Lucent Technologies
Bell Labs Innovations

CentreVu® Call Management System

Release 3 Version 8

Hardware Maintenance and Troubleshooting

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CentreVu ® Call Management System R3V8 Hardware Maintenance and Troubleshooting

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Preface

Overview

The *CentreVu*® *Call Management System Hardware Maintenance and Troubleshooting* (585-210-919) document is written for technicians and Lucent Technologies call center customers who install and maintain the *CentreVu* Call Management System (CMS). This document addresses *Sun** platforms using the *Solaris*† *7 3/99* operating system.

Organization

This document is organized as follows:

- **Chapter 1 — Introduction**

  Provides an overview of the supported *CentreVu* CMS, supported hardware platforms, required software, and supported switch releases. It also includes the purpose of the *Sun* platforms, roles and responsibilities, and helpline information.

- **Chapter 2 — Enterprise 3000 Maintenance**

  Describes how to add hard disk drives, memory, and tape drives; as well as other maintenance procedures.

- **Chapter 3 — Enterprise 3000 Troubleshooting**

  Describes how to fix various hardware, power, and installation problems.

- **Chapter 4 — *SPARCserver* Maintenance**

  Describes how to add hard disk drives, memory, and tape drives; as well as other maintenance procedures.

- **Chapter 5 — *SPARCserver* Troubleshooting**

  Describes how to fix various hardware, power, and installation problems.

- **Chapter 6 — *Ultra 5* System Maintenance**

  Describes how to add hard disk drives, memory, and tape drives; as well as other maintenance procedures.

- **Chapter 7— *Ultra 5* System Troubleshooting**

  Describes how to fix various hardware, power, and installation problems.

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- **Chapter 8 — Cross-Platform Procedures**

  Describes recovering from a disk corruption or crash, installing the operating system, recovering system space, and various other maintenance and troubleshooting procedures that apply to all platforms discussed in this book.

- **Glossary**

  Lists and defines technical terms used in this, and related documents. Also lists and expands abbreviations and acronyms used in this and related documents.

- **Index**

  Provides a reference for material covered in this document.

Related Documents

This section lists where you can find specific information about CMS. To order any of these documents, call the BCS Publications Center at 1-800-457-1235 or +1-317-361-5353.

Title	Document Number
Installing CMS Computers	
CentreVu® Call Management System Sun® Enterprise™ 3500 Computer Hardware Installation	585-215-873
CentreVu® Call Management System Sun® Enterprise™ 3500 Computer Connectivity Diagram	585-215-877
CentreVu® Call Management System Sun® Ultra™ 5 Computer Hardware Installation	585-215-871
CentreVu® Call Management System Sun® Ultra™ 5 Computer Connectivity Diagram	585-215-872
CentreVu® Call Management System Release 3 Version 6 Sun® Enterprise™ 3000 Computer Hardware Installation	585-215-867
CentreVu® Call Management System Release 3 Version 6 Sun® Enterprise™ 3000 Computer Connectivity Diagram	585-215-865
CentreVu® Call Management System Release 3 Version 6 Sun® SPARCserver™ Computers Hardware Installation	585-215-857

Title	Document Number
CentreVu® Call Management System Release 3 Version 6 Sun® SPARCserver™ Computers Connectivity Diagram	585-215-858
CentreVu® Call Management System Release 3 Version 5 Sun® SPARCserver™ Installation and Maintenance	585-215-827
CentreVu® Call Management System Release 3 Version 5 Sun® SPARCserver™ Connectivity Diagram	585-215-828
Installing and Setting Up the Software on a CMS Computer	
CentreVu® Call Management System Release 3 Version 8 Software Installation and Setup	585-210-941
CentreVu® Call Management System Software Installation and Setup (R3V6 and earlier)	585-215-866
Setting Up a Disk-Mirrored System	
CentreVu® Call Management System Release 3 Version 8 Disk-Mirrored Systems	585-210-940
CentreVu® Call Management System Disk-Mirrored Systems (R3V6)	585-215-841
Connecting, Administering, and Troubleshooting Switch Connections	
CentreVu® Call Management System Switch Connections and Administration	585-215-876
Installing, Setting Up, and Troubleshooting Terminals, Printers, and Modems	
CentreVu® Call Management System Terminals, Printers, and Modems	585-215-874
Maintaining and Troubleshooting a CMS Computer	
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CentreVu® Call Management System Hardware Maintenance and Troubleshooting (R3V6 and earlier)	585-215-861
Upgrading a CMS Computer	
CentreVu® Call Management System Release 3 Version 8 Upgrades and Migrations	585-210-913
CentreVu® Call Management System Release 3 Version 6 Upgrades and Migrations	585-215-856

Title	Document Number
CentreVu® Call Management System Release 3 Version 5 Upgrades and Migrations	585-215-826
Administering a CMS Computer	
CentreVu® Call Management System Release 3 Version 8 Administration (Volumes 1 and 2)	585-210-910
CentreVu® Call Management System Release 3 Version 6 Administration (Volumes 1 and 2)	585-215-850
CentreVu® Call Management System Release 3 Version 5 Administration (Volumes 1 and 2)	585-215-820
Other Documents	
CentreVu® Call Management System Release 3 Version 8 Open Database Connectivity	585-210-911
CentreVu® Call Management System Release 3 Version 6 Open Database Connectivity	585-215-852
CentreVu® Call Management System Release 3 Version 5 Open Database Connectivity	585-215-839
CentreVu® Call Management System Release 3 Version 8 External Call History Interface	585-210-912
CentreVu® Call Management System Release 3 Version 6 External Call History Interface	585-215-854
CentreVu® Call Management System Release 3 Version 5 External Call History Interface	585-215-824
CentreVu® Supervisor Version 8 Reports	585-210-929
CentreVu® Supervisor Version 6 Reports	585-215-851
CentreVu® Call Management System Release 3 Version 5 Real-Time and Historical Reports	585-215-821
CentreVu® Call Management System Custom Reports	585-215-822
CentreVu® Call Management System Forecast	585-215-825
CentreVu® Call Management System Release 3 Version 6 Planning, Configuration, and Implementation	585-215-879
Lucent Call Center Release 8 Change Description	585-210-925
Lucent Call Center Release 8 Documentation CD-ROM	585-210-926

Introduction

Overview

CentreVu® Call Management System is a software application offered in association with the Automatic Call Distribution (ACD) feature of Lucent Technologies switches. The *CentreVu* CMS application provides monitoring and recording of ACD calls, age handling these calls, and the use of Vector Directory Numbers (VDNs) for these calls to measure system and agent performance.

Supported Features

The *CentreVu* CMS software supports the following features, which Lucent Technologies can enable at installation:

- Expert Agent Selection (EAS) (switch feature)
- Call Vectoring (switch feature and *CentreVu* CMS feature package)
- Forecasting Feature Package (*CentreVu* CMS)
- Graphics Package (*CentreVu* CMS)
- External Call History Feature Package (*CentreVu* CMS)
- Multiple ACDs (*CentreVu* CMS).

Supported Hardware Platforms

CentreVu CMS is certified to run on the following computers:

- *Sun** *Enterprise*† 3000 system
- *Sun SPARCserver*‡ 20
- *Sun SPARCserver* 10§
- *Sun SPARCserver* 5
- *Sun Ultra*¶ 5.

This manual addresses the *Sun Enterprise* 3000 system, *Sun SPARCserver*, and, *Sun Ultra 5* system platforms.

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†*Enterprise* is a trademark of Sun Microsystems, Inc.
‡*SPARCserver* is a trademark of SPARC International Inc.
§Supports *CentreVu* CMS R3V6 only as a bug fix.
¶*Ultra* is a trademark of Sun Microsystems, Inc.

Required Software

To operate properly, *CentreVu* CMS requires the following software packages:

- *Sun Solaris*[*] 7 3/99 operating system (Hardware: 11/97 version)
- Common Desktop Environment (CDE) 1.0.2
- *Sun* Validation Test Suite (VTS) 2.1.1
- High-Speed Serial Interface (HSI) (optional; for systems having multiple ACDs)
- Serial Asynchronous Interface/PCI (SAI/P) drivers (optional; *Ultra* 5 only)
- Bay Networks Annex R10.0-R4.2 *Network Terminal Server*[†] (NTS) drivers (optional)
- *Solstice*[‡] for Server Connect X.25 Version 9.1 drivers
- *INFORMIX*[§]
  - — Structured Query Language (SQL) (optional)
  - — Standard Engine (SE)
  - — International Language Supplement (ILS)
- *Solstice DiskSuite*[¶]
- *Sun Solaris* patches
- *CentreVu* CMS
- CMS patches
- CMS Supplemental Services
- Open Database Connectivity (ODBC) (optional)
- Aurora Ports Card drivers (optional; *SPARCserver* only).

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¶_Solstice DiskSuite_ is a trademark of Sun Microsystems, Inc.

Supported Switch Releases

CentreVu CMS is certified to run with the following Lucent Technologies switches:

- *DEFINITY* Communications System Generic 2.2 Release 3.0 (QPPCN 696DR) and later
- *DEFINITY* Communications System Generic 3i Release 13.3 (QPPCN 576) and later
- *DEFINITY* Communications System Generic 3r Release 8.5 and later
- *DEFINITY* Communications System Generic 3s Release 14.2 and later
- *DEFINITY* Communications System Generic 3 Version 1
- *DEFINITY* Communications System Generic 3 Version 2 Load 82 and later
- *DEFINITY* Communications System Generic 3 Version 3
- *DEFINITY* Communications System Generic 3 Version 4
- *DEFINITY* Enterprise Communications Server Release 5
- *DEFINITY* Enterprise Communications Server Release 6.

CentreVu CMS Helplines

If an installation problem arises that requires assistance, Lucent Technologies technicians or the customer may call the following numbers:

Customer Number

1-800-242-2121

By calling this number, the customer reports the problem and generates a trouble ticket so the problem can be escalated through the services organization.

The customer will be prompted to identify the type of problem (ACD, hardware, or *CentreVu* CMS) and will be connected to the appropriate service organization.

Technician Number

1-800-248-1234

The technician should provide the TSC personnel with the customer's name, the password for the *root* login ID on the *Sun Enterprise* 3000, *Sun SPARCserver,* and *Ultra 5* systems, the phone number of the dial-in port, and a description of the problem.

If the TSC engineers cannot solve the problem, they will escalate it to the Customer Support Organization of Lucent Technologies.

International Support

For international support contact your Lucent Technologies representative/distributor for more information.

Enterprise 3000 Maintenance

Overview

This chapter explains some of the principle maintenance issues for the *CentreVu*® Call Management System Release 3 Version 8 (CMS R3V8) hardware. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document and the *Sun** *Enterprise*† 3000 system documentation for additional information.

This chapter discusses the following maintenance procedures:

- Add Hard Disk Drives
- Add Memory
- Add, Remove, or Replace Tape Drives
- Replace the Clock Board

Personnel at the Technical Service Center (TSC) will need assistance from an on-site technician or the customer's *CentreVu* CMS administrator to do most of the procedures in this chapter.

NOTE:

If you should need to remove a side panel from the *Sun Enterprise* 3000 System for any reason, it is necessary to pull out on the bottom center of the panel before sliding the panel upwards to remove it. See the *Sun Enterprise* 3000 System, System Manual for additional information.

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Add Hard Disk Drives

Overview

The *Solstice DiskSuite* 4.2 software treats all the hard disks on your system as a single logical disk, allowing the call center data base to grow quite large. All factory-installed R3V8 systems have OLDS; systems upgraded in the field must have had OLDS installed to accommodate requirements of R3V8 CMS.

To add a hard disk drive to a system follow the procedure in this section.

Add the Disk Drive

To add more disks to a system that is already up and running, perform these steps:

1. Do a cmsadm backup.

   See *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document, for more details.

2. Make sure the system is in firmware mode (use the `init 0` command to get to the `ok` prompt).

3. Do the following in sequential order:

   a. Turn off the system unit.

   b. Turn off the system monitor.

   c. Turn off all external devices starting with the device closest to the system unit and working toward the farthest device.

4. Install the new disk drives. See the *CentreVu Call Management System Release 3 Version 6, Sun Enterprise 3000 System Hardware Installation* (585-215-867) document for more details.

5. Set the SCSI IDs on the new disk drives such that they do not conflict with devices already on the system. Turn on the power to the system units, in the opposite order in which you powered them off.

   When you power on the system, the system begins to boot. Interrupt the boot by entering **Stop** **A**. The system responds:

```
ok
```

CAUTION:

If you are on a *Sun Enterprise* 3000 system, see Chapter 3, *Enterprise* 3000 Troubleshooting, "Probe-SCSI Command Problem" section before executing the next command.

6. To verify that the system sees all devices, including the new disk drive, enter the following command:

```
ok probe-scsi-all
```

The system responds as follows:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

NOTE:

The actual devices listed depends on the devices installed on the SCSI bus.

7. Enter the following command:

```
ok boot -r
```

The system responds as follows:

```
Boot device ...
   .
   .
   .
Configuring the /dev directory
Configuring the /dev directory (compatibility devices)
The system is coming up. Please wait.
checking filesystems
/dev/rdsk/c0t1d0s0:    is clean
/dev/rdsk/c0t3d0s5:    is clean
   .
   .
   .
/dev/rdsk/c0t1d0s1 mounted
/dev/rdsk/c0t3d0s5 mounted
/dev/rdsk/c0t1d0s0 mounted
   .
   .
   .
Starting terminal server network daemons.
Network Terminal Server daemon(s) startup complete.
The system is ready.

hostname console login:
```

8. Log in as root.

   You may now partition the disks.

Partition the Disks

To partition the disks, do the following steps:

1. At the system prompt, enter the `format` command:

```
# format
```

The following screen appears:

```
Searching for disks ... done

AVAILABLE DISK SELECTIONS:
   0.  c0t0d0 <SUN4.2G cyl 3880 alt 2 hd 16 sec 135
       /sbus@3,0/SUNW,fas@3,8800000/sd@0,0
   1.  c0t1d0 <SUN4.2G cyl 3880 alt 2 hd 16 sec 135
       /sbus@3,0/SUNW,fas@3,8800000/sd@1,0
   2.  c0t2d0 <SUN4.2G cyl 3880 alt 2 hd 16 sec 135
       /sbus@3,0/SUNW,fas@3,8800000/sd@2,0
   3.  c1t4d0 <SUN4.2G cyl 3880 alt 2 hd 16 sec 135
       /sbus@3,0/SUNW,fas@3,8800000/sd@e,0
Specify disk (enter its number):
```

2. Enter the number that corresponds to the disk you added.

NOTE:

Be careful to specify the number that exactly matches the disk you are adding.

```
Specify disk (enter its number):
```

The system displays the disk you are partitioning (for example, `c1t1d0` for disk 5) and the Format Menu as shown below:

```
selecting c1t1d0

FORMAT MENU:
disk            -    select a disk
type            -    Select (define) a disk type
partition       -    select (define) a partition table
current         -    describe the current disk
format          -    format and analyze the disk
repair          -    repair a defective sector
label           -    write label to the disk
analyze         -    surface analysis
defect          -    defect list management
backup          -    search for backup labels
verify          -    read and display labels
save            -    save new disk/partition definitions
inquiry         -    show vendor, product and revision
volname         -    set 8-character volume name
quit            -

format>
```

3. At the `format>` prompt, enter `partition`.

```
format> partition
```

The program displays a confirmation message and the Partition menu as follows:

```
PARTITION MENU:
0         -change ‘0’partition
1         -change ‘1’partition
2         -change ‘2’partition
3         -change ‘3’partition
4         -change ‘4’partition
5         -change ‘5’partition
6         -change ‘6’partition
7         -change ‘7’partition
select    -select a predefined table
modify    -modify a predefined partition table
name      -name the current table
print     -display the current table
label     -write partition map and label to the disk
quit
partition> Current partition table (original):
Total disk cylinders available: 3880 + 2 (reserved cylinders)
```

4. At the `partition>` prompt, enter the `print` menu option to check the default partition table.

```
partition> print
```

The system displays the default partition table, for example, the table for a 4.2-GB disk could look like the following:

```
Current partition table (original):
Total disk cylinders available: 3880 + 2 (reserved cylinders)

Part       Tag    Flag     Cylinders     Size            Blocks
  0  unassigned    wm       0 -    1      2.11MB      (2/0/0)       43
  1  unassigned    wm       2 - 3879     3.99GB     (3878/0/0)   83764
  2      backup    wm       0 - 3879     4.00GB     (3880/0/0)   83808
  3  unassigned    wm       0            0          (0/0/0)
  4  unassigned    wm       0            0          (0/0/0)
  5  unassigned    wm       0            0          (0/0/0)
  6  unassigned    wm       0            0          (0/0/0)
  7  unassigned    wm       0            0          (0/0/0)
```

You may have to set up the partitions on the disks you added.

5. At the `partition>` prompt, enter `0`.

```
partition> 0
```

   The system responds as follows:

```
Enter partition id tag [unassigned]:
```

6. Enter un for unassigned.

   The system responds as follows:

```
Enter partition permission flags [wm]:
```

7. Press Enter to accept the default `wm`. This indicates that the partition is writable and mountable.

   The system responds as follows:

```
Enter new starting cyl [0]:
```

8. Press Enter to accept `0` as the starting cylinder. The system responds as follows:

```
Enter partition size [205632b, 204c, 100.41mb]:
```

9. Enter 2c for the size of the partition.

   The system responds with the `partition>` prompt.

10. At the `partition>` prompt, enter `1` as shown below:

```
partition> 1
```

11. Enter un for the partition ID tag, `wm` for the partition permission flags, and 2 as the starting cylinder.

12. Enter the size of the partition which is equal to the full partition size minus 2.
13. At the `partition>` prompt, enter the `print` menu option to verify that the partition table is accurate.

```
partition> print
```

NOTE:

If partitions 3 through 7 have cylinders assigned, zero them out. **Do not** zero out partition 2, leave it as the whole disk.

14. At the `partition>` prompt, enter the `label` menu option.

```
partition> label
```

15. To label the disk, enter y at the message prompt.

```
partition> label
Ready to label disk, continue: y
```

The system responds as follows:

```
partition>
```

16. Exit the partition menu by entering q at the `partition>` prompt and q at the `format>` prompt. The system prompt returns as shown below:

```
partition> q
format > q
#
```

NOTE:

If you added more than one disk drive to your system, repeat steps 1 through 15 for each drive.

17. If cms is running, stop it by running `cmsadm` and executing the `run_cms` option as follows:

```
# cmsadm
Lucent Technologies CentreVu(TM) Call Management System
Select a command from the list below.
  1) acd_create  Define a new ACD
  2) acd_remove  Remove all administration and data for an A
  3) backup      Filesystem backup
  4) diskmap     Estimate disk requirements
  5) memory      Estimate memory requirements
  6) realtime    Estimate real-time report refresh rate
  7) pkg_install Install a feature package
  8) pkg_remove  Remove a feature package
  9) run_cms     Turn CentreVu on or off
Enter choice (1-9) or q to quit: 9

Select one of the following
1) Turn on CMS
2) Turn off CMS
Enter choice (1-2): 2

*** Turning off CMS, Please wait ***
.  .  .
*** CMS is now off
#
```

NOTE:

It is important that CMS be turned off for the remaining steps. If it is on, anyone trying to write to the filesystem will receive multiple error messages.

18. Determine the current size of the /cms file system. You can do that by entering a `df -k` command. The system responds by listing the current file systems. For example:

```
# df  -k  /cms

Filesystem           kbytes    used   avail  capacity Mounted on
/dev/dsk/c0t3d0s0    xxxxxx  310956  xxxxxx       45%  /
/proc                     0       0       0        0%  /proc
fd                        0       0       0        0%  /dev/fd
/dev/md/dsk/d19      xxxxxx       9  xxxxxx        0%  /cms

#
```

The operative figures are the "`kbytes`" and "`available`" figures for the `/` and `/cms` file systems, shown here as "`xxxxxx`." Divide each of those numbers by 1000, and record the results. You will use them later to verify that the figures have increased as a result of adding a disk drive.

19. Check disk partitioning by entering the following commands:

```
# export  PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds
# olds  -check_disks cxtydz
      .
      .
#
```

where c*x*t*y*d*z* is the device name of the disk you added.

20. Create a new md.tab file by entering the following commands:

```
# olds  -metadbs
# olds  -mk_files  /dev/dsk/cxtydz
      .
      .
      .
#
```

When the system prompt reappears, check to make sure that all the disk drives on your system have been recognized.

To do that, read the file `/olds/md.tab.new` into an editor such as VI. Find the `#/cms` section; it should reflect the precise number of disk drives on your system.

The following example shows three disk drives on the system:

```
# vi /olds/md.tab.new

<contents of the file is displayed>

   .
   .
   .
#/cms
d19 3 1 /dev/dsk/c0t1d0s1 1 /dev/dsk/c0t3d0s3 1 /dev/dsk/c0t2d0s1
```

If the file reflects the precise number of drives on your system, go directly to step 21 on page 2-14.

If the number of drives is incorrect, complete steps a through h as follows:

a. Reboot the system with an `init 0` command. The system reboots and displays the ok prompt as follows:

```
# init 0
    .
    .
    .
ok
```

b. Do the following in sequential order:
   1. Turn off the system unit.
   2. Turn off the system monitor.
   3. Turn off all external devices starting with the device closest to the system unit and working toward the farthest device.

c. Check all disk drive connections to make certain they are secure. Also check the SCSI IDs on the disk drives to make sure no two drives have the same IDs.

d. Turn on the power to the system units in the opposite order in which you powered them off.

When you power on the system unit, the system begins to boot. Interrupt the boot by entering Stop A. The system responds as follows:

```
ok
```

CAUTION:

If you are on a *Sun Enterprise* 3000 system, see Chapter 3, *Enterprise* 3000 Troubleshooting, "Probe-SCSI Command Problem" section before executing the next command.

e. To verify that the system sees all SCSI devices, including the new disk drive, enter the following command:

```
ok probe-scsi-all
```

The system responds as follows:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
    .
    .
    .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

f. When you have verified that the system is recognizing all its disk drives, enter the following command:

```
ok boot -r
```

The system responds as follows:

```
Boot device ...
   .
   .
   .
Configuring the /dev directory
   .
   .
   .
/dev/rdsk/c0t1d0s1 mounted
   .
   .

hostname console login:
```

g. Log in as root, and press **Enter**. The system displays the last login on the console (same date and time) and returns you to the system prompt. For example:

```
Sun Microsystems Inc. SunOS 5.2 Generic November 1995
#
```

h. Repeat steps 19 and 20 until all the disk drives have been recognized.

21. Attach the new disk and grow the /cms file system by running the olds script as follows:

```
# /olds/olds  -setup  /dev/rdsk/cxtydz
```

where c*x*t*y*d*z* is the device name of the disk you added.

The system responds with a series of system messages reflecting the disk drive setup process, eventually reporting success. For example:

```
valid disks are <device>
    .
    .
    .
super-block backups (for fsck -F ufs -o b=#) at:
32, 16240, 32448, 48656, 64864, 81072, 97280, 113488,
     .
     .
     .
1854992, 1871200, 1887408, 1903616, 1919824, 1936032

re-adding swap files

Success, activating or growing /cms metadevice.
#
```

22. Check to make sure that the new disk was indeed attached. You can do that by executing a `df -k` command on the /cms file system, and doing some quick math on the result. For example:

```
# df  -k  /cms

Filesystem          kbytes used availcapacityMounted on
/dev/dsk/c0t3d0s0   xxxxxx310956xxxxxx45% /
/proc               0     0 0      0%   /proc
fd                  0     0 0      0% /dev/fd
/dev/md/dsk/d19     xxxxxx9xxxxxx0%    /cms

#
```

The `/` and `/cms` “`kbytes`” and “`avail`” figures (shown here as “`xxxxxx`”) are the critical numbers. Divide each one by 1000 to determine the size, in megabytes, of your newly expanded disk drive system. Compare these new numbers to the ones you recorded in step Step 18.

The numbers should have increased as the result of adding the disk drives.

23. Finish the procedure by rebooting the system:

```
# init  6
```

24. Start CMS (type a `cmssvc` or `cmsadm` command, and select the `Run CMS` option).

Add Memory

Overview

This section describes the procedures use to add more memory to a *Sun Enterprise* 3000 system that is already up and running.

Prepare the System

NOTE:

You need to perform a CMSADM backup before continuing. Refer to the *CentreVu* Call Management System, Release 3 Version 6, Admininstarion document (Volumes 1 and 2), 585-215-850 for details.

1. Enter the `prtconf` command, and record the displayed memory size as follows:

```
# prtconf | grep Memory

Memory size: xx Megabytes
```

2. Make sure the system is in the firmware mode by using the `init 0` command to get to the `ok` prompt.
3. Do the following in sequential order:
   a. Turn off the *Sun Enterprise* 3000 system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun Enterprise* 3000 system and working toward the farthest device.

Install the Single In-line Memory Modules (SIMMs)

Install the SIMMs into the *Sun Enterprise* 3000 system using the procedures described in *CentreVu Call Management System Release 3 Version 6, Sun Enterprise 3000 System Hardware Installation* (585-215-867) document for more information on installing SIMMs.

Restart the System

1. Do the following in sequential order:
   a. Turn on devices attached to the *Sun Enterprise* 3000 system starting with the most distant device and working toward the computer.
   b. Turn on the *Sun Enterprise* 3000 system.
   c. Turn on the system monitor.
2. Boot the system.

```
ok boot -r
```

3. After the machine is booted, log in as root.
4. Enter the `prtconf` command.

```
# prtconf | grep Memory

Memory size: xx Megabytes
```

5. Verify that the displayed memory size is correct (compare with value recorded in Step 1). If not, see *CentreVu Call Management System Release 3 Version 6, Sun Enterprise 3000 System Hardware Installation* (585-215-867) document for more information.

Add, Remove, or Replace Tape Drives

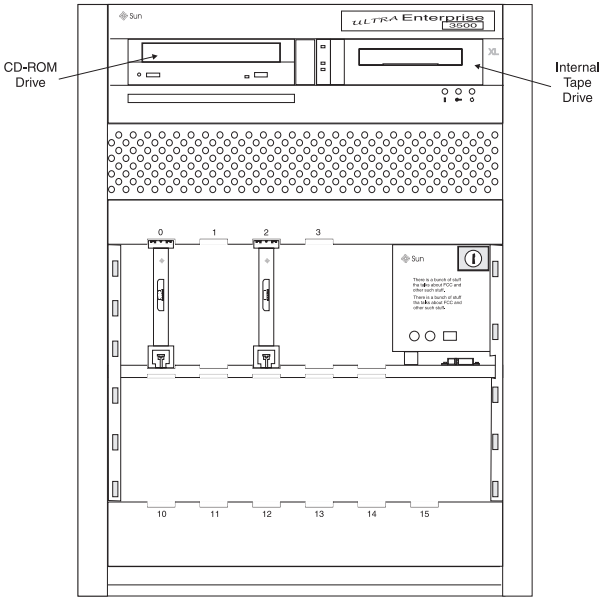
Overview

This section describes how to replace the internal tape drive and how to add and remove an external tape drive from an existing system. External SCSI devices are not generally supported on the *Sun Enterprise* 3000 system. The only exception is for migration purposes. For migration purposes, connect the external SCSI tape drive, perform the migration, and then remove the external SCSI tape drive.

Replace the Internal Tape Drive

The basic configuration for the *Sun Enterprise* 3000 system equipped for CMS application includes a 14-GB internal tape drive. This tape drive is installed in the right hand side of the SCSI tray which mounts from the front of the system (see the following figure).

Front View of the *Sun Enterprise* 3000 System



Procedure

To replace a tape drive in the SCSI tray:

1. Remove the front bezel

   NOTE:

   It may be necessary to apply pressure to release the front bezel anchor pins. To do this, place your thumbs against the face of the SCSI tray installed units and press in with your thumbs while pulling out with your fingers.

2. Loosen the two captive screws.

   CAUTION:

   When loosening or tightening the captive screws, use your thumb and fingers only. The shaft of these screws is thin and can easily be broken if too much pressure is applied.

3. Remove the SCSI tray with any installed devices.
4. Remove seven screws on top of the tray and remove the top panel.
5. Remove the old tape drive:
   a. Loosen the three captive screws securing the tape drive to the tray.
   b. Remove the mounting plate from the old tape drive and attach it to the new tape drive using the same screws.
   c. Set the SCSI address to 5.
   d. Secure the tape drive with the mounting bracket to the SCSI tray using the three captive screws.
6. Reverse Steps 1 through 4.

Add an External Tape Drive

This procedure is use only as a temporary measure during the migration process.

When adding an external tape drive to an existing system, do the following:

- Remove existing SCSI device files (to prepare for new SCSI hardware configuration).
- Install an FSBE card.
- Set the SCSI device ID(s).
- Connect the tape drive(s) to the FSBE card.
- Reboot and reconfigure the system.

Procedures

To remove SCSI device files, do the following:

1. Enter the following command:

```
# rm /dev/rmt/*
```

   If you do not remove the device files before rebooting the system, the SCSI device files may not match the hardware configuration.

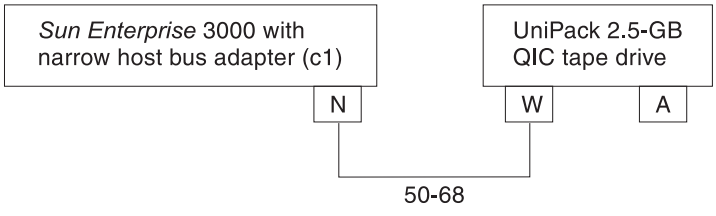
2. Shut the system down using the following command:

```
# init 0
```

3. Do the following in sequential order:
   a. Turn off the *Sun Enterprise* 3000 system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun Enterprise* 3000 system and working toward the farthest device.
4. Install an FSBE card on the SBus I/O board. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for information.
5. Set the SCSI ID to 4.
6. Connect the tape drive to the FSBE card.

Connect the SCSI cable between the FSBE card to the in-connector on the back of the device. The following figure shows the SCSI cabling scheme.

SCSI Cabling Scheme



W= 68-pin wide SCSI III bus connection
N = 50-pin narrow SCSI II bus connection
A = Auto-terminated

7. Connect the power cord from the tape drive to a power source.

   The power-on diagnostics will occur when the computer is turned on.

   While the system is booting up, enter the OpenBoot environment by doing the following:

8. Press the Stop and A keys simultaneously after the display console banner appears but before the system starts booting the operating system.

   CAUTION:

   See Chapter 3, *Enterprise* 3000 Troubleshooting, "Probe-SCSI Command Problem" section before executing this command.

   After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

9. Enter the following command and verify that the system recognizes the SCSI devices:

CAUTION:

See Chapter 3, *Enterprise* 3000 Troubleshooting, "Probe-SCSI Command Problem" section before executing this command.

```
ok probe-scsi-all
```

The system responds as follows:

```
/sbus@3,0/sunw,fas@3,8800000
Target 0
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991


. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok /sbus@2,0/sunw,fas@3,8800000
```

The actual response (devices listed) depends on the devices installed on the SCSI bus.

10. Enter the following command to reboot the system and reconfigure the devices.

```
ok boot -r
```

Remove the External Tape Drive

When removing the external tape drive from an existing system, you need to do the following:

- Remove SCSI device files (to prepare for new SCSI hardware configuration).
- Remove the SCSI tape drive.
- Remove the FSBE card.
- Reboot and reconfigure the system.

Remove SCSI Device Files

To remove SCSI device files, enter the following command:

```
# rm /dev/rmt/*
```

NOTE:

If you do not remove the device files before rebooting the system, the SCSI device files may not match the hardware configuration.

Remove the SCSI Tape Drive

To remove the SCSI tape drive, do the following:

1. Shut the system down using the following command:

```
# /usr/sbin/shutdown -i0 -g0 -y
```

2. Do the following in sequential order:
   a. Turn off the *Sun Enterprise* 3000 system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun Enterprise* 3000 system and working toward the farthest device.
3. Remove the tape drive from the FSBE card.

Remove the FSBE Card

Remove the FSBE card from the SBus I/O board using the procedures given in *CentreVu Call Management System Release 3 Version 6 Sun Enterprise 3000 System Hardware Installation* (585-215-867) document.

Reboot and Reconfigure the System

To reboot and reconfigure the system, do the following:

1. Disconnect the tape drive power cord from the power source.
2. Do the following in sequential order:
   a. Turn on the *Sun Enterprise* 3000 system.
   b. Turn on the system monitor.

   The power-on diagnostics will occur when the computer is turned on.

   While the system is booting up, enter the OpenBoot environment by doing the following:
3. Press the **Stop** and **A** keys simultaneously after the display console banner appears but before the system starts booting the operating system.

   After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

4. Enter the following command, and verify that the system recognizes the SCSI devices.

   CAUTION:

   See Chapter 3, *Enterprise* 3000 Troubleshooting, "Probe-SCSI Command Problem" section before executing this command.

```
ok probe-scsi-all
```

The system responds as follows:

```
/sbus@3,0/sunw,fas@3,8800000
Target 0
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991



. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok /sbus@2,0/sunw,fas@3,8800000
```

The actual response (devices listed) depends on the devices installed on the SCSI bus.

5. Enter the following command to reboot the system and reconfigure the devices:

```
ok boot -r
```

Replace the Clock Board

Overview

This procedure applies only to the *Sun Enterprise* 3000 System platform. This operation should be performed by or with the assistance of a Sun Microsystems Inc. technician.

Procedure

1. Remove the faulty clock board. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for more details.
2. Remove the Non-Volatile Random Access Memory (NVRAM) chip from the old Clock Board and insert it into the new Clock Board.
3. Install the new Clock Board in the system. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for more details.
4. If this does not solve the problem, you need to replace the NVRAM chip.
5. If X.25 is installed, you will need to call Sun Microsystems Inc. and obtain a new X.25 licence.

Replace the Non-Volatile Random Access Memory (NVRAM)

If the NVRAM needs to be replaced, use the following procedure to insure that the boot device is set correctly.

1. Use the `eeprom` command to check that the new NVRAM has the boot device set correctly. The result should look like the following:

```
# eeprom | grep boot-device
  boot-device=disk diskbrd diskisp disksoc net
```

2. The first device must be `disk` to boot off the local disk. If this is not the case, enter the following command:

```
# eeprom boot-device=disk
```

If the system will not boot and reports that it is trying to boot up from the network, you can fix the problem from the ok> prompt using the `printenv` and `setenv` commands.

3. First enter the `printenv` command as shown below:

```
ok> printenv boot-device
```

4. Check the first parameter. If it is not disk, change it using the `setenv` command as shown below:

```
ok> setenv boot-device disk
```

Enterprise 3000 Troubleshooting

Overview

This chapter contains troubleshooting information about the *Sun** *Enterprise*† 3000 System and the *CentreVu*® Call Management System (CMS R3V8) application. Additional troubleshooting procedures can be found in *CentreVu* CMS Terminals, Printers, and Modems (585-215-874) and *CentreVu* CMS Switch Connections and Administration (585-215-876).

You should use the information to clear problems that may arise during and after the *CentreVu* CMS installation.

The following list outlines the sections in this chapter:

- Solving Hardware-Related Problems
- Solving Power-Related Problems
- Solving Clock Synchronization Problems.

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†*Enterprise* is a trademark of Sun Microsystems, Inc.

Solving Hardware-Related Problems

Overview

This section describes how to solve the most common system hardware problems that may arise before or after the installation of the *CentreVu* CMS software.

Hardware Diagnostic Tools and Resources

The remote maintenance person has four tools/resources that do hardware diagnostics:

- OpenBoot Firmware (requires console redirection [see Redirect the Remote Console Using Solaris Operating System as described on page 3-12])
- Power on self test (POST) messages during a reboot (requires console redirection)
- *Sun* Validation Test Suite (VTS)
- Error logs (do not require console redirection).

OpenBoot Firmware

The OpenBoot firmware serves two purposes:

- Boots the operating system from either a mass storage device or from a network
- Provides extensive features for testing hardware and software interactively.

Using OpenBoot Firmware

To use OpenBoot Firmware, do the following steps:

1. Do **one** of the following to enter the OpenBoot environment:
   - Stop the operating system with either the *Solaris** `/usr/sbin/shutdown -y -i0 -g0 command` (preferred method) or the command sequence:
     a. Turn off CMS
     b. At the prompt enter `sync` Enter
     c. Now do `halt` Enter.
   - Press the Stop and A keys simultaneously on the keyboard while *Solaris* is running.

**Solaris* is a registered trademark of Sun Microsystems, Inc.

CAUTION:

Using the Stop and A keys simultaneously while *Solaris* is running breaks the execution of the operating system and should be used with caution. Use this key combination as a last resort if the previous method fails.

- Power off and power on the *Sun Enterprise* 3000 system. Press the Stop and A keys simultaneously on the keyboard after the display console banner appears but before the system starts booting the operating system (referred to as power-cycling the system)

CAUTION:

Use this method **only** if the previous methods fail to work.

