary UNIX partition using the rest of the disk (option 3). This partition holds the online Redo log files.
 3. the primary UNIX partition active so you can boot UNIX (option 5; then specify partition 1).
 4. Display the partition table (option 1) and compare it to the following:

Partition	Status	Type	Start	End	Size
1	Active	UNIX	144	40982	40839
2	Inactive	UNIX	40983	45535	4553
3	Inactive	UNKNOWN	1	143	143

NOTE: Partition 3 is the Compaq systems partition.

5. Quit **fdisk** by pressing **ENTER** to continue and entering
q

Swap Space Allocation Prompt

SCO recommends a swap size of 1 1/2 to 2 times the amount of system memory. Allocate 250 Megabytes (256,000 1-Kbyte blocks) for this database server configuration by entering the following at the prompt:

256000

/U Filesystem Prompts

For this configuration, we create a separate */u* filesystem for the ORACLE7 Server programs and applications as well as the archived log files. The size allocated leaves about 245 Megabytes for the *root* filesystem. When you reach the prompts concerning a separate */u* filesystem, complete these steps:

1. When asked if you want to create a separate */u* filesystem, enter
y
2. When prompted for the number of 1-Kbyte blocks to allocate to the */u* filesystem, enter
410000
3. The following prompt displays:

Do you wish to make manual adjustments?

In our example of the database server configuration, we changed the name to the more descriptive *oracle_fs*. To do so, enter

y

The **divvy** table displays:

Name	Type	New FS	#	First Block	Last Block
root	EAFS	no	0	0	252506
swap	NON FS	no	1	252507	508506
u	EAFS	no	2	508507	918506
	Not used	no	3	-	-
	Not used	no	4	-	-
	Not used	no	5	-	-
recover	Non FS	no	6	918507	918517
d1057all	Whole Disk	no	7	0	918877

- change the name for the second partition from *u* to *oracle_fs*, enter the following:

```
n
2
oracle_fs
```

- Quit **divvy** by entering
q
- To install the new setup, enter
i

Software Selection Menu

If you are installing SCO UNIX Software from Compaq, the Software Selection Menu displays on the screen. Select the following :

- Extended Utilities (selected by default)
- SCO UNIX Support Software from Compaq (Compaq EFS; selected by default)
- TCP/IP Runtime System
- TCP/IP Development System
- LLI
- MPX
- UNIX Development System

NOTE: Unless you need it, de-select the International Supplement.

Ethernet/Token Ring Driver Prompts

As you follow the prompts, answer them with these recommended responses:

Table 4-1
Ethernet/Token Ring Driver Prompts

Prompt	Response
Add the board in slot <i>x</i> to the cet driver configuration? (y/n)	y
Do you want to use TCP/IP facilities on the board in slot <i>x</i> ? (y/n)	y
Internet address of this interface:	Enter the appropriate address (default=255.255.255.0)
Netmask for this interface:	Enter the netmask (default =255.255.255.0)
Does the interface use a broadcast address of all 1's? (y/n)	Enter y or n as appropriate (default is y)
Broadcast address for this interface:	Enter the appropriate address (default = xxx.xxx.255.255)

! **IMPORTANT:** If you are not prepared to answer the internet addressing questions when they appear, use 132.147.160.1 (for example) as the internet address and accept the defaults for the remaining prompts. You can correct the address later.

The basic operating system installation is now complete. Continue with the next chapter, "Disk Configuration."

Chapter 5

Chapter Title

When you ran the Compaq System Configuration Utility, you configured the disk drives into logical drives 1, 2, and 3, plus a spare. In the first phase of the operating system installation, you created the primary and secondary partitions on Logical Drive 1. In this phase, you complete the partitioning of logical drives 1, 2, and 3, as well as tune the kernel parameters for improved disk performance.

The following table describes the disks, logical drives, and their partitions.

Physical Disk	Logical Disk	fdisk Partition	Contents	Size
0&1	1	1	UNIX operating system Oracle7 filesystem swap space	245 MB 400 MB 250 MB
		2	redo log files (7 14-MB files)	98 MB
		3	Compaq Utility programs	3 MB
2&3	2	1	Oracle7 rollback raw device	425 MB
			Oracle7 index raw device	425 MB
			Oracle7 system raw device	50 MB
			Oracle7 temp raw device	75 MB
			Oracle7 tools raw device	25 MB
4&5	3	1	ora_dsp2, ora_dsp3)	333 MB each
6	On-line spare			1 GB

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Logical Drive 1

Completing the configuration of Logical Drive 1 involves:

- Using **sysadmsh** to set up the *oracle_fs* filesystem to mount automatically.
- Using **divvy** to divide Partition 2 into seven divisions for the online Redo log files.

