Avaya™ Call Management System (CMS)

Sun® Enterprise™ 3000 and SPARCserver™ Computers Hardware Maintenance and Troubleshooting

585-214-016
Issue 2.1
February 2002
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Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

Preventing Toll Fraud

"Toll fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or working on your company's behalf). Be aware that there may be a risk of toll fraud associated with your system and that, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

Avaya Fraud Intervention

If you *suspect that you are being victimized* by toll fraud and you need technical assistance or support, call Technical Service Center Toll Fraud Intervention Hotline at +1 800 643 2353 for the United States and Canada. For additional support telephone numbers, see the Avaya Web site:

http://www.avaya.com

Select **Support**, then select **Escalation Lists US and International**. This Web site includes telephone numbers for escalation within the United States. For escalation telephone numbers outside the United States, select **Global Escalation List**.

Providing Telecommunications Security

Telecommunications security (of voice, data, and/or video communications) is the prevention of any type of intrusion to (that is, either unauthorized or malicious access to or use of) your company's telecommunications equipment by some party.

Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that could be accessed via this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who may be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

Such intrusions may be either to/through synchronous (time-multiplexed and/or circuit-based) or asynchronous (character-, message-, or packet-based) equipment or interfaces for reasons of:

- Utilization (of capabilities special to the accessed equipment)
- Theft (such as, of intellectual property, financial assets, or toll-facility access)
- Eavesdropping (privacy invasions to humans)
- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there may be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it could result in a variety of losses to your company (including but not limited to, human/data privacy, intellectual property, material assets, financial resources, labor costs, and/or legal costs).

Your Responsibility for Your Company's Telecommunications Security

The final responsibility for securing both this system and its networked equipment rests with you - an Avaya customer's system administrator, your telecommunications peers, and your managers. Base the fulfillment of your responsibility on acquired knowledge and resources from a variety of sources including but not limited to:

- Installation documents
- System administration documents
- Security documents
- Hardware-/software-based security tools
- Shared information between you and your peers
- Telecommunications security experts

To prevent intrusions to your telecommunications equipment, you and your peers should carefully program and configure:

- your Avaya-provided telecommunications systems and their interfaces
- your Avaya-provided software applications, as well as their underlying hardware/software platforms and interfaces
- any other equipment networked to your Avaya products.

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Haverhill, MA 01835 USA
Attention: Avaya Account Manager

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Order: Document No. 585-214-016, Issue 2.1
February 2002

Avaya Support

Avaya provides a telephone number for you to use to report problems or to ask questions about your call center. The support telephone number is 1-800-242-2121 in the United States. For additional support telephone numbers, see the Avaya Web site:

http://www.avaya.com

Select **Support**, then select **Escalation Lists US and International**. This Web site includes telephone numbers for escalation within the United States. For escalation telephone numbers outside the United States, select **Global Escalation List**.

Acknowledgment

This document was written by the CRM Information Development group.

Avaya Call Management System
Sun Enterprise 3000 and SPARCserver Computers
Hardware Maintenance and Troubleshooting

Contents

SPARCserver maintenance

Troubleshooting

Preface

Overview

Avaya Call Management System Sun® Enterprise™ 3000 and SPARCserver™ Computers Hardware Maintenance and Troubleshooting, 585-214-016, is written for technicians and Avaya call center customers who maintain and troubleshoot the Sun Enterprise 3000 and SPARCserver computers.

Reasons for reissue

Issue 2.1 of this document was issued for the following changes:

- To transition from the CentreVu® CMS name to the Avaya CMS name.
- To remove information about maintaining and troubleshooting Network Terminal Servers (NTS). This information is now contained in *Avaya CMS Terminals, Printers, and Modems*, 585-215-874.
- To add information about checking and resetting EEPROM settings after replacing a system board (Maintaining boards on page 20).
- To update the disk replacement procedures for Enterprise 3000 computer (see Maintaining disk drives on page 37).
- To add information about setting CMS tunables when adding CPUs to the system (see Installing a CPU on page 80).
- To make general wording corrections to the document.

Issue 2.0 of this document was issued for the following changes:

- To update information about the SunFastEthernet™ card for Enterprise 3000 and SPARCserver computers (see Maintaining I/O cards on page 28 and Maintaining I/O cards on page 82).
- To update the disk replacement procedures for Enterprise 3000 and SPARCserver computers (see Maintaining disk drives on page 37 and Maintaining disk drives on page 103).
- To make general wording corrections to the document.

Issue 1.1 of this document was issued for the following changes:

- To add a section on maintaining I/O boards for Enterprise 3000 computers (see Maintaining boards on page 20).
- To add information about the new SunFastEthernet card for Enterprise 3000 and SPARCserver computers (see Installing or removing I/O cards on page 29 and Installing or removing I/O cards on page 83).
- To update the HSI card installation procedures for Enterprise 3000 and SPARCserver computers (see Installing HSI/S cards on page 32 and Installing HSI/S cards on page 87).
- To update the disk replacement procedures for Enterprise 3000 and SPARCserver computers (see Maintaining disk drives on page 37 and Maintaining disk drives on page 103).
- To add I/O card replacement procedures for SPARCserver computers (see Maintaining I/O cards on page 82).
- To move information about Aurora serial ports under the I/O card maintenance (see Aurora serial ports on page 92).
- To update the SunVTS procedures (see SunVTS diagnostics on page 154).
- To update the remote console procedures (see Using the remote console on page 130).
- To consolidate redundant information.
- To make general wording and format corrections to the document.

Issue 1.0 of this document was issued for the following changes:

- To replace *Call Management System R3V8 Hardware Maintenance and Troubleshooting*, 585-210-919.
- To remove maintenance and troubleshooting information about the Sun Ultra™ 5 computer. This information is now contained in *Avaya Sun Ultra 5 Computer Hardware Installation, Maintenance, and Troubleshooting*, 585-215-871.

Organization

This document is organized as follows:

- Introduction – Provides an overview of the Enterprise 3000 and SPARCserver computers, and support information.
- Enterprise 3000 maintenance – Describes maintenance procedures for the Enterprise 3000 computer.
- SPARCserver maintenance – Describes maintenance procedures for the SPARCserver computers.
- Troubleshooting – Describes troubleshooting procedures that apply to both the Enterprise 3000 and SPARCserver computers.
- Glossary
- Index

Related documents

This section lists sources for information related to contact center products and features. Not all documents are supported for all CMS releases or equipment.

To order Avaya documentation, call the Avaya Publications Center at 1-800-457-1235 (United States and Canada) or +1-410-568-3680 (outside the United States and Canada).

CMS software documents

Document title	Document number
Installing software on a CMS computer	
Call Management System Release 3 Version 9 Software Installation, Maintenance, and Troubleshooting	585-215-956
Call Management System Release 3 Version 8 Software Installation, Maintenance, and Troubleshooting	585-210-941
Call Management System Software Installation and Setup (R3V6 and earlier)	585-215-866
Setting up a disk-mirrored system	
Call Management System Release 3 Version 9 Software Installation, Maintenance, and Troubleshooting	585-215-956
Call Management System Release 3 Version 8 Disk-Mirrored Systems	585-210-940
Call Management System Disk-Mirrored Systems (R3V6)	585-215-841

Upgrade documents

There are several upgrade paths supported with CMS. For each of these upgrades, there is a document designed to support that upgrade. Note that none of these documents are available from the publications center, but are available from the Avaya CMS documentation Web site.

- Base load upgrades

  A base load upgrade is used when upgrading CMS to a more recent load of the same version (for example, R3V9 ak.g to R3V9 al.k). A specific set of instructions are written for the upgrade and are shipped to the customer site with the CMS software CD as part of a Quality Protection Plan Change Notice (QPPCN).

Document title
Call Management System Release 3 Version 9 Base Load Upgrade Procedures
Call Management System Release 3 Version 8 Base Load Upgrade Procedures

- Platform upgrades and data migration

  A platform upgrade is used when upgrading to a new hardware platform (for example, upgrading from a SPARCserver 5 to an Enterprise 3500). The new hardware platform is shipped from the Avaya factory with the latest CMS load. Therefore, as part of the upgrade you will automatically upgrade to the latest CMS load (for example, R3V8 to R3V9 or the latest load of the same CMS version). For R3V9, a specific set of instructions are written for the upgrade and are shipped to the customer site with the new hardware. For R3V8, see the Avaya CMS documentation Web site.

Document title
Call Management System Release 3 Version 9 Platform Upgrade and Data Migration Instructions
Call Management System Release 3 Version 8 Platform Upgrade and Data Migration Instructions

- CentreVu Upgrade Express (CVUE)

  CVUE is used in the following conditions:

  — CMS is being upgraded from an earlier version (for example, R3V5u or R3V6) to the latest version (for example, R3V8 or R3V9).

  — The hardware platform is not changing.

  A specific set of upgrade instructions are written for the upgrade and are shipped to the customer site with the CVUE kit.

Document title
Call Management System Release 3 Version 9 Sun Ultra 5 Computer CVUE Instructions
Call Management System Release 3 Version 9 Sun Enterprise 3000 Computer CVUE Instructions
Call Management System Release 3 Version 9 Sun Enterprise 3000 Computer Mirrored System CVUE Instructions
Call Management System Release 3 Version 9 Sun Enterprise 3500 Computer CVUE Instructions
Call Management System Release 3 Version 9 Sun Enterprise 3500 Computer Mirrored System CVUE Instructions
Call Management System Release 3 Version 8 Sun SPARCserver 5 Computer CVUE Instructions
Call Management System Release 3 Version 8 Sun SPARCserver 20 Computer CVUE Instructions
Call Management System Release 3 Version 8 Sun Ultra 5 Computer CVUE Instructions
Call Management System Release 3 Version 8 Sun Enterprise 3000 Computer CVUE Instructions
Call Management System Release 3 Version 8 Sun Enterprise 3000 Computer Mirrored System CVUE Instructions
Call Management System Release 3 Version 8 Sun Enterprise 3500 Computer CVUE Instructions
Call Management System Release 3 Version 8 Sun Enterprise 3500 Computer Mirrored System CVUE Instructions

Hardware documents

Document title	Document number
Sun Blade 100 Computer Hardware Installation, Maintenance, and Troubleshooting	585-310-783
Sun Blade 100 Computer Connectivity Diagram	585-310-782
Sun Enterprise 3500 Computer Hardware Installation, Maintenance, and Troubleshooting	585-215-873
Sun Enterprise 3500 Computer Connectivity Diagram	585-215-877
Call Management System Sun Ultra 5 Computer Hardware Installation, Maintenance, and Troubleshooting	585-215-871
Call Management System Sun Ultra 5 Computer Connectivity Diagram	585-215-872
Call Management System Sun Enterprise 3000 and SPARCserver Computers Hardware Maintenance and Troubleshooting	585-214-016
Call Management System Terminals, Printers, and Modems	585-215-874
Call Management System Release 3 Version 6 Sun Enterprise 3000 Computer Hardware Installation	585-215-867
Call Management System Release 3 Version 6 Sun Enterprise 3000 Computer Connectivity Diagram	585-215-865
Call Management System Release 3 Version 6 Sun SPARCserver Computers Hardware Installation	585-215-857
Call Management System Release 3 Version 6 Sun SPARCserver Computers Connectivity Diagram	585-215-858
Call Management System Release 3 Version 5 Sun SPARCserver Installation and Maintenance	585-215-827
Call Management System Release 3 Version 5 Sun SPARCserver Connectivity Diagram	585-215-828

Switch documents

Document title	Document number
CMS Switch Connections, Administration, and Troubleshooting	585-215-876

Administration documents

Document title	Document number
Call Management System Release 3 Version 9 Administration	585-214-015
Call Management System Release 3 Version 8 Administration	585-210-910
Call Management System Release 3 Version 6 Administration	585-215-850
Call Management System Release 3 Version 5 Administration	585-215-820

Other documents

Document title	Document number
CMS Open Database Connectivity	585-215-951
CMS Release 3 Version 9 External Call History Interface	585-215-952
CMS Custom Reports	585-215-822
CMS Release 3 Version 5 Forecast	585-215-825
Visual Vectors Version 9 Installation and Getting Started	585-210-947
Visual Vectors Version 9 User Guide	585-210-944
Call Management System Alarm Origination Manager	585-215-884

Documentation Web sites

For product documentation for all Avaya products and related documentation, go to http://www.avayadocs.com.