After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

2. At the `ok` prompt, enter `help` for a list of available commands, or see the table on the following page for a summary of some of the OpenBoot firmware test commands.

Additional Reference

Additional information about the OpenBoot firmware is available by contacting the Technical Service Center (TSC).

Test Command	Description	
probe-scsi	Identifies the devices attached to the built-in SCSI bus. Note: If you are using a *Sun Enterprise* 3000, see Probe-SCSI Command Problem as described on page 3-7 for procedures used with the `probe-scsi` and `probe-scsi-all` commands.	
probe-scsi-all [device-path]	The same command as the probe-scsi command, except it includes all SCSI buses installed in the system below the specified device tree node. If the device path is absent, the root node is used.	
test [Alias]	This command executes the specified device's self-test method. Possible values for device-specifier are listed in the **Alias** column below:	
	Alias	**Description**
	memory	memory
	cdrom	cdrom
	tape1	14-GB for the *Sun Enterprise* 3000 system or QIC 2.5-GB or 4-8 GB SLR* for *SPARCserver* platforms
	tape2	QIC 2.5-GB or 4-8 GB SLR
	disk	disk1
	disk1	disk1
	disk2	disk2
	floppy	floppy
	Note: If you need to test additional devices that do not have an alias, use the test-all command.	
test-all [device-specifier]	This command tests all of the devices that have built-in self-test methods below the specified device tree node. If <device-specifier> is absent, the root node is used.	
watch-clock	This command tests the clock function.	
eject [device-specifier]	This command ejects **either** the floppy or cdrom devices.	

*The 4-8 GB SLR tape drive replaces the QIC 2.5-GB tape drive which is no longer available for new systems.

POST Messages Diagnostics

Procedure

To use the Power On Self Test (POST) messages (during a reboot) to diagnose remote hardware problems, do the following steps:

1. At the ok> prompt, enter the following command to boot your system:

```
ok> boot
```

2. Scan the displayed messages on the screen. Watch for error messages.

System Fails to Boot Properly

This section discusses some common reasons why your system fails to boot properly and provides some corrective procedures.

Power-On Initialization Sequence

You can identify problems more accurately if you are familiar with the system power-on initialization messages. These messages show you the types of functions the system performs at various stages of system start-up. These messages can also show the transfer of control from OpenBoot firmware to POST.

Procedures

The following table describes the OpenBoot initialization command sequences provided by the *Sun Enterprise* 3000 system. These commands are useful in some boot-failure situations. To use the commands, hold down the keys after turning on the power to your system. Keep the keys pressed until the keyboard lights flash and the screen displays the firmware (ok>) prompt.

Keyboard Commands

Command	Description
`Stop`	Bypass POST. This command does not depend on the security-mode. (Note: some systems bypass POST as a default; in such cases, use the **Stop** and **A** key combination to start POST.)
`Stop-A`	Abort.
`Stop-D`	Enter diagnostic mode (set `diag-switch?` to `true`).
`Stop-F`	Enter Forth on TTYA instead of probing. Use `exit` to continue with the initialization sequence. This is useful if hardware is broken.
`Stop-N`	Reset NVRAM contents to default values.

Preserving Data After a System Crash

Enter the Prom monitor (OpenBoot) `sync` command at the `ok>` prompt to force any information on its way to the hard disk to be written out immediately. This is useful if the operating system has crashed or has been interrupted before preserving all data.

The `sync` command returns control to the operating system and performs the data saving operations. After the disk data has been synchronized, the operating system begins to save a core image of itself. If you do not need this core dump, you can interrupt the operation using the **Stop** and **A** key sequence.

System Will Not Boot from Disk

Problem: You are booting from a disk, and the system fails with the following message:

```
The file just loaded does not appear to be executable.
```

Solution: The boot block is missing or corrupted. Reinstall the *Solaris* operating system, and restore all of the data.

Problem: You are booting from a disk, and the system fails with the following message:

```
The file just loaded does not appear to be executable.
```

Solution: The disk may be powered down (especially if it is an external disk). Turn on the power to the disk, and make sure the SCSI cable is connected to the disk and the system.

Probe-SCSI Command Problem

Problem: When using the "`probe-scsi`" or "`probe-scsi-all`" command, users may get the following message

> "`This command may hang the system if a Stop-A or halt command has been executed. Please type reset-all to reset the system before executing this command. Do you wish to continue [Y/N].`"

The appropriate user response is not intuitively obvious.

Solution:

Do Not continue. Instead, do the following:

1. Type “n” so that the `probe-scsi` does not continue.
2. Type “`setenv auto-boot? false`”

   Otherwise, when you do run the `reset-all` command the machine automatically reboots instead of leaving you at the `OK` prompt.
3. Type “`reset-all`”

   This may take a minute or so to complete.
4. Now it is all right to execute “`probe-scsi`” or “`probe-scsi-all`” and perform any other boot prom level diagnostics.
5. Before booting up the machine, be sure reset the system to “`setenv auto-boot? true`”

   Failure to do this will cause the reboot commands to stop at the boot prompt instead of proceeding through the normal boot-up.

SCSI Problems

Problem: Your system has more than one disk installed, and you get SCSI-related errors.

Solution:

1. To quickly check the SCSI-related errors, enter the following command:

```
ok probe-scsi-all
```

The program responds:

```
/sbus@3,0/sunw,fas@3,8800000
Target 0
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991


. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

/sbus@2,0/sunw,fas@3,8800000
ok
```

NOTE:

The actual response (devices listed) depends on the devices installed on the SCSI bus.

2. Fix any obvious errors.

Your system might have duplicate SCSI target number settings on one bus. Try the following procedure:

NOTE:

Two targets may have the same target number if they are on different SCSI busses.

1. Unplug all but one of the disks.
2. At the ok prompt, enter:

```
ok probe-scsi-all
```

CAUTION:

See Probe-SCSI Command Problem as described on page 3-7 before executing this command.

NOTE:

Use the target number and its corresponding unit number.

3. Plug in another disk, and perform Step 2 again.
4. If you get an error, change the target number of this disk to one of the unused target numbers.
5. Repeat Steps 2-4 until all the disks are plugged back in.

Blank Screen — No Output

Problem: The local monitor is blank.

Solutions:

1. Check to see if the machine is in the process of booting up; the screen goes blank during initialization and stays blank for a few minutes. This is especially true if the system is being booted to a remote console.
2. Find out if the console is remoted and the remote user is in the OpenBoot mode. Check the lights on the modem to indicate if someone might be dialed-in.
3. If all else fails, power-down and immediately hold down the Stop and N keys until something appears on the screen. Hold the keys down for at least a minute. If the machine is functioning properly, this forces the console to be local. Take a look at the keyboard — look for flashing green lights on the keys.
4. If nothing is seen after a minute or so, there is probably a hardware failure. Do the following:
    a. Check to make sure the keyboard is attached. If the keyboard is unplugged, the output goes to TTYA instead. To fix this problem, power down the system and do the following in sequential order:
        1. Turn off the *Sun Enterprise* 3000 system.
        2. Turn off the system monitor.
        3. Turn off all external devices starting with the device closest to the *Sun Enterprise* 3000 system and working toward the farthest device.
    b. Plug in the keyboard, and power on again by using the following sequence:
        1. Turn on devices attached to the *Sun Enterprise* 3000 system starting with the device at the end of the SCSI chain and working toward the system.

2. Turn on the *Sun Enterprise* 3000 system.
3. Turn on the system monitor.

c. Check to make sure the monitor is turned on and plugged in. Check the power cable on the monitor. Make sure the monitor cable is plugged into the system frame buffer; then, turn the monitor on.

d. See if the `output-device` is set to TTYA. This means that the NVRAM parameter `output-device` is set to `ttya` instead of being set to `screen`. You can do **one** of the following:

— Power down the system (using the preceding steps). Then, turn it on (using the proceeding steps), and immediately press the Stop and N keys. This sets all NVRAM parameters to their default values. As a result, the `output-device` parameter is set to `screen`.

WARNING:

In addition, all previous nondefault settings are reset to their default values. You must restore the settings as needed. See "Method 2 — From Local Site" in the following section of this chapter to restore the settings.

— Connect a terminal to TTYA, and reset the system. After getting to the `ok` prompt on the terminal, enter `screen output` to send the output to the frame buffer. Use the `setenv` command to change the default display device, if needed.

e. Check to see if the system has multiple frame buffers. If your system has several plugged-in frame buffers, then it is possible that the wrong frame buffer is being used as the console device.

Refer to your system documentation and call the TSC.

Diagnose Problems Using the Remote Console

If your system will not boot, the TSC personnel could ask you to redirect the remote console to identify a problem. You can redirect the remote console using **either** of the following methods:

- Using *Solaris* operating system.
- Using OpenBoot firmware.

Redirect the Remote Console Using *Solaris* Operating System

This section describes how to redirect the console to port A on the *Sun Enterprise* 3000 system using the *Solaris* operating system. Redirecting the console allows the TSC to dial in and do remote maintenance.

WARNING:

The following procedure should not be performed if your terminal does not have the ability to send a “break character”.

Set the Console to Remote

To set the console to the remote, do the following:

1. Dial in (from the remote terminal) to the remote console modem (for example, access port A on the system), and log in as root.
2. Remove the port monitor by entering the following command:

```
# /cms/install/bin/abcadm -r ttya
```

The program responds:

```
ttya is currently set to incoming

Are you sure you want to remove it?
```

3. Enter y. The program responds:

```
ttya administration removed
```

4. Redirect the console to port A (remote console) by entering the following commands:

```
# /cms/install/bin/abcadm -c -b 9600 ttya
```

The program responds:

```
This change requires a reboot to take affect

Are you ready to reboot? [y,n,?]
```

5. Press Y. The system will automatically reboot, and port A will come up as the console.

   As the system reboots, the shutting down messages will appear on the *Sun Enterprise* 3000 system monitor. When the system starts to come back up, the *Sun Enterprise* 3000 system monitor should go blank, and the system boot diagnostics should appear on the remote console terminal. After the system reboots, a `console login:` prompt should appear on the remote console terminal.

6. Log into the remote console as root.

   NOTE:

   At this time, an *Openwindows** login window will appear on the *Sun Enterprise* 3000 system monitor.

To set the console to local, do the following:

1. Redirect the console back to the local console by entering the following command:

```
# /cms/install/bin/abcadm -c local
```

The program responds:

```
Console set to local

This change requires a reboot to take affect

Are you ready to reboot? [y,n,?]
```

**Openwindows* is a trademark of Sun Microsystems, Inc.

2. Press Y.

   The program responds:

```
Starting port monitor.
Setting console parameters.
Proceeding to reboot.
```

3. The system will automatically reboot, and port A will come up as the dial in. A `login:` prompt appears.

   As the system reboots, the shutting down reset and rebooting messages will appear on the remote console monitor. When the system starts to come back up, the system boot diagnostics should appear on the system monitor. After the system reboots, a login prompt should appear on the system monitor.

4. Log into the local console as root.

   See the hardware installation document for your platform, describing factory installation procedures, for more information about setting the remote console modem options, connecting the remote console to the platform, and administering the remote console ports.

Redirect the Remote Console Using OpenBoot commands

Use the OpenBoot mode to redirect port A (remote console port) on the *Sun Enterprise* 3000 system when the *Solaris* method does not work (typically because the system will not boot).

To redirect the local console to the remote console from the OpenBoot environment (prompt is `ok>`), do the following steps:

Enter the OpenBoot environment (prompt is `ok>`) in **one** of the following ways:

- If in the *Solaris* environment, halt the operating system with the *Solaris* `halt` command.
- If in the *Solaris* environment and the `halt` command does not work (for example, the system is hung up), press the Stop and A keys simultaneously.

  CAUTION:

  The Stop and A key combination abruptly breaks the execution of the operating system and should be used with caution.

- If the above methods fail, press the Stop and A keys simultaneously after the display console banner appears but before the system starts booting the operating system.

To redirect the console to remote from the OpenBoot environment (prompt is ok>), perform the following steps:

1. To display a list of the current parameter settings on your system, enter the following command:

```
ok> printenv
```

   The system responds:

```
Parameter Name        Value          Default Value
output-device         screen         screen
input-device          keyboard       keyboard
   .
   .
   .
```

2. At the ok> prompt, enter the `setenv` command to set the configuration parameters. Set the parameters to the values specified. (See the following table.) For example:

```
ok>setenv output-device ttya
```

   The system responds:

```
output device=ttya
```

Parameter Commands

Parameter	Values
output-device	ttya
input-device	ttya
ttya-rts-dtr-off	true
ttya-ignore-cd	true
ttya-mode	9600,8,n,1,- In this example, the baud rate is 9600. The baud rate should correspond to the setting on the local modem. Typically, a 3830 would call for a setting of 9600, a 3715 would call for a setting of 9600, and an 2400 would call for a setting of 2400.

3. To verify the parameter changes, enter the following command:

```
ok> printenv
```

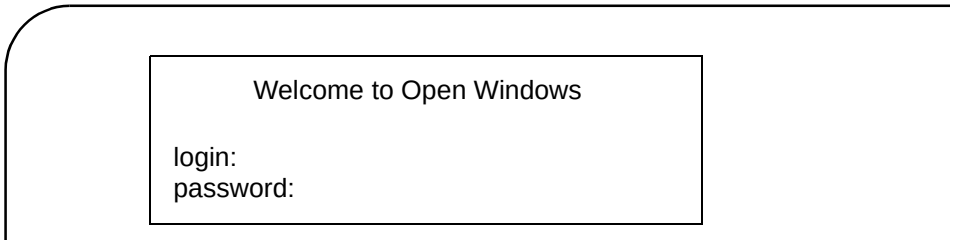
The system responds:

```
Parameter Name        Value          Default Value
output-device         ttya           screen
input-device          ttya           keyboard
   .
   .
   .
```

4. For the changes to take effect, boot the system by entering:

```
ok> boot
```

The system responds on the local console with the XDM login prompt (see the following example) or on the remote console with the console login:



To redirect the remote console to the local console, enter the OpenBoot environment (prompt is `ok>`) in the following way:

- If in the *Solaris* environment, halt the operating system with the *Solaris* `halt` command.

To redirect the remote to the console from the OpenBoot environment (prompt is `ok>`), use one of the following methods:

Method 1 — From the Remote Site (Use this method from the remote site when the *Solaris* method does not work)**.**

1. From the remote console, if not in OpenBoot, get into OpenBoot mode in **one** of the following ways:
   - If in the *Solaris* environment, halt the operating system with the *Solaris* halt command.
   - Power-cycle the machine, and press **Break** from the remote console (requires a local person).
2. To display a list of the current parameter settings on your system, enter the following command:

```
ok> printenv
```

The system responds:

```
Parameter Name        Value          Default Value
output-device         ttya           screen
input-device          ttya           keyboard
   .
   .
   .
```

3. To set the configuration parameters, enter the parameters (see the following table) via the `setenv` command at the `ok>` prompt. For example:

```
ok> setenv output-device ttya
```

Specific Parameter Commands:

Parameter	Values
output-device	screen
input-device	keyboard
ttya-rts-dtr-off	true
ttya-ignore-cd	false

4. To activate the changes, boot the system by entering:

```
ok> reset
```

5. Log into the system as root at the local monitor.

6. From the local monitor, enter the `cms/install/bin/abcadm -k` command to see what is on the `ttya` port. Start a port monitor on the `ttya` port if there is not one already.

```
# /cms/install/bin/abcadm -k
```

7. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abcadm -c -b <baud>ttya
```

   The system responds:

```
answer n to "Do you want to reboot?"
```

8. Press **N**.

Method 2 — From the Local Site (Use this method when the previous OpenBoot method does not work or if you want to switch the console from the local site).

At the local site (when the system is not running *Solaris*), do the following:

1. Power down the machine.
2. Press the **Stop** and **N** keys simultaneously. Continue to press the **Stop** and **N** keys simultaneously until something appears on the screen. The system reboots to the local console.
3. Log into the system as root at the standard interface.
4. From the local monitor, enter the following command to check what is on the `ttya` port:

```
# /cms/install/bin/abcadm -k
```

5. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abcadm -c -b <baud> ttya
```

   The system responds:

```
#
```

6. Enter n in response to the following message:

```
# answer n to "Do you want to reboot?"
```

7. Start a port monitor on ttya.

```
# /cms/install/bin/abcadm -i -b<baud> ttya
```

Single-User Mode and the Remote Console

Prerequisite: You must be logged into the customer's machine through the remote console interface.

To place the system in single-user mode, do the following:

1. At the remote console, enter the following command:

```
# /usr/sbin/shutdown -y -is -g0
```

NOTE:

The system will **not** successfully enter single-user mode if you execute the `shutdown` command from the local console while the console is redirected. When this occurs, the local console will not respond if you try to enter data. The remote console will also be unresponsive.

To recover from the situation described in the previous note, put the system into single-user mode by doing the following:

1. Select a new window on the local console.
2. In the new window, enter the following command:

```
# /usr/sbin/shutdown -y -i0 -g0
```

3. On the remote console, enter the following command at the `ok>` prompt:

```
ok> boot -s
```

Machine Panics

If a machine panic is detected on your system, you must call the TSC (domestic) or remote (international) support personnel. The TSC may request that you deliver the following information on a tape:

- Crash dump from `/var/crash/<hostname>/vmcore.n.`
- Namelist from `/var/crash/<hostname>/unix.n.`
- Output of the `showrev -p` (put the information in a file). See the hardware installation document for your platform, Appendix D, describing factory installation procedures for details.
- Output of the `prtconf -pv` (put the information in a file).
- Possibly output from the `/var/adm/messages` file.

Procedure

To put all the files on one tape, do the following procedures:

1. Log in as root.
2. Change to the `dump` directory by entering the following command:

```
# cd /var/crash/<hostname>
```

3. Verify that *unix.n* and *vmcore.n* are present, and match the date for the crash in question.

4. To retrieve the output from the `showrev -p` buffer, enter the following command:

```
# showrev -p>showrev.out
```

5. Create a `dmesg.out` file:

```
# dmesg>dmesg.out
```

6. To retrieve the output from the prtconf -pv buffer, enter the following command:

```
# prtconf -pv>prtconf.out
```

7. To copy the output from the */var/adm/messages* file, enter the following command:

```
# cp /var/adm/messages messages
```

8. Insert a tape into the default backup tape drive.

9. Enter the following command:

```
# tar cvf <device-name> unix.n vmcore.n dmesg.out showrev.out
prtconf.out messages
```

NOTE:

The letter n represents the number of the crashdump.

The system responds with a list of all of the files.

10. To remove the temporary files, enter the following command:

```
# rm unix.n vmcore.n dmesg.out showrev.out prtconf.out messages
```

NOTE:

The letter n represents the number of the crash dump.

11. Log out of the system.
12. Remove the tape from the disk drive.
13. Send the tape to the TSC.

Keyboard Gets Unplugged

If the console keyboard cable gets unplugged during system operation, the system will continue to run. If the console is reattached to the cable, the system freezes on its current display.

Do the following to correct the problem:

1. Plug in the keyboard. The system responds:

```
ok>
```

2. Enter the following command at the ok> prompt:

```
ok> go
```

The system responds by continuing to run. It was not running during the time between getting the ok> prompt and entering go.

NOTE:

If the system is rebooted, instead of entering go, you may be prompted to use the `fsck` command to repair the *Solaris* file systems.

Solving Power-Related Problems

Overview

This section provides some troubleshooting solutions to power-related problems (for example, when the *CentreVu* CMS *Sun Enterprise* 3000 system loses power). If you cannot solve the power-related problems, escalate the problem through normal procedures.

When System Loses Power

If the *Sun Enterprise* 3000 system loses power, it is recommended (but not required) to empty the CD-ROM and tape drive(s). The system boots from the disk by default.

Turn the Power Back On

To turn the power back *on*, use the following sequence:

1. Turn on devices attached to the *Sun Enterprise* 3000 system.
2. Turn on the *Sun Enterprise* 3000 system.
3. Turn on the system monitor.

If the *Sun Enterprise* 3000 system is operating properly, the monitor displays a banner screen up to 3 minutes after it is powered on.

```
        UE3000 MP (2x390Z55), Keyboard Present
        ROM Rev. 2.12, XX MB memory installed, Serial #XXX
        Ethernet address X:X:YY:Z:BB, Host ID: XXXXXXXX
$
```

Turning the Power Off

The following sequence is recommended to turn off the power:

1. Bring up the `ok` prompt, by entering the following command

```
# shutdown -g0 -i0 -y
```

2. Accept all defaults to the subsequent questions.

   When the `ok` prompt appears on the console, the system can be powered off.

3. Turn off the *Sun Enterprise* 3000 system.

4. Turn off the system monitor.
5. Turn off all external devices starting with the device closest to the *Sun Enterprise* 3000 system and working toward the farthest device.

NOTE:

For more information about restarting the *Sun Enterprise* 3000 system because of a power failure, refer to the user documentation that came with the system.

System Fails to Auto-Boot After Power Failure or When Given Reboot Command

If the system fails to automatically pass the boot prompt (stops at the ok prompt) when the reboot command is given or on a restart from a power failure, a boot environment variable may be set incorrectly.

To correct this problem do the following:

1. At the ok prompt enter `printenv`
2. Scroll until you come to the variable `auto-boot?`

The auto-boot variable should be set to `true`. If not, do the following:

1. Enter the command `setenv auto-boot? true`
2. Enter `boot`

The system should now reboot after a power failure without stopping at the boot prompt.

Solving Clock Synchronization Problems

Overview

Each I/O board has its own clock. These clocks must be synchronized for proper system operation. After removing and replacing an I/O board, the system may experience a clock synchronization problem. That is, the clock on the I/O board will become un-synchronized with the clock on the Clock Board.

Re-Synchronize Clocks

To re-synchronize the clocks, do the following:

1. If CMS is running, turn it off.
2. Go to the boot prompt. You can do that in one of three ways:
   a. You can type `init 0`, or
   b. You can type `/usr/sbin/shutdown -y -g0 -i0`, or
   c. You can press Stop-A while the *Enterprise* is booting, after the *Sun* logo displays
3. Type the following command:

```
copy-clock-tod-to-io-boards
```

4. Boot the machine by typing one of the following commands:

```
boot
      OR
boot -r (to reconfigure for new devices)
```

SPARCserver Maintenance

Overview

This chapter explains how to maintain the *CentreVu®* Call Management System Release 3 Version 8 (R3V8) hardware. Refer to the *Sun*[*] *SPARCserver*[†] computer documentation for additional maintenance information. Also, see the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for software maintenance information.

This chapter discusses the following maintenance procedures:

- Adding SCSI Hard Disk Drives
- Adding Memory
- Adding, Removing, or Replacing Tape Drives
- Identifying Device Entry Names for Ports on the Aurora Expander Box
- Removing Aurora SBus *Multiport*[‡] Software Drivers
- Adding, Removing, or Moving Aurora SBus *Multiport* Cards

Personnel at the Technical Service Center (TSC) will need assistance from an on-site technician or the customer's *CentreVu* CMS administrator to do most of the procedures in this chapter.

**Sun* is a registered trademark of Sun Microsystems, Inc.
†*SPARCserver* is a trademark of SPARC International, Inc.
‡*Multiport* is a trademark of Aurora Technologies, Inc.

Adding SCSI Hard Disk Drives to a System Running *Solstice DiskSuite* 4.2 Software

Overview

The *Solstice DiskSuite* software treats all the hard disks on your system as a single logical disk, allowing the call center data base to grow quite large. All factory-installed R3V8 systems have OLDS; systems upgraded in the field usually will have had OLDS installed only when needed to allow CMS to handle more than 5200 agents.

To add a hard disk drive to a system running *Solstice DiskSuite* software, follow the procedure in this section.

Add SCSI Disks

To add more SCSI disks to a *Sun SPARCserver* computer that runs with *Solstice DiskSuite* software and that is already up and running, perform these steps:

1. Do a CMSADM backup.

   See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.

2. Make sure the system is in firmware mode (use the `init 0` command to get to the `ok` prompt).

3. Do the following in sequential order:

   a. Turn off the system unit.

   b. Turn off the system monitor.

   c. Turn off all external devices starting with the device closest to the system unit and working toward the farthest device.

4. Install the FSBE/S card (if needed) in the next available Sbus slot.

   NOTE:

   You need to install an additional FSBE/S card only when you have reached the limit on the number of disk drives per SCSI controller. That limit is four for systems running *Solstice DiskSuite* software.

5. Attach the new disk drives to the appropriate FSBE/S cards. See the *Sun FSBE/S SBus Card Manual,* or the *CentreVu Call Management System Release 3 Version 6 Sun SPARCserver Computers, Hardware Installation* (585-215-857) document for details.

6. Set the SCSI IDs on the new disk drives such that they do not conflict with devices already on the same SCSI chain. In the case of a normal external disk unit, a rotary switch on the rear of the unit sets the SCSI ID.
7. Turn on the power to the system units, in the opposite order in which you powered them off.

   NOTE:

   Power on the SCSI devices first, starting with the device at the end of the chain and working toward the system unit. Then power on other devices, again working toward the system unit. Then power on the system unit itself and, finally, the system monitor.

   When you power on the system unit, the system begins to boot. Interrupt the boot by entering Stop A. The system responds:

```
ok
```

8. To verify that the system sees all SCSI devices, including the new disk drive, enter the following command:

```
ok probe-scsi-all
```

   The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

NOTE:

The actual devices listed depends on the devices installed on the SCSI bus (see the table below).

SCSI Information for External Disks **(Systems running Solstice DiskSuite Software):**

Device	Disk	Target	Unit	File System
c0t2d0s0	3	2	0	overlap
c0t0d0s0	4	0	0	overlap
c1t1d0s0	5	1	1	overlap
c1t2d0s0	6	2	1	overlap
c1t3d0s0	7	3	1	overlap
c1t4d0s0	8	4	1	overlap
c2t1d0s0	9	1	2	overlap
c2t2d0s0	10	2	2	overlap
c2t3d0s0	11	3	2	overlap
c2t4d0s0	12	4	2	overlap

9. Enter the following command:

```
ok boot -r
```

The system responds:

```
Boot device ...
   .
   .
   .
Configuring the /dev directory
Configuring the /dev directory (compatibility devices)
The system is coming up. Please wait.
checking filesystems
/dev/rdsk/c0t1d0s0:        is clean
/dev/rdsk/c0t0d0s5:        is clean
   .
   .
   .
/dev/rdsk/c0t1d0s1 mounted
/dev/rdsk/c0t0d0s5 mounted
/dev/rdsk/c0t1d0s0 mounted
   .
   .
   .
Starting terminal server network daemons.
Network Terminal Server daemon(s) startup complete.
The system is ready.

hostname console login:
```

10. Log in as root.

    You may now format and partition the disks.

Partition the Disks

CAUTION:

Only **TSC PERSONNEL** should perform the procedures in this section.

To partition the disks, do the following steps:

1. At the system prompt, enter the `format` command:

```
# format
```

The following appears:

NOTE:

Be careful to specify the number that exactly matches the disk you are adding. See the previous table for more information.

```
Searching for disks ... done

AVAILABLE DISK SELECTIONS:
   0.  c0t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
       /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@1,0
   1.  c0t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
       /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@2,0
   2.  c0t0d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
       /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@3,0
   3.  c1t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
       /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@1,0
   4.  c1t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
       /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@2,0
Specify disk (enter its number):
```

2. Enter the number that corresponds to the disk you added.

```
Specify disk (enter its number):
```

The system displays the disk you are adding (for example, `c1t1d0` for disk 5) and the format menu:

```
selecting c1t1d0

FORMAT MENU:
disk
type
partition
current
format
repair
label
analyze
defect
backup
verify
save
inquiry
volname
quit

format>
```

3. At the `format>` prompt, enter the `partition` command.

```
format> partition
```

The program displays a confirmation message and the Partition menu.

```
***Do not format the drive, it is formatted already***

PARTITION MENU:
0         -change ‘0’partition
1         -change ‘1’partition
2         -change ‘2’partition
3         -change ‘3’partition
4         -change ‘4’partition
5         -change ‘5’partition
6         -change ‘6’partition
7         -change ‘7’partition
select    -select a predefined table
modify    -modify a predefined partition table
name      -name the current table
print     -display the current table
label     -write partition map and label to the disk
quit

partition>
```

4. At the `partition>` prompt, enter the `print` menu option to check the default partition table.

```
partition> print
```

The system displays the default partition table. The table for a 2.1-GB disk, for example, could look like this:

```
Current partition table (original):
Total disk cylinders available: 2733 + 2 (reserved cylinders)

Part         Tag      Flag      Cylinders      Size         Blocks
  0    unassigned      wm        0 -    1      1.48MB      (2/0/0)
  1    unassigned      wm        2 - 2732      1.98GB      (2731/0/0)
  2        backup      wm        0 - 2732      1.98GB      (2733/0/0)
  3    unassigned      wm        0             0           (0/0/0)
  4    unassigned      wm        0             0           (0/0/0)
  5    unassigned      wm        0             0           (0/0/0)
  6    unassigned      wm        0             0           (0/0/0)
  7    unassigned      wm        0             0           (0/0/0)
```

You may have to set up the partitions on the external disks you added. The following table lists the partitioning information for the 9.1- GB external disk.

Partitioning Information for External Disks:

			CMS R3V8 4.2-GB Disk SCSI		CMS R3V8 9.1-GB Disk SCSI	
Partitions	**Partition ID Tag**	**Partition Permission Flags**	**Start Cylinders**	**Size (Cylinders)**	**Start Cylinder**	**Size (Cylinders)**
0	unassigned	wm		1023	0	616
1	unassigned	wm	1023	7	616	7
2	backup	wm	0	3880	0	4924
3	unassigned	wm	1030	1079	623	3716
4	swap		2109	971	4339	585
5-7	unassigned			0		0

5. At the `partition>` prompt, enter `0`.

```
partition> 0
```

The system responds:

```
Enter partition id tag [unassigned]:
```

6. Enter un for unassigned.

The system responds:

```
Enter partition permission flags [wm]:
```

7. Enter `wm` to indicate that the partition is writable and mountable.

   The system responds:

```
Enter new starting cyl [0]:
```

8. Enter `0` as the starting cylinder. The system responds:

```
Enter partition size [205632b, 204c, 100.41mb]:
```

9. Enter `2c` for the size of the partition (see the previous table).

   The system responds with the `partition>` prompt.

10. At the `partition>` prompt, enter `1`.

```
partition> 1
```

11. Enter `un` for the partition ID tag, `wm` for the partition permission flags, and `2` as the starting cylinder.

12. Enter the size of the partition which is equal to the full partition size minus 2.

13. At the `partition>` prompt, enter the `print` menu option to verify that the partition table is accurate (see the previous table).

```
partition> print
```

NOTE:

If partitions 3 through 7 have cylinders assigned, zero them out. **Do not** zero out partition 2, leave it as the whole disk.

14. At the `partition>` prompt, enter the `label` menu option.

```
partition> label
```

15. To label the disk, enter y at the message prompt.

```
partition> label
Ready to label disk, continue: y
```

The system responds:

```
partition>
```

16. Exit the partition menu by entering q at the `partition>` prompt and q at the `format>` prompt. The system prompt returns.

```
partition> q
format > q
#
```

NOTE:

If you added more than one disk drive to your system, repeat steps 1 through 15 for each drive.

17. If cms is running, stop it by running `cmsadm` and executing the `run_cms` option:

```
# cmsadm
Lucent Technologies CentreVu(TM) Call Management System
Select a command from the list below.
  1) acd_create  Define a new ACD
  2) acd_remove  Remove all administration and data for an A
  3) backup      Filesystem backup
  4) diskmap     Estimate disk requirements
  5) memory      Estimate memory requirements
  6) realtime    Estimate real-time report refresh rate
  7) pkg_install Install a feature package
  8) pkg_remove  Remove a feature package
  9) run_cms     Turn CentreVu on or off
Enter choice (1-9) or q to quit: 9

Select one of the following
1) Turn on CMS
2) Turn off CMS
Enter choice (1-2): 2

*** Turning off CMS, Please wait ***
.  .  .
*** CMS is now off
#
```

NOTE:

It is important that CMS be turned off for the remaining steps. If it is on, anyone trying to write to the filesystem will receive multiple error messages.

18. Determine the current size of the /cms file system. You can do that by entering a `df -k` command. The system responds by listing the current file systems. For example:

```
# df  -k  /cms

Filesystem           kbytes    used   avail  capacity Mounted on
/dev/dsk/c0t0d0s0    xxxxxx  310956  xxxxxx       45%  /
/proc                     0       0       0        0%  /proc
fd                        0       0       0        0%  /dev/fd
/dev/md/dsk/d19      xxxxxx       9  xxxxxx        0%  /cms

#
```

The operative figures are the “kbytes” and “available” figures for the / and /cms file systems, shown here as “xxxxxx.” Divide each of those numbers by 1000, and record the results. You will use them later to verify that the figures have increased as a result of adding a disk drive.

19. Check disk partitioning by entering the following commands:

```
# export  PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds
# olds  -check_disks cxtydz
      .
      .
#
```

where c*x*t*y*d*z* is the device name of the disk you added. See “SCSI Information for External Disks (Systems running Solstice DiskSuite Software),” on page 4-124 for details about external SCSI disks.

20. Create a new md.tab file by entering the following commands:

```
# olds  -metadbs
# olds  -mk_files  /dev/dsk/cxtydz
      .
      .
      .
#
```

When the system prompt reappears, check to make sure that all the disk drives on your system have been recognized.

To do that, read the file `/olds/md.tab.new` into an editor. Find the `#/cms` section; it should reflect the precise number of disk drives on your system. The example below, for instance, shows three disk drives on the system:

```
# vi /olds/md.tab.new

<contents of the file is displayed>

   .
   .
   .
#/cms
d19 3 1 /dev/dsk/c0t1d0s1 1 /dev/dsk/c0t0d0s3 1 /dev/dsk/c0t2d0s1
```

If the file reflects the precise number of drives on your system, go directly to step 24 on page 4-16.

If the number of drives is incorrect, complete the following steps a through g.

a. Reboot the system with an `init 0` command. The system reboots and displays the ok prompt:

```
# init 0
    .
    .
    .
ok
```

b. Do the following in sequential order:

   1. Turn off the system unit.
   2. Turn off the system monitor.
   3. Turn off all external devices starting with the device closest to the system unit and working toward the farthest device.

c. Check all disk drive connections to make certain they are secure. Also check the SCSI IDs on the disk drives to make sure no two drives on the same SCSI chain have the same IDs. (A normal external disk unit has a rotary switch on the rear of the unit that sets the SCSI I).

d. Turn on the power to the system units in the opposite order in which you powered them off.

   Power on the SCSI devices first, starting with the device at the end of the chain and working toward the system unit. Then power on other devices, again working toward the system unit. Then power on the system unit itself and, finally, the system monitor.

   When you power on the system unit, the system begins to boot. Interrupt the boot by entering Stop A. The system responds:

```
ok
```

e. To verify that the system sees all SCSI devices, including the new disk drive, enter the following command:

```
ok probe-scsi-all
```

   The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
    .
    .
    .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

f. When you have verified that the system is recognizing all its disk drives, enter the following command:

```
ok boot -r
```

The system responds:

```
Boot device ...
    .
    .
    .
Configuring the /dev directory
    .
    .
    .
/dev/rdsk/c0t1d0s1 mounted
    .
    .

hostname console login:
```

g. Log in as root, and press **Enter**. The system displays the last login on the console (same date and time) and returns you to the system prompt. For example:

```
Sun Microsystems Inc. SunOS 5.2 Generic November 1995
#
```

h. Repeat steps 22 and 23.

21. Attach the new disk and grow the /cms file system by running the olds script:

```
# /olds/olds  -setup  /dev/rdsk/cxtydz
```

where c*x*t*y*d*z* is the device name of the disk you added. See “SCSI Information for External Disks (Systems running Solstice DiskSuite Software),” on page 4-124 for details about external SCSI disks.

The system responds with a series of system messages reflecting the disk drive setup process, eventually reporting success. For example:

```
valid disks are <device>
    .
    .
    .
super-block backups (for fsck -F ufs -o b=#) at:
32, 16240, 32448, 48656, 64864, 81072, 97280, 113488,
     .
     .
     .
1854992, 1871200, 1887408, 1903616, 1919824, 1936032

re-adding swap files

Success, activating or growing /cms metadevice.
#
```

22. Check to make sure that the new disk was indeed attached. You can do that by executing a `df -k` command on the /cms file system, and doing some quick math on the result. For example:

```
# df  -k  /cms

Filesystem            kbytes    used   avail  capacity   Mounted on
/dev/dsk/c0t0d0s0     xxxxxx  310956  xxxxxx       45%   /
/proc                      0       0       0        0%   /proc
fd                         0       0       0        0%   /dev/fd
/dev/md/dsk/d19       xxxxxx       9  xxxxxx        0%   /cms

#
```

The / and /cms “kbytes” and “avail” figures (shown here as “xxxxxx”) are the critical numbers. Divide each one by 1000 to determine the size, in megabytes, of your newly expanded disk drive system. Compare these new numbers to the ones you recorded in step Step 18.