The *oracle_fs* Filesystem

To have the *oracle_fs* filesystem mount automatically when booting into multiuser mode, follow this procedure:

1. Boot UNIX into single user mode.
2. Start the **sysadmsh** utility by entering
sysadmsh
3. From the options listed, select *Filesystems*.
4. Select *Add*.
5. Then, select *1. Add a new filesystem*.
6. When prompted for the device name, enter
/dev/oracle_fs
7. When prompted for the directory name, enter
/ora_files
8. From the list of options, select *1. Always mount /dev/oracle_fs*.
9. To prevent users from mounting this filesystem, enter the following when prompted:
n
10. Exit **sysadmsh** by pressing **ENTER**, **F2**, and then **ENTER** again.

Configuring Partition 2 for the Online Redo Log Files

The next procedure uses **divvy** to divide Partition 2 of Logical Drive 1 into seven 14-megabyte divisions for the online Redo log files.

1. Start the **divvy** process by entering

```
divvy -m /dev/hd02
```

2. Select the default of one filesystem by pressing **ENTER**.

3. When prompted about making manual adjustments, enter

```
y
```

4. The following example illustrates how to use the **divvy** options to create the first division. Use this process and the information in Table 5-2, "Logical Drive 1, Partition 2 Divvy Table Online Redo Log File Divisions," to create the seven Redo log file divisions.

- a) Name the division by entering the following in order:

```
n      divvy option for naming the division
0      number of the division you wish to name
ora_red name for this division
o1
```

- b) Set the starting block number by entering the following in order:

```
s      divvy option for setting the starting block of the new division
0      number of the new division
0      starting block number for the new division
```

- c) Set the ending block number by entering the following in order:

```
e      divvy option for setting the ending block of the new division
0      number of the new division
14605  ending block number for the new division
```

Table 5-2
Logical Drive 1, Partition 2 divvy Table
Online Redo Log File Divisions

Name	Type	New F S	#	First Block	Last Block
ora_redo1	NON FS	no	0	0	14605
ora_redo2	NON FS	no	1	14606	29210
ora_redo3	NON FS	no	2	29211	43815
ora_redo4	NON FS	no	3	43816	58420
ora_redo5	NON FS	no	4	58421	73025
ora_redo6	NON FS	no	5	73026	87630
ora_redo7	NON FS	no	6	87631	102235
	WHOLE DISK	no	7	0	102442

5. **divvy** by entering

q

6. Install the setup shown on the **divvy** table by entering

i

The configuration of Logical Drive 1 is now complete.

Logical Drive 2

Setting up Logical Drive 2 involves:

- Adding the logical drive to the UNIX kernel using **mkdev** with **hd** as the argument.
- Defining the logical drive as one partition with **fdisk**.
- Dividing the drive into five raw devices with **divvy**.

1. Start the **mkdev** utility by entering

```
mkdev hd
```

NOTE: In the future, you can access this drive with **divvy** and **fdisk** by using the */dev/hd10* and */dev/rhd10* device files.

2. From the options list, select 3. *Add a hard disk to an IDA Controller (EISA)*.

3. When prompted for the logical drive number, enter

```
2
```

4. When prompted for the controller number, enter

```
1
```

5. At the prompt, "Do you wish to continue (y/n)," enter

```
y
```

The **fdisk** disk partitioning menu displays on the screen.

6. From the **fdisk** menu, select 2. *Use Entire Disk for UNIX*.

7. When prompted to continue, press **ENTER**.

8. Quit **fdisk** by entering

q

The **divvy** menu displays on the screen.

9. Use the **divvy** options to divide Logical Drive 2 into five raw devices according to the information in the following table:

Table 5-3
Logical Drive 2 divvy Table
Raw Devices

Name	Type	New F S	#	First Block	Last Block
ora_rollback	NOT USED	no	0	0	435202
ora_index	NOT USED	no	1	435203	870405
ora_system	NOT USED	no	2	870406	921608
ora_temp	NOT USED	no	3	921609	998411
ora_tools	NOT USED	no	4	998412	1024014
	NOT USED	no	5	-	-
	NOT USED	no	6	-	-
	WHOLE DISK	no	7	0	1024536

10. Quit **divvy** by entering

q

11. Install the setup shown on the **divvy** table by entering

i

The configuration of Logical Drive 2 is now complete.

Logical Drive 3

On Logical Drive 3 we set up three 333-megabyte raw devices for user table space. In this example configuration, we name these areas ora_dsp1, ora_dsp2, and ora_dsp3.

1. Start the **mkdev** utility by entering

```
mkdev hd
```

NOTE: In the future, you can access this drive with **divvy** and **fdisk** by using the `/dev/hd20` and `/dev/rhd20` device files.