Important:
Additional information about new software or hardware updates will be contained in future issues of this book. New issues of this book will be placed on the Web site when available.

Use the following web sites to view related support documentation:

- Information about Avaya products and service

  http://www.avaya.com.
- Sun hardware documentation

  http://docs.sun.com
- Okidata printer documentation

  http://www.okidata.com
- Informix documentation

  http://www.informix.com

Introduction

Overview

The Sun Enterprise 3000 and SPARCserver computers provide hardware platforms that support call center software applications.

Note:

The Sun SPARCserver computers support CMS R3V8 and earlier. CMS R3V9 and later releases are not supported on the Sun SPARCserver computers.

Support

If a problem arises that requires assistance, use the support information and help lines presented below.

Frequently asked questions (FAQs)

For solutions to common problems, CMS customers and Avaya technicians can access the CMS technical support FAQ at:

http://www.avaya.com

Click **Support**, then **Call Center/CRM Solutions**, then **CentreVu Call Management System**, and then **FAQ**.

Please check this information before you call in a trouble ticket. It could save you time and money.

Customer support for the United States

Customers can report problems and generate trouble tickets by calling:

1-800-242-2121

The customer is prompted to identify the type of problem (that is, Automatic Call Distribution, hardware, or Avaya CMS) and is then connected to the appropriate service organization.

Technician support for the United States

Avaya technicians can receive help by calling:

1-800-248-1234

Customer and technician support outside the United States

For customer and technician support outside the United States, see the Avaya Web site:

http://www.avaya.com

Click on **Support**, then click on **Escalation Lists US and International**. For escalation telephone numbers outside the United States, click on **Global Escalation List**.

Enterprise 3000 maintenance

Overview

This chapter describes maintenance procedures for the Sun Enterprise 3000 computer. See your CMS software installation, maintenance, and troubleshooting document, and the Enterprise 3000 system documentation for additional information.

This chapter describes the following maintenance procedures:

Note:

If you should need to remove a side panel from the Enterprise 3000 computer 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.

Maintaining boards

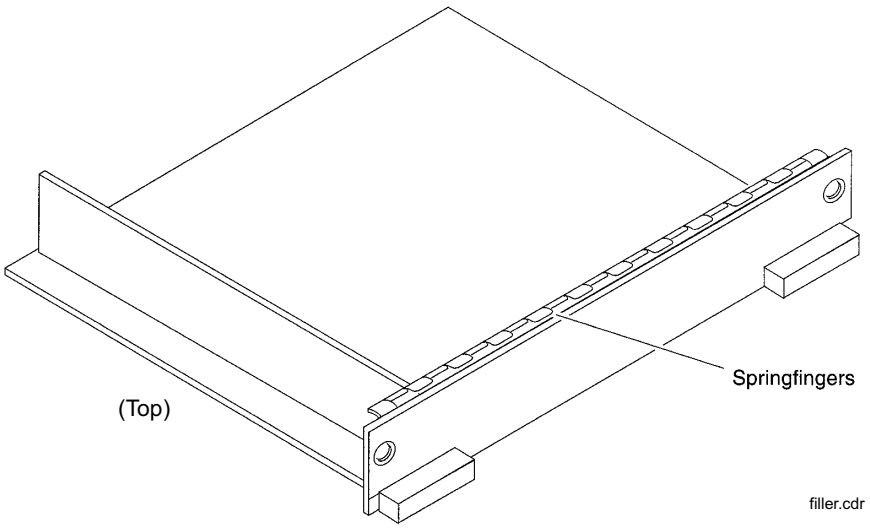
Overview

Procedures in this section include the following:

- Identifying free board slots
- Removing and installing boards on page 21
- Maintaining the system clock board on page 25

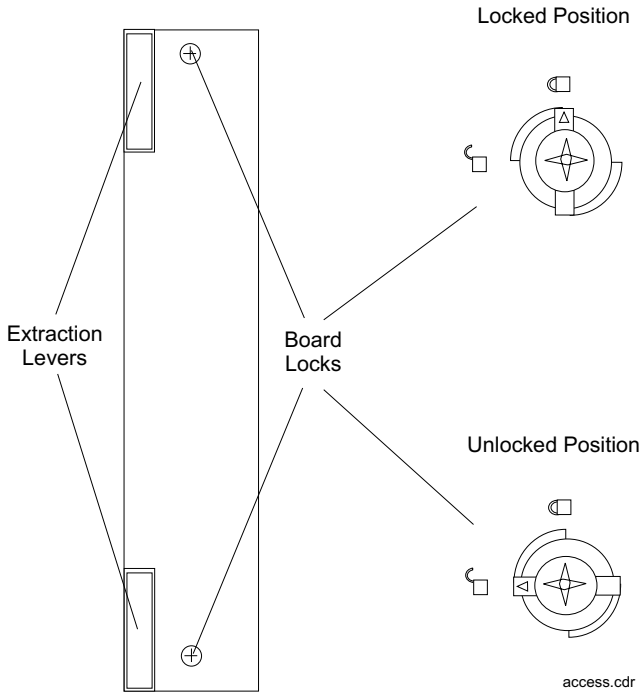
Identifying free board slots

Free board slots are covered by filler panels, which have rectangular plastic knobs instead of extraction levers. The following figure shows a filler panel.



Removing and installing boards

This section describes general procedures for removing and installing boards. Boards are accessed from the rear of the system. Each board is locked into place by a combination of extraction levers and board locks that help to seat the board in the centerplane receptacles. These centerplane receptacles and board locks align and attach the board to the system. The following figure shows the board-locking mechanisms.



Precautions for handling boards

To minimize the amount of board flexing, observe the following precautions:

WARNING:
You must wear an ESD wrist strap when installing or removing hardware components to prevent electrical discharge that can damage the system.

WARNING:
The CPU/Memory+ and I/O boards, and their modules and cards, have surface-mounted components that can break if you flex the boards.

- Hold the board only by the edges near the middle of the board, where the board stiffener is located. Do not hold the board only at the ends.
- When you remove the board from an antistatic bag, keep the board vertical until you lay it on an ESD mat.
- Do not place the board on a hard surface. Use a cushioned antistatic mat. The board connectors and components have very thin pins that bend easily.
- Transport the board in an antistatic bag.
- Be careful of the small parts that are located on the component side of the board.

Removing a board

To remove a board:

CAUTION:
A board should be removed from a powered-on system only after the Automatic System Reconfiguration (ASR) software has disabled that board. Otherwise, the operating system must be stopped and the system powered off prior to board removal.

1. Check to see that the board is in a “low-power mode.” A board is in low-power mode when:
   - All three LEDs on the rear panel are unlit (power is turned off), or
   - The two outer green LEDs are unlit and the yellow LED in the middle is lit.
2. If the board is not in a low-power mode, stop the system and turn off the power.
3. Using a Phillips screwdriver, turn the two board locks to the unlocked position.
4. Pull outward on the ends of both extraction levers simultaneously.
5. Slide the board out of the computer.
6. Place the board on a padded ESD mat or store the board in an antistatic bag.

Installing a board

To install a board:

1. Open the extraction levers by pulling outward on the ends of both levers.
2. Insert the board part of the way into the slot, with the component side of the board on your right.
3. Slide the board into the computer, and push in on the extraction levers until they lock.

   WARNING:
   Do not push on the panel. if you do, you will damage the connector pins.
4. Using a Phillips screwdriver, rotate the board locks into the locked position.
5. Turn on power to the system, or reboot.

Note:

Adding a board may require that you also add a PCM. There must be one PCM for every two boards that are installed in the system. The PCMs must be installed adjacent to populated board slots to ensure that the fan in the PCM can cool the associated boards.

Resetting the EEPROM settings

If you replace a system board, you must check and reset the EEPROM settings. For a listing of the correct settings, see *Displaying and setting the EEPROM parameters* in the CMS software installation, maintenance, and troubleshooting document for your CMS version.

Synchronizing the clocks

Each I/O board has its own clock that must be synchronized with the system clock board for proper system operation. After adding, removing, or replacing an I/O board or the system clock board, the clock on the I/O board might become unsynchronized with the clock on the system clock board.

If the clocks need resynchronizing, the system displays the following message when you reboot:

```
Clock board TOD does not match TOD on any IO board
```

To synchronize the clocks:

1. If CMS is running, turn it off.
2. Enter:

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

   The system shuts down and displays the `ok` prompt.
3. Enter:

   copy-clock-tod-to-io-boards

   This synchronizes the clocks.
4. Enter:

   boot -r

   This reboots the system and resynchronizes the clocks.
5. Turn CMS on.

Maintaining the system clock board

This procedure should be performed by or with the assistance of a Sun Microsystems Inc. technician.

Replacing the system clock board

To replace the system clock board:

1. Shut down the system
2. Remove the faulty clock board.
3. Remove the nonvolatile random access memory (NVRAM) chip from the old clock board and insert it into the new clock board.
4. Install the new clock board in the system.
5. Power up the system.

If this does not solve the problem, you must replace the NVRAM chip. When the NVRAM chip is replaced, all EEPROM settings are reset to the Sun factory default values. Some of the settings must be changed to the EEPROM parameter values required by CMS. For a listing of the correct CMS settings, see *Displaying and setting the EEPROM parameters* in the CMS software installation, maintenance, and troubleshooting document.

If you replace the NVRAM chip on an older system that is using X.25 software, you will need to call Sun Microsystems Inc. to obtain a new license key. On newer systems, you may not have to reinstall the license.

Setting the boot device on a new NVRAM chip

If the NVRAM chip has been replaced, use the following procedure to insure that the boot device is set correctly.

To display and set the boot device:

1. At the prompt, enter:

   eeprom | grep boot-device

   On a non-mirrored system, the system should display a message similar to the following:

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

   On a mirrored system, the system should display a message similar to the following:

   ```
     boot-device=disk bootdevice2
   #
   ```

2. If the first device displayed on a nonmirrored system is not `disk`, enter:

   eeprom boot-device=disk

   If the first and second devices displayed on a mirrored system are not `disk` and `bootdevice2`, enter:

   eeprom boot-device=disk bootdevice2

3. Enter:

   /usr/sbin/shutdown -y -g0 -i6

   This reboots the system so that is recognizes the new configuration.

If the system still does not boot, but reports that it is trying to boot up from the network:

1. Enter:

   printenv boot-device

2. Check the first parameter. If it is not `disk,` enter:

   setenv boot-device disk

   If you have a mirrored system, enter:

   setenv boot-device disk bootdevice2

3. Enter:

   /usr/sbin/shutdown -y -g0 -i6

   This reboots the system so that is recognizes the new configuration.

Synchronizing the clocks

Each I/O board has its own clock that must be synchronized with the system clock board for proper system operation. After adding, removing, or replacing an I/O board or the system clock board, the clock on the I/O board might become unsynchronized with the clock on the system clock board.

If the clocks need resynchronizing, the system displays the following message when you reboot:

```
Clock board TOD does not match TOD on any IO board
```

To synchronize the clocks:

1. If CMS is running, turn it off.
2. Enter:

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

   The system shuts down and displays the `ok` prompt.
3. Enter:

   copy-clock-tod-to-io-boards

   This synchronizes the clocks.
4. Enter:

   boot -r

   This reboots the system and resynchronizes the clocks.
5. Turn on CMS.