23. Finish off the procedure by rebooting the system:

```
# init  6
```

24. Start CMS (type a `cmssvc` or `cmsadm` command, and select the `Run CMS` option).

Adding Memory

Overview

This section describes how to add memory to your *Sun SPARCserver* system.

Adding Additional Memory

NOTE:

You need to perform a CMSADM backup before continuing. Refer to the *CentreVu Call Management System Release 3 Version 8 Administration* (585-210-910) document for details.

To add more memory to a *Sun SPARCserver* computer that is already up and running, do the following:

1. Enter the `prtconf` command, and record the displayed memory size as follows:

```
# prtconf | grep Memory

Memory size: xx Megabytes
```

2. Make sure the system is in the firmware mode by using the `init 0` command to get to the `ok` prompt.
3. Do the following in sequential order:
   a. Turn off the *Sun SPARCserver* computer.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Install the DSIMM into the *Sun SPARCserver* computer.
5. Do the following in sequential order:
   a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Sun SPARCserver* computer.
   c. Turn on the system monitor.

6. Boot the system.

```
ok boot -r
```

7. After the machine is booted, log in as root.
8. Enter the `prtconf` command.

```
# prtconf | grep Memory

Memory size: xx Megabytes
```

Add, Remove, or Replace Tape Drives

Overview

This section describes how to add, remove, or replace tape drives from an existing system.

Add or Replace a Tape Drive

When adding or replacing a tape drive to an existing system, you need to do the following:

- Remove existing SCSI device files (to prepare for new SCSI hardware configuration).
- Set the SCSI device ID(s).
- Connect the tape drive(s) to the SCSI chain.
- Reboot and reconfigure the system.

To remove SCSI device files, do the following:

1. Enter the following command:

```
# rm /dev/rmt/*
```

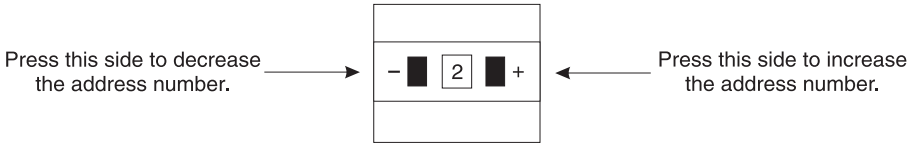
NOTE:

If you do not remove the device files before rebooting the system, the SCSI device files may not match the hardware configuration. If this occurs, repeat Steps 1 through 10.

2. Shut the system down using the following command:

```
# init 0
```

3. Do the following in sequential order:
   a. Turn off the *Sun SPARCserver* computer.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Set the SCSI ID(s) by doing the following:
   a. Locate the target address switch on the rear panel of the SCSI device (see the following figure).



   b. Identify which SCSI ID will be associated with each of the devices on a specific SCSI bus (see the following table).
   c. Press the left or right button on the switch until the appropriate SCSI ID number appears in the window.

Internal SCSI Bus ID Map (c0)

Device	SCSI ID	Node	Location
Base Disk	3	c0t0	Internal
Disk #2	1	c0t1	Internal
4-8 GB SLR Tape Drive*	4	c014	External
2.5-GB QIC UniPack Tape Drive†	4	c0t4	External
5-GB or 14-GB 8mm	5	c0t5	External
CD-ROM	6	c0t6	Internal
Disk #3	2	c0t2	External
Disk #4	0	c0t0	External
SCSI Controller	7	N/A	Internal

*The 4-8 GB SLR Tape Drive is the replacement for the QIC 2.5-GB Tape Drive. These two units are mutually exclusive.
†The QIC 2.5-GB UniPack Tape Drive is no longer available with new systems, however, if the customer has one it can be used.

NOTE:

All systems are shipped with one or more tape drives (QIC-150, QIC 2.5-GB, 4-8 GB SLR, 5-GB, and/or 14-GB). For systems with multiple tape drives, either the QIC-150, 4-8 GB SLR, or the QIC 2.5-GB is the first drive in the SCSI chain.

Valid device names are as follows:

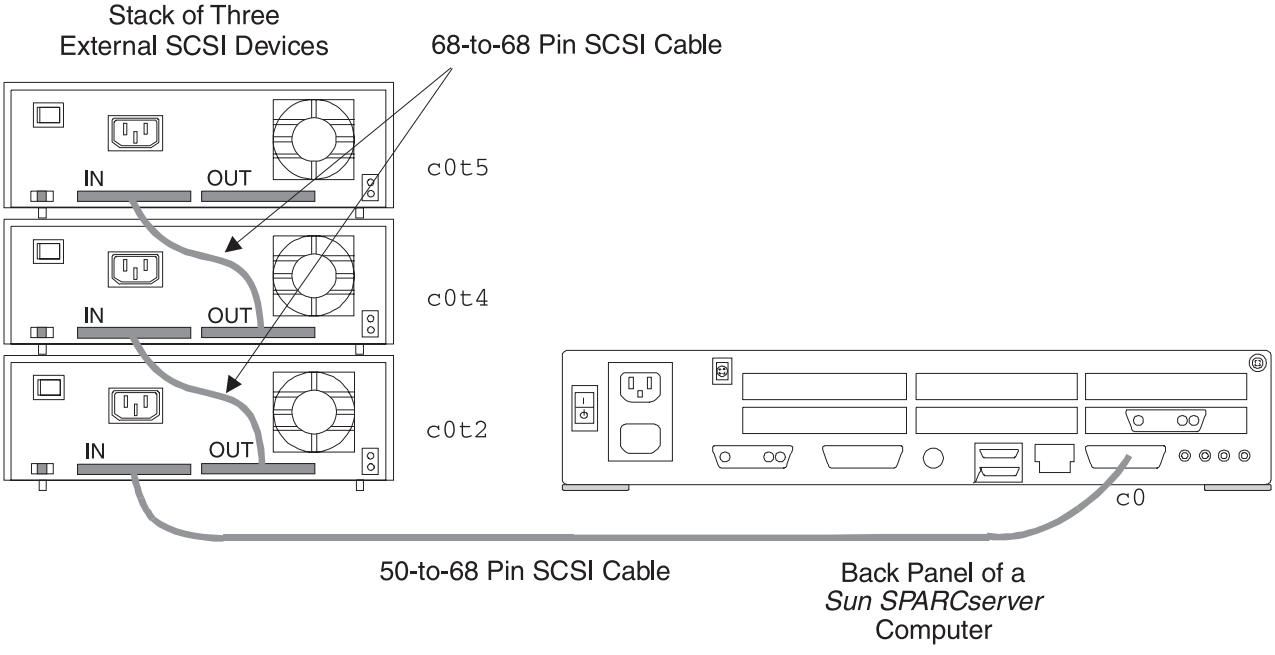
`/dev/rmt/0`	Indicates the tape drive with the lowest target number in the SCSI chain. See “Internal SCSi Bus ID Map (c0),” on page 4-22
`/dev/rmt/1`	Indicates the tape drive with the second lowest target number in the SCSI chain.
`/dev/rmt/0c`	Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB, 4-8GB SLR and the 14-GB tape drives support compressed mode).
`/dev/rmt/1c`	Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB, 4-8GB SLR and the14-GB tape drives support compressed mode).

5. Connect the tape drive to the other SCSI devices.

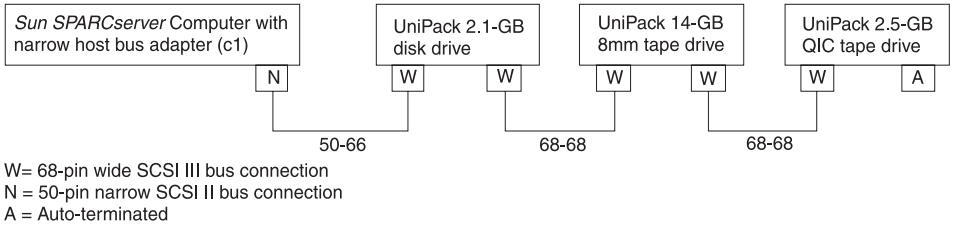
   The following figure shows how to connect a SCSI cable from SCSI port c0 on the back of the *Sun SPARCserver* to the in-connector on the back of the UniPack device that is closest to the *SPARCserver* in the chain. Another SCSI cable is then connected from the out-connector of that device to the in-connector of the next device. You continue this process until all assigned devices are connected in the SCSI chain.

   Since UniPack devices are auto-terminated, the last UniPack device in a SCSI chain does not require a terminator. To verify that the last UniPack device is terminated, check the LEDs on the back panel of the device labeled Auto Term High and Auto Term Low. In a CMS configuration, both LEDs are lit on the last device in the SCSI chain. If a Unipack device in the SCSI chain is not the last device, then neither termination LEDs are lit.

Sample Daisy Chaining of External SCSI Devices



The following figure shows the SCSI cabling scheme when one or more UniPack enclosures are present.



6. Connect the power cord from the tape drive to a power source.
7. Do the following in sequential order:
   a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Sun SPARCserver* computer.
   c. Turn on the system monitor.

The power-on diagnostics will occur when the computer is turned on.

While the system is booting up, enter the OpenBoot environment by doing the following:

8. Press the **Stop** and **A** keys simultaneously after the display console banner appears but before the system starts booting the operating system.

   After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

9. Enter the following command and verify that the system recognizes the SCSI devices:

```
ok probe-scsi-all
```

The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991


. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

NOTE:

The actual response (devices listed) depends on the devices installed on the SCSI bus.

10. Enter the following command to reboot the system and reconfigure the devices.

```
ok boot -r
```

Fix for the UniPack 2.5-GB QIC Tape Drive

When adding a 2.5-GB QIC tape drive to a *CentreVu* CMS system running *Solaris 7* 3/99, it is necessary to edit the `/kernel/drv/st.conf` file so the new tape drive is recognized.

NOTE:

The UniPack 2.5-GB QIC Tape Drive is no longer available for new installations, however, if the customer has one, it can be used. The 2.5-GB QIC Tape Drive has been replaced by the 4-8 GB SLR Tape Drive (also in a UniPack housing).

Do these steps to add the fix for the 2.5-GB QIC tape drive:

1. Log in as root.
2. Edit the `/kernel/drv/st.conf` file by entering the following command:

```
# vi /kernel/drv/st.conf
```

The system responds:

```
<contents of the file is displayed>
   .
   .
   .
```

3. Add the following four lines to the `/kernel/drv/st.conf` file:

```
tape-config-list=
“TANDBERG TDC 4200”, “Tandberg 2.5 Gig QIC”,“TAND-25G-FIXED”;
TAND-25G-FIXED=1,0x37,512,0x867a,1,0x00,0;
TAND-25G-VAR=1,0x37,0,0x867b,1,0x00,0;
```

4. Write and quit the file.

Remove a Tape Drive

When removing a tape drive from an existing system, you need to do the following:

- Remove SCSI device files (to prepare for new SCSI hardware configuration).
- Remove the SCSI tape drive. Reboot and reconfigure the system.

To remove SCSI device files, do the following:

1. Enter the following command:

```
# rm /dev/rmt/*
```

NOTE:

If you do not remove the device files before rebooting the system, the SCSI device files may not match the hardware configuration. If this occurs, repeat Steps 1 through 10.

2. Shut the system down using the following command:

```
# shutdown -i0 -g0 -y
```

3. Do the following in sequential order:
   a. Turn off the *Sun SPARCserver* computer.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Remove the tape drive from the SCSI chain.

5. Disconnect the tape drive power cord from the power source.
6. Reconnect the remaining SCSI devices using the procedures starting on page 4-23.
7. Do the following in sequential order:
   a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Sun SPARCserver* computer.
   c. Turn on the system monitor.

   The power-on diagnostics will occur when the computer is turned on.

   While the system is booting up, enter the OpenBoot environment by doing the following:
8. Press the **Stop** and **A** keys simultaneously after the display console banner appears but before the system starts booting the operating system.

   After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

9. Enter the following command, and verify that the system recognizes the SCSI devices:

```
ok probe-scsi-all
```

The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991


. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

NOTE:

The actual response (devices listed) depends on the devices installed on the SCSI bus.

10. Enter the following command to reboot the system and reconfigure the devices:

```
ok boot -r
```

Identifying Device Entry Names for Ports on the Aurora Expander Box

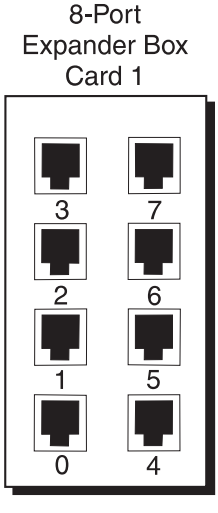
Overview

When the Aurora AURAcs and AURAsio drivers are installed, device entries are created to access the physical ports on the expander box(es).

The device name that is created is `/dev/term/N`, where N is a number. When only one Aurora SBus *Multiport* card is installed, the number matches the number that is printed next to the physical port on the expander box (see the following figure). If there is more than one Aurora SBus *Multiport* card installed, the system will create device names for all 8-port cards first and then create device names for 16-port cards (see the figure on page 4-32). To display the /dev/term devices used by each card, you can use the `/cms/toolsbin/display_ports` command. An output example from the display-ports tool is shown below:

```
Aurora 8 port card in Sbus slot 1:
/dev/term devices: 0 1 2 3 4 5 6 7

Aurora 16 port card in Sbus slot 2:
/dev/term devices: 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
```




```
/dev/term/0 = port 0
/dev/term/1 = port 1
/dev/term/2 = port 2
/dev/term/3 = port 3
/dev/term/4 = port 4
/dev/term/5 = port 5
/dev/term/6 = port 6
/dev/term/7 = port 7
```

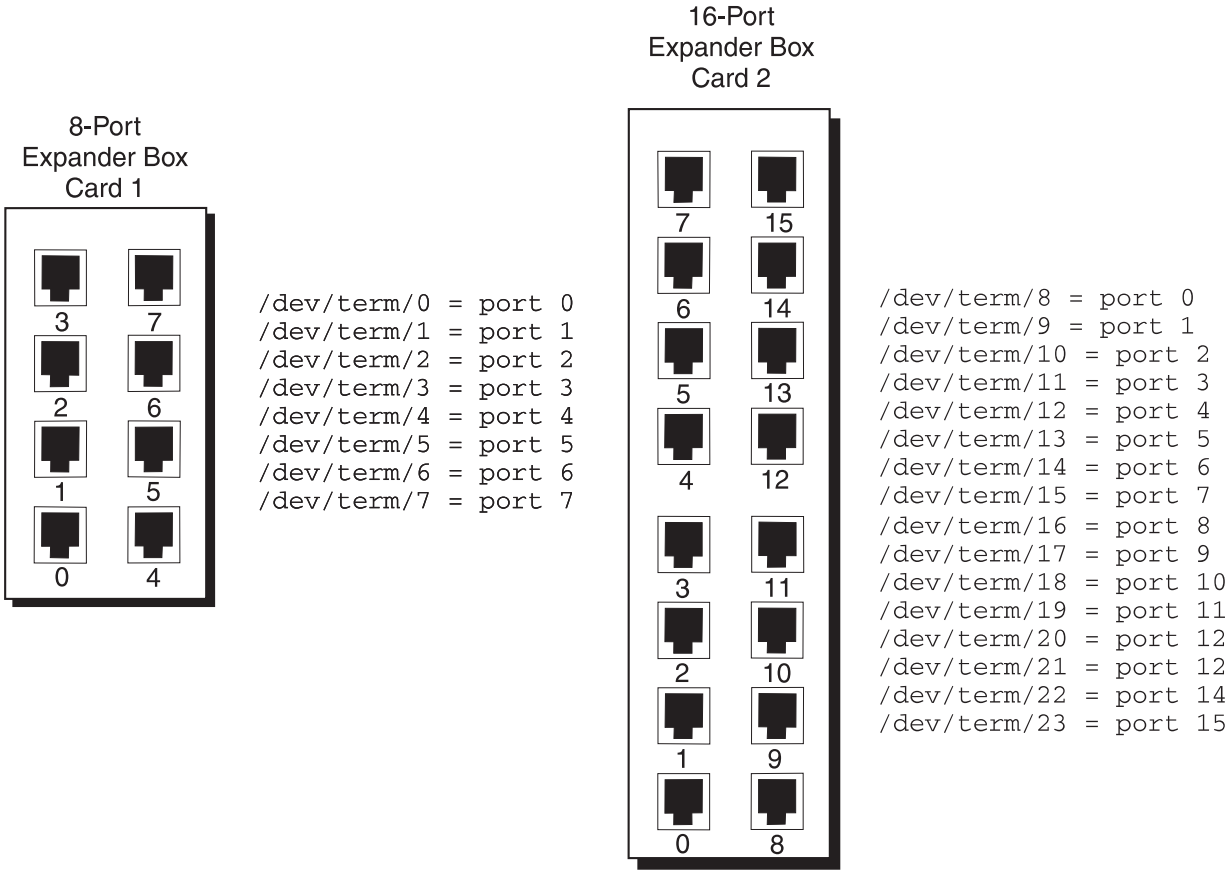
NOTE:

If an HSI card is installed in the system (prior to an Aurora SBus card), the HSI card is considered to be card 1 and uses device names `/dev/term/0` through `/dev/term/4`. An Aurora SBus *Multiport* card would be considered as card 2 and would begin at device name `/dev/term/5`.

When two Aurora SBus *Multiport* cards are installed, the system will create device names for all 8-port cards first and then create device names for 16-port cards. The device name for the second SBus card will start at the next available number. Thus, the device entry `/dev/term/0` corresponds to the physical port labeled “0” on the 8-port expander box connected to the first Aurora SBus *Multiport* card (see the following figure). The device entry `/dev/term/8` corresponds to the physical port labeled “0” on the 16-port expander box connected to the second Aurora SBus *Multiport* card (see the following figure).

The above scenario does not include an HSI card.

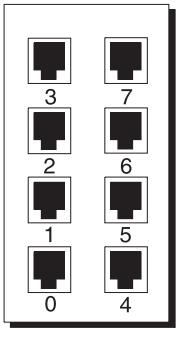
Device Names for Second Aurora SBus Card - No HSI Card Installed



If three or more Aurora ports cards are installed, the system creates device names for all 8-port cards first and then creates device names for 16-port cards regardless of the physical location of the cards (see the following figure).

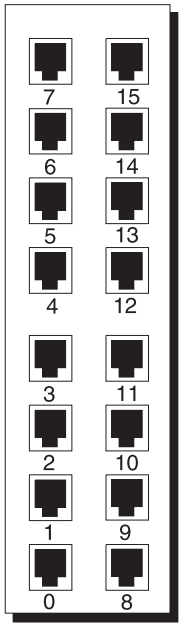
Device Names for Third Aurora SBus Card - No HSI Card Installed:

8-Port Expander Box Card 1



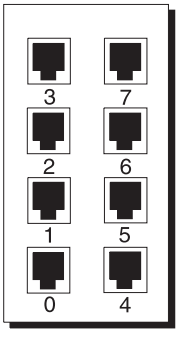

```
/dev/term/0 = port 0
/dev/term/1 = port 1
/dev/term/2 = port 2
/dev/term/3 = port 3
/dev/term/4 = port 4
/dev/term/5 = port 5
/dev/term/6 = port 6
/dev/term/7 = port 7
```

16-Port Expander Box Card 2




```
/dev/term/16 = port 0
/dev/term/17 = port 1
/dev/term/18 = port 2
/dev/term/19 = port 3
/dev/term/20 = port 4
/dev/term/21 = port 5
/dev/term/22 = port 6
/dev/term/23 = port 7
/dev/term/24 = port 8
/dev/term/25 = port 9
/dev/term/26 = port 10
/dev/term/27 = port 11
/dev/term/28 = port 12
/dev/term/29 = port 12
/dev/term/30 = port 14
/dev/term/31 = port 15
```

8-Port Expander Box Card 3




```
/dev/term/8  = port 0
/dev/term/9  = port 1
/dev/term/10 = port 2
/dev/term/11 = port 3
/dev/term/12 = port 4
/dev/term/13 = port 5
/dev/term/14 = port 6
/dev/term/15 = port 7
```

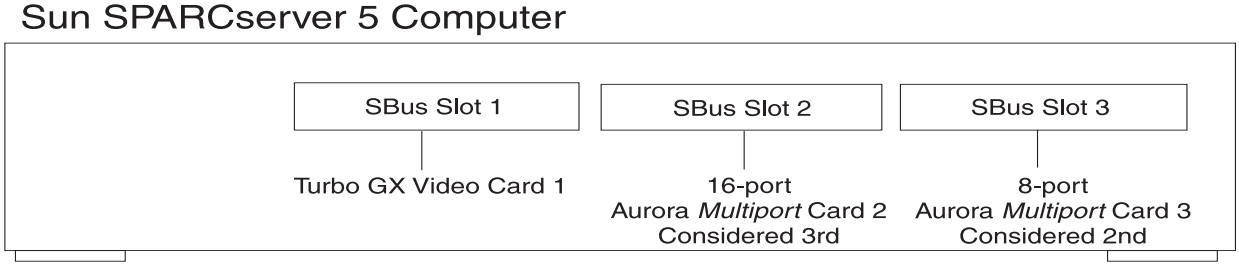
The order sequence of the Aurora SBus *Multiport* card(s) is determined by the SBus slot it occupies in the *Sun SPARCserver* computer and the type of Aurora card (8-port or 16-port) it has. Each SBus slot in the *Sun SPARCserver* computer is numbered.

When device names are created, the 8-port SBus cards inserted into the lowest numbered SBus slots are considered first, then the 16-port SBus cards inserted into the lowest numbered SBus slots are considered second, and so on. (see the following figure).

Determining the Order of Device Names for Aurora *Multiport* SBus Cards - No HSI Card Installed

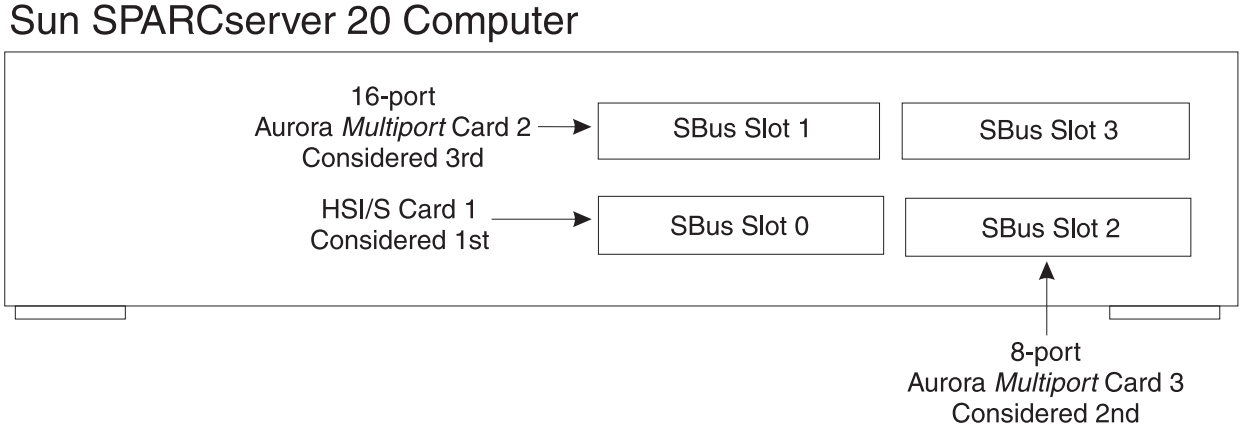
In the following figure, the Aurora SBus *Multiport* cards would be ordered as follows:

- 8-port Card 3- /dev/term/0-7
- 16-port Card 2- /dev/term/8-23



A system containing both an HSI card and Aurora SBus *Multiport* cards would be ordered differently than a system without an HSI card. Remember, HSI cards are always considered first (see the following figure).

Determining the Order of Device Names for Aurora Multiport SBus Cards and HSI Card



In the figure above, the HSI card and Aurora SBus *Multiport* cards would be ordered as follows:

- HSI Card 1- /dev/term/0-4
- 8-port Card 3- /dev/term/5-12
- 16-port Card 2- /dev/term/13-28.

Removing Aurora SBus *Multiport* Software Driver(s)

Overview

The following steps describe how to remove the Aurora SBus *Multiport* software driver(s):

1. Determine which Aurora software driver(s) is installed on the system by entering the following command:

```
# pkginfo |  grep AURA
```

The system displays the installed Aurora software drivers. For example:

```
# pkginfo |  grep AURA
system         AURAacsa        Aurora <version number>
```

The Aurora software drivers that may be installed on your system are:

- AURAacs Base Driver
- AURAacsa 8-port
- AURAsio16 16-port.

2. Identify which Aurora software driver(s) you want to remove.

NOTE:

Complete the following steps for each software driver you want to remove.

3. Start the software removal by entering the `pkgrm` command for each Aurora software driver you have. (The command for an 8-port driver is: `pkgrm AURAacsa` and `pkgrm AURAsio16` for a 16-port driver.) For example:

```
# pkgrm AURAacsa
```

The system responds:

```
# The following package is currently installed:
     AURAacsa          <version number>

Do you want to remove this package?
```

4. Enter y to start the removal of the AURAacsa software driver. The system responds:

```
## Removing installed package instance <AURAacsa>

   This package contains scripts which will be executed with
   super-user permission during the process of removing this
   package.

Do you want to continue with the removal of this package [y,n,q,?]
```

5. Answer y. The system responds:

```
## Verifying package dependencies.
## Processing package information.
## Executing preremove script.
```

If the removal is successful, the following message displays (this particular message is for the removal of an 8-port driver):

```
Removal of <AURAacsa> was successful.
```

The system prompt returns to your screen.

6. Reboot the system using the following command:

```
# shutdown -g0 -i6 -y
```

Adding, Removing, or Moving an Aurora SBus *Multiport* Card

Overview

This section describes how to add, remove or move an Aurora SBus *Multiport* card from or to your *Sun SPARCserver*.

Add an Aurora SBus *Multiport* Card

CAUTION:

Only **TSC PERSONNEL** should perform the procedures in this section.

The following steps describe how to add another Aurora SBus *Multiport* card to a system that is already up and running:

1. Enter this command:

```
# shutdown -g0 -y -i0
```

2. Do the following in sequential order:
   a. Turn off the *Sun SPARCserver* computer.
   b. Turn off the system monitor.
3. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Identify the existing Aurora SBus *Multiport* card(s) installed in the system.
5. Decide where you will install the new Aurora SBus *Multiport* card. Insert the Aurora SBus *Multiport* card into the *Sun SPARCserver* computer.
6. Connect the expander box to the new Aurora SBus *Multiport* card.
7. Do the following in sequential order:
8. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.

a. Turn on the *Sun SPARCserver* computer.

b. Turn on the system monitor.

9. Press the Stop and A keys simultaneously after the display console banner appears, but before the system starts booting.
10. Boot the system using the `boot` command.

```
ok boot -r
```

11. Do a "`sacadm -l`" and a "`pmadm -l`" command to get existing administration information. Record this information for later use.
12. Remove port administration for all Aurora SBus cards by using the following example:

```
# sacadm -r -p ttyaur2
# sacadm -r -p ttyaur3
# sacadm -r -p ttyaur4
```

13. Remove the Aurora SBus *Multiport* Software driver(s). Refer to the "Removing Aurora SBus *Multiport* Software Drivers" section in this chapter for instructions.
14. Install the Aurora SBus *Multiport* software driver (the 8-port driver must be installed before the 16-port driver). See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.
15. Administer all Aurora ports cards.
16. Perform a CMSADM file system backup to backup the updated system software and hardware configuration. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.

Remove an Aurora SBus *Multiport* Card

The following steps describe how to remove an Aurora SBus *Multiport* card from a system that is already up and running:

You must remove the port administration for all Aurora SBus cards in an ordering sequence behind the Aurora SBus card you remove. To avoid readministering, always try to remove the **last** card in the ordering sequence as described in the "Identifying Device Entry Names for Ports on the Aurora Expander Box(es)" section of this chapter.

For example: there are four Aurora SBus cards installed and you want to remove the second Aurora SBus card in the ordering sequence. With this scenario, you must remove the port administration for the second through fourth Aurora SBus cards and then readminister cards 2 and 3.

1. Do a "`sacadm -l`" and a "`pmadm -l`" command to get existing administration information. Record this information for later use.
2. Remove the port administration for the card you are moving as well as all Aurora SBus cards that follow the card you are removing by using the following example:

```
# sacadm -r -p ttyaur2
# sacadm -r -p ttyaur3
# sacadm -r -p ttyaur4
```

3. Remove the Aurora SBus *Multiport* Software driver(s). Refer to the Removing Aurora SBus *Multiport* Software Drivers" section in this chapter for instructions.
4. Enter this command:

```
# shutdown -g0 -y -i0
```

5. Do the following in sequential order:
   a. Turn off the *Sun SPARCserver* computer.
   b. Turn off the system monitor.
6. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
7. Remove the Aurora SBus *Multiport* card from the system.
8. Do the following in sequential order:
   a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Sun SPARCserver* computer.
   c. Turn on the system monitor.
9. Press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting.

10. Boot the system using the `boot` command.

```
ok boot -r
```

11. Install the Aurora SBus *Multiport* software driver (the 8-port driver must be installed before the 16-port driver). See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.
12. Readminister all terminals, modems, and printers that are connected to the Aurora Expander Box(es) that were ordered **after** the card that was removed.
13. Perform a CMSADM file system backup to backup the updated system software and hardware configuration. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.

Move an Aurora SBus *Multiport* Card

When moving Aurora SBus cards, make sure you preserve the original ordering sequence of the cards. To do this, you many need to move more than one card. See the “Identifying Device Entry Names for Ports on the Aurora Expander Box(es)” section in this chapter to determine the ordering sequence.

The following steps describe how to move an Aurora SBus *Multiport* card to a different SBus slot location in the *Sun SPARCserver* computer:

1. Remove the Aurora SBus *Multiport* software driver. See the “Removing Aurora SBus *Multiport* Software Drivers” section in this chapter for details.

After the software is removed, the system prompt returns to your screen.

2. Enter this command:

```
# shutdown -g0 -y -i0
```

3. Do the following in sequential order:
   a. Turn off the *Sun SPARCserver* computer.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Remove the Aurora SBus *Multiport* card from the SBus slot.
5. Install the Aurora SBus *Multiport* card into a different SBus slot by using the instructions described in the *CentreVu Call Management System Release 3 Version 6 Sun SPARCserver Computers, Hardware Installation* (585-215-857) document.

   CAUTION:

   Make sure you preserve the original ordering sequence of the Aurora SBus cards.
6. Do the following in sequential order:
   a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Sun SPARCserver* computer.
   c. Turn on the system monitor.
7. Press the Stop and A keys simultaneously after the display console banner appears, but before the system starts booting.
8. Boot the system using the `boot` command.

```
ok boot -r
```

9. Reinstall the Aurora SBus *Multiport* software driver. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.
10. Perform a CMSADM file system backup to back up the updated system software and hardware configuration. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.

*SPARC*server Troubleshooting

Overview

This chapter contains hardware troubleshooting information about the *Sun*[*] *SPARCserver*[†] computer and the *CentreVu*® Call Management System (CMS R3V8) application. You should use the information to clear problems that may arise during and after the *CentreVu* CMS installation. Additional troubleshooting procedures can be found in *CenterVu* CMS Terminals, Printers, and Modems (585-215-874) and *CenterVu* CMS Switch Connections and Administration (585-215-876).

The following list outlines the troubleshooting sections in this chapter:

- Solving Hardware-Related Problems
- Solving Power-Related Problems.

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†*SPARCserver* is a trademark of SPARC International, Inc.

Solving Hardware-Related Problems

Overview

This section describes how to solve the most common computer hardware problems that may arise before or after the installation of the *CentreVu* CMS.

Hardware Diagnostic Tools and Resources

The remote maintenance person has four tools/resources that do hardware diagnostics:

- OpenBoot Diagnostics (requires console redirection)
- Power on self test (POST) messages during a reboot (requires console redirection)
- Error logs (do not require console redirection).

OpenBoot Firmware

The OpenBoot firmware serves two purposes:

- Boots the operating system from either a mass storage device or from a network
- Provides extensive features for testing hardware and software interactively.

Using OpenBoot Firmware

To use OpenBoot Firmware, perform the following steps:

1. Do **one** of the following to enter the OpenBoot environment:
   - Stop the operating system with the *Solaris** `halt` or `shutdown -y -i0 -g0` command. This is the preferred method of stopping the operating system.
   - Press the Stop and A keys simultaneously on the keyboard while *Solaris* is running.

   CAUTION:

   Using the Stop and A keys simultaneously while *Solaris* is running breaks the execution of the operating system and should be used with caution. Use this key combination if the previous method fails.

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- Power off and power on the *Sun SPARCserver* computer. Press the Stop and A keys simultaneously on the keyboard after the display console banner appears but before the system starts booting the operating system (referred to as power-cycling the system).

CAUTION:

Use this method **only** if the previous two methods fail to work.

Once you are in the OpenBoot environment, the following prompt appears:

```
ok
```

2. At the `ok` prompt, enter `help` for a list of available commands, or see the following table for a summary of some of the OpenBoot diagnostic test commands.

   Additional information about the OpenBoot firmware is available by contacting the Technical Service Center (TSC).

Summary of OpenBoot Firmware Test Commands

<table>
<tr><th>Test Command</th><th colspan="2">Description</th></tr>
<tr><td>probe-scsi</td><td colspan="2">This command identifies the devices attached to the built-in SCSI bus.</td></tr>
<tr><td>probe-scsi-all [device-path]</td><td colspan="2">This command is the same as the probe-scsi command except that it includes all of the SCSI buses installed in the system below the specified device tree node. If the device path is absent, the root node is used.</td></tr>
<tr><td rowspan="12">test device-specifier</td><td colspan="2">This command executes the specified device's self-test method. Possible values for device-specifier are listed in the Alias column below:</td></tr>
<tr><td>Alias*</td><td>Description</td></tr>
<tr><td>memory</td><td>memory</td></tr>
<tr><td>cdrom</td><td>cdrom</td></tr>
<tr><td>tape</td><td>QIC 2.5-GB or 4-8 GB SLR*</td></tr>
<tr><td>tape1</td><td>QIC 2.5-GB or 4-8 GB SLR</td></tr>
<tr><td>tape2</td><td>14-GB</td></tr>
<tr><td>disk</td><td>disk 1</td></tr>
<tr><td>disk1</td><td>disk 1</td></tr>
<tr><td>disk2</td><td>disk 2</td></tr>
<tr><td>floppy</td><td>floppy</td></tr>
<tr><td colspan="2">*If you need to test additional devices that do not have an alias, use the test-all command.</td></tr>
<tr><td>test-all [device-specifier]</td><td colspan="2">This command tests all of the devices that have built-in self-test methods below the specified device tree node. If <device-specifier> is absent, the root node is used.</td></tr>
<tr><td>watch-clock</td><td colspan="2">This command tests the clock function.</td></tr>
<tr><td>eject [device-specifier]</td><td colspan="2">This command ejects either the floppy or cdrom devices.</td></tr>
</table>

*The 4-8 GB SLR tape drive replaces the QIC 2.5-GB tape drive which is no longer available on new installs.

POST Messages Diagnostics

To use the Power On Self Test (POST) messages (during a reboot) to diagnose remote hardware problems, do the following steps:

1. At the ok> prompt, enter the following command to boot your system:

```
ok> boot
```

2. Scan the displayed messages on the screen. Watch for error messages.

System Fails to Boot Properly

This section discusses some common reasons why your system fails to boot properly and provides some corrective procedures.

Power-On Initialization Sequence

You can identify problems more accurately if you are familiar with the system power-on initialization messages. These messages show you the types of functions the system performs at various stages of system start-up. These messages can also show the transfer of control from OpenBoot firmware to POST.

Procedures

The following table describes the OpenBoot initialization command sequences provided by the *Sun SPARCserver* computer. These commands are useful in some boot-failure situations. To use the commands, hold down the keys after turning on the power to your system. Keep the keys pressed until the keyboard lights flash and the screen displays the firmware (ok>) prompt.

Keyboard Commands

Command	Description
`Stop`	Bypass POST. This command does not depend on the security-mode. (Note: some systems bypass POST as a default; in such cases, use the Stop and A key combination to start POST.)
`Stop-A`	Abort.
`Stop-D`	Enter diagnostic mode (set `diag-switch?` to `true`).
`Stop-F`	Enter Forth on TTYA instead of probing. Use `exit` to continue with the initialization sequence. This is useful if hardware is broken.
`Stop-N`	Reset Non-Volatile Random Access Memory (NVRAM) contents to default values.

Preserve Data After a System Crash

Enter the Prom monitor (OpenBoot) `sync` command at the `ok>` prompt to force any information on its way to the hard disk to be written out immediately. This is useful if the operating system has crashed or has been interrupted before preserving all data.