2. From the options list, select 3. *Add a hard disk to an IDA Controller.*

3. When prompted for the logical drive number, enter

```
3
```

4. When prompted for the controller number, enter

```
1
```

5. At the "Do you wish to continue (y/n)" prompt, enter

```
y
```

The **fdisk** disk partitioning menu displays on the screen.

6. From the **fdisk** menu, select 2. *Use Entire Disk for UNIX.*

7. When prompted to continue, press **ENTER**.

8. Quit **fdisk** by entering

```
q
```

A message indicates that there are 1024199 blocks in the UNIX area.

9. When prompted for the number of filesystems to create from these blocks, enter

```
1
```

10. When prompted about making manual adjustments, enter

```
y
```

11. Use the **divvy** options to divide Logical Drive 3 into three raw devices according to the information in the following table:

Table 5-4
Logical Drive 3 divvy Table
Raw Devices

Name	Type	New F S	#	First Block	Last Block
ora_dsp1	NOT USED	no	0	0	341302
ora_dsp2	NOT USED	no	1	341303	682605
ora_dsp3	NOT USED	no	2	682606	921608
	NOT USED	no	3	921609	1023805
	NOT USED	no	4		
	NOT USED	no	5	-	-
	NOT USED	no	6	-	-
	WHOLE DISK	no	7	0	1024536

12. Quit the divvy process by entering

q

13. Install the setup shown on the divvy table by entering

i

The configuration of Logical Drive 2 is now complete.

Kernel Configuration

Several kernel parameters were adjusted automatically during the MPX installation. Those adjustments include most of the settings recommended for high-performance SCSI disk operation. The following adjustments complete the recommended settings for SCSI disks. Included are adjustments for maximum user memory and asynchronous input/output. The Asynchronous I/O (AIO) and Post-Wait (sleeper) drivers used by Oracle7 are also added to the kernel.

1. Change directories by entering

```
cd /etc/conf/cf.d
```

2. Enter the following commands:

```
./configure SDSKOUT=256
./configure MAX_CFGSIZ=4096
./configure MAXBUF=14800
./configure MAXUMEM=6144
./configure NAIORREQ=512
./configure NAIORBUF=512
./configure NAIORQPP=512
```

3. To add the Post-Wait driver, edit */etc/conf/sdevice.d/sleeper*, changing the N in column two to Y.

4. To add the AIO driver, enter

```
mkdev aio
```

5. To add the driver, enter

```
1
```

6. When prompted about relinking the kernel, enter

```
n
```

7. Start the DAT Drive configuration by entering

```
mkdev tape
```

8. Select *Install a Tape Drive* by entering

```
1
```

9. Select *Install SCSI Tape Drive* by entering
4
10. Select *Install SCSI DAT Drive* by entering
4
11. Answer the following prompts with the response indicated:

**Table 5-5
DAT Drive Prompts**

Prompt	Response
Enter prefix of the SCSI host adapter that supports this drive	ccs
Which 'ccs' SCSI host adapter supports this device	0
What is the Target ID for this device?	5
What is the LUN of this device	0
Update SCSI configuration	y
Press <Return> to Continue	Press ENTER
Enter new string, ... q to quit	q
Select an option or enter q to quit	q
Do you wish to create a new kernel now?	y

12. Shut down the system by entering
`/etc/shutdown -g0 -y`
13. After shutdown is complete, press any key to boot the new UNIX kernel.

Disk configuration is now complete. Continue with the next chapter, "Oracle7 Installation."

Chapter 6

Oracle7 Installation

This chapter describes the procedure to install Oracle7.

1. Use the **sysadmsh** utility provided by SCO UNIX to add an Oracle user account with the following parameters:

Username: **oracle**

Login group: **dba**

Login shell: **ksh**

Home Directory: **/ora_files/oracle**

Password: **your choice**

2. Change the ownership, access, and group specifications of the files created for the database by entering

```
chgrp dba /dev/ora* /dev/rora*
```

```
chown oracle /dev/ora* /dev/rora*
```

```
chmod 600 /dev/ora* /dev/rora*
```

3. Login as the oracle user.

You may read and discard the greeting mail, if you wish.

4. Now you must add the Oracle7 environment variables to the login profile. Insert the following at the end of the file *.profile*:

```
ORACLE_HOME=$HOME
ORACLE_SID=DB1
TK2DEV=$TERM
USE_AIO=true
export ORACLE_HOME ORACLE_SID TK2DEV USE_AIO
```

NOTE: The environment variable ORACLE_SID=DB1 differentiates one ORACLE database from another on the same system. Typically, the value is from 1-4 characters and is of your choosing. For details on this variable, refer to the Oracle document, *Oracle7 Server for SCO INTEL-Based UNIX Installation & Configuration Guide*.

NOTE: For this TechNote, DB1 is used. You may change it to suit your requirements.