Maintaining I/O cards

Introduction

Procedures in this section include the following:

Required references

You need access to the following documents to do the procedures in this section:

- *CMS R3V11 Software Installation, Maintenance, and Troubleshooting,* 585-215-115
- *CMS R3V9 Software Installation, Maintenance, and Troubleshooting,* 585-215-956
- *CMS R3V8 Software Installation, Maintenance, and Troubleshooting,* 585-210-941
- *CMS Software Installation and Setup* (R3V5 and R3V6), 585-215-866
- *CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876
- *Sun Enterprise 3000 System Reference Manual*

I/O card compatibility with CMS loads

New I/O cards are not compatible with all releases of CMS. This section describes the compatibility of newer I/O cards.

SunFastEthernet I/O card

The SunFastEthernet card is compatible with the following releases of CMS:

- r3v6au.k and later (or any CMS R3V6 load with Solaris patch 104212-15)
- r3v8al.k with Solaris patch 108263-06, or r3v8am.X and later
- All R3V9 loads

Solaris patches can be downloaded from:

http://drdtl.dr.avaya.com/docs/patches/

Installing or removing I/O cards

The I/O cards you may have to install or remove include the following:

- Monitor video card (installed in card slot 0 of the I/O board in board slot 1)
- SunFastEthernet card (optional) – This card has an ethernet port and a Media Independent Interface (MII) port. CMS uses only the ethernet port.
- FSBE card (optional) – This card has a SCSI port and an ethernet port.
- HSI card (optional)
- Token ring card (optional, installed by the factory and provisioned by Professional Services)

Use the following general instructions when installing, moving, and removing I/O cards. Other sections in this chapter describe specific I/O card maintenance instructions. Use those instructions as appropriate.

To install or remove an I/O card:

1. For a system that is currently in operation, verify that you have a recent CMSADM file system backup before you change I/O card configurations.
2. Enter:

   `/cms/toolsbin/rmSBusdev`

   The system queries whether you want to continue with the shutdown.
3. Enter: **`y`**

   This command removes the current I/O card configuration, and shuts down the system. When finished, the `ok` prompt displays.
4. Turn off the system.
5. Turn off the system monitor.
6. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

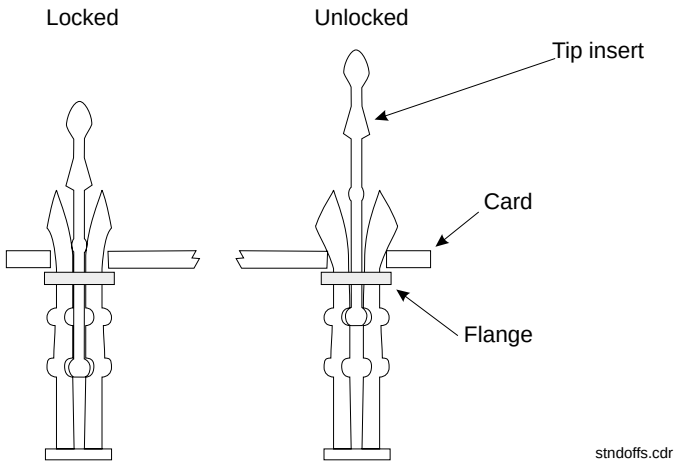
   WARNING:

   You must wear an ESD wrist strap when installing or removing hardware components to prevent electrical discharge that can damage the system.
7. Remove the I/O board from the computer.
8. Remove the filler panel from the slot where you are installing the new card.
9. Unpack the I/O card and prepare it for installation.

   Note:

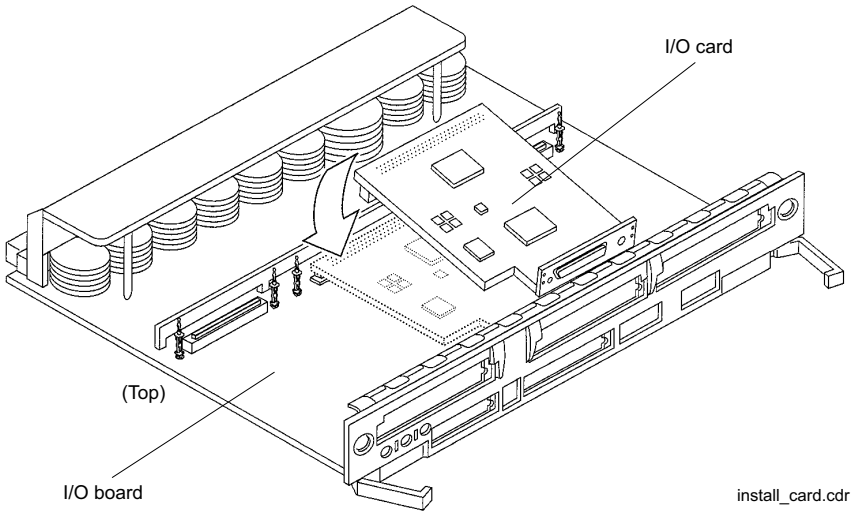
   Depending on the card and packaging, some card preparation may be required. See the *Sun Enterprise 3000 System Reference Manual* for more information.

10. If the plastic standoffs for the I/O card slot are locked (that is, if they are in the down position), gently but firmly lift up on the tip inserts until they move to the unlocked position.



11. Holding the I/O card by the edges, place the I/O card faceplate under the spring finger and against the rear face of the I/O board front panel.

    The I/O connectors of the I/O card should be visible through the slot opening in the I/O board front panel.



12. Align the mounting holes in the rear of the I/O card with the unlocked plastic standoffs.
13. Gently but firmly press down on the rear corners of the I/O card until the connector is fully seated.
14. Gently but firmly press down on the tip insert of each plastic standoff until it seats into the locked position.

15. Replace the face plate screws through the front of the I/O board to secure the I/O card to the I/O board front panel.
16. Replace the I/O board in the slot from which you removed it in Step 1.
17. Remove the ESD wrist strap.
18. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
19. Turn on the system monitor.
20. Turn on the system.
21. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
22. Enter:

    boot -r

    This reboots the system so that it recognizes the new configuration.
23. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Installing HSI/S cards

An HSI/S card supports X.25 switch links. For eight ACDs, two HSI/S cards are needed. If the system uses TCP/IP signaling for all ACDs, HSI/S cards are not needed.

If this is the initial installation of one or two HSI/S cards, start with Installing the first HSI/S card. If a second HSI/S card is being added to a system that already has one HSI/S card, see Adding a second HSI/S card on page 35.

Installing the first HSI/S card

To install the first HSI/S card in the system:

1. Verify that you have a recent CMSADM file system backup before you change I/O card configurations.
2. Log in to the system as root.
3. Enter:

   cmssvc

   The system displays the CMS Services menu.
4. Enter **3** to select the **run_cms** option.
5. Enter **2** to turn off CMS.
6. Before you remove CMS, you must first save the CMS tools in a temporary save directory. Enter the following two commands:

   ```
   if [ ! -d /save ]; then mkdir /save; fi
   cp -p /cms/toolsbin/rmSBusdev /cms/toolsbin/lnSBusdev /save
   ```
7. Enter:

   pkgrm cms

   The system runs the **pkgrm** command to remove the CMS software, and displays the following message:

   ```
   Do you want to preserve CMS data? [y,n,?]
   ```

   Important:
   Enter: **y**
8. After you remove CMS, you must copy the CMS tools back in to their working directory. Enter the following two commands:

   ```
   if [ ! -d /cms/toolsbin ]; then mkdir /cms/toolsbin; fi
   cp -p /save/rmSBusdev /save/lnSBusdev /cms/toolsbin/
   ```

9. Enter:

   `/cms/toolsbin/rmSBusdev`

   The system queries whether you want to continue with the shutdown.

10. Enter: **`y`**

    This command removes the current I/O card configuration, and shuts down the system. When finished, the `ok` prompt displays.

11. Turn off the system.
12. Turn off the system monitor.
13. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
14. Install the HSI/S card in an available port on the first-available I/O board. See Installing or removing I/O cards on page 29 for more information.
15. Attach the HSI/S patch panel, and connect the switch links to the patch panel by following the instructions described in *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876.
16. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
17. Turn on the system monitor.
18. Turn on the system.
19. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
20. Enter:

    `boot -r`

    This reboots the system so that it recognizes the new HSI/S card.

    Note:

    Sometimes the system fails to recognize a newly installed HSI card. If this happens, the command **`show-devs`** does not show the HSI card and **/var/adm/messages** fails to recognize the card upon bootup. See the troubleshooting chapter of *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876, for information about troubleshooting HSI/S cards.

21. When the system comes back up, log in as root.

Installing HSI/S software and patches

Using the procedures in your CMS software installation, maintenance, and troubleshooting document:

- Install the HSI/S software
- Install the X.25 drivers and license
- Reinstall the Solaris patches
- Reinstall the CMS software

Setting up the switch link for each ACD

To change the switch link administration for each ACD:

1. Enter:

   `cmssvc`

   The system displays the CMS Services menu.
2. Select the **`swsetup`** option.
3. Select the ACD that you want to set up.
4. Accept the existing defaults for the following:
   - Switch name
   - Switch model (release)
   - Vectoring
   - Expert agent
   - Central office disconnect supervision
   - Local port
   - Remote port
5. Select “X.25” and a specific link number when prompted for the link information.
6. Repeat Step 2 through Step 5 for each ACD that will use the HSI card.
7. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.
8. Turn on CMS using the **`run_cms`** option of the **`cmssvc`** command.

Adding a second HSI/S card

Use the following procedures if you are adding a second HSI/S card to a system that is currently in operation. Before you do this procedure, verify that CMS is installed.

To add a second HSI/S card:

1. Verify that you have a recent CMSADM file system backup before you change I/O card configurations.
2. Log in to the system as root.
3. Edit the **/etc/path_to_inst** file and search for HSI. Remove all such lines.
4. Enter the following commands:

   ```
   rm /dev/hih*
   ```

   ```
   rm /devices/sbus*/HSI*
   ```

5. Enter:

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

   This shuts down the system.
6. Turn off the system.
7. Turn off the system monitor.
8. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
9. Install the second HSI/S card in an available port on the first-available I/O board. See Installing or removing I/O cards on page 29 for more information.
10. Attach the HSI/S patch panel, and connect the switch links to the patch panel by following the instructions in *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876.
11. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
12. Turn on the system monitor.
13. Turn on the system.
14. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.

15. Enter:

    `boot -r`

    This reboots the system so that it recognizes the new HSI/S card.

    Note:

    Sometimes the system fails to recognize a newly installed HSI card. If this happens, the command **`show-devs`** does not show the HSI card and **/var/adm/messages** fails to recognize the card upon bootup. See the troubleshooting chapter of *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876, for information about troubleshooting HSI/S cards.

16. When the system comes back up, log in as root.
17. Enter:

    `/cms/toolsbin/lnSBusdev`

18. Administer the switch links as shown in Setting up the switch link for each ACD on page 34.

Maintaining disk drives

Overview

Procedures in this section include the following:

Disk drive compatibility with CMS loads

When a new or replacement disk drive is installed in an older system, the CMS load may not be compatible with the disk drive if the CMS configuration files have not been updated. These configuration files (**/olds/disk.conf** and **/olds/olds-funcs**) must be edited or replaced with the correct information. Contact the Avaya technical support organization for assistance.

Prerequisites

Do a CMSADM backup, if possible, before you add or replace a disk drive. See your CMS software installation, maintenance, and troubleshooting document for this procedure.

Before you attempt to replace defective nonboot disks, try to print the current setup for all ACDs. This information must be readministered after you install replacement disks.

Required references

You need access to the following documents to do the procedures in this section:

- *CMS R3V11 Software Installation, Maintenance, and Troubleshooting*, 585-215-115
- *CMS R3V9 Software Installation, Maintenance, and Troubleshooting*, 585-215-956
- *CMS R3V8 Software Installation, Maintenance, and Troubleshooting,* 585-210-941
- *CMS Software Installation and Setup* (R3V5 and R3V6), 585-215-866
- *CMS R3V8 Disk-Mirrored Systems*, 585-210-940
- *CMS Disk-Mirrored Systems* (for R3V6), 585-215-841

Adding or replacing disk drives

To add a hard disk drive to a system that is currently in operation, or to replace a defective disk drive, follow the procedures in this section.