The `sync` command returns control to the operating system and performs the data saving operations. After the disk data has been synchronized, the operating system begins to save a core image of itself. If you do not need this core dump, you can interrupt the operation using the Stop and A key sequence.

System Will Not Boot from Disk

You are booting from a disk, and the system fails with the following message:

```
The file just loaded does not appear to be executable.
```

Solution

The boot block is missing or corrupted. Reinstall the *Solaris* operating system, and restore all of the data.

Problem

You are booting from a disk, and the system fails with the following message:

```
The file just loaded does not appear to be executable.
```

Solution

The disk may be powered down (especially if it is an external disk). Turn on the power to the disk, and make sure the SCSI cable is connected to the disk and the system.

SCSI Problems

Your system has more than one disk installed, and you get SCSI-related errors.

Solution

1. To quickly check the SCSI-related errors, enter the following command:

```
ok probe-scsi-all
```

The program responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991


. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

NOTE:

The actual response (devices listed) depends on the devices installed on the SCSI bus.

2. Compare output with the physical devices present. Work trouble (with the TSC) until all devices can be probed.

Duplicate SCSI Target Number

If your system has duplicate SCSI target number settings. Try the following procedure:

1. Unplug all but one of the disks.
2. At the ok prompt, enter:

```
ok probe-scsi-all
```

NOTE:

Use the target number and its corresponding unit number.

3. Plug in another disk, and repeat step 2.

4. If you get an error, change the target number of this disk to one of the unused target numbers.
5. Repeat steps 2-4 until all the disks are plugged back in.

Blank Screen — No Output

The local monitor is blank.

Solutions

1. Check to see if the machine is in the process of booting up; the screen goes blank during initialization and stays blank for a few minutes. This is especially true if the system is being booted to a remote console.
2. Find out if the console is remoted and the remote user is in the OpenBoot mode. Check the lights on the modem to indicate if someone might be dialed-in.
3. If all else fails, cycle the power (power-down and power-up), and immediately hold down the **Stop** and **N** keys until something appears on the screen. Hold the keys down for at least a minute. If the machine is functioning properly, this forces the console to be local. Take a look at the keyboard — look for flashing green lights on the keys.
4. If nothing is seen after a minute or so, there is probably a hardware failure. Do the following:
    a. Check to make sure the keyboard is attached. If the keyboard is unplugged, the output goes to TTYA instead. To fix this problem, shut down the system and do the following in sequential order:
        1. Turn off the *Sun SPARCserver* computer.
        2. Turn off the system monitor.
        3. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
    b. Plug in the keyboard, and power on again by using the following sequence:
        1. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
        2. Turn on the *Sun SPARCserver* computer.
        3. Turn on the system monitor.

c. Check to make sure the monitor is turned on and plugged in. Check the power cable on the monitor. Make sure the monitor cable is plugged into the system frame buffer; then, turn the monitor on.

d. Check to make sure the `output-device` is set to TTYA. This means that the NVRAM parameter `output-device` is set to `ttya` instead of being set to `screen`. You can do **one** of the following:

— Power down the system (using the proceeding steps). Then, turn it on (using the proceeding steps), and immediately press the Stop and N keys. This sets all NVRAM parameters to their default values. As a result, the `output-device` parameter is set to `screen`.

WARNING:

In addition, all previous nondefault settings are reset to their default values. You must restore the settings as needed. See "Method 2 — From Local Site" in the following section of this chapter to restore the settings.

— Connect a terminal to TTYA, and reset the system. After getting to the `ok` prompt on the terminal, enter `screen output` to send the output to the frame buffer. Use the `setenv` command to change the default display device, if needed.

e. Check to see if the system has multiple frame buffers. If your system has several plugged-in frame buffers, then it is possible that the wrong frame buffer is being used as the console device.

Refer to your system documentation and call the TSC.

Diagnose Problems Using the Remote Console

If your system will not boot, the TSC personnel could ask you to redirect the remote console to identify a problem. You can redirect the remote console using **either** of the following methods:

- Using *Solaris* software package
- Using OpenBoot diagnostics.

Redirect the Remote Console Using *Solaris* Operating System

This section describes how to redirect the console to port A on the *Sun SPARCserver* computer using the *Solaris* operating system. Redirecting the console allows the TSC to dial in and do remote maintenance.

To set the console to the remote, do the following:

1. Dial in (from the remote terminal) to the remote console modem (for example, access port A on the computer), and log in as root.
2. Remove the port monitor by entering the following command:

```
# /cms/install/bin/abcadm -r ttya
```

The program responds:

```
ttya is currently set to incoming

Are you sure you want to remove it?
```

3. Enter y. The program responds:

```
ttya administration removed
```

4. Redirect the console to port A (remote console) by entering the following commands:

```
# /cms/install/bin/abcadm -c -b 2400 ttya
```

The program responds:

```
This change requires a reboot to take affect

Are you ready to reboot? [y,n,?]
```

NOTE:

The baud rate will vary depending on the modem (for example, 2400 or 9600).

5. Press Y. The system will automatically reboot, and port A will come up as the console.

   As the system reboots, the shutting down messages will appear on the *Sun SPARCserver* computer monitor. When the system starts to come back up, the *Sun SPARCserver* computer monitor should go blank, and the system boot diagnostics should appear on the remote console terminal. After the system reboots, a `console login:` prompt should appear on the remote console terminal.

6. Log into the remote console as root.

   NOTE:

   At this time, an *OpenWindows* login window will appear on the *Sun SPARCserver* computer monitor.

Set the Console to Local

To set the console to local, do the following:

1. Redirect the console back to the local console by entering the following command:

```
# /cms/install/bin/abcadm -c local
```

   The program responds:

```
Console set to local

This change requires a reboot to take affect

Are you ready to reboot? [y,n,?]
```

2. Press Y.

   The program responds:

```
Starting port monitor.
Setting console parameters.
Proceeding to reboot.
```

3. The system will automatically reboot, and port A will come up as the dial in. A `login:` prompt appears.

   As the system reboots, the shutting down reset and rebooting messages will appear on the remote console monitor. When the system starts to come back up, the system boot diagnostics should appear on the *Sun SPARCserver* computer monitor. After the system reboots, a login prompt should appear on the *Sun SPARCserver* computer monitor.

4. Log into the local console (*Sun SPARCserver* system) as root.

Redirect the Remote Console Using OpenBoot commands

Use the OpenBoot mode to redirect port A (remote console port) on the *Sun SPARCserver* computer when the *Solaris* method does not work (typically because the system will not boot).

NOTE:

This procedure should be done only at the direction of the TSC.

To redirect the local console to the remote console from the OpenBoot environment (prompt is `ok>`), do the following steps:

Enter the OpenBoot environment (prompt is `ok>`) in **one** of the following ways:

- If in the *Solaris* environment, halt the operating system with the *Solaris* `halt` command.
- If in the *Solaris* environment and the `halt` command does not work (for example, the system is hung up), press the Stop and A keys simultaneously.

  CAUTION:

  The Stop and A key combination abruptly breaks the execution of the operating system and should be used with caution.

- If the above methods fail, press the Stop and A keys simultaneously after the display console banner appears but before the system starts booting the operating system.

To redirect the console to remote from the OpenBoot environment (prompt is ok>), perform the following steps:

1. To display a list of the current parameter settings on your system, enter the following command:

```
ok> printenv
```

   The system responds:

```
Parameter Name        Value          Default Value
output-device         screen         screen
input-device          keyboard       keyboard
   .
   .
   .
```

2. At the ok> prompt, enter the `setenv` command to set the configuration parameters. Set the parameters to the values specified. (See the following table.) For example:

```
ok>setenv output-device ttya
```

   The system responds:

```
output device=ttya
```

Parameter Commands

Parameter	Values
output-device	ttya
input-device	ttya
ttya-rts-dtr-off	true
ttya-ignore-cd	true
ttya-mode	9600,8,n,1,- In this example, the baud rate is 9600. The baud rate should correspond to the setting on the local modem. Typically, a 3830 would call for a setting of 9600, a 3715 would call for a setting of 9600, and an 2400 would call for a setting of 2400.

3. To verify the parameter changes, enter the following command:

```
ok> printenv
```

The system responds:

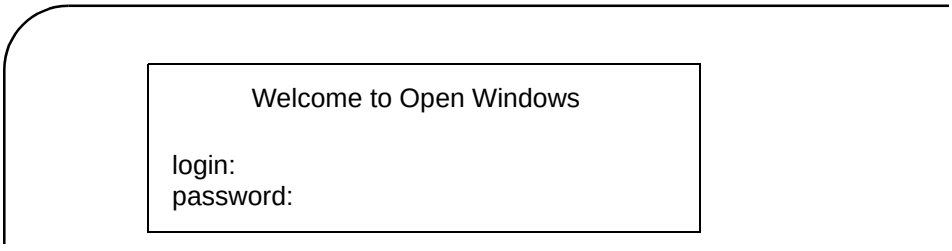
```
Parameter Name        Value          Default Value
output-device         ttya           screen
input-device          ttya           keyboard
   .
   .
   .
```

4. For the changes to take effect, boot the system by entering:

```
ok> boot
```

The system responds on the local console with the XDM login

prompt (see the following example) or on the remote console with the console login:



To redirect the remote console to the local console, enter the OpenBoot environment (prompt is `ok>`) in the following way:

- If in the *Solaris* environment, halt the operating system with the *Solaris* `halt` command.

To redirect the remote to the console from the OpenBoot environment (prompt is `ok>`), use one of the following methods:

Method 1 — From the Remote Site

Use this method from the remote site when the *Solaris* method does not work**.**

1. From the remote console, if not in OpenBoot, get into OpenBoot mode in **one** of the following ways:
   - If in the *Solaris* environment, halt the operating system with the *Solaris* halt command.
   - Power-cycle the machine, and press **Break** from the remote console (requires a local person).
2. To display a list of the current parameter settings on your system, enter the following command:

```
ok> printenv
```

The system responds:

```
Parameter Name        Value          Default Value
output-device         ttya           screen
input-device          ttya           keyboard
    .
    .
    .
```

3. To set the configuration parameters, enter the parameters (see the following table) via the `setenv` command at the `ok>` prompt. For example:

```
ok> setenv output-device ttya
```

Parameter	Values
output-device	screen
input-device	keyboard
ttya-rts-dtr-off	true
ttya-ignore-cd	false

4. To activate the changes, boot the system by entering:

```
ok> reset
```

5. Log into the system as *root* at the local monitor.
6. From the local monitor, enter the `cms/install/bin/abcadm -k` command to see what is on the `ttya` port. Start a port monitor on the `ttya` port if there is not one already.

```
# /cms/install/bin/abcadm -k
```

7. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abcadm -c -b <baud>ttya
```

The system responds:

```
answer n to "Do you want to reboot?"
```

8. Press N.

Method 2 — From the Local Site

Use this method when the previous OpenBoot method does not work or if you want to switch the console from the local (customer) site.

At the local site (when the system is not running *Solaris*), do the following:

1. Power down the machine.
2. Press the Stop and N keys simultaneously. Continue to press the Stop and N keys simultaneously until something appears on the screen. The system reboots to the local console.
3. Log into the system as root at the standard interface.
4. From the local monitor, enter the following command to check what is on the `ttya` port:

```
# /cms/install/bin/abcadm -k
```

5. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abcadm-c-b <baud>ttya
```

The system responds with the following prompt:

```
#
```

6. Enter n in response to the following message:

```
# answer n to "Do you want to reboot?"
```

7. Start a port monitor on ttya.

```
# /cms/install/bin/abcadm -i -b<baud>ttya
```

Single-User Mode and the Remote Console

Prerequisite: You must be logged into the customer's machine through the remote console interface.

To place the system in single-user mode, at the remote console, enter the following command:

```
# shutdown -y -is -g0
```

NOTE:

The system will **not** successfully enter single-user mode if you execute the `shutdown` command from the local console while the console is redirected. When this occurs, the local console will not respond if you try to enter data. The remote console will also be unresponsive.

To recover from the situation described in the previous note, put the system into single-user mode by doing the following:

1. Select a new window on the local console.
2. In the new window, enter the following command:

```
# shutdown -y -i0 -g0
```

3. Enter the following command at the ok> prompt:

```
ok> boot -s
```

Machine Panics

If a machine panic is detected on your system, you must call the TSC (domestic) or remote (international) support personnel. The TSC may request that you deliver the following information on a tape:

- Crash dump from /var/crash/<*hostname*>/vmcore.n.
- Namelist from /var/crash/<*hostname*>/unix.n.
- Output of the showrev -p (put the information in a file).
- Output of the prtconf -pv (put the information in a file).
- Possibly output from the /var/adm/messages file.

Create a Panic Tape for the TSC

To put all the files on one tape, do the following procedures:

1. Log in as root.
2. Change to the dump directory by entering the following command:

```
# cd /var/crash/<hostname>
```

3. Verify that unix.n and vmcore.n are present, and match the date for the crash in question.

4. To retrieve the output from the showrev -p buffer, enter the following command:

```
# showrev -p>showrev.out
```

5. To retrieve the output from the prtconf -pv buffer, enter the following command:

```
# prtconf -pv>prtconf.out
```

6. To copy the output from the `/var/adm/messages` file, enter the following command:

```
# cp /var/adm/messages messages
```

7. Insert a tape into the default backup tape drive.
8. Create a `dmesg.out` file:

```
# dmesg>dmesg.out
```

9. Enter the following command:

```
# tar cvf <device-name> unix.n vmcore.n dmesg.out showrev.out
prtconf.out messages
```

NOTE:

The letter n represents the number of the crashdump.

The system responds with a list of all of the files.

Remove the Temporary Files

1. Create a `dmesg.out` file:

```
# dmesg>dmesg.out
```

2. To remove the temporary files, enter the following command:

```
# rm unix.n vmcore.n dmesg.out showrev.out prtconf.out messages
```

NOTE:

The letter n represents the number of the crash dump.

3. Log out of the system.
4. Remove the tape from the tape drive.
5. Send the tape to the TSC.

Keyboard Gets Unplugged

If the console keyboard cable gets unplugged during system operation, the system will continue to run. If the console is reattached to the cable, the system freezes on its current display. Do the following to correct the problem:

1. Plug in the keyboard. The system responds:

```
ok>
```

2. Enter the following command at the ok> prompt:

```
ok> go
```

The system responds by continuing to run. It was not running during the time between getting the ok> prompt and entering go.

NOTE:

If the system is rebooted, instead of entering go, you may be prompted to use the `fsck` command to repair the *Solaris* file systems.

Solving Power-Related Problems

Overview

This section provides some troubleshooting solutions to power-related problems (for example, when the *CentreVu* CMS *Sun SPARCserver* system loses power). If you cannot solve the power-related problems, escalate the problem through normal procedures. For printers with power-related problems, see the “Solving Printer-Related Problems” section in this manual.

When System Loses Power

If the *Sun SPARCserver* (system unit) loses power, it is recommended (but not required) to empty the CD-ROM and tape drive(s). The system boots from the disk by default.

Power On Sequence

To turn the power back *on*, use the following sequence:

1. Turn on devices attached to the *Sun SPARCserver computer* starting with the device at the end of the SCSI chain and working toward the computer.
2. Turn on the *Sun SPARCserver* computer.
3. Turn on the system monitor.

If the *Sun SPARCserver* computer is operating properly, the monitor displays a banner screen up to 30 seconds after it is powered on.

```
        SPARCstation 10 MP (2x390Z55), Keyboard Present
        ROM Rev. 2.12, XX MB memory installed, Serial #XXX
        Ethernet address X:X:YY:Z:BB, Host ID: XXXXXXXX
$
```

Power Off Sequence

The following sequence is recommended to turn off the power:

1. Shutdown the computer using the following command:

```
# shutdown -g0 -i0 -y
```

   When the `ok` prompt appears on the console, the system can be powered off

2. Turn off the *Sun SPARCserver* computer.
3. Turn off the system monitor.
4. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.

When the `Console Login:` prompt appears on the console terminal, the computer will be up and running.

NOTE:

For more information about restarting the *Sun SPARCserver* computer because of a power failure, refer to the user documentation that came with the computer and call the TSC.

Ultra 5 Maintenance

Overview

This chapter explains some of the principal maintenance and upgrade issues for the *CentreVu*® Call Management System hardware. Refer to the *CentreVu*® *Call Management System Sun Ultra 5 Computer Hardware Installation* document (585-215-871) for additional information.

This chapter discusses the following maintenance procedures:

- Replacing the Primary Internal EIDE Hard Disk Drive
- Installing an Optional Second Internal Hard Drive
- Adding Memory
- Adding, Removing, or Replacing Tape Drives
- Identifying Device Entry Names for Ports on *Sun* SAI/P Cards
- Removing SAI/P Software Driver(s)
- Adding, Removing, or Moving a *Sun* SAI/P Card
- Replacing an UltraSCSI Card with a *SunSwift** Card

Personnel at the Technical Service Center (TSC) will need assistance from an on-site technician or the customer's *CentreVu* CMS administrator to do most of the procedures in this chapter.

NOTE:

If a side panel needs to be removed from the *Sun Ultra 5* system for any reason, it is necessary to pull out on the bottom center of the panel before sliding the panel upwards to remove it.

**SunSwift* is a trademark of Sun Microsystems, Inc.

Replacing the Primary Internal EIDE Hard Disk Drive

Overview

This procedure describes how to replace the primary internal hard drive. See *CentreVu* CMS Sun Ultra 5 Hardware Installation (585-215-871) for instructions on replacing the secondary internal hard drive.

Add the disk Drive

Replace a hard drive to the *Ultra 5* as follows:

1. Power off the system unit.
2. Remove the top cover.

   CAUTION:

   Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface..

3. Attach the wrist strap.
4. Remove the primary internal hard drive as follows. Refer to the figures on the page 6-4.
   a. Remove the power cable connector and CD-ROM drive cable from the rear of the CD-ROM drive.
   b. Remove the power cable connector and the hard drive cable connector from the hard drive.
   c. Remove the two screws securing the hard drive bracket to the chassis.
   d. Remove the hard drive and hard drive bracket from the chassis.
   e. Remove the four screws securing the hard drive to the hard drive bracket.
   f. Remove the hard drive from the hard drive bracket.
5. Place the hard drive into the *Ultra 5* as follows. Refer to the figures on the page 6-4.
   a. Position the hard drive into the hard drive bracket
   b. Using a number 2 Phillips-head screwdriver, replace the four screws securing the hard drive to the hard drive bracket.
   c. Position the hard drive and hard drive bracket into the chassis.

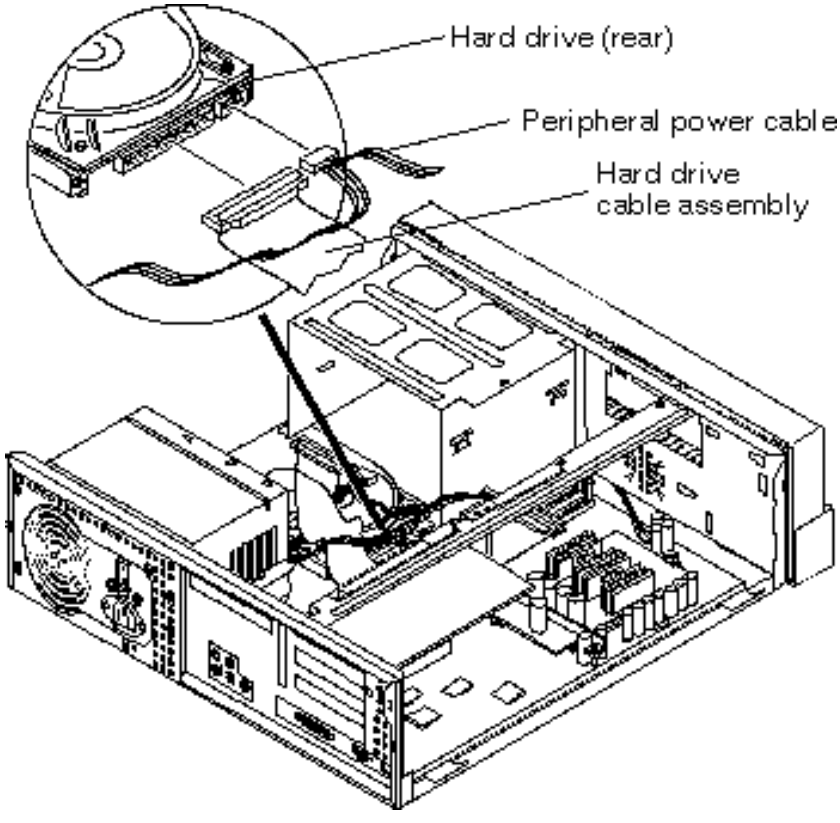
d. Using a number 2 Phillips-head screwdriver, replace the two screws securing the hard drive bracket to the chassis.

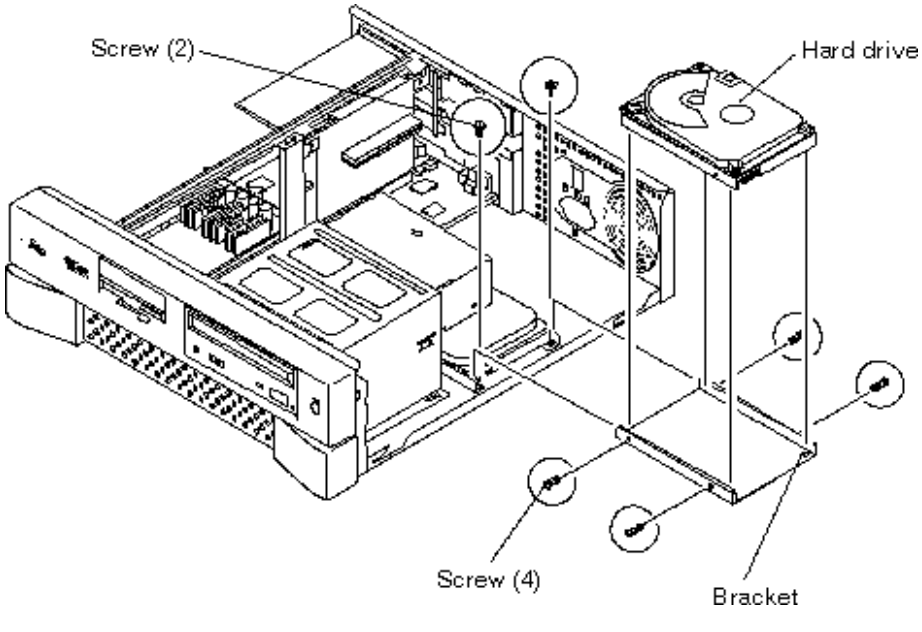
e. Connect the hard drive cable connector and the peripheral power cable connector to the hard drive.

f. Connect the peripheral power cable connector and the CD-ROM drive cable connector to the rear of the CD-ROM drive.

6. Connect the AC power cord to the system unit.
7. Detach the wrist strap.
8. Replace the top cover.
9. Power-on the system unit.
10. Restore or install the operating system and software as described earlier in chapter 8.

Removing and Replacing a Hard Drive:





Installing an Optional Second Internal Hard Drive

This section describes how to install an optional 9.1-GB hard drive in the *Ultra* 5 computer. The optional drive, together with hardware and a new ribbon cable, is packaged separately from the *Ultra* 5 computer.

NOTE:

In the following procedures, the hard drive that is already installed in the *Ultra* 5 computer is referred to as the *primary* drive, and the new drive that you install is referred to as the *secondary* drive.

Overview

The procedure for installing the optional hard drive involves these general steps:

1. Prepare your work area and unpack the secondary drive.
2. Open the computer.
3. Remove the diskette drive from the computer.
4. Install new cabling.
5. Install the secondary hard drive.
6. Reconnect cabling.
7. Close the computer.
8. Partition the new hard drive.

CAUTION:

You must wear an ESD wrist strap when you install or remove electronic components to prevent electrical discharge that may harm the system.

NOTE:

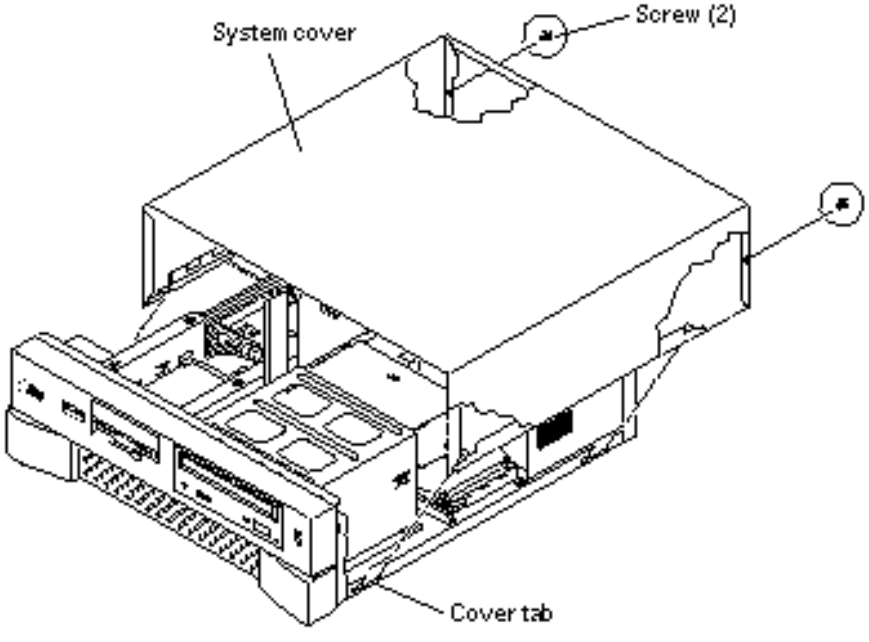
Install the optional secondary hard drive before you install a PCI card in Slot 2. If you are also installing memory modules, install those modules while you have the diskette drive out of the computer.

Prepare Work Area

Remove the following items from the box that contains the new hard drive and place them in a convenient location:

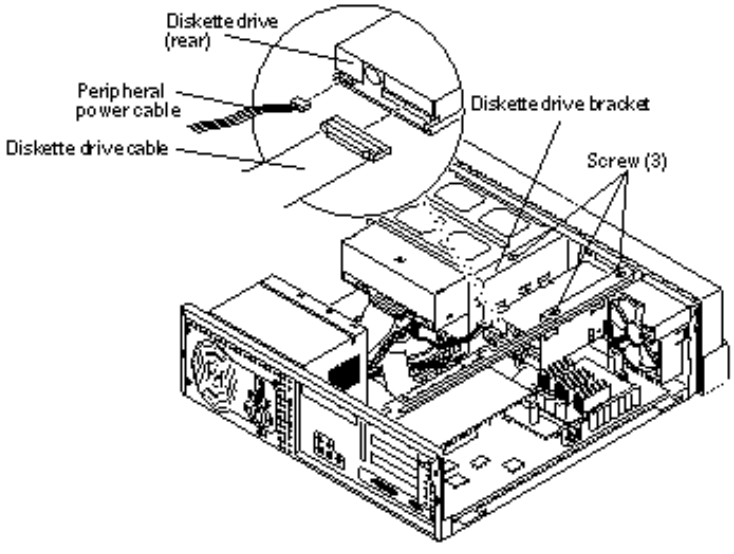
- Secondary hard drive
- Mounting bracket
- Four pan head screws
- New IDE ribbon cable.

Open the *Ultra* 5 Computer

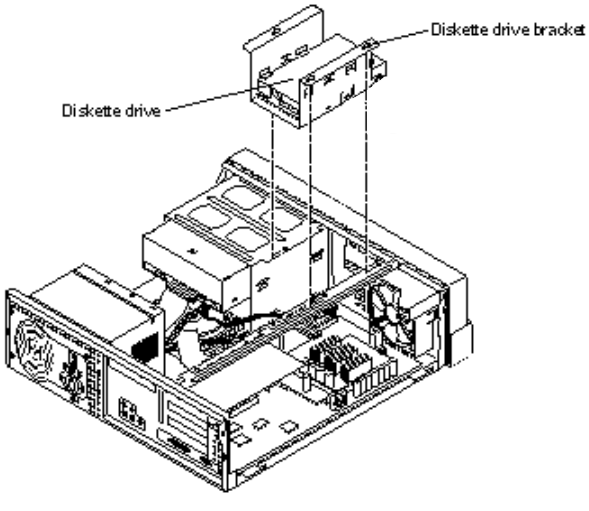


1. Power-off the computer.
2. Remove the two screws on the back of the unit that secure the cover to the chassis.
3. Slide the cover back an inch or two and lift it up away from the chassis.
4. Place the cover in a convenient location so that it does not interfere with your work.
5. Attach the antistatic wrist strap to the computer and your wrist.
6. If a PCI card is already installed in Slot 2, remove it and set it in a safe place.

Remove The Disk Drive

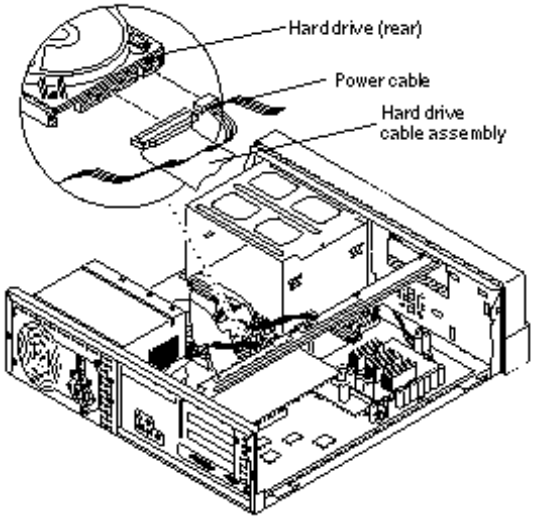


1. Disconnect the power cable and diskette drive cable from the rear of the diskette drive.
2. Loosen, but do not remove the three screws that secure the diskette drive mounting bracket to the top of the chassis frame.

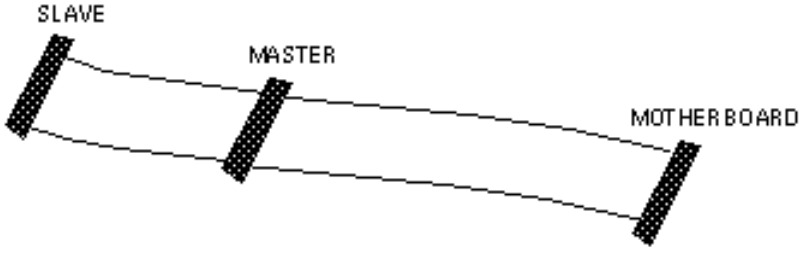


3. Remove the diskette drive bracket from the chassis by sliding it back and lifting it free of the three screws.
4. Lift out the mounting bracket and attached diskette drive.
5. At the motherboard, disconnect the diskette drive cable that comes from the diskette drive.
6. Leave the diskette drive and diskette drive cable with the customer.

Install New Cabling

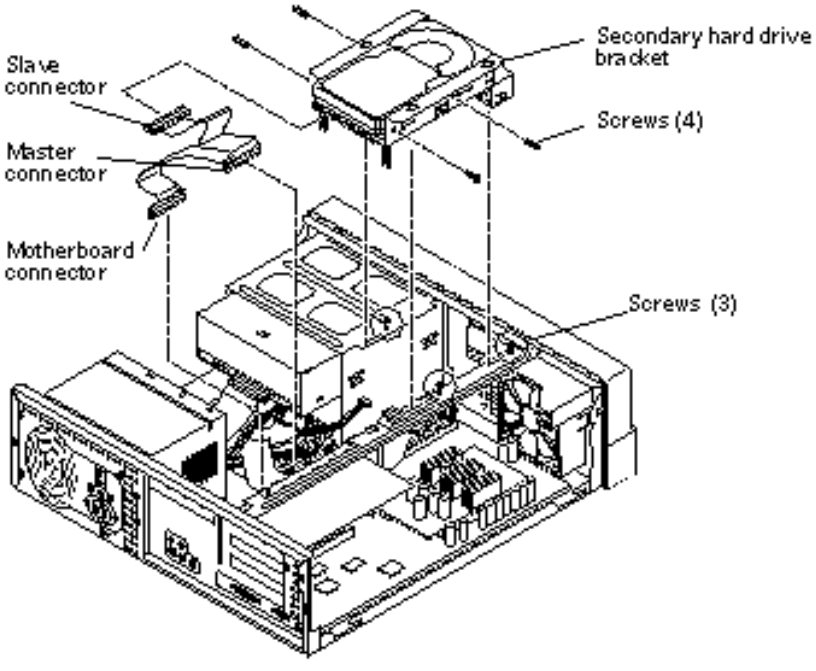


1. Remove the ribbon cable from the rear of the primary hard drive. You may need to remove the primary hard drive by removing the two screws securing the primary hard drive and lifting out the drive.
2. Remove the other end of this cable from the motherboard. Remember the slot in the motherboard from which you remove this connector. You will install another connector in this slot in the next step.



3. On the new ribbon cable (the cable that was supplied with the secondary hard drive), there are three connectors labeled Motherboard, Master, and Slave. Insert the connector labeled “Motherboard” into the slot in the motherboard from which you removed a connector in the previous step.
4. Connect the connector labeled “Master” to the primary hard drive.
5. If you previously removed the primary hard drive, reinstall it on the chassis.

Install Secondary Hard Drive



1. Attach the secondary hard drive to the supplied bracket with four pan head screws. Arrange the drive so that the connectors on the rear of the hard drive point to the open end of the bracket, and the label on the hard drive faces the open side of the bracket.
2. Set the jumpers on the secondary hard drive to the Cable Select (CS) setting. See the label on the hard drive to determine the CS jumper setting.
3. Connect the connector labeled “Slave” on the new ribbon cable to the rear of the secondary hard drive.
4. On the power harness that goes to the primary hard drive is an unused connector (labeled P2, P3, or P4) that will fit into the rear of the secondary hard drive. The harness wires are bundled into several loops near this connector. Cut the tie that secures these loops. Be careful not to damage any of the wires in the bundle.
5. Insert the power connector into the rear of the secondary hard drive.
6. Install the secondary hard drive mounting bracket to the frame of the chassis at the place where the diskette drive was installed. Slip the three holes in the mounting bracket over the three screws in the chassis frame. Be sure the connectors on the hard drive point to the rear of the computer.
7. Slide the mounting bracket forward as far as possible.

8. Tighten the three screws.
9. Dress the cables to provide clearance.
10. If you removed a PCI card in Slot 2 earlier, reinstall it now.

Close Computer

1. Replace the cover on the *Ultra* 5 computer and slide the cover forward until it fits snugly around the chassis.
2. Replace the two screws that you removed from the cover at the beginning of these procedures.

Partition The New Hard Drive

The hard drives must be partitioned when you reinstall the operating system. For CMS R3V8 and later systems, see *CentreVu CMS Software Installation and Setup* (585-210-941) for more information.

Use the following tables to partition the primary (boot) disk and the secondary disks. The second internal hard drive will always be a secondary disk, never the primary (boot) disk.

Primary (Boot) Disk

		Disk Size (in cylinders)			
Slice	**Slice Name***	**4.2-GB SCSI (SPARCserver, Ultra 5 and E3000)**	**8.4-GB EIDE (Ultra 5)**	**9.1 GB EIDE (Ultra 5)**	**9.1 GB SCSI (SPARCserver and E3000)**
0	/	1023	2134	2032	616
1	(blank)	7	7	7	7
2	overlap†	3880	16706	17660	4924
3	(blank)	1079	12533	13540	3716
4	*(swap)*	971	2032	2081	585

*For the boot mirror disk, the root slice name must remain unassigned (blank)
†*Overlap* partition sizes are automatically displayed in the Customize Disks scree during the Solaris installation. These values indicate the total number of cylinders for the disk drive models used in CMS R3V8. If the disk drive you are partitioning does not match one of these values, you have a non-standard disk. The system will not operate if the disk partitioning is incorrect. Escalate the issue to technical support.

Secondary Disks

		Disk Size (in cylinders)		
Slice #	**File System**	**4.2 GB SCSI (SPARCserver, Ultra 5 and E3000)**	**9.1 GB EIDE (Ultra 5)**	**9.1 GB SCSI (SPARCserver and E3000)**
0	/	2	2	2
1	*(blank)*	3878	17658	4922
2	overlap	3880	17660	4924

Adding Memory

The *Ultra* 5 comes equipped with one bank of dual inline memory modules (DIMMs) (256 MB) installed. If you need to install additional DIMMs, they must be installed in full banks (pairs).

DIMM Installation Sequence

The computer must have at least two identical DIMMs installed in paired sockets of any DIMM bank. For best system performance, install four identical DIMMs.