5. Execute the *.profile* commands by logging off your system and then logging on.

6. To display all the environment variables, enter

```
env
```

7. Now you must create the administrative directories. Enter

```
mkdir DB1
cd DB1
mkdir arch
cd $ORACLE_HOME (or cd ~)
```


Preparing the Oracle7 Installer Program

1. Insert the Oracle7 release tape into the tape drive.

NOTE: Verify that the tape is rewound before continuing.

2. Extract the installer program by entering

```
cpio -iBdumvc < /dev/rct0
```

This creates a directory named *newoi* and copies files there.

3. Change to the *newoi* directory and run the first pass of the installer by entering

```
cd newoi
```

```
./orainst
```

4. An ANNOUNCEMENTS screen displays with information about the optional use of the GNU software. This option is not used in this platform.

During the install process, the Oracle7 installer displays various windows pertaining to the installation. Some windows require input, some report on installation progress, and some provide information. All windows have an appropriate title at the top.

These windows also have "action buttons" at the bottom. These buttons are: *(Yes)*, *(No)*, *(OK)*, *(Help...)*, *(Backup)*, and *(Cancel)*. Select a button with the **Tab** key and activate it with the **ENTER** key.

For windows that require input, pressing **ENTER** in the input field is the same as tabbing to *(OK)* and then pressing **ENTER**.

NOTE: You can also select the *(Yes)* or *(No)* options by pressing the letters **y** or **n**. However, the screen usually changes so quickly that you cannot see if you made the proper selection.

The following steps contain the titles that appear at the top center of the windows. During the installation, you might also see other windows titled "Oracle" between the windows detailed here. These other windows inform you of the progress being made on a part of the installation and do not require input.

ORACLE HOME

Enter the path name for your ORACLE_HOME directory:

5. This window requests the Oracle home directory. The entry field should already contain
`/ora_files/oracle`
6. To accept this, press **ENTER**.

ORACLE Owner

Enter the name of the ORACLE owner:

6. To accept oracle as the owner, press **ENTER**.

Information

You have completed the installation of
Oracle*Installer. Change directory to ...

7. This window tells you that you have successfully prepared the installer, and that your next step is to run it.
Press **ENTER**.
This completes the installation of the installer.

LOADING THE DATABASE FILES

To load the database files and create the database, you must change to the database install directory *orainst* and run the installer from there.

1. Change to the install directory by entering

```
cd ../orainst
```

2. Before running the installer again, the superuser **root** must run the script *rootpre.sh* found in the *orainst* directory. You can do this from the oracle user login by entering the **su** (set user) command as follows:

```
su root
(enter root password)
./rootpre.sh
```

3. Oracle7 displays several prompts. Respond to them as shown below:

Table 6-1
***rootpre.sh* Prompts**

Prompt	Response
Do you want to install Oracle Icons for SCO ODT System? (Y/N)	n
Continue with rootpre.sh ? (Y/N)	y
Please enter the name of oracle user:	oracle
Please enter the group the oracle user belongs to:	dba
(a list of file names displays with owner, group, and mode settings)	
Continue with the above settings? (Y/N)	y
Are you installing Oracle through a floppy device? (Y/N)	n

4. After you complete your responses to the prompts, return to the oracle user by entering:

```
exit
```

INSTALLING THE DATABASE TABLES

The steps presented here select the loading of all the demo databases tables. If you do not want to load a particular demo, then select (*No*) for that demo.

1. Start the installer by entering

```
./orainst
```

2. The ANNOUNCEMENTS screen displays. Press **Enter** to continue.

```
ORACLE HOME
Enter the path name for your ORACLE_HOME directory:
```

3. This window requests the Oracle home directory as it did in the first running or **orainst**. The entry field should again contain

```
/ora_files/oracle
```

To accept this, press **ENTER**.

```
.../README.FIRST
The following contains critical information that the customer needs to
be aware of prior to installing Oracle7 Release 7.0.13.1.
```

4. This screen applies to the customer who currently has a running Oracle system and is upgrading to Oracle7. It also contains a reminder to run the *rootpre.sh* script.

Press **ENTER** to continue.

Skip README
Would you like to skip the displaying of this
README file ... in the future?

5. To skip future displays of the .../README.FIRST screen, select (*Yes*).

Yes/No
Root must have already run the shell script
'rootpre.sh' before you proceed with Oracle
installation. Rootpre.sh can be found in the
\$ORACLE_HOME/orainst/ directory.

6. must confirm the execution of *rootpre.sh*. Select (*Yes*) to continue.

ORACLE Owner
Enter the name of the ORACLE owner:

7. To re-affirm oracle as the owner, press **ENTER**.

Install Actions

Select the desired Installer action:

8. The Install Actions window provides you with several options for installing the Oracle7 software. With the option *Build Staging Area Only from Tape*, you may establish a temporary or a permanent area (directory) into which the files are copied from tape and out of which the database is created.