Powering down the system

To power down the system

1. Enter:

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

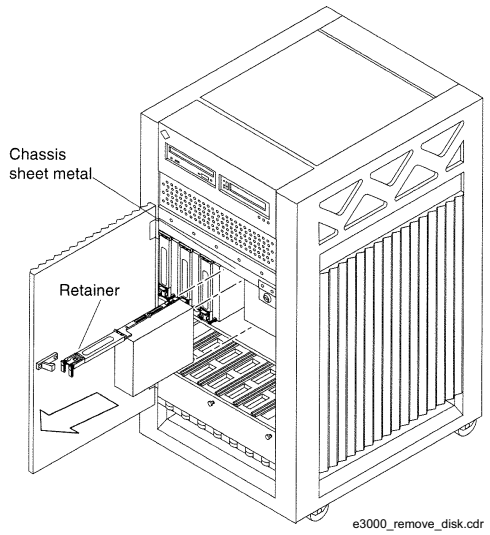
   The system shuts down and displays the `ok` prompt.
2. Turn off the system.
3. Turn off the system monitor.
4. If any external SCSI devices are installed, turn off the SCSI devices starting with the device that is closest to the system and working toward the farthest device.
5. Wait 30-60 seconds after removing power to allow the disk drives to spin down.

Installing the new drives

You install the internal hard disk drives in the front of the system. To expose the disk drive bays, open the front access door.

WARNING:

You must wear an ESD wrist strap when installing or removing disk drives to prevent electrical discharge that can harm system components.



For a CMS computer, you can install as many as ten disk drives. The drive bays are numbered 0 through 3 on the upper level and 10 through 15 on the lower level.

Set the SCSI IDs on the new disk drives such that they do not conflict with devices already on the system.

In a CMS mirrored system, disk drives must be installed in pairs, and each pair must be the same size. For more information on disk mirroring, see *CentreVu CMS R3V11 Software Installation, Maintenance, and Troubleshooting*, 585-215-115, *CentreVu CMS R3V9 Software Installation, Maintenance, and Troubleshooting*, 585-215-956, *CentreVu CMS R3V8 Disk-Mirrored Systems*, 585-210-940, or *CentreVu CMS Disk-Mirrored Systems* for R3V6, 585-215-841.

Each disk drive has a retainer latch/drive handle on the front of the drive. To install a drive, unlatch and extend the retainer and slide the drive carefully into the appropriate drive bay. When the drive stops, gently apply pressure to the face of the drive until the connectors engage. Lower the retainer latch and snap it in place, making certain that the drive is secure and does not extend beyond the front of the chassis.

WARNING:

Do not use excessive force to seat the connector or to close the retainer latch. Using excessive force can damage the disk drive and computer.

Powering up the system

To power up the system:

1. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
2. Turn on the system monitor.
3. Turn on the system.
4. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.

   The system displays the `ok` prompt.
5. Enter the following commands:

   `setenv auto-boot? false`

   `reset-all`

   The system reboots to the `ok` prompt.
6. Enter:

   `probe-scsi-all`

   This verifies that the system recognizes all of the disk devices, including the newly installed ones.

   The system displays a message similar to the following:

```
/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
```

   The devices listed depends on the number of disks that are installed in the system.

7. Enter the following commands:

   `setenv auto-boot? true`

   `boot -r`

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

8. Log in as root.
9. Continue with Setting up the disk drives on page 42.

Setting up the disk drives

After you replace defective disk drives, do one of the following:

Drive replaced	System	Procedure
Boot disk	Nonmirrored	Continue with the CMSADM restore procedure for a nonmirrored system in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.
Both boot disks	Mirrored	Continue with the CMSADM restore procedure for a mirrored system in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.
One boot disk	Mirrored	Partition the new boot disk drive (see Partitioning disk drives on page 44). Continue with the procedures in *Recovering a mirrored system after disk failure* in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.
Nonboot disk	Mirrored	Partition and administer the drive so that it works with the existing disk drives (see Partitioning disk drives on page 44 and Administering nonboot disk drives on page 52). Continue with the procedures in *Recovering a mirrored system after disk failure* in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.
Nonboot disk	Nonmirrored	Partition and administer the drive so that it works with the existing disk drives (see Partitioning disk drives on page 44 and Administering nonboot disk drives on page 52). Continue with the procedures in *Recovering a nonmirrored system after data disk failure* in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.

After you add new disk drives, do the following:

Drive added	System	Procedure
Nonboot disk	Mirrored or nonmirrored	Partition and administer the drive so that it works with the existing disk drives (see Partitioning disk drives on page 44 and Administering nonboot disk drives on page 52).

Partitioning disk drives

Requirements for partitioning disk drives differs for the releases of CMS.

R3V9 and later

If you are adding new disk drives to a system where CMS is operational, partitioning is done automatically using CMS commands. Skip manual partitioning and continue with Administering nonboot disk drives on page 52.

If you are replacing a defective nonboot disk drive in a system and CMS is not operational, or if you are replacing a defective boot disk in a mirrored system, you must manually partition the disk drive. Use the following information:

- Disk partition values, R3V9 and later boot disks on page 45 or R3V9 and later nonboot disks on page 46
- Partitioning and formatting a disk on page 48

R3V8 and earlier

For R3V8 and earlier systems, you must partition and format the new or replacement disk drives. Use the following information:

- Disk partition values, R3V8 and earlier nonboot disks on page 47
- Partitioning and formatting a disk on page 48

Disk partition values

During the disk partitioning procedure, you must enter the size of each partition. Since disk models change often, see the software installation document for your current CMS release to verify the correct disk partitioning values.

R3V9 and later boot disks

The following table lists the boot disk drives that are currently used for R3V9 and later. These partition sizes are entered in gigabytes (gb) and cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
18-GB	0	root	wm	0	4gb
	1	swap	wu	1781	1gb
	2	backup	wm	Use the default values for partition 2.	
	3	un	wm	2227	3gb
	4	un	wm	3563	2gb
	5	un	wm	4454	2gb
	6	un	wm	5345	2gb
	7	un	wm	6236	1270c

R3V9 and later nonboot disks

The following table lists the nonboot disk drives that are currently used for R3V9 and later. These partition sizes are entered in gigabytes (gb) and cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
18-GB	0	un	wm	0	2gb
	1	un	wm	891	2gb
	2	backup[1]	wm	Do not enter a value for partition 2.	
	3	un	wm	1782	2gb
	4	un	wm	2673	2gb
	5	un	wm	3564	2gb
	6	un	wm	4455	2gb
	7	un	wm	5364	2169c
4.2-GB	0	un	wm	0	2gb
	1	un	wm	1942	2gb
	2	backup[1]	wm	Do not enter a value for partition 2.	
	3-7	un	wm	0	0c

1. The *backup* value indicates the size of the disk drives. If the disk drive you are partitioning does not closely match the size of the disk your are partitioning, you have a nonstandard disk. Escalate the issue to Avaya technical support.

R3V8 and earlier nonboot disks

The following table lists the nonboot disk drives that are currently used for R3V8 and earlier. These partition sizes are entered in cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
18-GB[1]	0	un	wm	0	2c
	1	un	wm	2	7504c
	2	backup[2]	wm	0	7506c
	3-7	un	wm	0	0c
4.2-GB	0	un	wm	0	2c
	1	un	wm	2	3878c
	2	backup[1]	wm	0	3880c
	3-7	un	wm	0	0c

1. The 18-GB disk is compatible with loads r3v6be.f or later, and r3v8al.g or later. For older systems, see Disk drive compatibility with CMS loads on page 37 for more information.

2. The *backup* value indicates the size of the disk drives. If the disk drive you are partitioning does not closely match the size of the disk your are partitioning, you have a nonstandard disk. Escalate the issue to Avaya technical support.

Partitioning and formatting a disk

To partition and format a disk:

1. At the system prompt, enter:

   `format`

   The system displays a message that is similar to the following example:

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

2. Enter the disk number that corresponds to the disk that you added. Be sure to specify the number that **exactly** matches the disk added.

```
Specify disk (enter its number): 1
```

   The system displays the device number of the disk that you are partitioning, for example, `c0t1d0`, and the Format Menu:

```
selecting c0t1d0

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
        !<cmd>     - execute <cmd>, then return
        quit
format>
```

3. Enter:

   partition

   The system displays the partition menu:

```
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
        !<cmd> - execute <cmd>, then return
        quit
partition>
```

4. At the `partition>` prompt, enter:

   print

   The system displays the default partition table. The table for a 4.2-GB SCSI nonboot disk might look like the following example:

```
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)       4320
  1  unassigned    wm       2 - 3879     3.99GB     (3878/0/0)   8376480
  2      backup    wm       0 - 3879     4.00GB     (3880/0/0)   8380800
  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)
```

5. Partition the disk by completing the following Steps a through e for all partitions as specified in the Disk partition values on page 45.

   a. At the `partition>` prompt, enter the partition number from the table. For example:

   ```
   partition> 0
   ```

   The system prompts for the partition ID tag.

   b. Enter the partition ID tag from the table. For partition 0, press **Enter** to accept the default of unassigned.

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

   The system prompts for permission flags.

   c. Press **Enter** to accept the default (`wm`). That indicates that the partition is writable and mountable.

   The system prompts for the starting cylinder.

   d. Enter the number of the starting cylinder from the table. For example:

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

   The system prompts for the partition size.

   e. Enter the partition size from the table. For example:

   ```
   Enter partition size [0b, 0c, 0mb]: 2c
   ```

   The system displays the `partition>` prompt.

6. When you have sized all of the partitions, enter:

   `print`

7. Compare the partition table that is now displayed to the Disk partition values on page 45. If there are any discrepancies, correct them by repeating the disk partitioning.

8. When you determine that the disk partitioning is correct, enter:

   `label`

   Important:
   Do *not* forget to label the disk drive.

   The system prompts you to continue.

9. Enter: **y**

   The system displays the `partition>` prompt.

10. Enter: **q**

    The system displays the `format>` prompt.

11. Enter:

    format

    The system displays the following message:

```
Ready to format. Formatting cannot be interruped
and takes XX minutes (estimated). Continue? (y or n)
```

12. Enter: **y**

    The system displays a message similar to the following:

```
Begin format. The current time is <timestamp>

Formatting...
done

Verifying media...
        pass 0 - pattern = 0xc6dec6de
   4923/26/7

        pass 1 - pattern = 0x6db6db6d
   4923/26/7

Total of 0 defective blocks repaired.
format>
```

13. If you added more than one disk drive, enter **disk**, and repeat Step 2 through Step 12 for each drive.
14. After you have partitioned each drive, enter: **q**
15. Continue with Administering nonboot disk drives on page 52.

Administering nonboot disk drives

After the nonboot disk drives have been installed, partitioned, and formatted, you must administer the disk drives. The procedures are different for CMS releases and whether the system is mirrored or nonmirrored.

The procedures in this section include:

Administering new nonboot disks, R3V9 and later

Administration of new disks in R3V9 and later has been automated using commands on the CMS Services menu.

To administer one or more new disks to a nonmirrored system, or to administer one or more pairs of disks to a mirrored system:

1. Enter:

   cmssvc

   The system displays the CMS Services menu.

   Note:
   If the system also displays the following message, you must first turn on IDS before continuing with Step 2.

   ```
   cmssvc: warning IDS off-line it will take approx 30 seconds to start
   ```

2. Enter the number that corresponds to the `disk_space` option.
3. Enter the number that corresponds to the `Add new disks` option.

   The system displays the disks to be added.
4. Enter the number that corresponds to the disk you want to add.