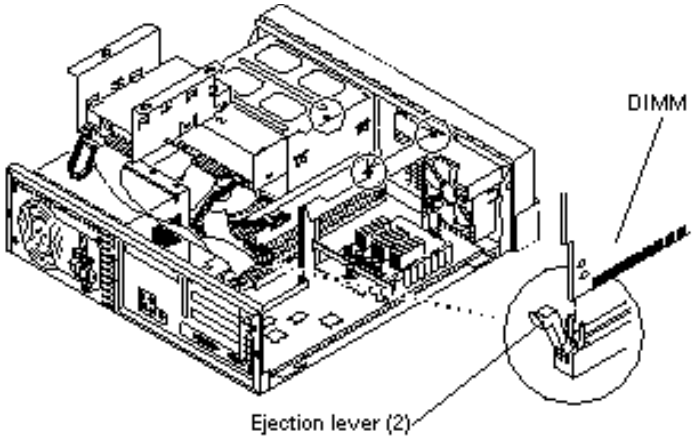
Install the DIMMs as shown in the table below.

DIMM Bank	Slot Pairs
0	DIMM1 and DIMM2
1	DIMM3 and DIMM4

Open the *Ultra* 5 Computer

1. Power-off the computer.
2. Remove the two screws on the back of the unit that secure the cover to the chassis. See Open the Ultra 5 Computer as described on page 6-6.
3. Slide the cover back an inch or two and lift it up away from the chassis.
4. Place the cover in a convenient location so that it does not interfere with your work.
5. Attach the antistatic wrist strap to the computer and your wrist.

Installing DIMMs



1. Loosen the three screws that hold the diskette or second hard disk drive bracket and move the disk drive out of the way.
2. Unlock (press down) the ejector levers at both ends of the connectors, insert the DIMM into the slot, and relock the ejector levers.
3. Replace the diskette/disk drive bracket and tighten the screws that hold the bracket.

Close Computer

1. Replace the cover on the *Ultra* 5 computer and slide the cover forward until it fits snugly around the chassis.
2. Replace the two screws that you removed from the cover at the beginning of these procedures.

Adding, Removing, or Replacing Tape Drives

Overview

This section describes how to add, remove, or replace an external tape drive from an existing system.

NOTE:

External tape drives are pre-installed and required at all times on the *Ultra* 5 system. Adding an additional tape drive is used only as a temporary measure during the migration process.

Add or Replace a Tape Drive

When adding or replacing a tape drive to an existing system, you need to do the following:

- Remove existing SCSI device files (to prepare for new SCSI hardware configuration).
- Set the SCSI device ID(s).
- Connect the tape drive(s) to the SCSI chain.
- Reboot and reconfigure the system.

To remove SCSI device files, do the following:

1. Enter the following command:

```
# rm /dev/rmt/*
```

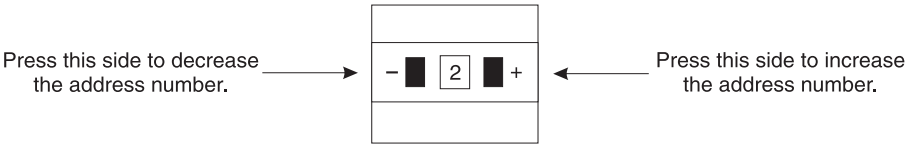
NOTE:

If you do not remove the device files before rebooting the system, the SCSI device files may not match the hardware configuration. If this occurs, repeat Steps 1 through 10.

2. Shut the system down using the following command:

```
# init 0
```

3. Do the following in sequential order:
   a. Turn off the *Ultra* 5 computer.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Ultra* 5 computer and working toward the farthest device.
4. Set the SCSI ID(s) by doing the following:
   a. Locate the target address switch on the rear panel of the SCSI device (see the following figure).



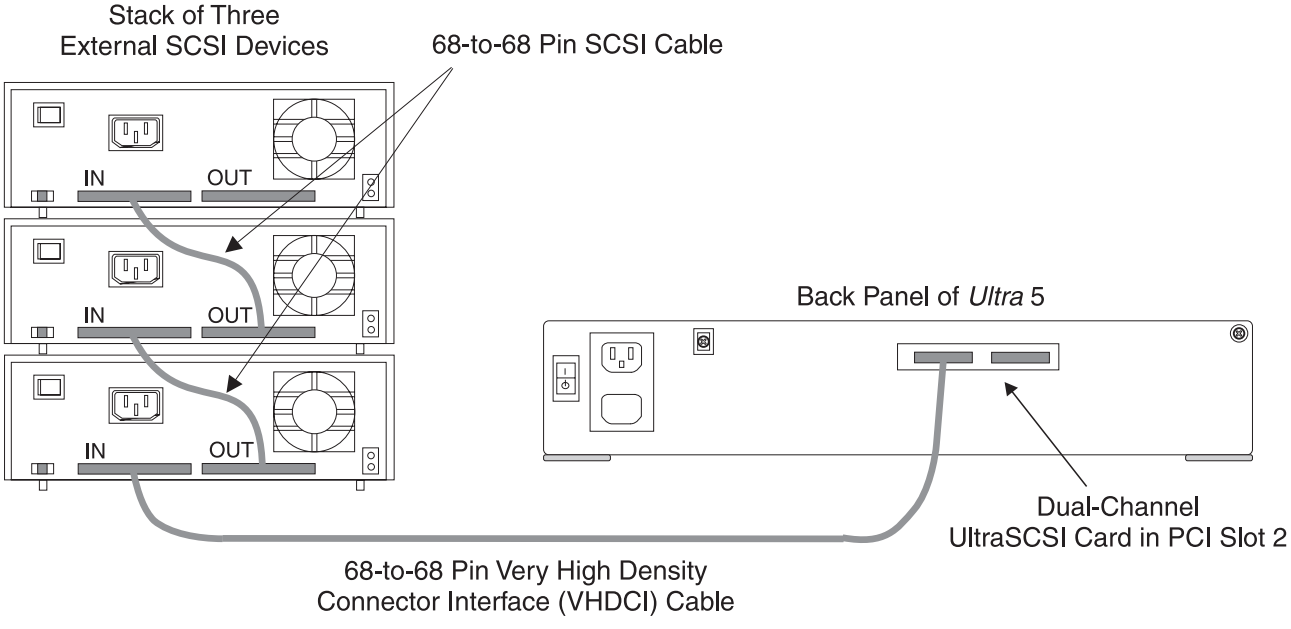
   b. Identify which SCSI ID will be associated with each of the devices on a specific SCSI bus (see the following table).
   c. Press the left or right button on the switch until the appropriate SCSI ID number appears in the window.

Device	Address
Disk Drive 1	0
Disk Drive 2	1
Disk Drive 3	2
Disk Drive 4	3
Tape Drive 1	4
Tape Drive 2	5

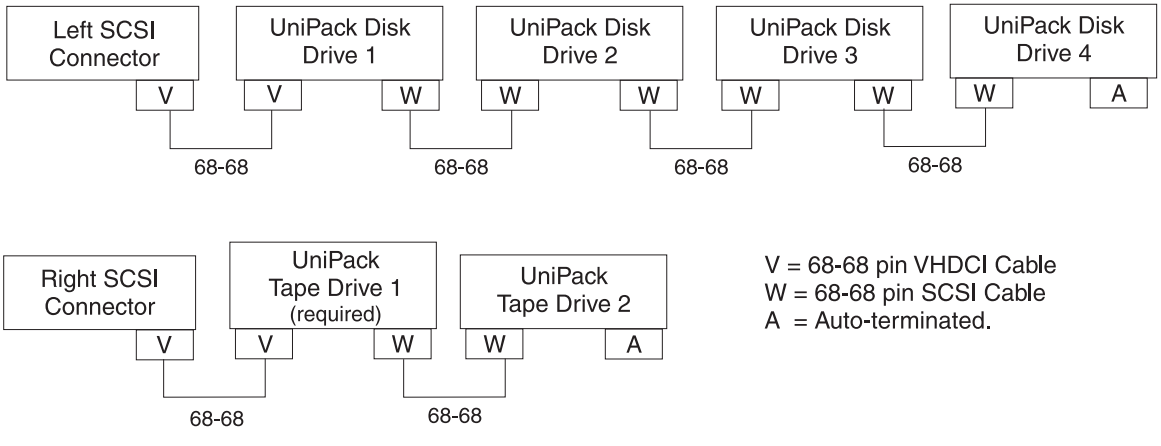
5. Connect the tape drive to the other SCSI devices. SCSI devices connect to either the Dual-Channel UltraSCSI card or to the SunSwift card.

a. If you are using an UltraSCSI card, use the following figures:

Sample Daisy Chaining of External Devices Connected to an UltraSCSI card

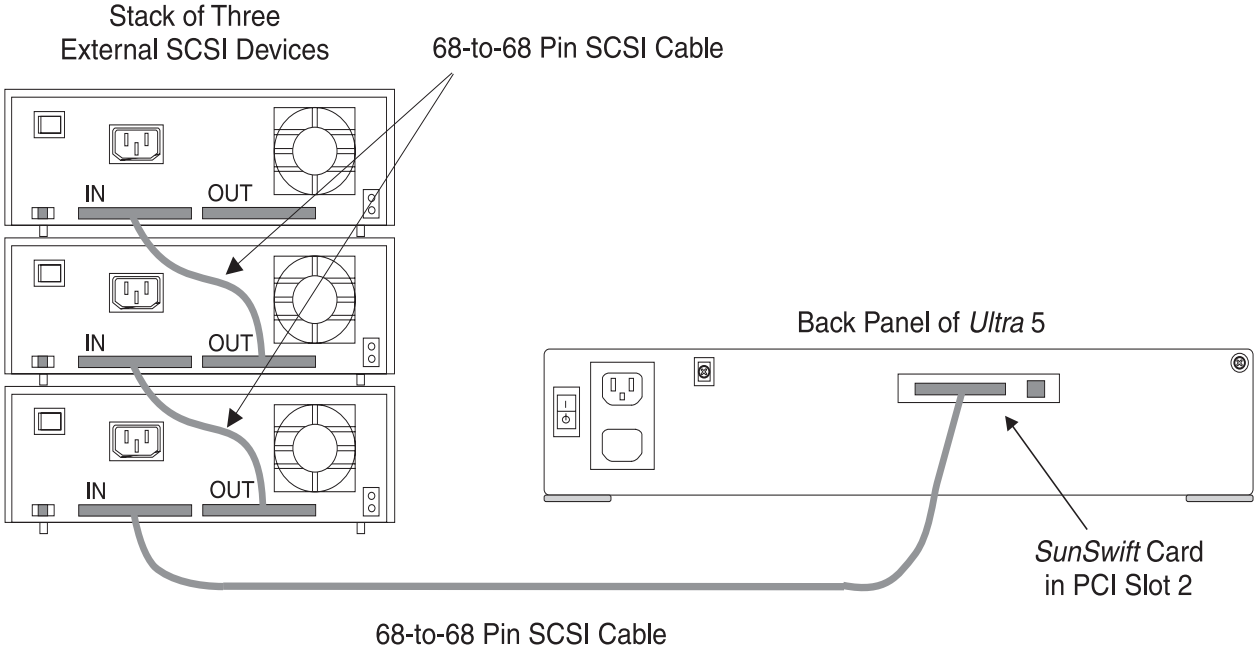


The figure below shows the SCSI cabling schemes that are possible with an UltraSCSI card installed in an *Ultra* 5 computer.

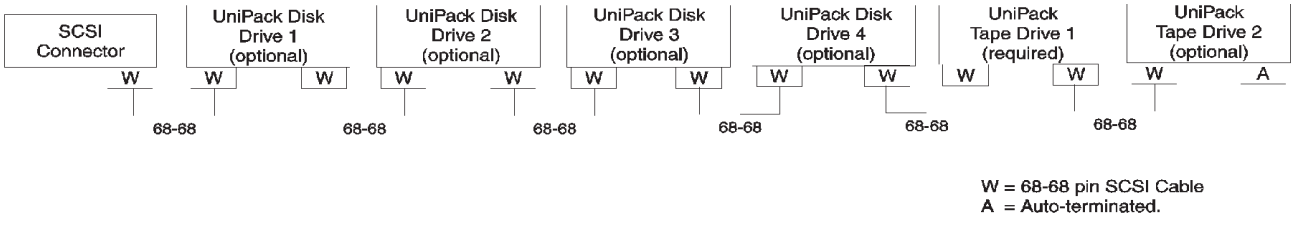


b. If you are using an UltraSCSI card, use the following figures:

Sample Daisy Chaining of External Devices Connected to a *SunSwift* card



The figure below shows the SCSI cabling schemes that are possible with a *SunSwift* card installed in an *Ultra* 5 computer.



6. Connect the power cord from the tape drive to a power source.
7. Do the following in sequential order:
   a. Turn on devices attached to the *Ultra* 5 computer starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Ultra* 5 computer.
   c. Turn on the system monitor.

The power-on diagnostics will occur when the computer is turned on.

While the system is booting up, enter the OpenBoot environment by doing the following:

8. Press the **Stop** and **A** keys simultaneously after the display console banner appears but before the system starts booting the operating system.

   After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

9. Enter the following command and verify that the system recognizes the SCSI devices:

```
ok probe-scsi-all
```

The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991


. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

NOTE:

The actual response (devices listed) depends on the devices installed on the SCSI bus.

10. Enter the following command to reboot the system and reconfigure the devices.

```
ok boot -r
```

Removing the External Tape Drive

When removing the external tape drive from an existing system, you need to do the following:

- Remove SCSI device files (to prepare for new SCSI hardware configuration).
- Remove the SCSI tape drive.
- Reboot and reconfigure the system.

Removing SCSI Device Files

To remove SCSI device files, enter the following command:

```
# rm /dev/rmt/*
```

NOTE:

If you do not remove the device files before rebooting the system, the SCSI device files may not match the hardware configuration.

Removing the SCSI Tape Drive

To remove the SCSI tape drive, do the following:

1. Shut the system down using the following command:

```
# /usr/sbin/shutdown -i0 -g0 -y
```

2. Do the following in sequential order:
   a. Turn off the *Sun Ultra 5* system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun Ultra 5* system and working toward the farthest device.
3. Remove the cable connecting the tape drive to the SCSI card.

Rebooting and Reconfiguring the System

To reboot and reconfigure the system, do the following:

1. Disconnect the tape drive power cord from the power source.
2. Do the following in sequential order:
   a. Turn on the *Sun Ultra 5* system.
   b. Turn on the system monitor.

The power-on diagnostics will occur when the computer is turned on.

While the system is booting up, enter the OpenBoot environment by doing the following:

3. Press the Stop and A keys simultaneously after the display console banner appears but before the system starts booting the operating system.

   After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

4. Enter the following command, and verify that the system recognizes the SCSI devices.

   CAUTION:

   See Chapter 7, "*Ultra 5* Troubleshooting" and the "Probe-SCSI Command Problem" section before executing this command.

   The system responds as follows:

```
/sbus@3,0/sunw,fas@3,8800000
Target 0
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991


. . . . .
. . . . .
. . . . .

ok /sbus@2,0/sunw,fas@3,8800000
```

   The actual response (devices listed) depends on the devices installed on the SCSI bus.

5. Enter the following command to reboot the system and reconfigure the devices:

```
ok boot -r
```

Identifying Device Entry Names for Ports on *Sun* SAI/P Cards

Overview

The *Sun* SAI/P (Serial Asynchronous Interface/PCI) card connects terminals, printers and modems to your *Sun Ultra* Computer, which can accommodate two SAI/P cards. Each SAI/P card is associated with an external, 8-port expander box. When the *Sun* SAI/P card driver is installed, device entries are created to access the physical ports on the expander box.

The device name that is created is `/dev/term/N`, where `N` represents SAI/P slot and expander box port entries. For example, when two *Sun* SAI/P cards are installed, the card in the lowest numbered slot is associated with physical ports a000-a0007, while ports for the second card are denoted by b000-b-007.

To display the port designations for each SAI/P card, use the `/cms/toolsbin/display_ports` command.

```
# /cms/toolsbin/display_ports

/dev/term devices:a000 a001 a002 a003 a004 a005 a006 a007
#
```

Removing SAI/P Software Driver(s)

Overview

The following steps describe how to remove the *Sun* SAI/P software driver(s):

1. Start the software removal by entering the `pkgrm` command for the SAI/P software, as shown in the following example:

```
# pkgrm SUNWsaip
```

The system responds as follows:

```
# The following package is currently installed:
     SUNWsaip         Serial Asynchronous Interface Driver (PCI)
                     (sparc) 1.0.0

Do you want to remove this package?
```

2. Enter y to start the removal of the SAI/P software driver. The system responds as follows:

```
## Removing installed package instance <SAI/P>

   This package contains scripts which will be executed with
   super-user permission during the process of removing this
   package.

Do you want to continue with the removal of this package [y,n,q,?]
```

3. Answer y. The system responds as follows:

```
## Verifying package dependencies.
## Processing package information.
## Executing preremove script.
```

If the removal is successful, the following message displays:

```
Removal of <SAI/P> was successful.
```

The system prompt returns to your screen.

Adding, Removing, or Moving a *Sun* SAI/P Card

Overview

This section describes how to add, remove or move a *Sun* SAI/P card from or to your *Sun Ultra 5* system.

Adding a *Sun* SAI/P Card

CAUTION:

Only **TSC PERSONNEL** should perform the procedures in this section.

The following steps describe how to add another SAI/P card to a system that is already up and running:

1. Identify the existing SAI/P card(s) installed in the system.
2. Shutdown the system using the following command:

```
# shutdown -g0 -y -i0
```

3. Do the following in sequential order:
   a. Turn off the *Sun Ultra 5* system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun Ultra 5* system and working toward the farthest device.
4. Decide where you will install the new SAI/P card. Insert the SAI/P card into the *Ultra 5*. See *CentreVu® Call Management System Sun Ultra 5 Computer Hardware Installation* document (585-215-871) for more information.
5. Connect the expander box to the new SAI/P card.
6. Do the following in sequential order:
   a. Turn on devices attached to the *Sun Ultra 5* system starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Sun Ultra 5* system.
   c. Turn on the system monitor.

7. Press the Stop and A keys simultaneously after the display console banner appears, but before the system starts booting.
8. Boot the system using the `boot` command, as shown below:

```
ok boot -r
```

9. Do a "`sacadm -l`" and a "`pmadm -l`" command to get existing administration information. Record this information for later use.
10. Remove port administration for all SAI/P cards by using the command shown below:

```
# pmadm -r -p ttysaips<slot> -r tty<portdesignator>
```

where *slot* indicates slot a or slot b, and *portdesignator* is the full SAI/P port designation (a000, a001, etc.).

11. Remove the SAI/P Software driver(s). Refer to the "Removing SAI/P Software Drivers" section in this chapter for instructions.
12. Install the *Sun* SAI/P software driver. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup (585-210-941) document* for details.
13. Administer all SAI/P ports cards.
14. Perform a CMSADM file system backup to backup the updated system software and hardware configuration. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup (585-210-941) document* for details.

Removing a *Sun* SAI/P Card

The following steps describe how to remove a *Sun* SAI/P card from a system that is already up and running:

1. Do a "`sacadm -l`" and a "`pmadm -l`" command to get existing administration information. Record this information for later use.

2. Remove the port administration:

```
# pmadm -r -p ttysaipslot -r ttyportdesignator
```

   Where *slot* is the slot (a or b), and *portdesignator* is the full SAI/P port designation (a000, a001, etc.).

3. Remove the *Sun* SAI/P Software driver(s). Refer to the “Removing *Sun* SAI/P Software Drivers” section in this chapter for instructions.
4. Shutdown the system using the following:

```
# shutdown -g0 -y -i0
```

5. Do the following in sequential order:
   a. Turn off the *Sun Ultra 5* system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun Ultra 5* system and working toward the farthest device.
6. Remove the SAI/P card from the system.
7. Do the following in sequential order:
   a. Turn on devices attached to the *Ultra 5* starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Ultra 5* system.
   c. Turn on the system monitor.
8. Press the Stop and A keys simultaneously after the display console banner appears, but before the system starts booting.
9. Boot the system using the `boot` command, as shown below:

```
ok boot -r
```

10. Readminister all terminals, modems, and printers connected to the SAI/P Expander Box(es) that were ordered **after** the card that was removed.
11. Perform a CMSADM file system backup. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup (585-210-941) document* for details.

Moving a *Sun* SAI/P Card

When moving SAI/P cards, remember to preserve the original ordering sequence of the cards. To do this, you many need to move more than one card. See the “Identifying Device Entry Names for Ports on the SAI/P Expander Box(es)” section in this chapter to determine the ordering sequence.

The following steps describe how to move a *Sun* SAI/P card to a different PCI slot location in the *Sun Ultra 5* system:

1. Remove the *Sun* SAI/P software driver. See the “Removing *Sun* SAI/P Software Drivers” section in this chapter for details.

   After the software is removed, the system prompt returns to your screen.

2. Enter this command:

```
# shutdown -g0 -y -i0
```

3. Do the following in sequential order:
   a. Turn off the *Sun Ultra 5* system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun Ultra 5* system and working toward the farthest device.
4. Remove the *Sun* SAI/P card from the PCI slot.
5. Install the SAI/P card into a different PCI slot by using the instructions described in the *CentreVu® Call Management System Sun Ultra 5 Computer Hardware Installation* document (585-215-871).

   CAUTION:

   Remember to preserve the original ordering sequence of the SAI/P cards.

6. Do the following in sequential order:
   a. Turn on devices attached to the *Sun Ultra 5* system starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Sun Ultra 5* system.
   c. Turn on the system monitor.

7. Press the Stop and A keys simultaneously after the display console banner appears, but before the system starts booting.
8. Boot the system using the `boot` command, as shown below:

```
ok boot -r
```

9. Reinstall the *Sun* SAI/P software driver. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup (585-210-941) document* for details.
10. Perform a CMSADM file system backup to back up the updated system software and hardware configuration. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup (585-210-941) document* for details.

Replacing an UltraSCSI Card with a *SunSwift* Card

This section describes how to replace an UltraSCSI card in an *Ultra* 5 with a *SunSwift** card.

Prerequisites

- Obtain a SunSwift PCI card.
- Obtain two new 68-to-68 pin SCSI cables.
- Turn off CMS before shutting down the system.

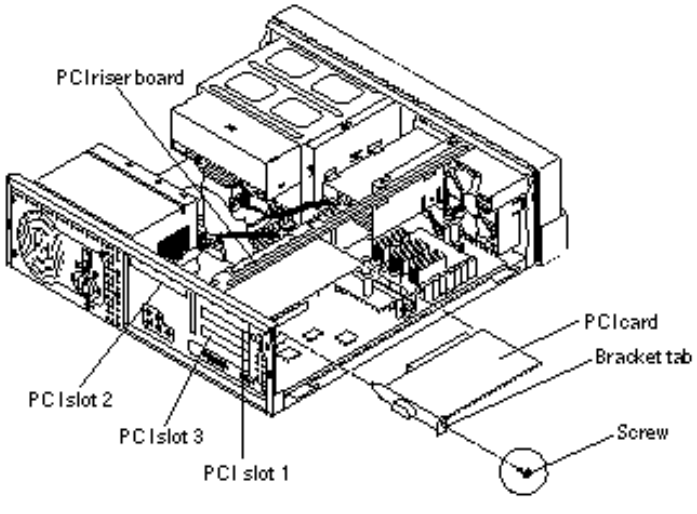
Procedure

Do the following to replace an UltraSCSI card with a *SunSwift* card:

1. Shut down the system to the boot level by entering the following:

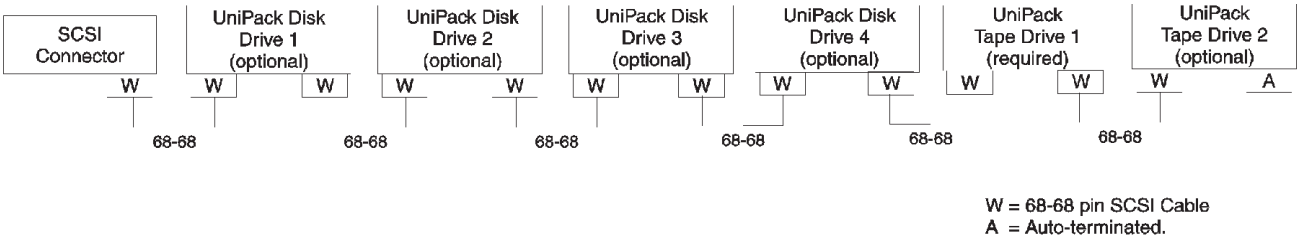
   ```
   /usr/sbin/shutdown -y -i0 -g0
   ```

   After the system attains boot level 0, the `ok` prompt displays.
2. Turn off the computer, turn off the system monitor, and then turn off all external devices (such as SCSI disk drives and tape drives) starting with the device closest to the computer and working toward the farthest device.
3. Disconnect each 68-to-68 pin VHDCI cable from the UltraSCSI card and from the first external device in each SCSI chain.
4. Remove the UltraSCSI card. It should be located in PCI slot 2.



SunSwift is a trademark of Sun Microsystems, Inc.

5. Install the SunSwift card in PCI slot 2 (or wherever the UltraSCSI card was installed).
6. Reconfigure the SCSI devices in the order shown in the following figure.



SCSI devices are addressed as shown in the table below. These addresses are set using the push buttons or thumbwheels on the back of each SCSI device.

Device	Address
Disk Drive 1	0
Disk Drive 2	1
Disk Drive 3	2
Disk Drive 4	3
Tape Drive 1	4
Tape Drive 2	5

7. Turn on power to the external devices in the opposite order in which you powered them off. That is, power on the external devices first, working your way toward the computer. Then power on the computer and the system monitor.

   When you power on the system unit, the system begins to boot. Interrupt the boot by pressing the Stop and A keys simultaneously. The system responds with the ok prompt.
8. Enter boot -r to reboot the system and recognize the new *SunSwift* card.

NOTE: This boot procedure and subsequent steps are being determined by development.

Ultra 5 Troubleshooting

Overview

This chapter contains troubleshooting information about the *Sun** *Ultra 5* System and the *CentreVu*® Call Management System application. Additional troubleshooting procedures can be found in *CentreVu* CMS Terminals, Printers and Modems (585-215-874) and *CentreVu* CMS Swith Connections and Administration (585-215-876).

You should use the information to clear problems that may arise during and after the *CentreVu* CMS installation.

The following list outlines the sections in this chapter:

- Solving Hardware-Related Problems
- Solving Power-Related Problems.

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Solving Hardware-Related Problems

Overview

This section describes how to solve the most common system hardware problems that may arise before or after the installation of the *CentreVu* CMS software.

Hardware Diagnostic Tools and Resources

The remote maintenance person has five tools or resources that perform hardware diagnostics:

- OpenBoot (PROM) On-Board Firmware
- OpenBoot Firmware (requires console redirection [see the "Redirecting the Remote Console Using *Solaris* Operating System" section in this chapter])
- Power On Self Test (POST) messages during a reboot (requires console redirection)
- *Sun* Validation Test Suite (VTS) 2.1
- Error Logs (do not require console redirection).

OpenBoot PROM On-Board Firmware

The OpenBoot PROM (OBP) On-Board firmware serves to routinely test the network controller, diskette drive system, memory, cache, system clock, network monitoring, and control registers.

OpenBoot PROM On-Board firmware test commands are identified in the table on the following page.

<table>
<tr><th>Test Command</th><th colspan="2">Description</th></tr>
<tr><td>probe-scsi-all</td><td colspan="2">This command identifies the devices attached to the SCSI bus. This command will always be preceded by the command <code>reset-all.</code>
Note: If your platform is a Sun Ultra 5 system, see the “Probe-SCSI-all Command Problem” section in this chapter for procedures used with the <code>probe-scsi-all</code> command.</td></tr>
<tr><td>probe-ide</td><td colspan="2">This command transmits an inquiry command to internal and external IDE devices connected to the system unit on-board IDE interface. This command will always be preceded by the command <code>reset-all.</code>
Note: See the “Probe-IDE Command Problem” section in this chapter for procedures used with the <code>probe-ide</code> command</td></tr>
<tr><td>test [alias]-all</td><td colspan="2">This command executes the specified device’s self-test method. Possible values for device-specifier are listed in the Alias column below:</td></tr>
<tr><td rowspan="10"></td><td>Alias</td><td>Description</td></tr>
<tr><td>memory</td><td>memory</td></tr>
<tr><td>cdrom</td><td>cdrom</td></tr>
<tr><td>tape1</td><td>14-GB or QIC 2.5-GB or 4-8 GB SLR</td></tr>
<tr><td>tape2</td><td>14-GB or QIC 2.5-GB or 4-8 GB SLR</td></tr>
<tr><td>disk</td><td>disk1</td></tr>
<tr><td>disk1</td><td>disk1</td></tr>
<tr><td>disk2</td><td>disk2</td></tr>
<tr><td>floppy</td><td>floppy</td></tr>
<tr><td colspan="2">Note: If you need to test additional devices that do not have an alias, use the <code>test-all</code> command.</td></tr>
<tr><td>test [device-specifier] -all</td><td colspan="2">This command tests all of the devices that have built-in self-test methods below the specified device tree node. If <device-specifier> is absent, the root node is used.</td></tr>
<tr><td>watch-clock</td><td colspan="2">This command tests the clock function.</td></tr>
<tr><td>watch-net and watch-net-all</td><td colspan="2">This command monitors Ethernet packets on the Ethernet interfaces connected to the system.</td></tr>
</table>

OpenBoot Firmware

The OpenBoot firmware serves two purposes:

- Boots the operating system from either a mass storage device or from a network
- Provides extensive features for testing hardware and software interactively.

OpenBoot Diagnostics (OBDiag) is a menu-driven diagnostic tool that verifies the following:

- Internal I/O system
- Ethernet
- IDE
- Keyboard
- Mouse
- Serial port
- Parallel port
- Audio
- Diskette
- NVRAM
- PCIO ASICs

OBDiag performs root-cause failure analysis on the referenced devices by testing internal registers, confirming subsystem integrity, and verifying device functionality.

Using OpenBoot Firmware

To use OpenBoot Firmware, do the following steps:

1. Do **one** of the following to enter the OpenBoot environment:
   - Stop the operating system with either the *Solaris** `/usr/sbin/shutdown -y -i0 -g0 command` (preferred method) or the command sequence `sync` Enter. Next turn off CMS. Now do `halt` Enter.
   - Press the Stop and A keys simultaneously on the keyboard while *Solaris* is running.

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CAUTION:

Using the Stop and A keys simultaneously while *Solaris* is running breaks the execution of the operating system and should be used with caution. Use this key combination as a last resort if the previous method fails.

- Power off and power on the *Sun Ultra 5* system. Press the Stop and A keys simultaneously on the keyboard after the display console banner appears but before the system starts booting the operating system (referred to as power-cycling the system).

CAUTION:

Use this method **only** if the previous methods fail to work.

After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

2. Type “obdiag” to load the test program.

3. At the `ok` prompt, type `obtest` for the OBDiag Menu, or refer to the following table for a summary of OpenBoot Diagnostic test commands.

Key Command	Command Name	Description
0	PCI/PCIO	The sub-tests of this diagnostic perform the following: • Verifies the PCIO ASIC vender ID and the PCIO ASIC device ID • Verifies the PCI configuration space is accessible as half-word bytes • Verifies the address class code • Performs walk-one test on status register, latency timer, and interrupt line. • Verifies interrupt pin is logic-level high (1) after reset.
1	EBUS DMA/TCR Registers	This command performs a walking ones bit test; verifies that the status register is properly set; and validates the DMA capabilities and FIFOs.

Key Command	Command Name	Description
2	Ethernet	The Ethernet diagnostic commands • reset the Ethernet channel • perform Ethernet channel engine internal loopback, • enable the 10Base-T data to be routed back to the receive MII data outputs • enable MII transmit data to be routed to the MII receive data path • force the twisted-pair transceiver into loopback mode.
3	Keyboard	This command consists of an external and internal loopback.
4	Mouse	This command performs a keyboard-to-mouse loopback.
5	Floppy	This command verifies the diskette drive controller initialization.

Key Command	Command Name	Description
6	Parallel Port	The Parallel Port commands • set up the SuperIO configuration register to enable extended/compatible parallel port select • enables ECP mode and ECP DMA configuration, and FIFO test mode.
7	Serial Port A	This command invokes the uart_loopback test for Serial Port A. Note: The serial port A diagnostic will stall if the TIP line is installed on serial port A.
8	Serial Port B	This command invokes the uart_loopback test for Serial Port B. Note: The serial port B diagnostic will stall if the TIP line is installed on serial port B.
9	NVRAM	This command verifies the NVRAM operation by performing a write and read to the NVRAM.

Key Command	Command Name	Description
10	Audio	This command verifies the cs4231 internal registers; performs line-in to line-out external loopback; and performs microphone to headphone external loopback.
11	ide	This command validates both the IDE chip and IDE bus subsystem.
12	All Above	This command validates the system unit. Note: The all above diagnostic will stall if the TIP line is installed on serial port A or serial port B.
13	Quit	
14	Display this Menu	
15	Toggle script-debug	
16	Enable External Loopback Tests	
17	Disable External Loopback Tests	

Additional Reference

Additional information about the OpenBoot firmware is available by contacting the Technical Service Center (TSC).

POST Messages Diagnostics

To use the Power On Self Test (POST) messages (during a reboot) to diagnose remote hardware problems, do the following steps:

1. At the ok> prompt, enter the following command to boot your system:

```
ok> boot
```

2. Scan the displayed messages on the screen. Watch for error messages.

DIMM Failure

The operating system, diagnostic program, or POST may not display a DIMM location (U number) as part of a memory error message. In this situation, the only available information is a physical memory address and failing byte. The following table lists physical memory addresses to locate a defective DIMM.

DIMM Slot	DIMM Pair (non-nterleave)
DIMM(0)	00000000 - 0fffffff
DIMM1	
DIMM2	10000000 - 1fffffff
DIMM3	

Hard Drive or CD-ROM Drive Failure

This section provides hard drive and CD-ROM drive failure symptoms and suggested actions.

Read, Write, or Parity Errors Reported by the Operating System

A hard drive read, write, or parity error is reported by the operating system.

A CD-ROM drive read error or parity error is reported by the operating system.

Solution:

Replace the drive indicated by the failure message. The operating system identifies the internal drives as indicated in the following table:

Operating System Address	Drive Physical Location and Target
c0t#d0s0	Hard drive, target #
c0t6d0s0	CD-ROM drive, target 6

NOTE:

The # symbol in the operating system address examples represents a numeral between 0 and 7 that describes the slice or partition on the drive.

Failure to Respond to Commands

The hard drive or CD-ROM drive fails to respond to commands.

Solution:

Test the drive response to the `probe-ide` commands as follows:

1. Type `reset-all`.
2. Type `probe-ide`.

NOTE:

For more information about the Probe-ID command see page 7-15

If the hard drive responds correctly to the `probe-ide` command, the following message is displayed.

```
ok probe-ide
 Device 0 ( Primary Master )
         ATA Model: ST34342A

 Device 1 ( Primary Slave )
         ATA Model: ST34342A

ok
```

This indicates that the system EIDE controller has successfully probed the device and that the motherboard is operating correctly.

If the probe-ide test fails to show the device in the message, replace the drive and rerun probe-ide (Refer to the *Ultra 5* "Maintenance" chapter for information on removing and replacing a hard drive). If replacing the drive does not correct the problem, replace the motherboard.

System Fails to Boot Properly

This section discusses some common reasons why your system fails to boot properly and provides some corrective procedures.

Power-On Initialization Sequence

You can identify problems more accurately if you are familiar with the system power-on initialization messages. These messages show you the types of functions the system performs at various stages of system start-up. These messages can also show the transfer of control from OpenBoot firmware to POST.

Keyboard Commands

The following table describes the OpenBoot initialization command sequences provided by the *Sun Ultra 5* system. These commands are useful in some boot-failure situations. To use the commands, hold down the keys after turning on the power to your system. Keep the keys pressed until the keyboard lights flash and the screen displays the firmware (`ok>`) prompt.

Command	Description
`Stop`	Bypass POST. This command does not depend on the security-mode. Note: some systems bypass POST as a default; in such cases, use the **Stop** and **A** key combination to start POST.
`Stop-A`	Abort.
`Stop-D`	Enter diagnostic mode (set `diag-switch?` to `true`).
`Stop-F`	Enter Forth on TTYB instead of probing. Use `exit` to continue with the initialization sequence. This is useful if hardware is broken.
`Stop-N`	Reset NVRAM contents to default values.

Preserving Data After a System Crash

Enter the Prom monitor (OpenBoot) `sync` command at the `ok>` prompt to force any information on its way to the hard disk to be written out immediately. This is useful if the operating system has crashed or has been interrupted before preserving all data.

The `sync` command returns control to the operating system and performs the data saving operations. After the disk data has been synchronized, the operating system begins to save a core image of itself. If you do not need this core dump, you can interrupt the operation using the **Stop** and **A** key sequence.