When the database is installed from a temporary staging area, the files are moved to the database's home directory. With the permanent staging area, the files are copied to the home directory. This makes it possible to install many different databases or to reinstall the same one without recopying files from tape.

For this TechNote, the option *Install Directly from Tape* was used. This option displays after selecting the option *Complete Software/Database Fresh Install*.

To select the highlighted action *Complete Software/Database Fresh Install*, press **ENTER**.

INSTALL Source

Select one of the following:

9. Select Install Directly from Tape.

This is a misnomer, because the tape files are copied to a temporary staging area and then installed from there.

ORACLE_SID

Enter your ORACLE_SID:

10. Enter the SID that you chose earlier.

NLS

Select the native language to be Installed:

(If you are licensed to use Multilingual

Option, select 'ALL LANGUAGES')

11. Select the language that complies with your need and license.

Relink All Executables?

Would you like to relink Oracle product
executables? ...

12. Select (Yes).

Information

The installation log will be written to

/ora_files/oracle/orainst/install.log.

Post-installation steps that need to be run by

root will be written to

/ora_files/oracle/orainst/root.sh

13. Read and continue on.

NOTE: Instructions for any required post-installation processing are placed in the *root.sh* script.

Non-rewinding Device

Enter the non-rewinding device name:

14. To accept */dev/nrct0*, press **ENTER**.

NOTE: In this configuration, the *rct0* device files are linked to the *stp0* device files. Therefore, their use is interchangeable.

Rewinding Device

Enter the rewinding device name:

15. To accept */dev/rct0*, press **ENTER**.

Information

Insert tape number 1.

16. Verify that the tape is still in the drive and press **ENTER**.

Oracle

Setting Up. . .

17. Several minutes elapse while the product install scripts are copied from the release tape to disk.

Available Products

Products available on /ora_files/oracle/stage

18. A list of the available products on the tape displays. Use the **up** and **down** arrow keys to position the cursor at a product. Then use the **F11** key to select (or de-select) that product for installation.

NOTE: For this platform, the following products were selected:

Oracle Data Query
Oracle*Terminal
Oracle7 Procedural Option (PL/SQL V2)
Oracle7 Server (RDBMS)
PRO*C
SQL*Forms
SQL*Menu
SQL*Net TCP (V1)
SQL*Net V2
SQL*Plus
SQL*Report
SQL*ReportWriter
SQL*TextRetrieval
TCP/IP Protocol Adapter (V2)

When you finish making your selection(s), tab to the (*Install...*) button and press **ENTER**.

Install SQL*Net Configuration Tool tables?

Would you like to install the SQL*Net
Configuration Tool tables in your database?

19. Select (Yes).

Information

Note that SQL*Forms30 must also be installed.

20. This message informs you that SQL*Forms30 is required for the tool tables selected above. You selected SQL*Forms30 for installation earlier. Press **ENTER** to continue.

ORACLE

Analyzing Dependencies. . .

21. Oracle verifies that any dependencies for the selected products are satisfied.

Information

The environment variable ULIMIT is not set.

22. The ULIMIT kernel parameter is adequately set to satisfy Oracle's needs. Press **ENTER** to continue.

DBA Group

Please select the group which should be able to act as DBA of the database.

23. Select *dba*.

Database Name

Enter the database name associated with the DB1 instance:

24. Enter the SID that you used in step 7.

Character Set

Select the character set for creating this database (if the desired character set is not listed, select (Others..) and enter the character set manually)

25. Select *US7ASCII*.

SYSTEM Password

Please enter the password for the 'SYSTEM' ORACLE userid:

(For security reasons, your input will not be echoed. ...)

26. Enter a password for the 'SYSTEM' ORACLE userid and then re-enter to confirm. Be sure to record this password in a safe place.

SYS Password

Please enter the password for 'SYS' ORACLE userid:

(For security reasons, your input will not be echoed. ...)

27. Enter a password for the 'SYS' ORACLE userid and then re-enter to confirm. Be sure to record this password in a safe place.

DBA/Operator Passwords

Would you like to (1) set the passwords for the internal users ...

28. Select (No).

Control Files

Do you want to use the following files as control files?

29. Select (No).

Then, as each control file name displays, change the *db*s part of the filename to *DB1/admin* by performing the following steps:

- a. Use the left arrow key to position the cursor at the beginning of *db*s.
- b. Delete *db*s by pressing the **DELETE** key three times.
- c. Type DB1/admin.
- d. To enter the new control file name, press **ENTER**.

DB Defaults

The following are the default file names and sizes which will be used to create the new database. ...

30. To complete viewing the default database file names, select (*OK*) twice. Then continue with the next step to change them.

Default DB

Select (*Yes*) to accept the default file names and sizes shown on the previous screens.
Select (*No*) to specify new values.