   The system administers the new disks, which may take several minutes depending on the number and size of the disks. The system displays the following message:

   ```
   added new disk cXtXd0
   disk_space command completed.
   ```

Administering replacement nonboot disks, R3V9 and later

If a nonboot disk drive fails, you must follow the recovery procedures as outlined in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS. The appropriate sections to refer include:

- *Recovering a nonmirrored system after data disk failure*
- *Recovering a mirrored system after disk failure*

Administering a new nonboot disk, R3V8 and earlier, nonmirrored

To administer a new nonboot disk that you have added to a nonmirrored system:

1. Turn off CMS. It is important that CMS remain off while you perform this procedure.
2. Verify that the disk has been partitioned.
3. Enter:

   df -k /cms

   The system displays the percentage of total space that CMS is currently occupying, as in the following example:

   ```
   Filesystem            kbytes    used   avail capacity  Mounted on
   /dev/md/dsk/d19      6569538   670411 5899127     11%    /cms
   #
   ```

   Note the capacity percentage (in this example, 11%). The capacity used by **/cms** will be smaller after a new disk is added.
4. Enter the following commands to set the path variables:

   PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

   export PATH
5. Check the disk partitioning by entering the following commands:

   olds -check_disks *cxtydz*

   where ***cxtydz*** is the device name of the disk that you added (for example, c0t1d0).
6. Create a new **md.tab** file by entering the following command:

   olds -metadbs

   Ignore any error messages about failures while activating new replicas.
7. Enter:

   olds -mk_files *cxtydz*

8. Enter:

   pg /olds/md.tab.new

   This verifies that all the disk drives on your system have been recognized.

   The system displays a message that is similar to the following example, which shows three disk drives on the system:

```
   .
   .
   .
#/cms
d19 3 1 /dev/dsk/c0t1d0s1 1 /dev/dsk/c0t3d0s3 1 /dev/dsk/c0t2d0s2
```

9. Depending on what is displayed, perform one of the following actions:

   - If the file shows the exact number of drives that are on the system, continue with Step 10.
   - If the file does not show the exact number of drives on the system, complete the following steps:

     i. Enter:

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

        The system shuts down and displays the `ok` prompt.

     ii. Turn off the system.

     iii. Turn off the system monitor.

     iv. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

     v. Check all disk drive connections to make sure that they are secure.

     vi. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.

     vii. Turn on the system monitor.

     viii. Turn on the system.

     ix. The system begins to boot. Interrupt the boot by pressing **Stop** plus **A**.

        The `ok` prompt displays.

     x. Enter the following commands:

        setenv auto-boot? false

        reset-all

        The system reboots to the `ok` prompt.

xi. To verify that the system recognizes all the disk devices, including the newly installed ones, enter:

probe-scsi-all

The system displays a message that is similar to the following example:

```
/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
```

The devices that are listed depends on the number of disk drives that are installed in the system. Check to make certain that all of the disk drives are listed.

xii. Enter the following commands:

setenv auto-boot? true

boot -r

CAUTION:

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

The system reboots and the system displays the login window.

xiii. Log in as root.

xiv. Enter the following commands to set the path variables:

PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

export PATH

10. Enter:

    olds -setup *cxtydz*

    This attaches the new disk and grow the **/cms** file system, where ***cxtydz*** is the device name of the disk that you added.

    The system displays a series of messages similar to the following that reflect the disk drive setup process. The system eventually reports success.

```
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.
#
```

11. Enter:

    df -k /cms

    The system displays the percentage of total space that CMS is currently occupying, as in the following example:

```
# df -k /cms
Filesystem            kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d19      15271904  670412 14601492     5%    /cms
#
```

    Compare the capacity figure now with what was displayed in Step 3. In this example, the capacity percentage went down from 11% to 5% because the system has more disk space. This shows that the new disk drive was indeed added successfully to the system.

12. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

13. Turn on CMS when finished adding disks.

Administering a new pair of nonboot disks, R3V8 and earlier, mirrored

To administer a new pair of nonboot disks that you have added to a mirrored system:

1. Turn off CMS. It is important that CMS remain off while you perform this procedure.
2. Verify that the disk has been partitioned.
3. Enter:

   df -k /cms

   The system displays the percentage of total space that CMS is currently occupying, as in the following example:

```
# df -k /cms
Filesystem            kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d21      6569538   670411 5899127     11%    /cms
#
```

   Note the capacity percentage (in this example, 11%). The capacity used by **/cms** will be smaller after a new disk is added.

4. Enter the following commands to set the path variables:

   PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

   export PATH

5. Check the disk partitioning by entering the following commands:

   olds -mirrored -check_disks

6. Create a new **md.tab** file by entering the following command:

   olds -mirrored -metadbs

   Ignore any error messages about failures while activating new replicas.

7. Enter:

   olds -mirrored -mk_files

8. Enter:

   pg /olds/md.tab.new

   This verifies that all the disk drives on your system have been recognized.

   The system displays a message that is similar to the following example, which shows four disk drives on the system:

```
   .
   .
   .
#/cms
d21 3 1 /dev/dsk/c0t0d0s1 1 /dev/dsk/c0t1d0s3 1 /dev/dsk/c1t4d0s2 1
/dev/dsk/c1t5d0s2
```

9. Depending on what is displayed, perform one of the following actions:

   - If the file shows the exact number of drives that are on the system, continue with Step 10.
   - If the file does not show the exact number of drives on the system, complete the following steps:

     i. Enter:

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

        The system shuts down and displays the `ok` prompt.

     ii. Turn off the system.

     iii. Turn off the system monitor.

     iv. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

     v. Check all disk drive connections to make sure that they are secure.

     vi. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.

     vii. Turn on the system monitor.

     viii. Turn on the system.

     ix. The system begins to boot. Interrupt the boot by pressing **Stop** plus **A**.

        The `ok` prompt displays.

     x. Enter the following commands:

        setenv auto-boot? false

        reset-all

        The system reboots to the `ok` prompt.

xi. To verify that the system recognizes all the disk devices, including the newly installed ones, enter: **probe-scsi-all**

The system displays a message that is similar to the following example:

```
/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
```

The devices that are listed depends on the number of disk drives that are installed in the system. Check to make certain that all of the disk drives are listed.

xii. Enter the following commands:

setenv auto-boot? true

boot -r

CAUTION:

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

The system reboots and the system displays the login window.

xiii. Log in as root.

xiv. Enter the following commands to set the path variables:

PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

export PATH

10. Enter:

    olds -mirrored -setup *cxtydz cxtydz*

    where the first disk is the primary nonboot disk and the second disk is the paired nonboot disk. This attaches the new disks and grows the **/cms** file system.

    The system displays a series of messages similar to the following that reflect the disk drive setup process. The system eventually reports success.

```
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.
#
```

11. Enter:

    df -k /cms

    The system displays the percentage of total space that CMS is currently occupying, as in the following example:

```
# df -k /cms
Filesystem            kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d21      15271904  670412 14601492     5%    /cms
#
```

    Compare the capacity figure now with what was displayed in Step 3. In this example, the capacity percentage went down from 11% to 5% because the system has more disk space. This shows that the new disk drive was indeed added successfully to the system.

12. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

13. Turn on CMS when finished adding disks.

Administering a replacement nonboot disk, R3V8 and earlier, nonmirrored

To administer a new disk drive that is a replacement for a defective disk drive on a nonmirrored system:

1. Verify that the disk has been partitioned.
2. Enter the following commands to set the path variables:

   PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

   export PATH
3. Enter:

   olds -check_disks

   This checks the disk partitioning.

   The system displays a message similar to the following:

   ```
   disk:cot0d0 is partitioned ok
   disk:cot1d0 is partitioned ok
   disk:cot2d0 is partitioned ok
   Warning: Current Disk has mounted partitions
   disk:cot0d0 is partitioned ok
   Success, checking disks
   #
   ```
4. Enter:

   olds -mk_files

   The system displays the following message:

   ```
   Success, creating md.tab.new and/or vfstab.new
   #
   ```
5. Enter:

   olds -metadbs

   This sets up the metadevices. Ignore any error messages about failures while activating new replicas.

6. Enter:

   nohup olds -setup | tee

   This sets up the **/cms** metadevice.

   The system displays the following message:

```
     .  .  .
prtvtoc:  c0t6d0s0:  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
#
```

7. Enter:

   mount /cms

   This mounts the **/cms** file system.

8. Enter:

   df -k /cms

   The system displays file system information for **/cms**. For example:

```
# df -k /cms
Filesystem            kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d19      15271904  670412 14601492     5%    /cms
#
```

   The `kbytes` figure should be somewhat smaller than the total disk space on the entire system. In this example, the filesystem space is 15-GB for a system that has four 4.2-GB disk drives. This implies that the replacement disk drive has been successfully administered.

9. For an R3V6 or earlier system, install the swap file by entering:

   olds -addswapfile /cms

10. Enter:

    /usr/sbin/shutdown -y -i6 -g0

    The system reboots.

11. Continue with one of the following:
    - Restoring the /cms filesystem (R3V8)
    - Restoring the /cms filesystem (R3V6 and earlier) on page 65

Restoring the /cms filesystem (R3V8)

After administering the replacement disk, you must now restore the **/cms** filesystem. This procedure is for CMS R3V8.

To restore the **/cms** filesystem on the replacement disk drive:

1. Restore the most recent CMSADM backup by loading the backup tape into the tape drive and entering the following command on a single line at the command prompt:

   ```
   nohup cpio -icmudv -C 10240 -I /dev/rmt/<dev#> -M "Insert
     tape number %d" "cms" "cms/*" | tee
   ```

   The device number (**<*dev#*>**) is usually 0c, but could be 0, 1, or 1c.

   Note:

   You may get four error messages concerning the **/home** directory. These errors are displayed when the directory is already present, so you can ignore them.

2. You must run CMS setup to reinstall the data tables before you do a maintenance restore. Use the information you collected before you installed the replacement disk. See the software installation document for CMS setup procedures.
3. Turn on CMS.
4. Restore any CMS maintenance backups you have that are dated *after* the latest CMSADM backup. See the CMS Administration document for more information.
5. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Restoring the /cms filesystem (R3V6 and earlier)

After administering the replacement disk, you must now restore the **/cms** filesystem. This procedure is for CMS R3V6 and earlier.

To restore the **/cms** filesystem on the replacement disk drive:

1. Enter:

   ```
   ulimit unlimited
   ```

2. Restore the most recent CMSADM backup by loading the backup tape into the tape drive and entering the following command on a single line at the command prompt:

   ```
   nohup cpio -icmudv -C 10240 -I /dev/rmt/<dev#> -M "Insert
     tape number %d" "/cms" "/cms/*" | tee
   ```

   The device number (**<*dev#*>**) is usually 0c, but could be 0, 1, or 1c.

   Note:

   You may get four error messages concerning the **/home** directory. These errors are displayed when the directory is already present, so you can ignore them.

3. Turn on CMS.
4. Restore any CMS maintenance backups you have that are dated *after* the latest CMSADM backup. See the CMS Administration document for more information.
5. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Administering a replacement disk, R3V8 and earlier, mirrored

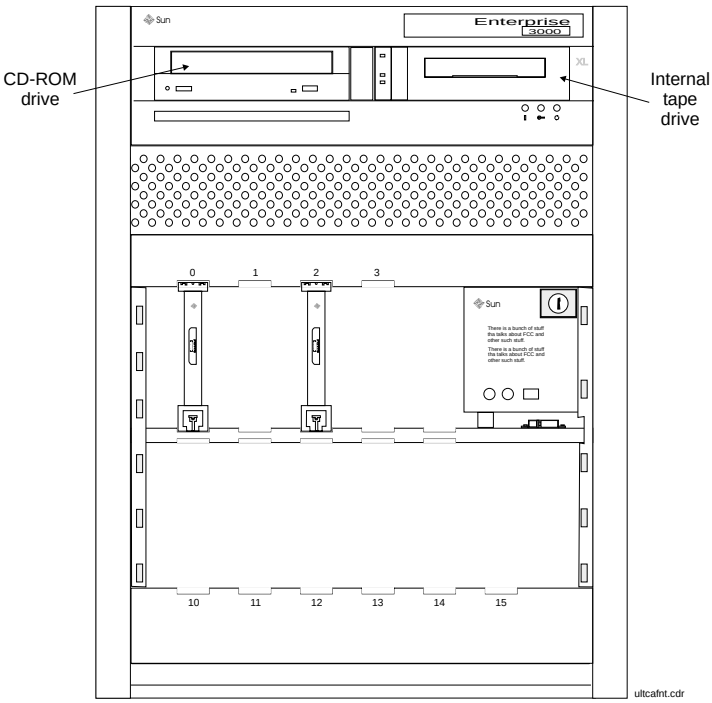
To administer a new disk drive that is a replacement for a defective disk drive on a mirrored system, see the section called "Replacing a faulty disk" in Chapter 3 of the following documents:

- *CMS R3V8 Disk-Mirrored Systems*, 585-210-940
- *CMS Disk-Mirrored Systems* (for R3V6), 585-215-841

Replacing the CD-ROM drive

This section describes the procedure that is used to replace the CD-ROM drive.