Probe-SCSI-all Command Problem

Problem: When using the "`probe-scsi-all`" command, users may get the following message:

```
This command may hang the system if a Stop-A or halt
command has been executed. Please type reset-all to
reset the system before executing this command. Do
you wish to continue [Y/N].
```

Solution:

Do not continue. Instead, do the following:

1. Type "n" so that the `probe-scsi-all` does not continue.
2. Type "`setenv auto-boot? false`"

   Otherwise, when you do run the `reset-all` command the machine automatically reboots instead of leaving you at the `OK` prompt.
3. Type "`reset-all`".

   This may take a minute or so to complete.
4. Now it is acceptable to execute "`probe-scsi-all`" and perform any other boot prom level diagnostics.
5. Before booting up the machine, be sure to reset the system to "`setenv auto-boot? true.`"

   Failure to do this will cause the reboot commands to stop at the boot prompt instead of proceeding through the normal boot-up.

SCSI Problems

Problem: Your system has more than one disk installed, and you get SCSI-related errors.

Solution:

1. To quickly check the SCSI-related errors, enter the following command:

```
ok probe-scsi-all
```

The program responds with the following:

```
/pci@1f, 0/pci@1/scsi@2,1
Target 0
  Unit 0 Disk SEAGATE ST19171W SUN9.OGOA78
/pci@1f, 0/pci@1/scsi@2

Target 4
  Unit 0 Removable Tape ARCHIVE VIPER 150 21531-004
SUN-04.00.00

Target 5
  Unit 0 Removable Tape TANDBERG TDG 4200 = 07:

ok
```

NOTE:

The actual response (devices listed) depends on the devices installed on the SCSI bus.

2. Fix any obvious errors.

Your system might have duplicate SCSI target number settings on one bus. Try the following procedure:

NOTE:

Two targets may have the same target number if they are on different SCSI busses.

1. Unplug all but one of the disks.
2. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

CAUTION:

See the “Probe-SCSI Command Problem” section in this chapter before executing this command.

NOTE:

Record the target number and its corresponding unit number.

3. Plug in another disk, and perform Step 2 again.

4. If you get an error, change the target number of this disk to one of the unused target numbers.
5. Repeat Steps 2-4 until all the disks are plugged back in.

Probe-IDE Command Problem

Problem: When using the "`probe-ide`" command, the system will hang.

Solution:

Do the following:

1. Type "`setenv auto-boot? false`"

   Otherwise, when you do run the `reset-all` command the machine automatically reboots instead of leaving you at the `OK` prompt.

2. Type "`reset-all`".

   This may take a minute or so to complete.

3. Now it is acceptable to execute "`probe-ide`" and perform any other boot prom level diagnostics.
4. Before booting up the machine, be sure to reset the system to "`setenv auto-boot? true.`"

Failure to do this will cause the reboot commands to stop at the boot prompt instead of proceeding through the normal boot-up.

Solving Power-Related Problems

Overview

This section provides some troubleshooting solutions to power-related problems (for example, when the *CentreVu* CMS *Sun Ultra 5* system loses power). If you cannot solve the power-related problems, escalate the problem through normal procedures.

When System Loses Power

If the *Sun Ultra 5* system loses power, it is recommended (but not required) to empty the CD-ROM and tape drive(s). The system boots from the disk by default.

Power-On sequence

To turn the power back *on*, use the following sequence:

1. Turn on devices attached to the *Sun Ultra 5* system.
2. Turn on the *Sun Ultra 5* system.
3. Turn on the system monitor.

If the *Sun Ultra 5* system is operating properly, the monitor displays a banner screen up to 3 minutes after it is powered on.

```
Sun Ultra 5/10 UPA/PCI (UltraSPARC-IIi 270MHz), Keyboard
Present OpenBoot 3.11, 128MB memory installed, Serial
#XXXXXX. Ethernet address X:XX:XX:XX:XX, Host ID: XXXX
$
```

Power-Off sequence

The following sequence is recommended to turn off the power:

1. Enter the following shutdown command:

   ```
   shutdown -g0 -i0 -y
   ```

   When the `ok` prompt appears om the console, the system can be powered off.
2. Turn off the *Sun Ultra 5* system.
3. Turn off the system monitor.

4. Turn off all external devices starting with the device closest to the *Sun Ultra 5* system and working toward the farthest device.

NOTE:

For more information about restarting the *Sun Ultra 5* system because of a power failure, refer to *Sun Ultra 5 ShowMe How* documentation that came with the system.

System Fails to Auto-Boot After Power Failure or When Given Reboot Command

If the system fails to automatically pass the boot prompt (stops at the `ok` prompt) when the reboot command is given or on a restart from a power failure, a boot environment variable may be set incorrectly.

To correct this problem do the following:

1. At the `ok` prompt enter `printenv.`
2. Scroll until you come to the variable `auto-boot?`

The auto-boot variable should be set to `true`. If not, do the following:

1. Enter the command `setenv auto-boot? true.`
2. Enter `boot.`

The system should now reboot after a power failure without stopping at the boot prompt.

Cross-Platform Procedures

Overview

This chapter explains some of the principal maintenance and upgrade issues for the *CentreVu*® Call Management System hardware.

Maintenance Procedures

This chapter describes the following maintenance procedures:

- Recovering from Disk Corruption
- Restoring an Entire System
- Run the CMS setup. See the CentreVu Call Management System Release 3 Version 8 Software Installation and Setup (585-210-941) document for details.
- Recover System Space
- Installing an HSI/S Card (Enterprise 3xxx and SPARCserver only)
- Installing an HSI/P Card (Ultra 5 only)
- Network Terminal Servers
- Change the Date or Time

Troubleshooting procedures

This chapter describes the following troubleshooting procedures:

- Diagnose Dial-In Access Problems
- Diagnose Remote Console Problems
- SunVTS Diagnostics
- Check Error Log Files
- Blank Screen — No Output
- Diagnose Problems Using the Remote Console
- Machine Panics
- Keyboard Gets Unplugged

Recovering from Disk Corruption

Overview

CAUTION:

Only **TSC PERSONNEL** should perform the procedures in this section.

The procedures for recovering a disk drive depend upon whether the disk is merely corrupted or has crashed, and whether the drive contained the operating system. If the disk is merely corrupted (you can boot up from the *Solaris** CD-ROM), you may be able to simply restore the `/cms` file system.

If the disk has crashed, or if the corrupted disk drive contained the operating system files, you may have to reinstall the entire system.

Restoring the `/cms` file system

To restore the file system only, follow the procedure in this section.

1. Remove stale information from the system files, and clear and reinitiate the metadevice by entering an `/olds/olds -cleanup` command as shown below:

   NOTE:

   This will remove everything from the `/cms` file system.

```
# /olds/olds  -cleanup
     .
     .
     .
Success, cleanup of DiskSuite, now reboot system.
#
```

2. Reboot the system with an `init 6` command as shown below:

```
# init  6
```

3. When the system prompt reappears, log on as root.

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4. Check disk partitioning with an `/olds/olds -check_disks` command as follows:

```
#  /olds/olds  -check_disks
      .
      .
      .
disk:c0t0d0 is partitioned ok
disk:c0t1d0 is partitioned ok
disk:c0t2d0 is partitioned ok
Warning: Current Disk has mounted partitions
disk:c0t0d0 is partitioned ok
Success, checking disks
#
```

5. Verify that all drives are accounted for with an `/olds/olds -mk_files` command as follows:

```
#  /olds/olds  -mk_files
      .
      .
      .
Success, creating md.tab.new and/or vfstab.new
```

6. Create the state database replicas by entering the following command:

```
#  /olds/olds  -metadbs
```

7. Set up the /cms metadevice with the /olds/olds -setup command shown below. This setup command will require an average time of 1 to 1.5 minutes per each gigabyte of disk space.

```
#  nohup  ./olds/olds  -setup  |  tee
     .  .  .
prtvtoc:  c0t6d0so:  device busy
device:  c0t0d0 will not be used
valid disks are c0t0d0  c0t1d0  c0t2d0  c0t3d0
     .  .  .
super-block backups (for fsck -F ufs -o b=#) at:
32, 16240, 32448, 48656, 64864, 81072, 97280, 113488,
     .  .  .
10532656, 10548864, 10565072, 10580000, 10596208
ufs fsck: sanity check: /dev/md/rdsk/d19 okay
Success, activating or growing /cms metadevice
#
```

8. Mount the file system by entering the following command:

```
# mount /cms
```

Restoring the Latest CMSADM Backup

CAUTION:

Perform this procedure only if you have a CMSADM backup available.

If you do not have a CMSADM backup, skip to the “Reinstall *CentreVu* CMS” section.

1. Make sure you are at the root level. To verify if you are in root, enter a cd command and a pwd command.
2. Restore the latest available CMSADM backup data by loading the backup tape into the tape drive and entering the following command:

```
# nohup  cpio  -icmud  -C  10240 -I /dev/rmt/#  -M “Please
remove the current tape, insert tape number %d and then
press ENTER” “cms”  “cms/*” | tee
```

NOTE:

The character “#” should be substituted with the tape drive device name

3. Run CMS set up. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.
4. If you have *CentreVu* CMS maintenance backups dated after the latest CMSADM backup, also restore the latest maintenance backups.

Reinstalling *CentreVu* CMS

Perform this procedure only if you have no CMSADM backup available. If you have a CMSADM backup, perform “Restoring the Latest CMSADM Backup” section in this chapter“ instead.

1. Reinstall *CentreVu* CMS. Refer to *CentreVu* CMS Software Installation and Setup (585-215-941).
1. Run CMS setup. Refer to *CentreVu* CMS Software Installation and Setup (585-215-941).
2. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See the *CentreVu Call Management System Release 3 Version 8 Administration* (585-210-910) document for details.

Restoring an Entire System

Overview

If you have a disk crash that disables the operating system disk drive, you must reenable the system to boot, then reinstall the missing packages. If a CMSADM backup is available (see "When a CMSADM Backup is Available"), the process takes much less time.

When a CMSADM Backup is Not Available

If a CMSADM backup is not available, do the following:

1. Reinstall the entire system including the following:
   - *Sun Solaris 7 (*3/99) operating system
   - *Sun* Online Validation Test Suite (VTS) 2.1.1
   - High-Speed Serial Interface/PCI Bus (HSI/P) Version 2.0 (optional)
   - Serial Asynchronous Interface/PCI (SAI/P) Adapter 2.0 (optional)
   - Bay Networks Annex *Network Terminal Server* (NTS) drivers (optional)
   - *Solstice* for Server Connect X.25 Network Interface Version 9.1 (optional)
   - *INFORMIX*[*]
     - — Structured Query Language (SQL) (optional)
     - — Standard Engine (SE)
     - — Runtime ESQL
     - — International Language Supplement (ILS)
     - — *Solstice DiskSuite* software
   - *Sun Solaris patches*
   - *Solstice DiskSuite* setup scripts
   - *CentreVu* Call Management System (CMS) software
   - CMS patches (if needed)
   - CMS Supplemental Services software

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- Set up the CMS software
- Open Database Connectivity (ODBC) software (optional)
- Set up the remote console
- Administer the NTS (optional)
- Perform a CMSADM backup

See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.

2. Run the CMS setup. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.
3. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for information on performing a *CentreVu* CMS Maintenance restore.
4. Re-administer Terminals, Printers, Modems, and other peripherals as needed. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-215-874) document for information on installing consoles, printers and modems.
5. Contact Professional Services for any previously installed customization.

When a CMSADM Backup is Available

If a CMSADM backup is available, do the following procedures:

- Install the *Solaris* Operating System. From a local console, see the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for more information.
- Install *Solstice DiskSuite* .
- Run the *Solstice DiskSuite* Setup Scripts
- “Running the CMSADM Backup Tape” on page 8-32.
- Run the CMS setup. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for details.
- Restore CMS Maintenance Backup

Installing the *Solaris* Operating System

The Solaris Installation Program is a menu-driven, interactive program that guides you step by step through installing the Solaris Software. It also has online help to answer your quetions.

Refer to the CenterVu Call Management System Release 3 Version 8 Software Installation and Setup (585-210-941) document for information on installing the Solaris operating System.

Booting from the Solaris 7 (3/99) CD-ROM USing a Remote Console

This Section describes how to boot the system from the Solaris 7 3/99 CD-ROM using a remote console.

Dialing In to the Customer's System.

If you are doing the boot remotely, use the following steps to dial in to a system remotely:

1. Dial up the customer's system.
2. Enter the console type for the remote console. You will be prompted for this information when you dial up the system. Select other and then enter 6300=.
3. Enter the root login and password.

Giving Control to the Remote Console

If you are doing the Solaris part of the upgrade. remotely. Use the following instructions to transfer controll of the console from the local system to the remote system. This procedure takes about 10minutes.

CAUTION:

If you are controlling the console remotely and the phone connection is interrupted during the Solaris upgrade, you can not dial back into the system. If that should happen, you can reset back to the local console with this procedure:

a. Turn off the Sun system.

b. Simultaneously hold down the Stop and N keys as you turn the machine back on. Keep holding down the Stop and N key sequence until the screen displays an OK prompt.

Now you can redirect the console.

NOTE:

You must first access the system with the dial command:

```
#  dkcu -b 8 mod9600 cu -ds9600 <customer's modem number>
```

This allows th eremote console to maintain control in the firmware mode.

1. Turn off the administration at serial port by entering the following command:

   ```
   #  /cms/install/bin/abcadm -r ttyx
   ```

   Where X is port a or b depending on the platform:

   - E3000 and SPARC use port a.
   - Ultra 5 use port b.

   The system responds as shown bellow:

   ```
   #  ttyx is currently turned off
   Are you shure you want to change it?
   ```

2. Answer y.

   The system responds as shown bellow:

```
#  ttyx administration removed
```

3. Enter the following command to enable the console for remote operation on serial port B:

```
#  /cms/install/bin/abcadm -c ttyx
```

   The system responds as shown bellow:

```
#  Console set to remote
This change requires a reboot to take effect
Are you ready to reboot? [y,n?]
```

4. Answer y.

   The shutdown begins as shown bellow:

```
#  Starting port monitor
setting console parameters
Proceeding to reboot.......
system console login:
```

5. Enter the root login and pasword.

   The local console screen blanks out and dysplays a console login and password prompt. Nothing should be done at the local console while the upgrade is being done remotely.

Booting Procedure

To boot hte computer from the CD_ROOM, do the following:

1. Verify that CMS is turned off.
2. Synch your system by entering the following command:

```
#  init 0
```

3. Load the Solaris 7 3/99 Hardware CD into the CD-ROM drive and from the OK prompt, enter the following command:

```
#  ok boot cdrom
```

   The boot process takes about 5-10 minutes. When the boot process completes, you are prompted to enter the language and locale as shown bellow:

```
Select location and locale
```

4. Enter the location and locale.

   The display shows the following:

```
What type of terminal are you using?
1) ANSI Standard CRT
2) DEC VT52
3) DEC VT100
4) Heathkit 19
5) Lear Siegler ADM31
6) PC Console
7) Sun Command Tool
8) Sun Workstation
9) Televideo 910
10) Televideo 925
11) Wyse Model 50
12) X Terminal Emulator (xterms)
13) Other
Type the number of your choice and press return:
```

5. Enter the number that corresponds to your console type. If you select 13) Other, you are prompted to enter your console type (for example, 6300+)

After you identify your console type, the system displays the following screen:

```
The Solaris Installation Program

You are now interacting with the Solaris installation program. T
program is divided into a series of short secctions. At the end c
section, you will see a sumry of the choices you have made, and b
the opportunity to make cahnges.

As you work with the program, you will complete one or more of t
following task:..............



F2_Continue      F6_Help
```

NOTE:

The keys you need for a given function differ depending on the console type. This manual refers only to function names; text at the bottom of each screen tell you hoe to execute available functions.

If you need help during the installation, use the Help Function to get more information about the current procedure.

6. To continue select the Continue function.

Identifying the System

When you select Continue in step 6 of the previous procedure, the following screen appears

```
Identifying This System

On the next screens, you must identify this system as networked
networked, and set the default time zone and date/time.

If this system is networked, the software will try to find the
information it needs to identify your system; you will be prompt
supply information it can not find.

> To beguin identifying this system, press F2



F2_continue         F6_Help
```

1. To continue select Continue.

   The following screen appears:

```
Host Name

On this screen you must enter your hhost name, which identifies
system on the network. The name must be unique within your domai
creatind a duplicate hostname will cause problems on the network
you install Solaris.

A host name must be at least two characters; it can contain lett
digits, and minus signs (-).

        Host Name:_____________________


F2_continue         F6_Help
```

2. Type the host name for the workstation (also known as the system name). Then select Continue.

   The following screen displays:

```
NEtwor Conectivity

On this screen you must specify wether this system is connected
network. If you specify Yes, the system should be connected to t
netowrk by an ethernet or similar network adapter.

>To make a selection, use the arrow keys to highlight the option
press return to mark it [X].

Networked

[X] Yes
[ ] No

F2_continue         F6_Help
```

3. Use the arrow keys to select the Yes box; then press Enter to mark it. Then select Continue.

   NOTE:

   If the system is equiped with more than one network board, the Primary Network Interface screen displays. You should:

   a. Select the hme0 option or the option for your platform:

      E3000 .....hme0
      SPARC ie0
      Ultra 5.....hme0

   b. press Enter

   c. select Continue.

   The following screen appears:

```
IP Addresss

On this screen you must enter the Internet Protocol (IP) address
this system. It must be unique and follow your site's address
conventions, or a system network failure could result.

IP addresses contain four sets of numbers separated by periods (
example 129.200.9.1

IP address:_____________________


F2_continue          F6_Help
```

4. Type the IP address for the workstation; then select continue.

The following screen appears:

```
Confirm Information

> Confirm the following information. If this is correct, press F
change any information, press F4.

Host name: abcxyz
Networked: Yes
IP address: 123.45.6.789



F2_continue          F4_Change          F6_Help
```

5. If the displayed information is correct, select Continue. If you select Change, the program jumps to the Name Service Screen.

   The following screen appears:

```
Nmae Service
On this screen you must provide name service information. Select
NIS if this system is known to the name server; select other if
site is using another name service ( for example, DCE or DNS); s
none if your site is not using a name service, or if is not yet
established.

> To make a selection, use the arrow keys to highlight the optio
press return to mark it [X].

Name service

[ ] NIS=
[ ] NIS (formerly yp)
[ ] Other
[X] None

F2_continue          F6_Help
```

6. Use the arrow keys to select the None box; then press Enter to mark it. Then select Continue.

The following screen appears:

```
Subnets
On this screen you must specify whether this system is part of a s
If you specify incorrectly, the system will have problems communi
on the network after you reboot.

> To make a selection, use the arrow keys to highlight the optio
press return to mark it [X].

System part of a subnet

[ ] Yes
[X] No


F2_continue         F6_Help
```

7. Use the arrow keys to select the No box; then press enter to mark it. Select Continue.

   The following screen appears:

```
Confirm Information
Confirm the following information. If it is correct, press F2; to
any information press F4.

> To make a selection, use the arrow keys to highlight the optio
press return to mark it [X].

Name service: None
System part of a subnet: No




F2_continue         F6_Help
```

8. If the displayed information is correct, select Continue. If you select Change, the program jumps to the Name Service screen.

Setting the Date and Time

When you select Continue (in step 8 of the previous section) the following screen appears:

```
Time Zone
On this screen you must specify your default time zone. You can
specify a time zone in three ways: Select one of the geographic
regions from the list, select other - offset from GMT, or other
- specify time zone file.

> To make a selection, use the arrow keys to highlight the
option and press return to mark it [X].

Regions
[ ]Asia, Western
[ ] Australia / New Zealand
[ ] Canada
[ ] Europe
[ ] Mexico
[ ] South America
[X] United States
[ ] Other - offset from GMT
[ ] Other - specify time zone file
[ ]
[ ]

F2_continue         F6_Help
```

1. Choose an option by using the arrow keys to position the cursor in the selection box next to the region appropiate to the customer's location. Press Enter to mark your choice. Finnaly, select Continue to record your choice and move on.

The following screen appears:

```
> To make a selection, use the arrow keys to highlight the option
press return to mark it [X].

Time Zones
[ ] Eastern
[ ] Central
[X] Mountain
[ ] Pacific
[ ] East-Indiana
[ ] Arizona
[ ] Michigan
[ ] Samoa
[ ] Alaska
[ ] Alutian
[ ] Hawaii


F2_continue         F5_Cancel           F6_Help
```

2. Select the appropiate time zone for the customer's location by using the arrow keys to position the cursor, and then pressing Enter to mark your choice. Then select Continue.

   The following screen appears:

```
Date and Time

>Accept the default date and time or enter new values.

Date and time: 10/11/99 3:28

Year     (4 digits):1999
Month    (1-12)    :10
Day      (1-31)    :11
Hour     (0-23)    :4
Minute   (0-59)    :13



F2_continue          F6_Help
```

3. Select continue to accept the dafault date and time, or use the arrow keys to select the fields that need correction and enter the correct information; then select Continue.

The following screen appears:

```
Confirm Information

>Confirm the following information. If it is correct, press F2; to
change any information press F4.


Time zone: US/Mountain
Date and time: 10/11/99 3:28



F2_continue          F4_Change          F6_Help
```

4. Select Continue if the displayed information is correct. If you select Change, the program returns to the Time Zone screen.

   The system date and time are now set. After a brief pause, the program continues with the installation of Solaris 7 3/99 system files.

Installing the Solaris 7 3/99 System Files

After the brief pause. the following screen appears.

```
Upgrade System

This system is upgradable.Coosing the upgrade option means
any bundled Solaris software will be updated to the new
release, and as many local modifications as possible will
be saved.

While your system is upgradable, you can choose the initial option
however, files on your disk will be overweitten and data will be
lost.

CAUTION: If you choode the upgrade option, it is specially
important to back up your system. However, backingup is also
recomended for the initial option if there is any data on the disk
you want to save.

> To start the upgrade option choose F2.
>To start the initial option choose F4.

F2_continue          F4_Initial        F5_Exit          F6_Help
```

1. To continue select Initial.

   The following screen appears:

```
System Type

On this screen you must specify one of the following system types.
A system types determines where a system will get its directories
and file systems, and whether it provides portions of Solaris
software to others sytems.

To make a selection, use the arrow keys to highlight the option an
press return to mark it [X].
                 [ ] Standalone
                 [ ] Server
                 [ ] Dataless Client

F2_continue        F3_Go Back        F4_Customize        F5_Exit
```

2. Put the cursor in the box next to Standalone and select Continue.

   The following screen appears:

```
Software

On this system you must select the Solaris software to install on
system. The software groups shown are bundled and defined by SunSo
You can accept the default [X] or select another.

NOTE: After selecting a software group, you can add or remove soft
from it by selecting F4 to customize. However, this requires
understanding of software dependencies and how solaris is packaged

> To make a selection, use the arrow keys to highlight the option
press return to mark it [X]. Then press F4 to customize or F2 to
continue.

[ ] Entire distribution plus OEM Support...449.34 MB
[ ] Entire distribution.....................449.21 MB
[ ] Developer System Support...............362.06 MB
[X] End USer System Support.................269.22 MB
[ ] Core System Support.....................164.89 MB

F2_continue        F3_Go Back        F4_Customize        F5_Exit
```

3. Move the cursor to the box next to End User System Support and press Enter. Then select Continue.

The following screen appears:

```
Disks

On this system you must select the disks for installing Solaris
software. Start by looking at the suggested minimum field; this
value is the approximate space needed to install the software you
selected. Keep selecting disks until the total selected value exce
the suggested minimum value.
For example:

> To make a selection, use the arrow keys to highlight the option
press return to mark it [X].
Disk Device         Size                    Available Space
============================================================
[X] c0t3d0          (4028 MB) bootdrive         4024 MB
[X] c0t1d0          (4028 MB)                   4024 MB

                                Total Selected:     0 MB
                             Suggested Minimum:   269 MB


F2_continue        F3_Go Back        F4_Customize        F5_Exit
```

Disks will be different for each plattform.

4. Select every disk by marking each one. When all are marked, select Continue.

   The following screen appears:

```
At least one of the disks you have selected has file system or unn
slices that you might want to save.
For example:

> To save file systems or unnamed slices, press F4.
> To allow current file systems and unnamed slicces to be overwrit
when solaris software is installed, press F2


F2_continue        F3_Go Back        F4_Customize        F5_Exit
```

5. Select Continue.

   The Automatically Layout File Systems? screen appears.

Partitioning the Hard Disks Using a Remote Console

To partition a disk from a remote console, use the following procedure:

```
Automatically Layout File Systems?

Do you want to use the auto-layout feature to automatically
layout file systems on your disks? Manually laying out file system
disks requires advanced administration skills.

> To use the auto-layout feature, press F2.
> To manually layout file systems, press F4.


F2_Auto Layout        F3_Go Back        F4_Manual Layout       F5_
```

1. Select Manual Layout. The system responds with the following screen:

```
Select Disks to Customize



> To select a disk, use the arrows keys to highlight it and press

Disk Device         Size            Configured File Systems
============================================================
[X] c0t0d0          (3880 MB)
[X] c0t1d0          (3084 MB)

F2_OK        F4_Customize       F6_Help
```

2. Highlight the first disk and select Customize.

The following screen appears:

```
Customize Disk: c0t0d0s0
Entry:        Recommended:      MB      Minimum     MB
========================================================
Slice  Mount Point          Size (MB)
       1                          0
       2    overlap            3880
       3                          0
       4                          0
       5                          0
       6                          0
       7                          0
========================================================
                  Capacity:     4028 MB
                 Allocated:        0 MB
                      Free:     3880 MB


F2_OK        F4_Options       F5_Cancel         F6_Help
```

3. Select Options (n order to partition disks by cylinders instead of Megabytes). The system respond with the following screen:

```
Select Options

Disk Editing Options

        Show size in:
            [ ] MB
            [X] Cylinders

        Other options:
            [ ] Cilinder boundaries
            [ ] Load existing slices from VOTC label


F2_OK        F5_Cancel         F6_Help
```

4. Mark Cylinders and select OK.

The system responds with the following screen:

```
Customize Disk: c0t0d0s0
Entry:        Recommended:      MB      Minimum     MB
========================================================
Slice  Mount Point          Size (MB)
       0    /                   1023
       1                        7
       2   overlap              3880
       3                        2788
       4                           0
       5                           0
       6                           0
       7                           0
========================================================
                  Capacity:     3880 MB
                 Allocated:        0 MB
                      Free:     3880 MB


F2_OK        F4_Options       F5_Cancel         F6_Help
```

5. Partition the boot disk according to the following Boot Disk Partition table. When you have filled out the necessary fields, enter F2..

Boot Disk Partition values

The disk cylinder values provided in the following table conform to the R3V8 disk partitioning specifications for all disk drives compatible with with R3V8. These partion settings will remain unchanged through the ensuing *Solaris* 2.7 upgrade.

NOTE FOR MIRRORED SYSTEMS:

When setting up disk partitions for mirrored Enterprise 3000 or 3500 systems, select the following disks (if feasible) to partition as the boot and alternate boot devices:

Enterprise 3000:

- boot - c0t0
- alternate boot - c0t1

Enterprise 3500:

- boot - c0t0
- alternate boot - c1t4

When you input the partition values for the boot and alternate disks, be careful to enter the correct slice names for partition 0:

- for primary boot disks, the slice name for partition 0 is always "/".
- for alternate boot disks, the slice name for partition 0 must always remain blank.

Boot Disk Partition Table:

		Disk Size (in cylinders)			
Slice	**Slice Name**	**4.2-GB SCSI (SPARCserver and E-3000)**	**8.4-GB EIDE (Ultra 5)**	**9.1-GB EIDE (Ultra 5)**	**9.1-GB SCSI (SPARCserver and E-3000) or FCAL (E-3500)**
0	/ **or** (*blank*) if alternate boot on mirrored systems	1023	2134	2032	616
1	(blank)	7	7	7	7
2	overlap*	3880	16706	17660	4924
3	(blank)	1879	12533	13540	3716
4	swap	971	2032	2081	585
5-7	(blank)				

* O*verlap* partition sizes are automatically displayed in the Customize Disks screen during the Solaris installation. These values indicate the total number of cylinders for the disk drive models used in CMS R3V8. If the disk drive you are partitioning does not match one of these values, you have a non-standard disk. Escalate the issue to Lucent technical support.

The system responds with the following screen:

```
Select Disks to Customize



> To select a disk, use the arrows keys to highlight it and press

Disk Device         Size            Configured File Systems
============================================================
c0t0d0          (3880 Cyls)
c0t1d0          (3084 MB)
c0t2d0          (3084 MB)


F2_OK        F4_Customize       F6_Help
```

6. Select the next disk (c0t1d0, for example) and select Customize.

The system responds with the following screen:

```
Customize Disk: c0t1d0s0
Entry:        Recommended:      MB      Minimum     MB
=====================================================
Slice  Mount Point          Size (MB)
       0                       0
       1                       0
       2   overlap          3084
       3                       0
       4                       0
       5                       0
       6                       0
       7                       0
=====================================================
                  Capacity:     4024 MB
                 Allocated:        0 MB
                      Free:     3084 MB


F2_OK        F4_Options       F5_Cancel         F6_Help
```

7. Configure this disk using the following table, and select OK.

Non-boot disk partition values

The non-boot disk cylinder values provided in the following table conform to the R3V8 disk partitioning specifications for all disk drives supported by R3V8.

NOTE:

- For non-boot disks, all slice names remain blank, except for “overlap”.
- The size of the overlap file system always defaults to the size of the entire disk. Do not change this value.

Non-boot Partition Table:

		Disk Size (in cylinders)		
Slice	**Slice Name**	**4.2-GB SCSI (SPARCserver and E-3000)**	**9.1-GB EIDE (Ultra 5)**	**9.1-GB SCSI (SPARCserver, E-3000) or FCAL (E-3500)**
0	(blank)	2	2	2
1	(blank)	3878	17658	4922
2	overlap*	3880	17660	4924
3	(blank)			
4-7	(blank)			

* O*verlap* partition sizes indicate the total number of cylinders for the disk drive models used in CMS R3V8. If the disk drive you are partitioning does not match one of these values, you have a non-standard disk. Escalate the issue to Lucent technical support.

The system responds with the following screen:

```
Customize Disk: c0t1d0s0
Entry:        Recommended:      MB      Minimum     MB
=====================================================
Slice  Mount Point          Size (MB)
       0                       2
       1                    3878
       2   overlap          3880
       3                       0
       4                       0
       5                       0
       6                       0
       7                       0
=====================================================
                 Capacity:     4024 MB
                Allocated:     3880 MB
                     Free:        0 MB


F2_OK        F4_Options       F5_Cancel         F6_Help
```

8. Select OK.

   The system respond with the following screen:

```
Select Disks to Customize



> To select a disk, use the arrows keys to highlight it and press

Disk Device         Size            Configured File Systems
============================================================
c0t3d0          (3880 Cyls)
c0t1d0          (3880 Cyls)


F2_OK        F4_Customize       F6_Help
```

NOTE:

If there are more non-boot disks to configure, repeat steps 6 through 8 for each one. Do not go until all disks in the system have been configured.

9. Select OK.

The system respond with the following screen:

```
File System and Disk Layout

The current file system layout for your disks is shown bellow.

NOTE: If you press F4 to customize, you should understand file syst
their intended purpose on the disk, and how changing tha plan migh
affect the operation of the system.

> To accept the layout and continue, press F2.
> To customize the layout, press F4

File system/Mount point        Disk/Slice        Size
============================================================
/                              c0t3d0s0         802 MB


F2_OK        F4_Customize       F6_Help
```

10. Select Continue. The system responds with the following screen:

```
Mount Remote File System?

Do you want to mount software from a remote file server?
This might be necessary if you had to remove software because
of disk space problems.

> To go mout the Remote File System screen, press F4.
> To bypass mounting remote file systems, press F2




F2_Continue       F3_Go Back       F4_Customize       F5_Exit
```

11. Select Continue.

The following screen appears:

```
Profile

The information bellow is your profile for understanding Solaris
software. It is a summary of the choices you have made in previous
screens.

> To go back to the beguinning to make cahnges, press F4.
=========================================================
          System Type: Standalone
         Software: Solaris 7 3/99, end user system support
       File System and disk layout: /       c0t3do   802 MB




F2_Continue       F4_Change       F5_Exit        F6_Help
```

12. Select Continue.

    The system displays the following screen:

```
Begin Installing Solaris

By default, your system will reboot after Solaris is installed.
However, you can bypass rebooting and acces a unix shell to make
changes before rebooting.
> To begin installing Solaris, press F2; to go back and make chang
press F5.
=====================================================================

              [X] Reboot
              [ ] Do not reboot




F2_Begin Installation      F5_Cancel
```

13. Select Begin Installation. The installation begins by showing the following messages:

```
Finding modified files. This might take several minutes.
Calculating space requirements.
Space check complete.
Starting upgrade:
Removing obsolete packages and saving modified files:
.
.
.
.
.
.
```

This part of the upgrade takes about one hour, and does the following:

- Finds modified files
- Caldulates space requirements
- Starts the upgrade
- Removes obsolete packages and saves modified files
- Removes patches
- Installs new packages.

The disk partitioning is now complete. Complete the installation with the procedure “Assigning a Root Password.”

Running the Solstice DiskSuite Setup Scripts

For information on running the Solstice DiskSuite Setup Scripts please see CenterVu CMS R3V8 Software Installation and Setup (858-210-941).

Restoring the CMSADM Backup Tape

To complete the restoration of your system and its files you must now run the CMSADM backup tape.

To do this, simply insert the tape into the tape drive and run the tape using one of the two following options:

1. If you want to restore everything (including CMS data), enter the following command:

```
#  cd /
#  cpio -icvmud -C10240 -I <device name>
```

2. If you want to restore the system without restoring CMS data, enter the following command:

```
#  cd /
#  cpio -icvmudf -C10240 -I <device name> /cms
```

Restoring Specific Files

To restore specific files, enter the following command at the system prompt:

```
# cpio -icmudv -C 10240 -I /dev/rmt/0 -M “Please remove the
current tape, insert tape number %d, and press ENTER”
<full_path_name>
```

NOTE:

`/dev/rmt/0` may be substituted with another tape device name.

Restoring a CMSADM File System Backup

If CMSADM file system backups are available, the complete file systems can be restored if an accidental loss of data occurs.

CAUTION:

Use this procedure only if you have a CMSADM file system backup available.

Procedure

1. Obtain the tape(s) that contain the CMSADM file system backups.
2. Obtain the printout of the `/etc/vfstab` file that was stored with the backup tapes.
3. Load the first backup tape.
4. If you have only one backup tape, enter the following command:

   ```
   cpio -icmudv -C 10240 -I /dev/rmt/0c
   ```

   If you have more than one backup tape, enter the following command on a single line:

   ```
   cpio -icmudv -C 10240 -I /dev/rmt/0c -M "Insert tape %d and press Enter"
   ```

   As the restore proceeds, the console displays the files being copied from the tape to the disk, and the light-emitting diode (LED) on the tape drive will alternately flash and light steadily. The program, which can take several hours depending on the amount of data being restored, responds as follows:

```
cpio: Cannot create temporary file, errno 18, Cross-device link
(There is a time delay between the first message and the rest of the
messages)
cpio: Cannot chmod() "/home", errno 89, Operation not applicable
cpio: Unable to reset modification time for "/home", errno 89,
Operation not applicable
cpio: Cannot chmod() "/home", errno 89, Operation not applicable
cpio: Cannot chown() "/home", errno 89, Operation not applicable
cpio: Cannot chmod() "/xfn", errno 89, Operation not applicable
cpio: Unable to reset modification time for "/xfn", errno 89, Operation
not applicable
cpio: Cannot chmod() "/xfn", errno 89, Operation not applicable
cpio: Cannot chown() "/xfn", errno 89, Operation not applicable
602780 blocks
9 error(s)
```

NOTE:

You may see some error messages about the `/home and /xfn` directories. These errors display when the directories are already present and can be ignored.

5. If you are not sure of the device path, enter the following commands:

   ```
   mt -f /dev/rmt/0c status
   mt -f /dev/rmt/1c status
   ```

   The correct device path will show information similar to the following:

```
Tandberg 2.5 Gig QIC tape drive:
   sense key(0x0)= No Additional Sense residual= 0 retries= 0
   file no= 0   block no= 0
```

6. If you have CMS maintenance backups dated after the latest CDMADM backup, restore the latest maintenance backups. See *CentreVu® CMS R3V6 Administration* (585-215-850) or *CentreVu® CMS R3V5 Administration* (585-215-820) for more information.

Doing CMS Maintenance Restores

The CMS software application allows you to restore CMS data lost due to events such as system failure or disk crashes. You can restore all CMS data that you previously backed up during a CMS maintenance backup.

If a disk crash does occur, you may have to reinstall the *Solaris* operating system, the supporting *Sun* applications, and CMS before you can perform a CMS maintenance restore. See *CentreVu® CMS R3V8 Hardware Maintenance and Troubleshooting* (585-210-919) or *CentreVu® CMS Sun® Enterprise™ 3500 Computer Maintenance and Troubleshooting* (585-215-875) for more information.