31. Select (*No*) and then enter the following as prompted:

NOTE: Until you enter the file size for the TOOLS Data File, you may correct data entry mistakes by selecting the (*Backup*) button. This restarts the data entry for the file names and sizes and displays your previous entries.

Window Title	Data to Enter
System Data File	/dev/rora_system
System Data File Size	51200k
Redo Log File 1	/dev/rora_redo1
Redo Log File 1 Size	14600k
Redo Log File 2	/dev/rora_redo2
Redo Log File 2 Size	14600k
Redo Log File 3	/dev/rora_redo3
Redo Log File 3 Size	14600k
Rollback Segment File	/dev/rora_rollbk
Rollback Segment File Size	435200k
Temporary Segment File	/dev/rora_temp
Temporary Segment File Size	76800k
User Data File	/dev/rora_dsp1
User Data File Size	341300k
TOOLS Data File	/dev/rora_tools
TOOLS Data File Size	25600k

Help Facility
Would you like to load the SQL*Plus Help
Facility?

32. Select (Yes).

Demo Tables

Would you like to load the SQL*Plus Demo
Tables?

33. Select *(Yes)* or *(No)* as you desire.

Oracle

Analyzing Dependencies. . .

34. More checking of dependencies occurs.

Default Terminal

Please select one of the following as a default
terminal type for SQL*ReportWriter:

35. Select *srw_ansi* - *SCO ansi console*.

Page Limit

Would you like to update the page limit for
SQL*ReportWriter?

36. If you wish to set a limit, select *(Yes)* and enter the limit. If you wish to
accept the default of no limit to the number of report pages, select *(No)*.

Load Tables

Would you like to load SQL*ReportWriter tables?

37. Select (Yes).

Centralized Tables

Would you like to centralize SQL*ReportWriter
tables?

38. Select (Yes).

Load Demo

Would you like to load the SQL*ReportWriter
demonstrations?

39. Select (*Yes*) or (*No*) as meets your needs. If you selected (*Yes*), the following applies:

Username

Enter the username to be used when starting the demonstration.

For example, enter

rpwdemo

Password

Enter the password to be used when accessing the SQL*ReportWriter demonstration account.

For example, enter

demopw

TERMDEF Data

Would you like to load the TERMDEF utility data into the SYSTEM account for SQL*ReportWriter?

40. Select (*Yes*).

Demo Tables

Would you like to install SQL*Forms 3.0 demo forms and tables?

41. Select (*Yes*).

Demo Tables

Would you like to install SQL*Menu 5.0 forms and tables?

42. Select (Yes).

Oracle

Analyzing Dependencies. . .

43. More checking occurs.

SYSTEXT password

SYSTEXT password? (SYSTEXT is the SQL*TextRetrieval:DBA)

44. Enter and then confirm a password for the SYSTEXT user. Example:

 systextpwd

SQL* TR Tablespace

Default tablespace for SQL*TextRetrieval users and data dictionary?

45. Press **ENTER** to accept the default of TOOLS.

SQL*TR Temporary Tablespace

Temporary tablespace for SQL*TextRetrieval users and data dictionary?

46. Press **ENTER** to accept the default of **TEMP**.

SQL*TR Demos

Would you like to install SQL*TextRetrieval demos?

47. Select (*Yes*).

SQL* TR Demo Directory

Please enter a directory to store the flat files used in the SQL*TextRetrieval demos and tutorials.

48. To accept the default filename, press **ENTER**.

SQL*TR Forms

Would you like to install SQL*TextRetrieval forms?

49. Select (*Yes*).

SQL*TR Menu

Would you like to install SQL*TextRetrieval
menus?

50. Select (*Yes*).

Help Facility

Would you like to load the Oracle Data Query
Dictionary Tables?

51. Select (*Yes*).

Oracle

Analyzing Dependencies. . .

52. The products selected for installation are now read from the install tape into the staging area. This requires several minutes.

Information

Completed loading Oracle software into the
staging area (/ora_files/oracle/stage). Select
(OK) to continue.

53. Select (*OK*).

Confirmation

There may be insufficient disk space to accommodate the requested installation. Do you wish to proceed anyway?

54. This window indicates that there might be insufficient disk space for the installation to complete successfully. This is incorrect. Ample disk space is available. Ignore this message and continue the installation by selecting *(Yes)*.

Oracle

Installing. . .

55. The database creation now begins. For the next thirty to forty-five minutes, this Oracle window displays the changing status as the selected products are installed.

Install Completed

The requested action has been performed for the selected products.

You should examine the installation . . .