The basic configuration for the Enterprise 3000 system includes an internal tape drive and a CD-ROM drive. The drives are installed in the SCSI media tray, which is mounted from the front of the system.



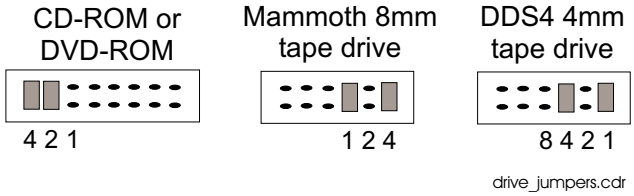
To replace a CD-ROM drive:

1. Remove any CD-ROM disk from the drive.
2. Shut down the system and turn off the power.
3. Attach an ESD wrist strap to the chassis of the computer and to your wrist.
4. Remove the top front cover. Grasp the cover on both sides near the center. Place your thumbs on top of the cover and place your fingers at the slight indentations under the cover for leverage.

   WARNING:
   When you loosen or tighten the captive screws, use your thumb and fingers only. The screws have thin shafts that may break if too much pressure is applied.

5. Loosen the two captive screws that secure the media tray to the chassis tray.
6. Remove the media tray. To access the devices that are in the media tray, turn the tray over and place it upside-down on the top of the cabinet.

7. Disconnect the drive data and power connectors from the socket in the media tray.
8. Remove the screws that secure the drive to the media tray.
9. Slide the drive out through the front of the tray.
10. Set the SCSI address on the new drive using the jumpers on the back of the drive. Set the tape drive to 5. Set the CD-ROM drive to 6.



11. Slide the replacement drive into the media tray and secure it with the screws that were removed earlier.

    Tip:

    Install each screw with just a few turns before you tighten all the screws.

12. Connect the data and power connector on the drive to the socket in the media tray.
13. Replace the media tray. Take care not to crimp the cables as you slide the tray into the cabinet.

    WARNING:

    When you loosen or tighten the captive screws, use your thumb and fingers only. The screws have thin shafts that may break if too much pressure is applied.

14. Tighten the captive screws that you loosened earlier.
15. Replace the front cover.
16. Remove the ESD wrist strap.
17. Power-up the system.
18. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
19. Enter the following commands:

    ```
    setenv auto-boot? false
    ```

    ```
    reset-all
    ```

    This resets the system and the system displays the `ok` prompt.

20. Enter:

    probe-scsi-all

    This checks to see that the system recognizes the new drive. If the new drive is not listed, make sure there is a secure cable connection.

21. Reboot the system by entering the following commands:

    setenv auto-boot? true

    boot -r

    CAUTION:

    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    This reboots the system so that it recognizes the new configuration.

Maintaining tape drives

Overview

This section describes the following tape drive maintenance procedures:

External SCSI devices are not generally supported on the Enterprise 3000 system. The only exception is for data migration. For data migration, connect the external SCSI tape drive, perform the data migration, and remove the external SCSI tape drive.

Tape drive compatibility with CMS loads

When adding a newer model tape drive to a system, you may have to edit the **/kernel/drv/st.conf** file to add information about the new tape drive. If editing the file is required, you will receive a Design Change Letter (DCL) instructing you how to change the file.

Cleaning the tape drive

The tape drive uses a dry cleaning cartridge. Each cartridge is good for about 20 cleaning cycles. Regular cleaning (weekly or daily) is recommended to maximize tape drive performance. Minimally, the tape drive should be cleaned after 30 hours of tape movement.

In addition, when 30 tape motion hours elapse, the top amber LED will light if the tape drive heads need cleaning.

To clean the tape drive:

1. Load the cleaning cartridge into the tape drive.

   The cleaning cycle begins automatically. The top LED flashes rapidly and turns off, and the bottom LED flashes slowly. When the cleaning cycle is complete, the cleaning cartridge is ejected automatically.

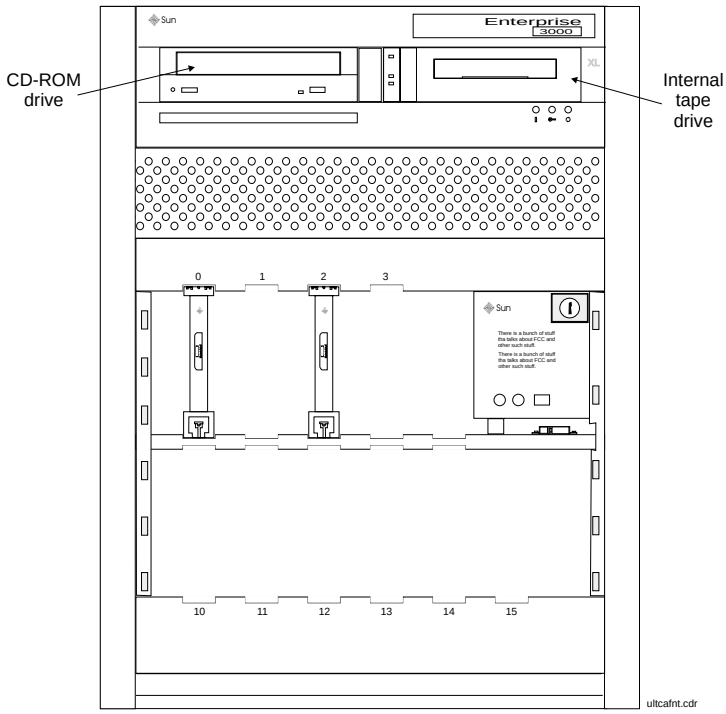
2. The first time you use the cleaning cartridge, record the date on the cleaning cartridge. Each time you clean the tape drive, mark an X in the box. After all boxes are filled, replace the cleaning cartridge.

3. Verify that the top amber LED turns off after the cleaning.

4. Return the cleaning cartridge to the plastic protection box.

Replacing the internal SCSI tape drive

The basic configuration for the Enterprise 3000 system includes an internal tape drive. This tape drive is installed in the right side of the SCSI tray which mounts from the front of the system (see the following figure).



To replace the internal tape drive:

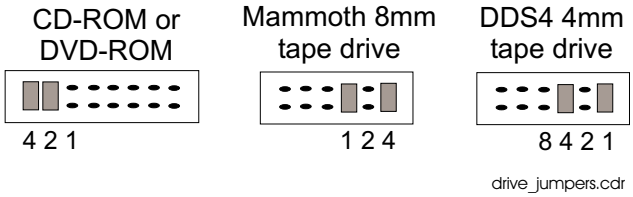
1. Shut down the system and turn off the power.
2. Attach an ESD wrist strap to the chassis of the computer and to your wrist.
3. Remove the top front cover. Grasp the cover on both sides near the center. Place your thumbs on top of the cover and place your fingers at the slight indentations under the cover for leverage.

   WARNING:

   When you loosen or tighten the captive screws, use your thumb and fingers only. The screws have thin shafts that may break if too much pressure is applied.

4. Loosen the two captive screws that secure the media tray to the chassis tray.
5. Remove the media tray. To access the devices that are in the media tray, turn the tray over and place it upside-down on the top of the cabinet.
6. Disconnect the drive data and power connectors from the socket in the media tray.
7. Remove the screws that secure the drive to the media tray.

8. Slide the drive out through the front of the tray.
9. Set the SCSI address on the new drive using the jumpers on the back of the drive. Set the tape drive to 5.



10. Slide the replacement drive into the media tray and secure it with the screws that were removed earlier.

    Tip:

    Install each screw with just a few turns before you tighten all the screws.

11. Connect the data and power connector on the drive to the socket in the media tray.
12. Replace the media tray. Take care not to crimp the cables as you slide the tray into the cabinet.

    WARNING:

    When you loosen or tighten the captive screws, use your thumb and fingers only. The screws have thin shafts that may break if too much pressure is applied.

13. Tighten the captive screws that you loosened earlier.
14. Replace the front cover.
15. Remove the ESD wrist strap.
16. Power-up the system.
17. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
18. Enter the following commands:

    ```
    setenv auto-boot? false
    ```

    ```
    reset-all
    ```

    This resets the system and the system displays the `ok` prompt.

19. Enter:

    ```
    probe-scsi-all
    ```

    This checks to see that the system recognizes the new drive. If the new drive is not listed, make sure there is a secure cable connection.

20. Reboot the system by entering the following commands:

    ```
    setenv auto-boot? true
    ```

    ```
    boot -r
    ```

    CAUTION:

    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    This reboots the system so that it recognizes the new configuration.

Adding an external SCSI tape drive

To add an external SCSI tape drive:

1. Log in to the system as root.
2. Enter the following commands:

   cd /dev/rmt

   pwd

   The **pwd** command verifies that you are in the **/dev/rmt** directory.
3. Enter:

   rm *

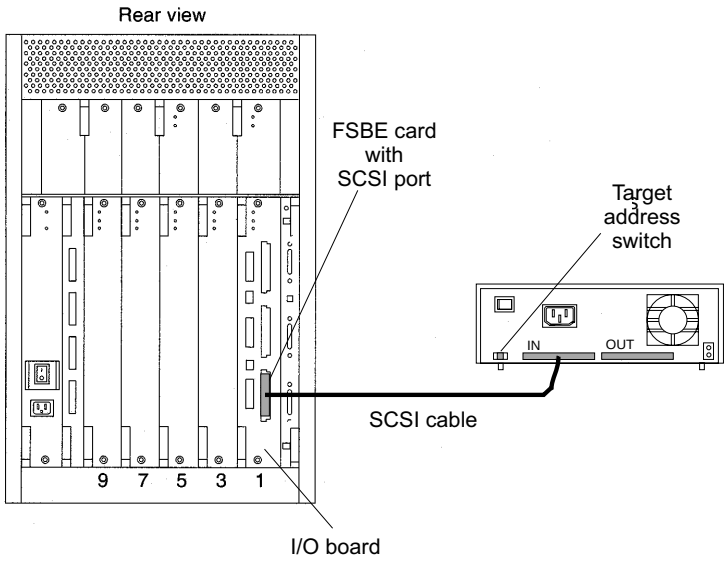
   This removes SCSI tape drive device files. If you do not remove the tape drive device files before rebooting the system, the SCSI tape drive device files may not match the hardware configuration.
4. Enter:

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

   The system shuts down.
5. Turn off the system.
6. Turn off the system monitor.
7. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
8. Using the Target Address Switch on the back of the external SCSI tape drive, set the SCSI ID to 4.
9. Install an FSBE card that has a SCSI port on the SBus I/O board. See Installing or removing I/O cards on page 29 for general information about installing an I/O card.

   If the system has a second I/O board, you can use the built-in SCSI port on that board instead of installing an FSBE card. The built-in SCSI port on the first I/O board *cannot* be used for an external tape drive.

10. Connect the tape drive to the FSBE card or to the built-in SCSI port on the second I/O board. The following figure shows a typical connection to a SCSI port on an FSBE card.