After you have the system in an operable state, restore the CMS administration and historical data from the most recent CMS maintenance backups. See the “Maintenance” chapter in *CentreVu® CMS R3V8 Administration* (585-210-910) for more information about backup strategy.

Depending on which backups are available, there are two possible scenarios when doing a CMS maintenance restore:

- Restoring data when only full maintenance backups are available
- Restoring data when both full and incremental maintenance backups are available.

Prerequisites

- CMS must be in the single-user state (System Setup: CMS State)
- Data collection must be turned off (System Setup:Data Collection).

Using Only Full Maintenance Backups

If only full CMS maintenance backups are available, the following steps are the fastest way to get the system running:

1. Load the most recent full maintenance backup tape.
2. In one of the windows at a console, log into the system by using a CMS administrator's login ID (`su - cms`). Supply the correct password if prompted.
3. Access the CMS main menu by typing `cms` and entering the correct terminal type.
4. Select the `Maintenance` option.
5. Select the `Restore Data` option.
6. Do an automatic restore of the system administration data, ACD-specific data, historical data, and non-CMS data by entering `y` in the `Restore from last backup (y/n):` field.
7. After the restore is finished, access the CMS Services menu by entering `cmssvc`.
8. Enter `3` to select the `run_cms` option.
9. Enter `2` to turn off CMS.

   CMS turns off.
10. Access the CMS Services menu again by entering `cmssvc`.

    The menu appears.
11. Select the `run_cms` option.
12. Enter `1` to turn on CMS.

    CMS turns on.

Using Both Full and Incremental Maintenance Backups

If both full and incremental CMS maintenance backups are available, the following steps are the fastest way to get the system running:

1. Load the most recent full maintenance backup tape.
2. In one of the windows at a console, log into the system by using a CMS administrator's login ID (`su - cms`). Supply the correct password if prompted.
3. Access the CMS main menu by typing `cms` and entering the correct terminal type.
4. Select the `Maintenance` option.
5. Select the `Restore Data` option.
6. Enter `n` in the `Restore from last backup (y/n):` field.
7. After the full restore is finished, load the most recent incremental maintenance backup tape.
8. Restore the historical data and non-CMS data.
9. After the incremental restore is finished, access the CMS Services menu by entering `cmssvc`.
10. Select the `run_cms` option.
11. Enter the number for the "`Turn on CMS`" option.

Recover System Space

Overview

This section describes how to regain system space and *CentreVu* CMS file system space.

Regaining System Space

When the amount of *CentreVu* CMS data to save is reduced, data stored in *INFORMIX*- SQL tables will still use the original amount of space. The *INFORMIX*- SQL tables must be removed and re-created to regain the system space. There are two ways to remove the *INFORMIX*- SQL tables and regain the system space, as explained in the following two sections.

CAUTION:

Only **TSC PERSONNEL** should perform the procedures in this section.

Reinitializing *CentreVu* CMS

One option is to reinitialize the *CentreVu* CMS database tables which you can do in the following manner:

1. Reduce the amount of historical data saved by making changes in the Data Storage Allocation window.
2. Run the daily, weekly and/or monthly archiver.

   The tables now contain the correct amount of data. When the archiver runs, it cleans up the data that is older than the new values you entered in Step 1. You may let the archiver(s) run automatically for the day, week, or month, or you may manually run the archiver(s) as follows:

   - If the amount of `intra-hour` data was reduced:

     Manually run the daily archiver for the previous day.

     OR

     Let the daily archiver run automatically at the end of the current day.

   - If the amount of `daily` data was reduced:

     Manually run the daily archiver for the previous day.

     OR

     Let the daily archiver run automatically at the end of the current day.

- If the amount of `weekly` data was reduced:

  Manually run the weekly archiver for the previous week.

  OR

  Let the weekly archiver run automatically at the end of the current week.

- If the amount of `monthly` data was reduced:

  Manually run the monthly archiver for the previous month.

  OR

  Let the monthly archiver run automatically at the end of the current month.

3. Perform a full *CentreVu* CMS Maintenance backup.
4. Print the following CMS windows:
   - Data Storage Allocation
   - Free Space Allocation
   - Storage Intervals
   - Switch Setup.
5. Run the CMSSVC `setup` option to reinitialize the *CentreVu* CMS database. Use the printouts obtained in step 4 and verify that the *CentreVu* CMS software has the same configuration as it did before setup was run.
6. Restore the *CentreVu* CMS from the latest *CentreVu* CMS maintenance backups. This restore loads the *CentreVu* CMS data up to the time of the last *CentreVu* CMS backup. See the *CentreVu CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for information on performing a *CentreVu* CMS Maintenance restore.
7. Stop and start *CentreVu* CMS when the *CentreVu* CMS maintenance restore is finished. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for information on starting and stopping *CentreVu* CMS.

Recreating Specific Tables

Another option is to manually remove and rebuild specific database tables, which you can do in the following manner:

1. Perform Steps 1 and 2 of the previous section “Reinitializing CentreVu CMS.”
2. Perform a full *CentreVu* CMS maintenance backup.

3. Save the schemas of the historical database tables for which the amount of data to save was reduced. Do this in the following manner:

   a. Log in as root.

   b. Enter the following commands:

      ```
      # INFORMIXTERM=terminfo
      # INFORMIXSERVER=cms_se
      # CLIENT_LOCAL=en_u5.utf8
      # DBPATH=/cms/db/inf;export DBPATH
      ```

   c. Change to the directory where you want to place a file. For example, enter the following:

      ```
      cd /cms/db/inf
      ```

   d. Save the database table schemas by entering the following command:

      `/usr/informix/bin/dbschema -t <tablename> -d cms -p all <table>.sql`

      This command produces an SQL command file ('`<table>.sql`") that contains the statements required to create the database table.

      Replace *<tablename>* with the name of the *INFORMIX* database table that has had its size reduced.

      Replace *<table>* with the name of the file where you want to save the SQL commands. Always use the suffix "`.sql`" for the output file name to simplify creating the tables. This file is placed in the directory where the `dbschema` command is executed.

      CAUTION:

      If you omit the `-t <tablename>` option, **all** the schemas for **all** the tables in the database are saved to the *<table>* file.

4. Note the file system of *CentreVu* CMS data. Output from the `dbschema` command does not contain the file system/directory of the database table. The file produced by the `dbschema` command must be edited, and the correct path must be added to the create table statement(s). Even if the historical data is in the /cms file system, the historical database tables are located in the /cms/cmstables directory. Historical data includes any of the following:
   - Trunk group
   - Agent trace
   - Exceptions
   - Call work codes
   - Forecasting
   - Trunks
   - Agents
   - Splits
   - Vectors
   - VDNs
   - Call records
   - Login/logout.

   The following data is an example of the dtrunk schema edited for the /cms file system:

```
{root is owner of table dtrunk}
create table dtrunk
(
row_date date,
acd smallint,
eqloc char(9),
incalls integer,
intime integer,
abncalls integer,
o_abncalls integer,
outcalls integer,
outtime integer,
failures integer,
```

```
audio integer,
mbusytime integer,
acdcalls integer,
othercalls integer,
shortcalls integer,
o_acdcalls integer,
o_othercalls integer,
incomplete smallint
) in "/cms/cmstables/dtrunk";
{root is owner of index dtk_ndx1}
create index dtk_ndx1 on dtrunk (row_date,eqloc,tkgrp);
revoke all on dtrunk from public;
grant dba to root;
grant resource to public;
grant insert on dtrunk to public;
grant delete on dtrunk to public;
grant index on dtrunk to public;
grant select on dtrunk to public;
grant update on dtrunk to public;
```

NOTE:

In the above example, the statement in **bold** is what you add to the schema.

5. Turn off *CentreVu* CMS. From the `run_cms` option on the *CentreVu* CMS Services menu, you can turn *CentreVu* CMS off.
   a. Access the *CentreVu* CMS Services menu by entering `cmssvc`. The menu appears.
   b. Enter 3 to select the `run_cms` option.
   c. Enter 2 to turn off *CentreVu* CMS.
6. Remove (drop) the database tables for which the administration changes were made by doing the following:
   a. Enter the command:

      `/usr/informix/bin/dbaccess`

      The dbaccess main menu appears.
   b. Select `Table` from the main menu.

c. Select `Drop` from the `Table` menu. You are prompted for a table name to drop.

d. Enter the table name you want dropped.

e. Select `Exit` to exit the `Table` menu.

7. Create the database tables in the correct directory as follows:

   a. Select `Query-Language` from the dbaccess main menu. You are prompted for the database name.

   b. Enter `cms`.

   c. Select `Choose` from the menu. A list of the files on the file system (such as your work directory) is displayed.

   d. Select a file.

   e. Select `Run` to execute the commands in the file to create the database tables(s).

   f. Select `Exit` to exit the `Query Language` menu.

   g. Select `Exit` (to exit dbaccess) when all the database tables have been created.

8. Turn on *CentreVu* CMS. From the `run_cms` option on the *CentreVu* CMS Services menu, you can turn *CentreVu* CMS on.

   a. Access the *CentreVu* CMS Services menu by entering `cmssvc`. The menu appears.

   b. Enter 3 to select the `run_cms` option.

   c. Enter `1` to turn on *CentreVu* CMS.

9. Perform a *CentreVu* CMS restore for all ACDs to restore the historical data into the *CentreVu* CMS database tables. If the *CentreVu* CMS full maintenance backup uses more than one tape, an automatic *CentreVu* CMS restore is most efficient. The automatic restore prompts for the necessary tapes to restore the historical data. You have the following options:

   - Use the `specific tables` option to restore data for specific database tables. This will save time if only one type of data is being changed.
   - Restore historical data using the `Start date` and `Start time` input fields in the Restore Data window to restore data from a specific period of time.

10. Remove the file created in step 3d by entering the following:

    `# rm /cms/db/inf/<table>.sql`

    (where *<table>*.sql is the name of the file you created).

Recovering *CentreVu* CMS File System Space

When you log into the system as a *CentreVu* CMS user, a program is executed that checks the free blocks available to */, /usr*, and the various *CentreVu* CMS-related file systems located on the hard disks. If one of these file systems has less than 5000 but more than 1000 free blocks, a message similar to the following will be displayed on your console screen:

```
WARNING: File system, "<file system>", has only "<XXXX>"
blocks free.
```

When this message occurs, file system maintenance must be done as soon as possible to keep the file system from running out of free blocks.

If one of these file systems has less than 1000 free blocks, a message similar to the following will be displayed:

```
*********************************************************
* CAUTION CAUTION CAUTION CAUTION CAUTION               *
*                                                       *
*                                                       *
*                                                       *
* File system, "<file system>", has only "<XXXX>"       *
* blocks free.                                          *
*********************************************************
```

When these messages occur, the file system is almost out of free blocks, and the *CentreVu* CMS software application can shut down at any time.

To reallocate space, use the Free Space Allocation window located in the System Setup subsystem. See the *CentreVu Call Management System Release 3 Version 8 Administration* (585-210-910) for more information.

Installing an HSI/S Card (*Enterprise 3xxx* and *SPARCserver* only)

Overview

HSI cards allow the *CentreVu* CMS system to support up to eight ACDs. For eight ACDs, two HSI cards and Patch Panels are needed.

If this is the initial installation of one or two HSI cards, use the following procedure. If a second HSI card is being added to a system already up and running, see the Add a Second HSI Card' section.

NOTE:

The following procedures pertains to HSI/S cards on the *Enterprise 3xxx* and *SPARCserver* platforms. Please see the "Install and HSI/P Card (*Ultra 5* only)" section for information on HSI/P cards on the *Ultra 5* platform.

HSI/S Card Installation Procedures

To install an HSI/S card to your system, do the following:

1. Log into the system as root.
2. Turn off *CentreVu* CMS. From the `run_cms` option on the *CentreVu* CMS Services menu, you can turn *CentreVu* CMS off.
   a. Access the *CentreVu* CMS Services menu by entering `cmssvc`. The menu appears.
   b. Enter 3 to select the `run_cms` option.
   c. Enter 2 to turn off *CentreVu* CMS
3. Remove the *CentreVu* CMS software using the `pkgrm` command. See the *CentreVu* Call Management System Release 3 Version 8, Upgrades and Migration document, 858-210-913 for more information.

   Enter y when asked:

   "Do you want to preserve CMS data? [y,n,?]"
4. Shut the system down by using the `shutdown` command.

```
# /usr/sbin/shutdown -y -i0 -g0
```

5. Do the following in sequential order:
   a. Turn off the system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the system and working toward the farthest device.
6. Install the HS/SI card into your system by following the instructions described in *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document.
7. Attach the HSI/S patch panel by following the instructions described in *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document.
8. Connect the switch links to the HSI/S patch panel by following the instructions described in *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document.

   NOTE:

   Do not use the “B” serial port to connect switch links when an HSI card is installed. The “B” serial port is used only for single ACD installations. In a multiple ACD arrangement, all switch links must be connected to an HSI patch panel.

9. Do the following in sequential order:
   a. Turn on devices attached to your system starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on your system.
   c. Turn on the system monitor.
10. Press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting.
11. Boot the system with the -r option so it will recognize the new HSI/S card:

```
ok boot -r
```

12. When the system comes back up, log in as root.

Install HSI/S Software

Install the HSI/S software by following the instructions described in the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document.

Install *Solaris* Patches

Install the *Solaris* patches package by following the instructions described in the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document.

Install *CentreVu* CMS Software

Install the *CentreVu* CMS software by following the instructions described in the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document.

Switch Link Administration (for all ACDs)

1. Change the switch link administration for ACD 1 by using the `cmssvc` command as follows:

```
# cmssvc
```

2. The system responds as follows:

```
CentreVu(TM) Call Management System Services Menu

Select a command from the list below.
  1) auth_display Display feature authorizations
  2) auth_set     Authorize CMS capabilities/capacities
  3) run_cms      Turn CentreVu CMS on or off
  4) setup        Set up the initial configuration
  5) swinfo       Display switch information
  6) swsetup      Change switch information
  7) upd_install  Install update from disk files
  8) upd_remove   Back out the currently installed update
  9) upd_save     Save update on disk for later installation
Enter choice (1-9) or q to quit:
```

3. Select the `swsetup` option 6).
4. Select ACD 1.

5. Accept the existing defaults for the following:
   - Switch name
   - Switch model (release)
   - Vectoring
   - Expert agent
   - Central Office Disconnect Supervision
   - Local port
   - Remote port.
6. Select “HSI link 0” when prompted for the link information.
7. Perform a CMSADM file system backup to save the updated system software and hardware configuration. See Restoring the CMSADM Backup Tape as described on page 8-32.
8. Turn on *CentreVu* CMS using the `run_cms` option of the cmssvc command.

Add a Second HSI/S Card

Use the following procedures if you are adding a second HSI/S card to a system that is already up and running. Prior to this procedure, make sure the new cms is installed.

Procedure

1. Log into the system as root.
2. Edit the /etc/path_to_inst file and search for HSI. Remove all such lines.
3. Run the following command:

```
# rm /dev/hih*
```

4. Now run this command:

```
# rm /devices/sbus*/HSI*
```

5. Shut the system down by using the `shutdown` command.

```
# /usr/sbin/shutdown -y -i0 -g0
```

6. Do the following in sequential order:
   a. Turn off the system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the system and working toward the farthest device
7. Do the following in sequential order:
   a. Turn on devices attached to your system starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on your system.
   c. Turn on the system monitor.
8. Press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting.
9. Boot the system with the -r option so it will recognize the new HSI/S card:

```
ok boot -r
```

10. When the system comes back up, log in as root.
11. Once *Solaris* is up, run the following command:

```
# /cms/toolsbin/lnSBusdev
```

Installing an HSI/P Card (*Ultra 5* only)

Overview

HSI/P cards allow the *CentreVu* CMS system to support up to eight ACDs. For eight ACDS, two HSI/P cards and quad cables are needed.

NOTE:

The following procedures pertains to HSI/P cards on the *Ultra 5* platform. Please see the “Install and HSI/S Cards (*Enterprise 3xxx and SPARCserver* only)” section for information on HSI/s cards on the *Enterprise 3xxx and SPARCserver* platforms.

HSI/P Card Installation Procedures

To install an HSI/P card in the *Sun Ultra 5* system, do the following:

1. Log into the system as root.
2. Turn off *CentreVu* CMS. From the `run_cms` option on the *CentreVu* CMS Services menu, you can turn *CentreVu* CMS off.
   a. Access the *CentreVu* CMS Services menu by entering `cmssvc`. The menu appears.
   b. Enter 3 to select the `run_cms` option.
   c. Enter 2 to turn off *CentreVu* CMS.
3. Shut the system down by using the `shutdown` command as shown below:

```
# /usr/sbin/shutdown -y -i0 -g0
```

4. Do the following in sequential order:
   a. Turn off the *Sun Ultra 5* system.
   b. Turn off the system monitor.
   c. Turn off all external devices starting with the device closest to the *Sun Ultra 5* system and working toward the farthest device.
5. Install the HSI/P card into the *Sun Ultra 5* system by following the instructions described in *CentreVu® Call Management System Sun Ultra Computers Hardware Installation* document (585-215-871).

6. Attach the HSI/P quad cable by following the instructions described in the *CentreVu* CMS Switch Connections and administration document (585-215-876).
7. Connect the switch links to the HSI/P quad cable by following the instructions described in the *CentreVu* CMS Switch Connections and administration document (585-215-876).

   NOTE:

   Do not use the “A” serial port to connect switch links when a HSI/P card is installed. The “A” serial port is used only for single ACD installations. In a multiple ACD arrangement, all switch links must be connected to an HSI/P quad cable.

8. Do the following in sequential order:
   a. Turn on devices attached to the *Sun Ultra 5* system starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Sun Ultra 5* system.
   c. Turn on the system monitor.
9. Press the Stop and A keys simultaneously after the display console banner appears, but before the system starts booting.
10. Boot the system with the -r option so it will recognize the new HSI/P card as shown below:

```
ok boot -r
```

11. When the system comes back up, log in as root.

Install HSI/P Software

Install the HSI/P software by following the instructions described in the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document.

Installing *Solaris* Patches

Install the *Solaris* patches package by following the instructions described in the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document.

Switch Link Administration (for all ACDs)

1. Change the switch link administration for ACD 1 by using the `cmssvc` command as follows:

```
# cmssvc
```

2. The system responds as follows:

```
CentreVu(TM) Call Management System Services Menu

Select a command from the list below.
  1) auth_display Display feature authorizations
  2) auth_set     Authorize CMS capabilities/capacities
  3) run_cms      Turn CentreVu CMS on or off
  4) setup        Set up the initial configuration
  5) swinfo       Display switch information
  6) swsetup      Change switch information
  7) upd_install  Install update from disk files
  8) upd_remove   Back out the currently installed update
  9) upd_save     Save update on disk for later installation
Enter choice (1-9) or q to quit:
```

3. Select the `swsetup` (option 6).
4. Select ACD 1.
5. Accept the existing defaults for the following:
   - Switch name
   - Switch model (release)
   - Vectoring
   - Expert agent
   - Central Office Disconnect Supervision
   - Local port
   - Remote port.
6. Select “HSI link 0” when prompted for the link information.
7. Perform a CMSADM file system backup to save the updated system software and hardware configuration. See the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for information.
8. Turn on *CentreVu* CMS using the `run_cms` option of the cmssvc command.

Adding a Second HSI/P Card

Use the following procedures if you are adding a second HSI/P card to a system that is already up and running. Prior to this procedure, verify that the new CMS is installed.

Procedure

1. Log into the system as root.
2. Edit the /etc/path_to_inst file and search for HSI. Remove all such lines.
3. Run the following command:

```
# rm /dev/hih*
```

4. Shut the system down by using the `shutdown` command as shown below:

```
# /usr/sbin/shutdown -y -i0 -g0
```

5. Do the following in sequential order:
   a. Turn off the *Sun Ultra 5* system.
   b. Turn off the system monitor.
6. Turn off all external devices starting with the device closest to the *Sun Ultra 5* system and working toward the farthest device.
7. Now you can install the card. See the *CentreVu® Call Management System Sun Ultra Computers Hardware Installation* document (585-215-871) for more information.
8. Do the following in sequential order:
   a. Turn on devices attached to the *Sun Ultra 5* system starting with the device at the end of the SCSI chain and working toward the computer.
   b. Turn on the *Sun Ultra 5* system.
   c. Turn on the system monitor.

9. Press the Stop and A keys simultaneously after the display console banner appears, but before the system starts booting.
10. Boot the system with the -r option so it will recognize the new HSI/P card as shown below:

```
ok boot -r
```

11. When the system comes back up, log in as root.

Network Terminal Servers

Overview

This section describes how to add and remove a Network Terminal Server (NTS) to your current configuration.

Adding Network Terminal Servers

To connect additional NTSs to your current configuration, use the procedures in your platform's hardware installation document. Also see the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document. You can connect a maximum of four NTSs per *Sun Enterprise* 3000 system.

Change Network Addresses

If you want to change the network address of your *Sun Enterprise* 3000 system and each NTS. See your platform's hardware installation document, for further information.

Removing a Network Terminal Server

This procedure will remove the Network Terminal Server (NTS).

CAUTION:

Only **TSC PERSONNEL** should perform the procedures in this section.

Remove the NTS

To remove the NTS, follow the procedure in this section.

1. Stop the erpcd daemon

```
# /etc/rc2.d/annex-initd stop
```

2. Remove the initialization files for 10.0x:

```
# rm /etc/rc2.d/*annex-initd
```

3. Remove the program files:

```
# rm -rf /usr/annex
```

4. Occasionally, garbage remains from a previous NTS installation (the package SUNWxyl).This will list the package if it's there.

```
# pkginfo -l SUNWxyl
```

Remove it if it exists with:

```
# pkgrm SUNWxyl
```

Respond "yes" to all the prompts.

Whether or not there was no package listing for SUNWxyl,

if any of these files exist, remove them with the command **rm**:

```
# /etc/rc2.d/S65ntserv
/etc/rc2.d/K41ntserv
/etc/rc3.d/S65ntserv
/etc/rc3.d/K41ntserv
/etc/init.d/ntsserv
```

Change the Date or Time

Overview

The switch time is displayed at the top of most *CentreVu* CMS screens.

NOTE:

Changing the switch time may cause a small distortion in the *CentreVu* CMS data when the change is made. A small amount of data may also be lost when the change occurs. For example, if the *Solaris* system time is advanced, the switch connection is reestablished causing a small amount of data to be lost. Furthermore, the time must be within 24 hours of the switch or the link will dropped.

Change the System Date and Time

Do the following steps to change the *Solaris* system time:

1. Log in as root.
2. Change to an OpenBoot mode with the following command:

```
# init 0
      .
      .
      .
```

3. At the ok prompt, enter the following command:

```
ok  boot -s
      .
      .
      .
Resetting...
Type Ctrl-d to proceed with normal startup
(or give root password for system maintenance):
```

4. Enter the root password.

The system responds as follows:

```
Entering System Maintenance Mode
Enter Terminal Type: (default is 615):
```

5. At the prompt, enter the terminal type.
6. At root, enter the `date` command to set the time and date.

```
# date mmddHHMM[[cc]yy]
```

For example:

- ***mm* (month):** Enter the month (numeric). Range: 1-12 (1=January, 2=February, and so on).
- ***dd* (day):** Enter the day of the month. Range: 1-31
- ***HH* (hour):** Enter the hour of day, military time. Range: 00-23.
- ***MM* (minute):** Enter the minute of the hour. Range: 00-59.
- ***[cc]* (century):** Enter the century minus 1. For example, for the 20th century, enter 19.
- ***[yy]* (year):** Enter the last two digits of the year (98, for example, means 1998).

7. Set the time zone environment variable in the `/etc/default/init` file by doing the following:
   a. Examine the `/usr/share/lib/zoneinfo` directory for time zones.
   b. Edit the `/etc/default/init` file with a text editor (for example, vi).
   c. Change the `/etc/default/init` file by using the `w!` command to overwrite the file.

8. Return to a multi-user state with the following command:

```
# /usr/sbin/shutdown -i6 -g0 -y
```

The `-i6` option of the `shutdown` command changes the system to a multi-user state.

Change the System Country and Time Zones

To set the country and time zones, do the following:

1. At the console, exit the *OpenWindows** environment if it is currently running.
2. To initiate an OpenBoot mode, enter the following command:

```
# init 0
```

3. At the `ok` prompt, enter the following command:

```
ok  boot -s
     .
     .
     .
Resetting...
Type Ctrl-d to proceed with normal startup
(or give root password for system maintenance):
```

4. Enter the root password.

   The system responds as follows:

```
Entering System Maintenance Mode
Enter Terminal Type: (default is 615):
```

5. At the prompt, enter the terminal type.

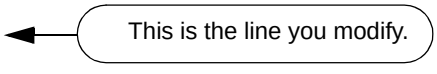
**OpenWindows* is a trademark of Sun Microsystems, Inc.

6. Edit the `/etc/default/init` file and set the `TZ` variable to equal the appropriate value in the `/usr/share/lib/zoneinfo` directory. Then write and quit the file. See the following example:

```
# vi /etc/default/init

<contents of the file is displayed>

# @(#)init.dfl 1.2 92/11/26
#
# This file is /etc/default/init. /etc/TIMEZONE is a symlink to this file.
# This file looks like a shell script, but it is not. To maintain
# compatibility with old versions of /etc/TIMEZONE, some shell constructs
# (i.e., export commands) are allowed in this file, but are ignored.
#
# Lines of this file should be of the form VAR=value, where VAR is one of
# TZ, LANG, or any of the LC_* environment variables.
#
TZ=US/Mountain
```



As an example for Mountain Standard Time, the `TZ` variable can be set to `MST` or `US/Mountain`. The entry in the `init` file is essentially a relative path name from the `/usr/share/lib/zoneinfo` directory. `MST` is a file in `/usr/share/lib/zoneinfo`, and `Mountain` is a file in `/usr/share/lib/zoneinfo/US`.

7. Reboot the machine using the following command:

```
# /usr/sbin/shutdown -i6 -g0 -y
```

Synchronize Clocks

NOTE: This procedure is for the Sun Enterprise 3000 system only.

Each I/O board has its own clock. These clocks must be synchronized for proper system operation. After removing and replacing an I/O board, the system may experience a clock synchronization problem. That is, the clock on the I/O board will become un-synchronized with the clock on the Clock Board.

To resync the clocks, do the following:

1. If CMS is running, turn it off.
2. Go to the boot prompt. You can do that in one of three ways:
   a. You can type `init 0`, or
   b. You can type `/usr/sbin/shutdown -y -g0 -i0`, or
   c. You can simultaneously press the **Stop** and the **A** keys while the *Sun Enterprise* is booting, after the *Sun* logo appears.
3. Type the following command:

```
copy-clock-tod-to-io-boards
```

4. Boot the machine by typing one of the following commands:

```
boot
                    OR
boot -r (to reconfigure for new devices)
```

Diagnose Dial-In Access Problems

This section describes the scenarios where the console is local and you are attempting to dial-in via serial port. It often takes a person on-site to look at the dial-in access problems.

Scenario 1:

The remote dial-in does not get the `Answered` and `Connected` responses displayed on the screen.**Solution:**

At the on-site location, make sure the modem is on, and check the following cabling connections:

- Phone line to the modem
- Modem to a serial port
- Port A to the *Sun Enterprise* 3000 system and SPARC Server
- Port B to the *Sun Ultra 5* system.

Scenario 2:

The remote user gets `Answered` and `Connected` responses displayed on the screen, but no login.

Solution:

1. Enter **one** of the following commands to make sure that a monitor is running:

```
# pmadm -l; sacadm -l
        <or>
# /cms/install/bin/abcadm -k
```

2. If no port monitor is running, start a port monitor by entering the following command:

```
# /cms/install/bin/abcadm -i -b <baud> ttya
```

Use `ttya` or `ttyb` according to platform.

3. If a port monitor is running, make sure that the port monitor is set up at the correct baud rate relative to the local modem.

4. If the baud rate is not correct, remove the current port monitor, and start a new port monitor at the correct baud rate. Enter the following commands:

```
# /cms/install/bin/abcadm -r ttya
        <and>
# /cms/install/bin/abcadm -i -b <baud> ttya
```

5. If the port monitor is running and is at the correct baud rate, try to fix the problem by disabling and enabling the port monitor by entering the following commands:

```
# pmadm -d -p ttymona -s ttya
        <and>
# pmadm -e -p ttymona -s ttya
```

Scenario 3:

The remote user gets the `Answered` and `Connected` responses displayed on the screen, but the *login* is scrambled (for example, a short line of graphics characters).

Solution:

Have the remote user enter a few keys (any keys), and see if it clears up the problem. If this does not clear up the problem, then the port monitor is probably not the same baud rate as the modem.

Diagnose Remote Console Problems

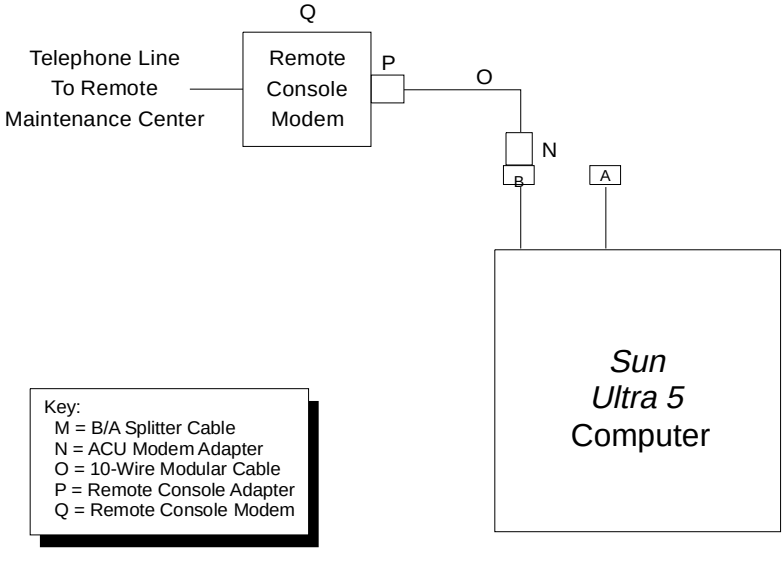
This section addresses problem scenarios that develop when you dial-in to the remote console port. In general, you should have a person on-site to look at remote console problems.

No Ringing and Answered Responses

You do not get the `RINGING` and `ANSWERED` responses displayed on the screen.

Solutions:

- Check the port connectivity — see the following figure. Refer to the hardware installation document for your platform and the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for more details.
- Check modem setup — see the following figure. Refer to the hardware installation document for your platform and the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for more details.
- Check serial port administration. Refer to the hardware installation document for your platform and the *CentreVu Call Management System Release 3 Version 8 Software Installation and Setup* (585-210-941) document for more details.



No Login Prompt

You get the `RINGING` and `ANSWERED` responses displayed on the screen, but get no login.

Solutions:

- Check the dial-in parameters — see the “Diagnosing Dial-In Access Problems” section in this chapter for details.
- Check the state of the system — the console may not be remoted, and there may not be a port monitor on the port.

  NOTE:

  The system could also be at the OpenBoot prompt (`ok>`), which would indicate that the console is local.

  To have an on-site person check the state of the system, enter the following command, and press **Enter** :

```
# /cms/install/bin/abcadm -k
```

Dial-In Returns Garbage Characters

The dial-in gives you garbage characters instead of a login.

Solution:

Try pressing a few keys to see if the problem corrects itself.

Scenario 1:

The dial-in continues to display garbage characters instead of a *login*.

Solution:

Check the baud rate of the remote console by doing the following:

a. Have an on-site person run the following command:

```
# /cms/install/bin/abcadm -k
```

b. Make sure the baud rate is consistent with the modem connected on-site and the modem and console at the remote site.

c. If there is a baud rate inconsistency on-site, reconfigure the machine with the appropriate baud rate for the modem with the following command:

```
#/cms/install/bin/abcadm -c -b<baud> <ttyb>
```

The system responds by rebooting.

d. If there is a baud rate inconsistency with the remote site, reconfigure the remote site and redial.

Scenario 2:

The above scenario does not resolve the symptoms.

Solution:

Set the console back to local by switching to the local console via the OpenBoot method. See the “Diagnosing Problems Using the Remote Console” section in this chapter for details.

SunVTS Diagnostics

The *Sun* Validation Test Suite (SunVTS) replaces the earlier diagnostic tool *SunDiag on Ultra 5 and Enterprise 3000.*The SunVTS software executes multiple diagnostic hardware tests from a single user interface. SunVTS verifies the configuration, functionality, and reliability of most hardware controllers and devices.

NOTE:

For specific SunVTS maintenance commands and to select test sessions, refer to the online help provided in the SunVTS diagnostic tool.

The SunVTS uses the following interfaces:

- Graphical User Interface (GUI) - Lets users select tests and test options by pointing and clicking with a mouse button. You can use the Common Desktop Environment (CDE) or OPEN LOOK (OL) interface.
- TTY Interface - Lets users run SunVTS from a terminal or modem attached to a serial port. This feature requires that you use the keyboard instead of the mouse, and it displays one screen of information at a time.
- Command Line Interface (CLI) - Lets users run each of the SunVTS tests individually from a shell command line using the command line syntax. Each test description contains the corresponding command line syntax.

Starting SunVTS

The SunVTS can be run either on a remote machine or on a local system.

The `sunvts` command starts both the SunVTS kernel and a user interface. It may not always be necessary to start both the kernel and the user interface. If the test machine is already running the SunVTS kernel, you may only want to start the user interface; or, you may want to start just the SunVTS kernel and leave it running as a background process.

Start SunVTS Kernel only

Prior to starting the SunVTS kernel, enter the following command:

```
# BYPASS_FS_PROBE=1; export BYPASS_FS_PROBE
```

To start only the SunVTS kernel using `vtsk`, type the following command:

```
# /opt/SUNWvts/bin/vtsk
```

NOTE:

If the SunVTS kernel is running on the test system, `vtsui` automatically connects to this kernel to start the CDE or OL interface.

Start SunVTS TTY Interface only

TTY Interface:

To start only the TTY interface, type the following command:

```
# /opt/SUNWvts/bin/vtstty
```

NOTE:

You do not need to be a superuser (root) to start only the user interface.

Start SunVTS Kernel *and* TTY Interface

TTY Interface:

To start the SunVTS kernel *and* the TTY-based user interface, specify the `-t` option by entering the following command:

```
# /opt/SUNWvts/bin/sunvts -t
```

Using SunVTS on a Remote Machine

You can view the progress of a testing session, change testing options, and control all testing features of another SunVTS testing session over modem lines or over a network.

SunVTS can be run on a remote machine in two ways:

- Connect the user interface to the SunVTS remote machine using the `-h` *hostname* option.
- Remotely log on to the machine as superuser, start the SunVTS kernel, and display the user interface on your machine.

Prior to starting the SunVTS kernel on a remote machine, enter the following command:

```
# BYPASS_FS_PROBE=1; export BYPASS_FS_PROBE
```

Connect the User Interface to a Remote SunVTS Kernel

To connect the User Interface to a Remote SunVTS Kernel, specify the -h *hostname* option by typing the following command:

```
# /opt/SUNWvts/bin/sunvts -h remote_hostname
```

Run SunVTS on a Remote Machine

1. Use `xhost` to give remote server access to your system before logging in. Use the following command:

```
# /usr/openwin/bin/xhost +remote_hostname
```

2. Replace `remote_hostname` with the remote machine host name.
3. Log in to the remote machine as superuser (root).
4. Change directories to the SunVTS `bin` directory, which is `/opt/SUNWvts/bin` by default.
5. Use the `sunvts` command, as follows, to start the SunVTS kernel and display the user interface on your machine.

```
# ./sunvts -display local_hostname:0
```

6. Replace *`local_hostname`* with your local machine's host name.

Run SunVTS on a Stand-Alone System

After starting the kernel and/or interface, use the following commands to start the Sun Validation Test Suite.

1. On a Local System, type the following command:

```
# ./sunvts
```

2. Comment out any remotely mounted file systems from the `/etc/vfstab` file.
3. Make sure `ypbind` is not running on the stand-alone system. Doing this ensures that `ypbind` is not started by the rc scripts.
4. Reboot your system to run SunVTS on a stand-alone machine.

Check Error Log Files

The `/var/adm/messages` files contain system messages that are often helpful in diagnosing problems.

Check Tape Related Problems

The `mt` command can be useful if you are having tape problems. Run this command with a tape inserted into the applicable drive.