56. Read and select *(OK)*.

Available Products

57. Exit the installer program by completing the following steps:

- a. Press **ESC+1**
 - b. Press **f+x**
- (Shortcut: Press **Ctrl+x**)

REQUIRED ROOT USER FUNCTIONS

You must now run the following as the **root** user:

1. the *root.sh* oracle script. Enter

```
./ora_files/oracle/orainst/root.sh
```
2. Complete the following steps that enable automatic database startup and shutdown during operating system boot up and shutdown.
 - a. Change to the */etc* directory:

```
cd /etc
```
 - b. Edit */etc/oratab*; locate line *DB1:/ora_files/oracle:N*; change *N* to *Y*.
 - c. Change to the */etc/rc2.d* directory:

```
cd /etc/rc2.d
```

- d. Create the file *S99dbstart*, and insert the following:

```
ORACLE_HOME=/ora_files/oracle
echo 'Starting Oracle Database(s)\n'
su oracle -c $ORACLE_HOME/bin/dbstart>$ORACLE_HOME/STARTUP
echo 'Oracle database(s) started'
```

NOTE: If you are using SQL*Net V1, also add:

```
su oracle -c $ORACLE_HOME/bin/orasrv>>$ORACLE_HOME/STARTUP
echo 'SQL*Net V1 listener (orasrv) started'
```

- e. Enter:

```
chmod 744 S99dbstart
cd /etc/rc0.d
```

- f. Create the file *K99dbshut*, and insert the following:

```
ORACLE_HOME=/ora_files/oracle
echo 'Shutdown Oracle Database(s)\c'
su oracle -c $ORACLE_HOME/dbshut > $ORACLE_HOME/SHUTDOWN
echo '.....Done'
```

- g. Enter:

```
chmod 744 K99dbshut
```

3. Lastly, you must update Network Services file.

- a. Change to the */etc* directory.

- b. Locate the file */etc/services* and add the following line:

```
listener 1521/tcp oracle SQL*Net V2 listener
orasrv 1525/tcp oracle SQL*Net V1 listener
```

ADDITIONAL Oracle7 CONFIGURATION STEPS

While logged in as the oracle user, complete the following steps to edit the *initDB1.ora* and *config.ora* files.

1. Change directory to *db*s. Enter

```
cd db
```

2. Complete the following edits on the *initDB1.ora* file:

- a. Delete all lines with # SMALL or # MEDIUM in the right margin.
- b. Uncomment (delete the # from column 1) all lines with # LARGE in the right margin.
- c. Uncomment the line: `log_archive_start = true`.
- d. Add the following lines:

```
use_post_wait_driver=true
```

```
db_writers=1
```

```
log_files=32
```

```
_db_block_write_batch=512
```

3. Complete the following edits on the *config.ora* file:

- a. Uncomment the following lines:

```
background_dump_dest ...
```

```
core_dump_dest ...
```

```
user_dump_dest ...
```

```
log_archive_dest ...
```


- b. In each of the above lines, change the path and file names as follows:

background_dump_dest	From: /ora_files/oracle/rdbms/log
	To: /ora_files/oracle/DB1/bdump
core_dump_dest	From: /ora_files/oracle/rdbms/dbs
	To: /ora_files/oracle/DB1/cdump
user_dump_dest	From: /ora_files/oracle/rdbms/log
	To: /ora_files/oracle/DB1/udump
log_archive_dest	From: /ora_files/oracle/dba/arch/arch.log
	To: /ora_files/oracle/DB1/arch/DB1

ADDING THE REMAINING DATABASE USER SPACE

The installer allowed for the configuration of only one user database file. Complete the following steps to add the remaining two data files and the index file.

1. Run SQL*Plus as the system user. Enter:

```
sqlplus system/systempwd
```

2. Add the second and third data files by entering:

```
alter tablespace users  
add datafile '/dev/rora_dsp2' size 341300k,  
'/dev/rora_dsp3' size 341300k;
```

ADDING THE ADDITIONAL REDO LOG FILES

Enter the following SQL commands:

```
Alter database DB1  
add logfile '/dev/rora_redo4' size 14600k reuse;
```

```
Alter database DB1  
add logfile '/dev/rora_redo5' size 14600k reuse;
```

```
Alter database DB1  
add logfile '/dev/rora_redo6' size 14600k reuse;
```

```
Alter database DB1  
add logfile '/dev/rora_redo7' size 14600k reuse;
```

SETTING THE ARCHIVELOG MODE

With the database up and no users connected, complete the following steps:

1. Execute the SQL*DBA program and connect internal by entering:
 sqldba
 connect internal
2. Put the database in the required state by entering:
 alter database close;
 alter database dismount;
 alter database mount exclusive;
3. To set the database mode to ARCHIVELOG, enter
 alter database archivelog;
4. Verify ARCHIVELOG mode by performing the following:
 - a. Press **F5** (activates top menu line).
 - b. Press **L** (opens the LOG window).
 - c. Press **L** (selects *List Archive Status*).
 - d. Scan the list that displays and verify that the **database mode** is ARCHIVELOG.
5. Shutdown and restart the database by entering:
 shutdown
 startup
6. Exit the SQL*DBA process by entering:
 exit

CONFIGURE THE ORACLE7 NETWORK LISTENER

NOTE: At the time of this writing, SQL*Net V2 client software was not available from Oracle. As much as possible, the server was made "ready" for SQL*Net V2 clients. However, without being able to test with SQL*Net V2, the completeness of the server V2 installation cannot be determined. SQL*Net TCP (V1) was fully integrated and tested on this platform with an MS-DOS SQL*Net V1 client.