11. Connect the power cord from the tape drive to a power source.
12. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
13. Turn on the system monitor.
14. Turn on the system.
15. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
16. Enter the following commands:

    `setenv auto-boot? false`

    `reset-all`

    The system resets.
17. Enter:

    `probe-scsi-all`

    This checks to see that the system recognizes the new tape drive. The resulting display should list the new drive as Target 4. If the new drive is not listed, check for a secure connection between the SCSI port and the new drive.

18. Reboot the system by entering the following commands:

    setenv auto-boot? true

    boot -r

    CAUTION:
    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    This reboots the system so that it recognizes the new configuration.

Removing an external SCSI tape drive

To remove an external tape drive:

1. Log in to the system as root.
2. Enter the following commands:

   cd /dev/rmt

   pwd

   The **pwd** command verifies that you are in the **/dev/rmt** directory.
3. Enter:

   rm *

   This removes SCSI tape drive device files. If you do not remove the tape drive device files before rebooting the system, the SCSI tape drive device files may not match the hardware configuration.
4. Enter:

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

   The system shuts down.
5. Turn off the system.
6. Turn off the system monitor.
7. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
8. Disconnect the tape drive from the SCSI port.
9. Remove the FSBE card from the SBus I/O board. See Installing or removing I/O cards on page 29.
10. Turn on all external SCSI devices starting with the device farthest from the system and working toward the system.
11. Turn on the system monitor.

12. Turn on the system.
13. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
14. Enter the following commands:

    `setenv auto-boot? false`

    `reset-all`

    The system resets.
15. Enter:

    `probe-scsi-all`

    In its default configuration, the computer should list out two SCSI devices other than the disk drives: the internal tape drive (Target 5), and the CD-ROM drive (Target 6).
16. Reboot the system by entering the following commands:

    `setenv auto-boot? true`

    `boot -r`

    CAUTION:

    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    This reboots the system so that it recognizes the new configuration.

Ordering tapes

Use the following information to order replacement tapes for Sun computers.

North America ordering process

E-mail: avayaparts@arrow.com (recommended method for ordering)

Voice: 1-800-833-3557, 7am-6pm, Monday through Friday

Fax: +1-952-976-7135

Non-North America ordering process

E-mail: avayaparts@arrow.com (recommended method for ordering)

Voice: +1-631-843-5000, 8am-5pm, eastern time, Monday through Friday

Fax: +1-631-843-5040

Part numbers

Use the following part numbers to order blank tapes and cleaning tapes:

Part number	Description	Tape drive
40963-1pk	DDS4 20/40-GB, 4mm	DDS4
45382	DDS4 cleaning cartridge	DDS4
312629-001	Mammoth 20/40-GB, 8mm	Mammoth 8mm
315205-001	Mammoth cleaning cartridge	Mammoth 8mm
SLR5-8GB	SLR5, 4/8-GB QIC	SLR5
5678-2	SLR5 cleaning cartridge	SLR5
307265-001	14-GB, 8mm	DX, XL, XS 8mm
309258-003	8mm cleaning cartridge	DX, XL, XS 8mm
QD9250	Magnus 2.5-GB QIC	2.5-GB

Adding memory and installing CPUs

This section describes procedures used to add memory and install a CPU.

Note:

You need to perform a CMSADM backup before continuing. Refer to the CMS software installation, maintenance, and troubleshooting document for details.

Installing memory

To add memory to the system:

1. Enter:

   `prtconf | grep Memory`

   The system displays the current memory size.

   ```
   Memory size: xx Megabytes
   ```

2. Record the current memory size.
3. Enter:

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

   The system shuts down.
4. Turn off the system.
5. Turn off the system monitor.
6. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
7. Install the SIMMs into the Enterprise 3000 system using the procedures described in *CMS R3V6 Sun Enterprise 3000 System Hardware Installation*, 585-215-867. Use this book as a guide regardless of your CMS release.
8. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
9. Turn on the system monitor.
10. Turn on the system.
11. When the system comes back up, log in as root.

12. Enter:

    prtconf | grep Memory

    The system displays the new memory size:

    ```
    Memory size: xx Megabytes
    ```

13. Verify that the memory size that is displayed is correct, and compare it to the value that you recorded before you added the new memory. If the new memory size is not correct, power down the system and check that all the memory modules are properly seated.

After adding memory to a system that is running CMS R3V6 or earlier, the system must be administered to allow the swap function to use the additional memory.

To add swap space to a CMS R3V6 or earlier system:

1. Enter:

   swap -a /cms/swap

2. Enter:

   swap -l

Do not use these commands on a CMS R3V8 or later system.

Installing a CPU

Installing a CPU is a critical procedure that requires special tools and should be done only by a qualified Sun Microsystems, Inc. technician. Contact your Avaya representative for more information.

If a CPU is added to a CMS R3V9 or later system, readminister the Informix® IDS tunables as described in the software installation, maintenance, and troubleshooting document.

SPARCserver maintenance

Overview

This chapter describes maintenance procedures for the Sun SPARCserver system and the CMS hardware. See your current CMS software installation document and the SPARCserver system documentation for additional information.

This chapter describes the following maintenance procedures:

Maintaining I/O cards

Procedures in this section include the following:

- I/O card compatibility with CMS loads
- Installing or removing I/O cards on page 83
- Installing HSI/S cards on page 87
- Aurora serial ports on page 92

Required references

You need access to the following documents to do the procedures in this section:

- *Sun SPARCserver System Reference Manual*
- *CMS R3V8 Software Installation, Maintenance, and Troubleshooting,* 585-210-941
- *CMS Software Installation and Setup* (R3V5 and R3V6), 585-215-866
- *CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876

I/O card compatibility with CMS loads

New I/O cards are not compatible with all releases of CMS. This section describes the compatibility of newer I/O cards.

SunFastEthernet I/O card

The SunFastEthernet card is compatible with the following releases of CMS:

- r3v6au.k and later (or any CMS R3V6 load with Solaris patch 104212-15)
- r3v8al.k with Solaris patch 108263-06, or r3v8am.X and later

Solaris patches can be downloaded from:

http://drdtl.dr.avaya.com/docs/patches/

Installing or removing I/O cards

The I/O cards you may have to install or remove include the following:

- Monitor video card (SPARCserver 5 only)
- SunFastEthernet card (optional) – This card has an ethernet port and a Media Independent Interface (MII) port. CMS uses only the ethernet port.
- FSBE card (optional) – This card has a SCSI port and an ethernet port.
- HSI card (optional)
- Token ring card (optional, installed by the factory and provisioned by Professional Services).

The I/O cards can be installed in any other available SBus card slots.

Use the following general instructions when installing, moving, and removing I/O cards. Other sections in this chapter describe specific I/O card maintenance instructions. Use those instructions as appropriate.

To install or remove an I/O card:

1. For a system that is currently in operation, verify that you have a recent CMSADM file system backup before you change I/O card configurations.
2. Enter:

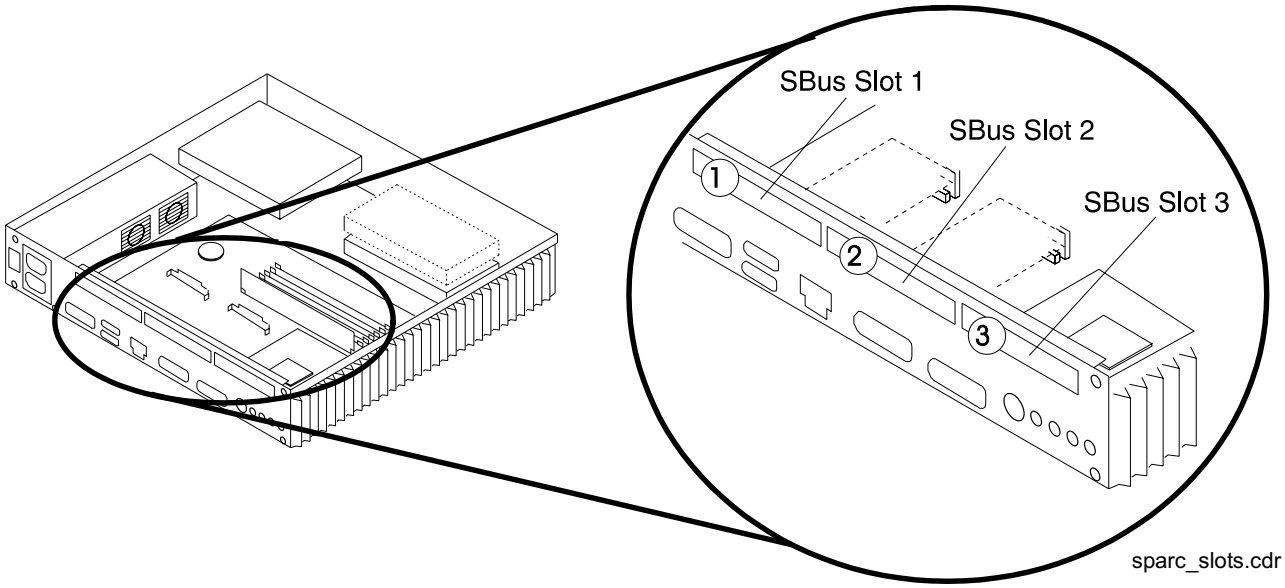
   `/cms/toolsbin/rmSBusdev`

   The system queries whether you want to continue with the shutdown.
3. Enter: **`y`**

   This command removes the current I/O card configuration, and shuts down the system. When finished, the `ok` prompt displays.
4. Turn off the system.
5. Turn off the system monitor.
6. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

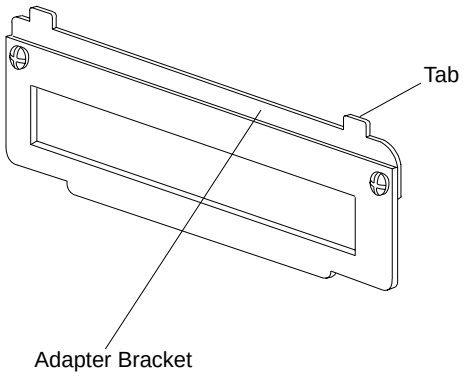
   WARNING:
   You must wear an ESD wrist strap when installing or removing hardware components to prevent electrical discharge that can damage the system.
7. Remove the computer cover.