NOTE:

If you run the `mt` command with no tape in the drive you get the following message:

```
# mt -f /dev/rmt/0  status
/dev/rmt/0:   no tape loaded or drive offline
```

To run the `mt` command enter one of the following, as appropriate for the tape drive with which you are having the problem:

```
# mt -f /dev/rmt/0  status
Tandberg 2.5 Gig QIC tape drive:
   sense key (0x0)= No Additional Senseresidual= 0retries= 0
    file no= 0block no= 0
```

and/or

```
# mt -f /dev/rmt/1  status
Exabyte EXB-8500 8mm tape drive:
   sense key (0x6)= Unit Attentionresidual= 0retries= 0
    file no= 0block no= 0
```

and/or

```
# mt -f /dev/rmt/0c  status
Tandberg 2.5 Gig QIC tape drive:
   sense key (0x0)= No Additional Senseresidual= 0retries= 0
    file no= 0block no= 0
```

and/or

```
# mt -f /dev/rmt/1c  status
Exabyte EXB-8500 8mm tape drive:
   sense key (0x0)= No Additional Senseresidual= 0retries= 0
    file no= 0block no= 0
```

Blank Screen — No Output

Problem: The local monitor is blank.

Solution:

1. Verify that the machine is in the process of booting up; the screen goes blank during initialization and stays blank for a few minutes. This is especially true if the system is being booted to a remote console.
2. Find out if the console is remoted and the remote user is in the OpenBoot mode. Check the lights on the modem to indicate if someone might be dialed-in. If no one is dialed-in, continue to step 3.
3. If all else fails, power-down and turn the machine on again. Immediately hold down the **Stop** and **N** keys until something appears on the screen. Hold the keys down for at least a minute. If the machine is functioning properly, this forces the console to be local. Take a look at the keyboard — look for flashing green lights on the keys.
4. If nothing is seen after a minute or so, there is probably a hardware failure. Do the following:
    a. Verify that the keyboard is attached. If the keyboard is unplugged, the output goes to TTYB instead. To fix this problem, power down the system and do the following in sequential order:
        1. Turn off the *Sun Ultra 5* system.
        2. Turn off the system monitor.

3. Turn off all external devices starting with the device closest to the *Sun Ultra 5* system and working toward the farthest device.

b. Plug in the keyboard, and power on again by using the following sequence:

1. Turn on devices attached to the *Sun Ultra 5* system starting with the device at the end of the SCSI chain and working toward the system.
2. Turn on the *Sun Ultra 5* system.
3. Turn on the system monitor.

c. Verify that the monitor is turned on and plugged in. Check the power cable on the monitor. Make sure the monitor cable is plugged into the system frame buffer; then, turn the monitor on.

d. See if the `output-device` is set to TTYB. This means that the NVRAM parameter `output-device` is set to `ttyb` instead of being set to `screen`. You can do **one** of the following:

— Power down the system (using the preceding steps). Then, turn it on (using the proceeding steps), and immediately press the Stop and N key sequence. This sets all NVRAM parameters to their default values. As a result, the `output-device` parameter is set to `screen`.

WARNING:

In addition, all previous nondefault settings are reset to their default values. You must restore the settings as needed. See “Method 2 — From Local Site” in the following section of this chapter to restore the settings.

— Connect a console to TTYB, and reset the system. After getting to the `ok` prompt on the console, enter `screen output` to send the output to the frame buffer. Use the `setenv` command to change the default display device, if needed.

e. Check if the system has multiple frame buffers. If your system has several plugged-in frame buffers, then it is possible that the wrong frame buffer is being used as the console device.

Refer to your system documentation and call the TSC.

Diagnose Problems Using the Remote Console

If your system will not boot, the TSC personnel could ask you to redirect the remote console to identify a problem. You can redirect the remote console using **either** of the following methods:

- Using *Solaris* operating system.
- Using OpenBoot firmware.

Redirect the Remote Console Using *Solaris* Operating System

This section describes how to redirect the console to port B on the *Sun Ultra 5* system using the *Solaris* operating system. Redirecting the console allows the TSC to dial in and do remote maintenance.

Set the Console to Remote:
To set the console to the remote, do the following:

1. Dial in (from the remote console) to the remote console modem (for example, access port B on the system), and log in as root.
2. Remove the port monitor by entering the following command:

   NOTE: Use the following port configuration according to the platform:

   Enterprise 3000 .....serial port a (`ttya`)

   Enterprise 3500 .....serial port a (`ttya`)

   SPARC Server .....serial port a (`ttya`)

   Ultra 5 .....serial port b (`ttyb`)

```
# /cms/install/bin/abcadm -r ttyb
```

The program responds as follows:

```
ttyb is currently set to incoming

Are you sure you want to remove it?
```

3. Enter y. The program responds as follows:

```
ttyb administration removed
```

4. Redirect the console to port B (remote console) by entering the following commands:

   The program responds as follows:

```
# /cms/install/bin/abcadm -c -b 9600 ttyb
```

```
This change requires a reboot to take affect

Are you ready to reboot? [y,n,?]
```

5. Press Y. The system will automatically reboot, and port B will come up as the console.

   As the system reboots, the shutting down messages will appear on the *Sun Ultra 5* system monitor. When the system starts to come back up, the *Sun Ultra 5* system monitor should go blank, and the system boot diagnostics should appear on the remote console terminal. After the system reboots, a `console login:` prompt should appear on the remote console terminal.

6. Log into the remote console as root.

   NOTE:

   At this time, an *Openwindows** login window will appear on the *Sun Ultra 5* system monitor.

**Openwindows* is a trademark of Sun Microsystems, Inc.*

Set the Console to Local

To set the console to local, do the following:

1. Redirect the console back to the local console by entering the following command:

```
# /cms/install/bin/abcadm -c local
```

   The program responds as follows:

```
Console set to local

This change requires a reboot to take affect

Are you ready to reboot? [y,n,?]
```

2. Press Y.

   The program responds as follows:

```
Starting port monitor.
Setting console parameters.
Proceeding to reboot.
```

3. The system will automatically reboot, and port B will come up as the dial in. A `login:` prompt appears.

   As the system reboots, the shutting down reset and rebooting messages will appear on the remote console monitor. When the system starts to come back up, the system boot diagnostics should appear on the system monitor. After the system reboots, a login prompt should appear on the system monitor.

4. Log into the local console as root.

   See the hardware installation document for your platform, describing factory installation procedures, for more information about setting the remote console modem options, connecting the remote console to the platform, and administering the remote console ports.

Redirect the Remote Console Using OpenBoot Commands

Use the OpenBoot mode to redirect port B (remote console port) on the *Sun Ultra 5* system when the *Solaris* method does not work (typically because the system will not boot).

To redirect the local console to the remote console from the OpenBoot environment (prompt is `ok>`), do the following steps:

Enter the OpenBoot environment (prompt is `ok>`) in **one** of the following ways:

- If in the *Solaris* environment, halt the operating system with the *Solaris* `halt` command.
- If in the *Solaris* environment and the `halt` command does not work (for example, the system is hung up), press the Stop and A keys simultaneously.

  CAUTION:

  The Stop and A key combination abruptly breaks the execution of the operating system and should be used with caution.
- If the above methods fail, press the Stop and A keys simultaneously after the display console banner appears but before the system starts booting the operating system.

To redirect the console to remote from the OpenBoot environment (prompt is `ok>`), perform the following steps:

1. To display a list of the current parameter settings on your system, enter the following command:

```
ok> printenv
```

The system responds as follows:

```
Parameter Name        Value          Default Value
output-device         screen         screen
input-device          keyboard       keyboard
   .
   .
   .
```

2. At the ok> prompt, enter the `setenv` command to set the configuration parameters. Set the parameters to the values specified, (see the following table) as shown in the following example:

```
ok>setenv output-device ttyb
```

The system responds as follows:

```
output-device=ttyb
```

The following table identifies configuration parameters and associated values:

Parameter	Values
output-device	ttyb
input-device	ttyb
ttyb-rts-dtr-off	true
ttyb-ignore-cd	true
ttyb-mode	9600,8,n,1,- In this example, the baud rate is 9600. The baud rate should correspond to the setting on the local modem. Typically, a 3830 would call for a setting of 9600, a 3715 would call for a setting of 9600, and a 2400 would call for a setting of 2400.

3. To verify the parameter changes, enter the following command:

```
ok> printenv
```

The system responds as follows:

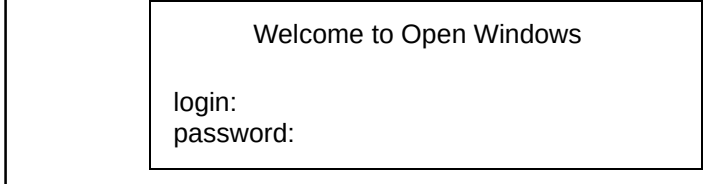
```
Parameter Name        Value          Default Value
output-device         ttyb           screen
input-device          ttyb           keyboard
   .
   .
   .
```

4. For the changes to take effect, boot the system by entering the following command:

   The system responds on the local console with the XDM login

```
ok> boot
```

   prompt (see the following example) or on the remote console with the console login:



To redirect the remote console to the local console, enter the OpenBoot environment (prompt is `ok>`) in the following way:

- If in the *Solaris* environment, halt the operating system with the *Solaris* `halt` command.

To redirect the remote to the console from the OpenBoot environment (prompt is `ok>`), use one of the following methods:

Method 1 — From the Remote Site

Use this method from the remote site when the *Solaris* method does not work**.**

1. From the remote console, if not in OpenBoot, get into OpenBoot mode in **one** of the following ways:
   - If in the *Solaris* environment, halt the operating system with the *Solaris* halt command.
   - Power-cycle the machine, and press **Break** from the remote console (requires a local person).
2. To display a list of the current parameter settings on your system, enter the following command:

```
ok> printenv
```

   The system responds as follows:

```
Parameter Name        Value          Default Value
output-device         ttyb           screen
input-device          ttyb           keyboard
   .
   .
   .
```

3. To set the configuration parameters, enter the parameters (see the following table) via the `setenv` command at the `ok>` prompt as shown in the following example:

```
ok> setenv output-device screen
```

Parameter	Values
output-device	screen
input-device	keyboard
ttyb-rts-dtr-off	true
ttyb-ignore-cd	false

4. To activate the changes, boot the system by entering the following commands:

```
ok> reset-all
```

5. Log into the system as root at the local monitor.
6. From the local monitor, enter the /`cms/install/bin/abcadm -k` command to see what is on the `ttyb` port.

```
# /cms/install/bin/abcadm -k
```

7. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abcadm -c -b <baud>ttyb
```

The system responds as follows:

```
"Do you want to reboot?"
```

8. Press N.

9. Start a port monitor on the `ttyb` port if there is not one already, by entering the following command:

```
/cms/install/bin/abcadm/ -i -b <baud> ttyb
```

Method 2 — From the Local Site

Use this method when the previous OpenBoot method does not work or if you want to switch the console from the local site.

At the local site (when the system is not running *Solaris*), do the following:

1. Power down the machine.
2. Press the Stop and N keys simultaneously. Continue to press the Stop and N keys simultaneously until something appears on the screen. The system reboots to the local console.
3. Log into the system as root at the standard interface.
4. From the local monitor, enter the following command to check what is on the `ttyb` port:

```
# /cms/install/bin/abcadm -k
```

5. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abcadm -c -b <baud> ttyb
```

The system responds as follows:

```
"Do you want to reboot?"
```

6. Press N.

7. Start a port monitor on ttyb, by entering the following command

```
# abcadm -i -b<baud> ttyb
```

Single-User Mode and the Remote Console

Prerequisite: You must be logged into the customer's machine through the remote console interface.

To place the system in single-user mode, do the following:

1. At the remote console, enter the following command:

```
# /usr/sbin/shutdown -y -is -g0
```

NOTE:

The system will **not** successfully enter single-user mode if you execute the `shutdown` command from the local console while the console is redirected. When this occurs, the local console will not respond if you try to enter data. The remote console will also be unresponsive.

To recover from the situation described in the previous note, put the system into single-user mode by doing the following:

1. Select a new window on the local console.
2. In the new window, enter the following command:

```
# /usr/sbin/shutdown -y -i0 -g0
```

3. On the remote console, enter the following command at the `ok>` prompt:

```
ok> boot -s
```

Machine Panics

If a machine panic is detected on your system, you must call the TSC (domestic) or remote (international) support personnel. The TSC may request that you deliver the following information on a tape:

- Crash dump from `/var/crash/<hostname>/vmcore.n.`
- Namelist from `/var/crash/<hostname>/unix.n.`
- Output of the `showrev -p` (put the information in a file). See the hardware installation document for your platform, Appendix D, describing factory installation procedures for details.
- Output of the `prtconf -pv` (put the information in a file).
- Possibly output from the `/var/adm/messages` file.

Procedure

To put all the files on one tape, do the following procedures:

1. Log in as root.
2. Change to the `dump` directory by entering the following command:

```
# cd /var/crash/<hostname>
```

3. Verify that *unix.n* and *vmcore.n* are present, and match the date for the crash in question.

4. To retrieve the output from the `showrev -p` buffer, enter the following command:

```
# showrev -p>showrev.out
```

5. To retrieve the output from the prtconf -pv buffer, enter the following command:

```
# prtconf -pv>prtconf.out
```

6. To copy the output from the */var/adm/messages* file, enter the following command:

```
# cp /var/adm/messages messages
```

7. Insert a tape into the default backup tape drive.

8. Enter the following command:

```
# tar cvf /dev/rmt/0 unix.n vmcore.n dmesg.out showrev.out
prtconf.out messages
```

NOTE:

The letter n represents the number of the crashdump.

The system responds with a list of all of the files.

9. To remove the temporary files, enter the following command:

```
# rm unix.n vmcore.n dmesg.out showrev.out prtconf.out messages
```

NOTE:

The letter n represents the number of the crash dump.

10. Log out of the system.
11. Remove the tape from the disk drive.
12. Send the tape to the TSC.

Keyboard Gets Unplugged

If the console keyboard cable gets unplugged during system operation, the system will continue to run. If the console is reattached to the cable, the system freezes on its current display.

Do the following to correct the problem:

1. Plug in the keyboard. The system responds as follows:

```
ok>
```

2. Enter the following command at the `ok>` prompt:

```
ok> go
```

The system responds by continuing to run. It was not running during the time between getting the `ok>` prompt and entering `go`.

NOTE:

If the system is rebooted, instead of entering `go`, you may be prompted to use the `fsck` command to repair the *Solaris* file systems.

Replacing an UltraSCSI Card with a *SunSwift* Card

This section describes how to replace an UltraSCSI card in an *Ultra* 5 with a *SunSwift** card. This is done when the customer wants to add a second ethernet port.

Prerequisites

- Obtain a *SunSwift* PCI card.
- Obtain one or two 68-to-68 pin SCSI cables (comcode 407934470, part number 595-4851-xx).
- Do a complete CMSADM backup.
- Turn off CMS before beginning this procedure.

Procedure

Do the following to replace an UltraSCSI card with a *SunSwift* card:

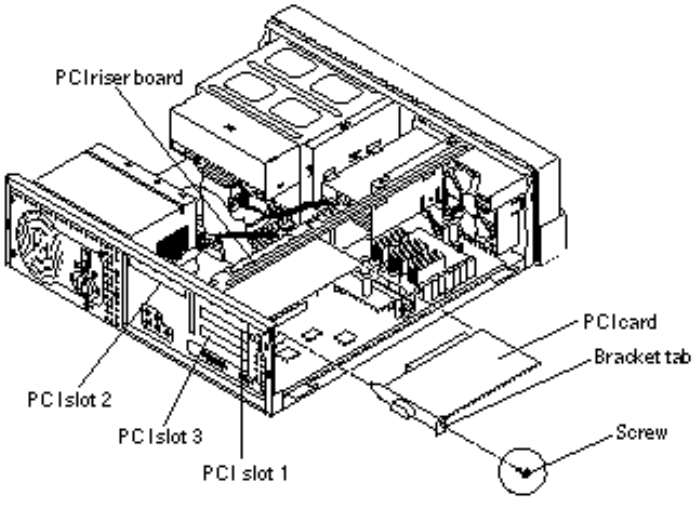
1. Remove the SCSI bus devices and shut down the system using the following command:

   ```
   /cms/toolsbin/rmSBusdev
   ```

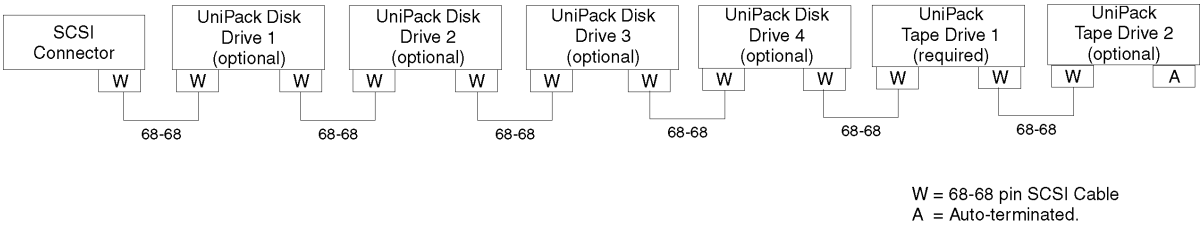
   After the system attains boot level 0, the `ok` prompt displays.
2. Turn off the computer, turn off the system monitor, and then turn off all the SCSI disk drives and tape drives starting with the device closest to the computer and working toward the farthest device.
3. Disconnect each 68-to-68 pin VHDCI cable from the UltraSCSI card and from the first external device in each existing SCSI chain. There may be one chain of disk drives and one chain of tape drives.

* *SunSwift* is a trademark of Sun Microsystems, Inc.

4. Remove the UltraSCSI card. It should be located in PCI slot 2.



5. Install the SunSwift card in PCI slot 2 (or wherever the UltraSCSI card was installed).
6. Reconfigure the SCSI devices in the order shown in the following figure.



SCSI devices are addressed as shown in the table below. These addresses are set using the push buttons or thumbwheels on the back of each SCSI device.

Device	Address
Disk Drive 1	0
Disk Drive 2	1
Disk Drive 3	2
Disk Drive 4	3
Tape Drive 1	4
Tape Drive 2	5

7. Turn on power to the external devices in the opposite order in which you powered them off. That is, power on the external devices first, working your way toward the computer. Then power on the computer and the system monitor.

   When you power on the computer, the system begins to boot. When the system boots up, the new *SunSwift* card and attached devices will be operational.

Glossary

Access Permissions Permissions assigned to a Call Management System (CMS) user so that the user can access different subsystems in CMS or administer specific elements (splits/skills, trunks, vectors, and so on) of Automatic Call Distribution (ACD). Access permissions are specified as **read** or **write** permission. Read permission allows the CMS user to access and view data (for example, run reports or view the Dictionary subsystem). Write permission allows the CMS user to add, modify, or delete data and execute processes.

ACD See Automatic Call Distribution (ACD)

Acknowledgment A window that requires the user to confirm an action or to acknowledge a system message (for example, system going down, warning, or fatal error for the user window). This window cannot be moved, sized, or scrolled and disappears only when the user confirms the message.

Action List A menu in the upper right corner of most user windows. The menu lists the actions available for that particular user window (for example, add, modify, delete, and so on). The user selects an action after entering necessary data in the window.

Add Package A *Solaris** operating system command (`pkgadd`) that allows you to add an additional software package.

ADU See Asynchronous Data Unit (ADU)

Agent A person who answers calls to an extension in an ACD split. This person is known to CMS by a login identification keyed into a voice terminal.

Agent Login ID A 1- to 4-digit number (Generic 2) or a 1- to 9-digit number (Generic 3) entered by the agent at the ACD extension to activate the position. Agent logins are required for all CMS-measured ACD agents.

Agent Skill The different types of calls a particular agent can handle. An agent can be assigned up to four skills. These skills are assigned as either primary or secondary skills. See “Primary Skill” or “Secondary Skill” definitions in this Glossary.

Agent State A feature of agent call handling that allows agents to change their availability to the system (for example, ACW, AVAIL, ACD).

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Automatic Call Distribution (ACD)	A switch feature. ACD is software that channels high-volume incoming call traffic to agent groups (splits or skills). Also an agent state where the extension is engaged in an ACD call (with the agent either talking to the caller or the call waiting on hold).
Backup	The process of protecting data by writing the contents of the disk to a tape that can be removed from the computer and stored safely. A spare copy of data or software that you keep in case the original is damaged or lost. CMS provides three different types of backups: CMSADM File System Backup, CMS Full Maintenance Backup, and CMS Incremental Maintenance Backup.
Boot	To load the system software into memory and start it running.
Bus	A signal route to which several items of a computer system may be connected in parallel so that signals can be passed between them. In general, a multiconductor electrical path used to transfer information over a common connection from any of several sources to any of several destinations.
Cables	Wires or bundles of wires configured with adapters or connectors at each end and used to connect two or more hardware devices.
CLI **Call Level Interface**	A database programming interface from the Structured Query Language (SQL) Access Group, an SQL membership organization. Under CLI, SQL statements are passed directly to the server without being recompiled.
Call Management System Query Language (CMS-QL)	A relational database management (operating) system used to organize most of CMS's data. Automatically comes with CMS and runs in the background.
Call Vectoring	A highly flexible method for processing ACD calls using Vector Directory Numbers (VDNs) and vectors as processing points between trunk groups and splits or skills. Call vectoring permits treatment of calls that is independent of splits or skills.
Cartridge Tape	A 0.25-inch (6.35-mm) magnetic tape used in the tape drive of the Desktop Backup Pack and External Storage Module to read and write data.
***CentreVu*® CMS**	*CentreVu* Call Management System (CMS). A software product used by business customers that have a Lucent Technologies telecommunications switch and receive a large volume of telephone calls that are processed through the Automatic Call Distribution (ACD) feature of the switch.

CMS	Call Management System. See *CentreVu*® CMS.
CMSADM	Call Management System Administration. The part of the CMS software that allows a user to administer features of CMS. See also “CMSSVC.”
CMSADM file system backup	A backup that saves all the file systems on the machine which includes *Solaris* 7 system and programs, CMS programs and data, and non-CMS data you place on the computer in addition to the CMS data. See the “Backup” definition for more details.
CMSSVC	Call Management System Services. The part of the CMS software product that allows a user to manage CMS system services. See also “CMSADM.”
Command	A command is an instruction used to tell the computer to perform a function or to carry out an activity.
Common Desktop Environment	A desktop user interface for *Solaris*. This replaces OpenWindows.
Configuration	Configuration is the way that the computer is set up to allow for particular uses or situations.
Copy	Copy means to duplicate information.
Custom Reports	Real-time or historical reports that have been customized from standard reports or created from original design.
Daemon	Pronounced “demon.” A *UNIX** program that executes in the background ready to perform an operation when required. Usually unattended processes initiated at start-up, such as print spoolers, e-mail handlers or schedulers.
Data Collection Off	CMS is not collecting ACD data. If you turn off data collection, CMS will not collect data on current call activity.
Database	A group of files that store ACD data according to a specific time frame: current and previous intrahour real-time data and intrahour, daily, weekly, and monthly historical data.

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Database Item	A name for a specific type of data stored in one of the CMS databases. A database item may store ACD identifiers (split numbers or names, login IDs, VDNs, and so on) or statistical data on ACD performance (number of ACD calls, wait time for calls in queue, current states of individual agents, and so on).
Database Tables	Tables that CMS uses to collect, store, and retrieve ACD data. Standard CMS items (database items) are names of columns in the CMS database tables.
Device	The term used to refer to the peripheral itself; for example, a hard disk or a tape drive. A peripheral is sometimes referred to as a subdevice or an Logical Unit (LU).
Disk	A round platter, or set of platters, coated with magnetic medium and organized into concentric tracks for storing data.
DSIMM	Dynamic random access memory Single In-line Memory Module. A small printed circuit card that contains Dynamic Random Access Memory (DRAM)
EAD	See Expert Agent Distribution (EAD)
EAS	See Expert Agent Selection (EAS)
ECC	See Error Correction Codes (ECC)
EIA	Electronic Industries Association. An organization that sets standards for consumer products and electronic components.
Error Correction Code (ECC)	A code that protects the customer’s system and data from single bit soft errors that can occur frequently depending on the environment.
Error Message	An error message is a response from a program indicating that a problem has arisen or something unexpected has happened, requiring your attention.
Ethernet	A type of network hardware that allows communication between systems connected directly together by transceiver taps, transceiver cables, and a coaxial cable. Also implemented using twisted-pair telecommunications wire and cable.

Ethernet Address — A unique number assigned to each system when it is manufactured. The Ethernet address of your system is displayed on the banner screen that appears when you power on your system.

Exception — A type of activity on the ACD which falls outside of the limits the customer has defined. An exceptional condition is defined in the CMS Exceptions subsystem, and usually indicates abnormal or unacceptable performance on the ACD (by agents, splits or skills, VDNs, vectors, trunks, or trunk groups).

Expert Agent Distribution (EAD) — A call queued for a skill will go to the most idle agent (primary skill agent). Agents who are idle and have secondary agent skills will receive the call queued for a skill if there are no primary agents available.

Expert Agent Selection (EAS) — An optional feature that bases call distribution on agent skill (such as language capability). EAS matches the skills required to handle a call to an agent who has at least one of the skills required.

Forecast Reports — These reports display expected call traffic and agent or trunk group requirements for the customer's call center for a particular day or period in the future.

Gigabyte (GB) — One gigabyte equals 2^{30} bytes (1073741824 bytes).

Hand-Shaking Logic — A format used to initiate a data connection between two data module devices.

Hard Disk — A device that stores operating systems, programs, and data files.

High Speed Serial Interface (HSI) — The HSI controller card is a 4-port serial communications card. Each of the four ports is used for a single physical X.25 link. It is an add-on package that is needed by CMS for multiple ACDs.

Historical Database — Contains intrahour records for up to 62 days in the past, daily records for up to 5 years in the past, and weekly or monthly records for up to 10 years for each CMS-measured agent, split or skill, trunk, trunk group, vector, and VDN.

Historical Reports — Reports that display past ACD data for various agent, split or skill, trunk, trunk group, vector, or VDN activities.

Host Computer — A computer that is attached to a network and provides services other than simply acting as a store-and-forward processor or communication switch. The *Sun*[*] *SPARCserver*[†] or *Sun Enterprise*[‡] *3000* computer is your host computer and hosts the CMS application software.

Host Name	A name that you (or your system administrator) assign to your system unit to uniquely identify it to the *Solaris 7* operating system (and also to the network).
Hung System	A system that does not respond to input from the keyboard or mouse.
ITU	See International Telecommunications Union (ITU)
INFORMIX*	A relational database management system used to organize CMS data. An add-on software package needed by CMS.
Install	The procedures used to set up the hardware and software of a computer, terminal, printer, and modem so that they can be used. Installing often includes customizing the system for a particular situation or user.
Interface	A common boundary between two systems or pieces of equipment.
International Telecommunica-tions Union (ITU)	Formerly the Consultative Committee for International Telephony and Telegraphy (CCITT). An international organization that sets communications standards.
Internet Protocol (IP)	An integral part of the internet communication protocol system (see Transmission Control Protocol/Internet Protocol [TCP/IP]). The IP provides the routing mechanism of the TCP/IP. See also Network Address.
LAPB	See Link Access Procedure Balanced (LAPB)
Link Access Procedure Balanced (LAPB)	The ITU standard error correction protocol used on most current X.25 packet switching networks.
Link	A transmitter-receiver channel or system that connects two locations.
Log In	The process of gaining access to a system by entering a user name and, optionally, a password.
Log Out	The process of exiting from a system.
Logical Unit	The term used to refer to a peripheral device such as a disk drive.

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†*SPARCserver* is a trademark of SPARC International, Inc.
‡*Enterprise* is a trademark of Sun Microsystems, Inc.
**INFORMIX* is a registered trademark of Informix Software, Inc.

Measured	A term that means an ACD element (agent, split or skill, trunk, trunk group, vector, VDN) has been identified to CMS for collection of data.
Megabyte (MB)	One megabyte equals 2^{20} bytes (1048576 bytes).
Menu	A list of items from which the user can select one. A menu cannot be moved or sized and does not count in the user window count.
Multi-user Mode	A mode of CMS in which any administered CMS user can log into CMS. Data continues to be collected if data collection is “on.”
Network Address	A unique number assigned to each system on a network, consisting of the network number and the system number. Also known as Internet Address or Internet Protocol (IP) address.
Network Hub	Hardware that connects a computer to a Network Terminal Server (NTS).
Network Terminal Server (NTS)	A hardware terminal that connects to the Network Hub via cabling. The NTS provides 50-pin switch champ connectors used to attach 64 serial devices using the patch panel cables and patch panels.
Network Terminal Server Patch Panel	Hardware that has ports for connecting serial peripheral devices (for example, printers, terminals and modems). The NTS patch panel connects to the NTS via PBX-Champ cabling.
Non-Volatile Random Access Memory (NVRAM)	A random access memory (RAM) system that holds its contents when external power is lost.
NTS	See Network Terminal Server (NTS)
NVRAM	See Non-Volatile Random Access Memory (NVRAM)
Open Window	A window that remains open because the user has not yet closed it with the “Exit” Screen Label Key (SLK). An open window becomes the current window when it initially appears on the screen or when the user makes it the current window using the “Current” SLK.
Operating System (OS)	The software that controls and allocates the resources, such as memory, disk storage, and the screen display for the computer.
Partitions	Sections of the hard disk that are used to store an operating system and data files or programs. By dividing the disk into partitions, you can use the space allocated in a more efficient and organized manner.

Password	A character string that is associated with a user name. Provides security for a user account. Desktop computers require you to type a password when you log into the system, so that no unauthorized person can use your system.
Port (I/O Port)	A designation of the location of a circuit that provides an interface between the system and lines and/or trunks.
Primary Skill	An agent will handle calls to many skills before calls to secondary skills. See “Agent Skill” in this Glossary.
Primary Window	The first window opened in response to a menu selection. A primary window may also generate another user window (secondary window). A primary window can be moved, sized, or scrolled, and counts in the window count.
Printer	A physical device that takes electronic signals, interprets them, and prints them on paper.
Processor Interface (PI)	A hardware device on the Generic 3i switches that prepares and sends architecture messages to other switches or application adjuncts.
QIC	Quarter-Inch Cartridge
Recommended Standard (RS)	Any one of several Electronic Industries Association (EIA) standards commonly used in U.S. electronic applications.
Refresh Rate	The number of seconds CMS should wait for each update of the real-time report data. A user’s fastest allowable refresh rate is defined in the User Permissions — User Data window as a minimum refresh rate. The default refresh rate when a user brings up the report input window is the administered minimum refresh rate plus 15 seconds.
RISC	Reduced Instruction Set Computer. A computer architecture that reduces chip complexity by using a simpler instruction set. RISC keeps instruction size constant, bans the indirect addressing mode, and retains only those instructions that can be overlapped and made to execute in one machine cycle or less.
RS	See Recommended Standard (RS)
RS-422	A balanced electrical interface (for example, RS-422 has a positive and a negative voltage). This interface is used by the HSI card.

RS-449	A 37-pin physical interface used by the HSI card.
SBus	The Input/Output bus for the *Sun SPARCserver* and *Enterprise* computers. Provides slots for additional cards (for example, HSI Controller Card).
SBus Expansion Subsystem	A peripheral device attached to a computer system. The SBus expansion subsystem provides three additional SBus slots and space for two optional SCSI hard disk drives. The SBus expansion subsystem consists of the following: the SBus expansion chassis, the expansion adapter card (in the computer system), and the SBus expansion subsystem cable.
Screen Labeled Key (SLK)	The first eight function keys at the top of the keyboard that correspond to the screen labels at the bottom of the terminal screen. The screen labels indicate the function each key performs.
SCSI	See Small Computer System Interface
SCSI Bus	An industry standard peripheral bus that is used to connect intelligent peripherals to a computer. It uses a daisy-chained cabling arrangement that originates at the Host Adapter to interconnect up to seven intelligent peripheral controllers on the bus. The *Sun SPARCserver* computer uses a fast SCSI-2 implementation.
SCSI ID	Each tap on the SCSI bus is required to have a unique identification or address, which is the SCSI ID. The ID is set by a switch located on each controller. In a Lucent Technologies' implementation, the Host Adapter card (with a SCSI ID of 7) is preset. The remainder can be set with external devices "push buttons." Users never have to open a chassis or touch a circuit-board switch.
SCSI Single-Ended Bus	A version of the SCSI bus designed to minimize cost and space. Cable lengths up to 6 meters are supported. It is not compatible with the differential version of the SCSI bus.
Secondary Skill	An agent will handle secondary skill calls after primary skill calls. See "Agent Skill" in this Glossary.
Secondary Window	A user window that is generated from a primary window. Secondary windows can be moved, sized, or scrolled and do not count in the user window count.
Serial Asynchronous Interface/PCI	A card that provides access to eight serial ports by connecting to an eight-port patch panel.

Single-User Mode	A CMS mode in which only one person can log into CMS. Data collection continues if data collection is “on.” This mode is required to change some CMS administration.
Skill	In relationship to the call center, think of skill as a specific customer need or requirement, or perhaps a business need of the call center.
SQL	See Structured Query Language (SQL)
Slot	An electronic connection designed to receive a module or a printed circuit board (such as a Single In-line Memory Module [SIMM] or a frame buffer board).
Small Computer System Interface (SCSI)	A hardware interface that allows the connection of peripheral devices (such as hard disks, tape drives and CD-ROM drives) to a computer system.
Split	A group of extensions that receive special-purpose calls in an efficient, cost-effective manner. Normally, calls to a split arrive over one or a few trunk groups.
Storage Device	A hardware device that can receive data and retain it for subsequent retrieval. Such devices cover a wide range of capacities and speeds of access.
Structured Query Language (SQL)	A language used to interrogate and process data in a relational database. SQL commands can be used to interactively work with a database or can be embedded within a programming language to interface to a database.
Submenu	A menu that appears as a result of a menu selection. All menu selections followed by a “>” have submenus.
Subsystem	Each CMS main menu selection (for example, Reports, Dictionary, System Setup, Exceptions, and so on), along with Timetable and Shortcut, is referred to as a subsystem of the Call Management System throughout this document.
***Sun Enterprise* System**	A series of host computer systems manufactured by Sun Microsystems Inc. The *Sun Enterprise* 3000 or 3500 computer is a platform used to support *CentreVu*® CMS R3V6 and later versions as a replacement for the discontinued *Sun SPARCserver* 10/20 platforms.

***Sun SPARCserver* Computer**	A host computer that is attached to a network and provides services other than simply acting as a store-and-forward processor or communication switch. For CMS R3V6, the *Sun SPARCserver* 5 is available for new installations. See *Sun Enterprise* systems above for replacement information.
Super-user	A user with full access privileges on a system, unlike a regular user whose access to files and accounts is limited.
Switch	A private switch system providing voice-only or voice and data communications services (including access to public and private networks) for a group of terminals within a customer's premises.
Syntax	The format of a command line.
System	A general term for a computer and its software and data.
Tap	A tap is any intelligent (microprocessor-based) controller connected to the SCSI bus.
Tape Cartridge	A magnetic piece of hardware that is used as a storage unit for data. The SCSI QIC-150, SCSI QIC 2.5-GB, SCSI 4-8 SLR, 8mm 5-GB, 8mm 14-GB, and 8mm 20/40-GB tape cartridges are used to back up and copy data for the platform.
TCP/IP	See Transmission Control Protocol/Internet Protocol (TCP/IP)
TSC	Technical Service Center. The Lucent organization that provides technical support for Lucent products.
Transmission Control Protocol/Internet Protocol (TCP/IP)	A communications protocol that provides interworking between dissimilar systems. It is the de facto standard for *UNIX* systems.
Trunk	A telephone line that carries calls between two switches, between a Central Office (CO) and a switch, or between a CO and a phone.
Trunk Group	A group of trunks that are assigned the same dialing digits — either a phone number or a Direct Inward Dialing (DID) prefix.
***UNIX* System**	The operating system on the computer on which CMS runs. A user can access the *UNIX* system from the "Commands" SLK. *SUN* uses *Solaris* as its *UNIX* operating system.

User ID	The login ID for a CMS user.
User Name	A combination of letters, and possibly numbers, that identifies a user to the system.
User Window	A window the user can move, size, or scroll. It may contain input fields, reports, or help information.
VDN	See Vector Directory Number (VDN)
Vector	A list of steps that process calls in a user-defined manner. The steps in a vector can send calls to splits, play announcements and/or music, disconnect calls, give calls a busy signal, or route calls to other destinations. Calls enter vector processing by way of VDNs, which may have received calls from assigned trunk groups, from other vectors, or from extensions connected to the switch.
Vector Directory Number (VDN)	An extension number that is used in ACD software to permit calls to connect to a vector for processing. A VDN is not assigned an equipment location; it is assigned to a vector. A VDN can connect calls to a vector when the calls arrive over an assigned automatic-in trunk group or when calls arrive over a dial-repeating (DID) trunk group, and the final digits match the VDN. The VDN by itself may be dialed to access the vector from any extension connected to the switch.
Write Permission	A mode of CMS that allows the CMS user to add, modify, or delete data and execute processes. Write permission is granted from the User Permissions subsystem.
X.25	An ITU communications protocol standard for packet switching networks that typically operates at 56 Kbps or less. An add-on software package that allows CMS to communicate with the switch using X.25 protocol.

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