Insert the following lines into the file */etc/listener.ora*:

```
LISTENER=  
  
(ADDRESS=  
  
(PROTOCOL = TCP)  
  
(HOST = dbserver)  
  
(PORT = 1521)  
  
)  
  
STARTUP_WAIT_TIME_LISTENER = 0  
  
CONNECT_TIMEOUT_LISTENER = 10  
  
SID_LIST_LISTENER=  
  
(SID_DESC =  
  
(SID_NAME = DB1)  
  
(oracle_home=/ora_files/oracle)  
  
)  
  
TRACE_LEVEL_LISTENER = OFF
```

Chapter 7

Database Backup and Restoration

This chapter contains information on shell scripts that you can use to back up, restore, and verify the database.



IMPORTANT: The database *must* be shut down when backing up or restoring. Otherwise, the state of the backup is undefined and not reliable.

Backing Up the Database

Use the following BOURNE/KORN shell script to back up the database as defined in this TechNote. This script should be located and run from the \$ORACLE_HOME directory. In tests on the database defined in this TechNote, a little more than one hour is required for the backup. The file *backtime* will contain the start and end times.

```
NOREWIND=/dev/nrStp1
```

```
REWIND=/dev/rStp1
```

```
DDBS=10240k
```

```
tape rewind $REWIND
```

```
date > backtime
```

```
echo "cpio Control Files" > $NOREWIND
```

```
find $ORACLE_HOME/DB1/admin -print | cpio -oBdumv > $NOREWIND
```

```
LOGS="redo1 redo2 redo3 redo4 redo5 redo6 redo7 rollbk temp"
```

```
SYSTEM="system dsp1 dsp2 dsp3 tools"
```

```
DBFILES="$SYSTEM $LOGS"
```

```
for file in $DBFILES
```

```
do
    file=/dev/rora_$file
    dbfsize $file
    echo "dd $file" > $NOREWIND
    dd if=$file of=$NOREWIND bs=$DDBS
done
echo "EOF" > $NOREWIND
date >> backtime
tape rewind $REWIND &
```

Restoring the Database

Use the following BOURNE/KORN shell script to restore the database as backed up by the backup script. This script should be located and run from the \$ORACLE_HOME directory. In tests on the database defined in this TechNote, the restoration requires a little more than one hour. The file *restoretime* will contain the start and end times.

NOTE: The database must be shutdown before running this script. Note also that this script does *not* create the target raw files; it only copies data from the tape to existing raw files.

```
REWIND=/dev/rStp1
NOREWIND=/dev/nrStp1
DDBS=10240k
tape rewind $REWIND
#
date > restime
while true
```

```
do
  cat $NOREWIND | read FMT FNAME
  echo restoring $FNAME
  echo $FMT
  case $FMT in
    dd)  dd if=$NOREWIND of=$FNAME bs=$DDBS ;;
    cpio) cpio -iBdumv < $NOREWIND ;;
  EOF)  echo "All done"
        break
        ;;
    *)  echo "Unknown tape format"
        break 5
        ;;
  esac
done
date >> restime
```

Verifying the Database Backup

Use the following BOURNE/KORN shell script to verify that the database was backed up by the backup script. This verification script compares the raw data on the tape to the raw data in the database files. The script should be located and run from the \$ORACLE_HOME directory. In tests on the database defined in this TechNote, the verification requires 2 1/2 hours. The file *vertime* will contain the start and end times.

NOTE: The database must be shutdown before running this script. Note also that this script does *not* create the target raw files; it only copies data from the tape to existing raw files.

```
REWIND=/dev/rStp1
NOREWIND=/dev/nrStp1
tape rewind $REWIND
#
date > vertime
while true
do
  cat $NOREWIND | read FMT FNAME
  echo verifying $FNAME
  case $FMT in
    dd)  cat $NOREWIND | cmp - $FNAME ;;
    cpio)      cpio -iBtv < $NOREWIND ;;
    EOF)  echo "All done"
           tape rewind $REWIND &
           reak
           ;;
    *)  echo "Unknown tape format"
        break 5
        ;;
  esac
done
date >> vertime
```

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