8. Unpack the I/O card and prepare it for installation.

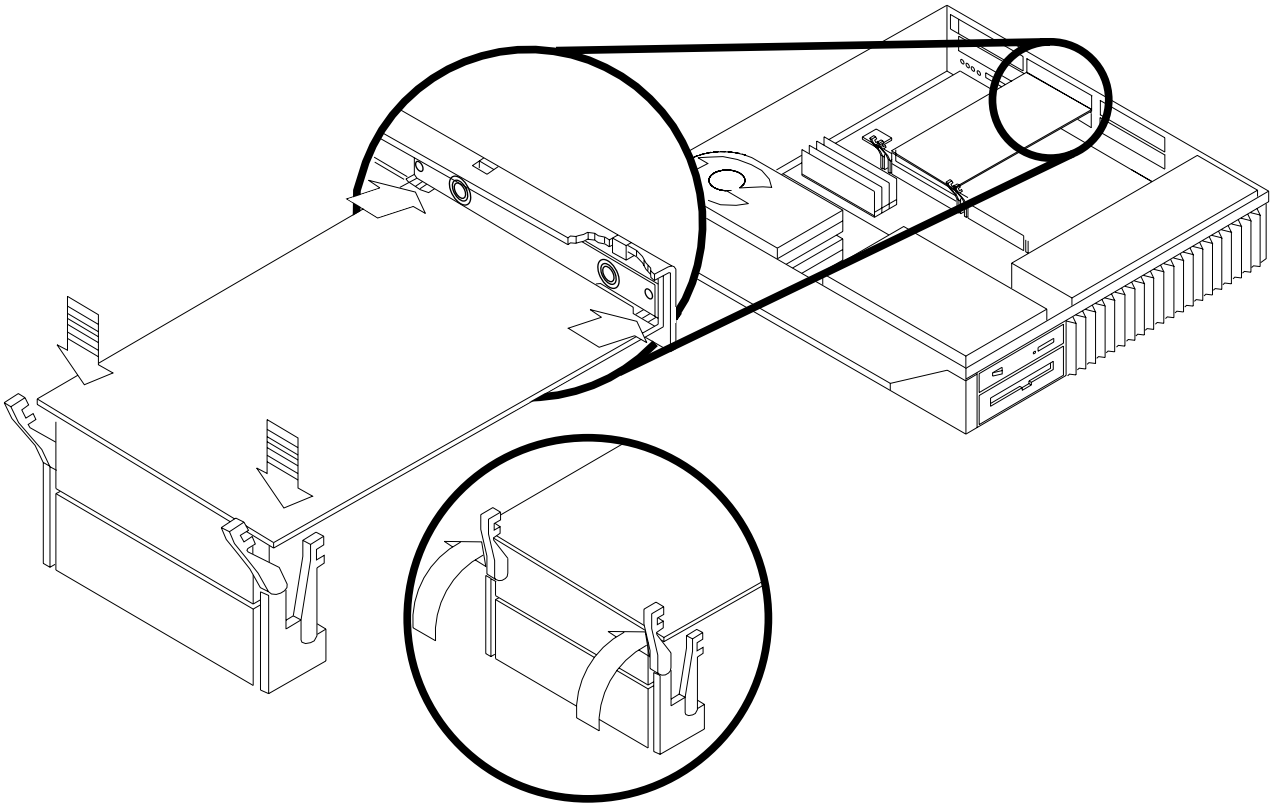


9. Look at the back of your system to identify how the filler panel is attached. The filler panel can be attached either by screws and washers (visible from the back of the unit) or by tabs (visible from inside the system unit).
10. Remove the filler panel from the SBus slot where the card will be installed using the appropriate one of the following procedures:
    - If the filler panel is held in place by screws and washers:
        i. Remove the screws and washers from outside the filler panel. Save the screws and washers because you will need them later.
        ii. Press in on the outside of the filler panel to release it.
        iii. Carefully remove and save the filler panel. You will need the filler panel if you ever remove an SBus card from the computer.
    - If the filler panel is held in place by tabs:
        i. From inside the machine, use both hands to grasp the tabs at the base of the filler panel.
        ii. Firmly squeeze both tabs until they are disengaged from the system chassis/unit, and swing the base of the filler panel away from the unit back panel.

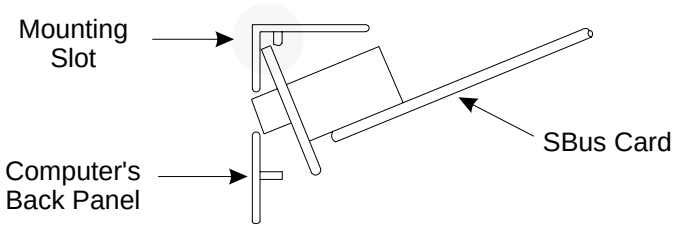
iii. Carefully remove and save the filler panel. You will need the filler panel if you ever remove an SBus card from the computer.



11. Place the SBus card at an angle (see the following figure) in the opening of the back panel.



12. Hook the upper card tabs into the mounting slot located above the rectangular openings in the back panel. The figure below shows a side view of how the card should hook into the mounting slot.



13. Align the card connector to the socket on the main-logic board.
14. Gently press the card into the socket. Do not force the card or you may damage the pins on the card.
15. Push the rear card retainers forward over the rear edge of the SBus card.
16. Replace the washers and screws (removed earlier). Tighten the screws to secure the SBus board to the back panel of the computer. Remove the filler panel from the slot where you are installing the new card.
17. Remove the ESD wrist strap.
18. Replace the computer cover.
19. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
20. Turn on the system monitor.
21. Turn on the system.
22. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
23. Enter:

    ```
    boot -r
    ```

    This reboots the system so that it recognizes the new configuration.
24. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Installing HSI/S cards

An HSI/S card supports X.25 switch links. For eight ACDs, two HSI/S cards are needed. If the system uses TCP/IP signaling for all ACDs, HSI/S cards are not needed.

If this is the initial installation of one or two HSI/S cards, start with Installing the first HSI/S card. If a second HSI/S card is being added to a system that already has one HSI/S card, see Adding a second HSI/S card on page 90.

Installing the first HSI/S card

To install the first HSI/S card in the system:

1. Verify that you have a recent CMSADM file system backup before you change I/O card configurations.
2. Log in to the system as root.
3. Enter:

   cmssvc

   The system displays the CMS Services menu.
4. Enter **3** to select the **run_cms** option.
5. Enter **2** to turn off CMS
6. Before you remove CMS, you must first save the CMS tools in a temporary save directory. Enter the following two commands:

   if [! -d /save]; then mkdir /save; fi

   cp -p /cms/toolsbin/rmSBusdev /cms/toolsbin/lnSBusdev /save
7. Enter:

   pkgrm cms

   This removes the CMS software.

   The system runs the **pkgrm** command and displays the following message:

   ```
   Do you want to preserve CMS data? [y,n,?]
   ```

   Important:
   Enter: **y**
8. After you remove CMS, you must copy the CMS tools back in to their working directory. Enter the following two commands:

   if [! -d /cms/toolsbin]; then mkdir /cms/toolsbin; fi

   cp -p /save/rmSBusdev /save/lnSBusdev /cms/toolsbin/

9. Enter:

   `/cms/toolsbin/rmSBusdev`

   The system queries whether you want to continue with the shutdown.

10. Enter: **`y`**

    This command removes the current I/O card configuration, and shuts down the system. When finished, the `ok` prompt displays.

11. Turn off the system.
12. Turn off the system monitor.
13. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
14. Install the HSI/S card in an available SBus card slot. See Installing or removing I/O cards on page 83 for more information.
15. Attach the HSI/S patch panel, and connect the switch links to the patch panel by following the instructions described in *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876.
16. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
17. Turn on the system monitor.
18. Turn on the system.
19. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
20. Enter:

    `boot -r`

    This reboots the system so that it recognizes the new HSI/S card.

    Note:

    Sometimes the system fails to recognize a newly installed HSI card. If this happens, the command **`show-devs`** does not show the HSI card and **/var/adm/messages** fails to recognize the card upon bootup. See the troubleshooting chapter of *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876, for information about troubleshooting HSI/S cards.

21. When the system comes back up, log in as root.

Installing HSI/S software and patches

Using the procedures in your CMS software installation, maintenance, and troubleshooting document:

- Install the HSI/S software
- Install the X.25 drivers and license
- Reinstall the Solaris patches
- Reinstall the CMS software

Setting up the switch link for each ACD

To change the switch link administration for each ACD:

1. Enter:

   cmssvc

   The system displays the CMS Services menu.
2. Select the **swsetup** option.
3. Select the ACD that you want to set up.
4. Accept the existing defaults for the following:
   - Switch name
   - Switch model (release)
   - Vectoring
   - Expert agent
   - Central office disconnect supervision
   - Local port
   - Remote port
5. Select “X.25” and a specific link number when prompted for the link information.
6. Repeat Step 2 through Step 5 for each ACD that will use the HSI card.
7. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation document for details.
8. Turn on CMS using the **run_cms** option of the **cmssvc** command.

Adding a second HSI/S card

Use the following procedures if you are adding a second HSI/S card to a system that is currently in operation. Before you do this procedure, verify that CMS is installed.

To add a second HSI/S card:

1. Verify that you have a recent CMSADM file system backup before you change I/O card configurations.
2. Log in to the system as root.
3. Edit the **/etc/path_to_inst** file and search for HSI. Remove all such lines.
4. Enter the following commands:

   ```
   rm /dev/hih*
   ```

   ```
   rm /devices/sbus*/HSI*
   ```

5. Enter:

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

   This shuts down the system.
6. Turn off the system.
7. Turn off the system monitor.
8. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
9. Install the HSI/S card in an available SBus card slot. See Installing or removing I/O cards on page 83 for more information.
10. Attach the HSI/S patch panel, and connect the switch links to the patch panel by following the instructions in *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876.
11. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
12. Turn on the system monitor.
13. Turn on the system.
14. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.

15. Enter:

    boot -r

    This reboots the system so that it recognizes the new HSI/S card.

    Note:

    Sometimes the system fails to recognize a newly installed HSI card. If this happens, the command **show-devs** does not show the HSI card and **/var/adm/messages** fails to recognize the card upon bootup. See the troubleshooting chapter of *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876, for information about troubleshooting HSI/S cards.

16. When the system comes back up, log in as root.
17. Enter:

    /cms/toolsbin/lnSBusdev

18. Administer the switch links as shown in Setting up the switch link for each ACD on page 89.

Aurora serial ports

This section describes the following procedures about the Aurora serial ports:

- Identifying device entry names for ports on the Aurora expander box
- Removing Aurora SBus Multiport software drivers on page 97
- Adding, removing, or moving an Aurora SBus Multiport card on page 98

Identifying device entry names for ports on the Aurora expander box

Overview

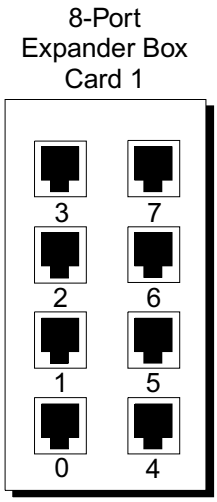
When the Aurora AURAcs and AURAsio drivers are installed, device entries are created to access the physical ports on the expander box(es).

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 followed by the device names for 16-port cards. 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
```



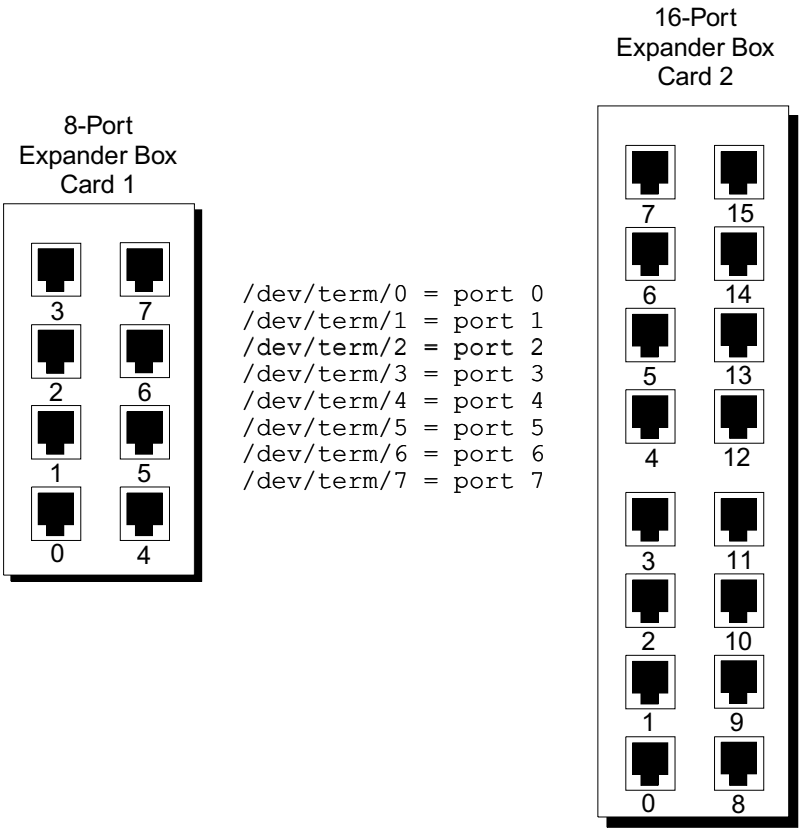

```
/dev/term/0 = port 0
/dev/term/1 = port 1
/dev/term/2 = port 2
/dev/term/3 = port 3
/dev/term/4 = port 4
/dev/term/5 = port 5
/dev/term/6 = port 6
/dev/term/7 = port 7
```

Note:

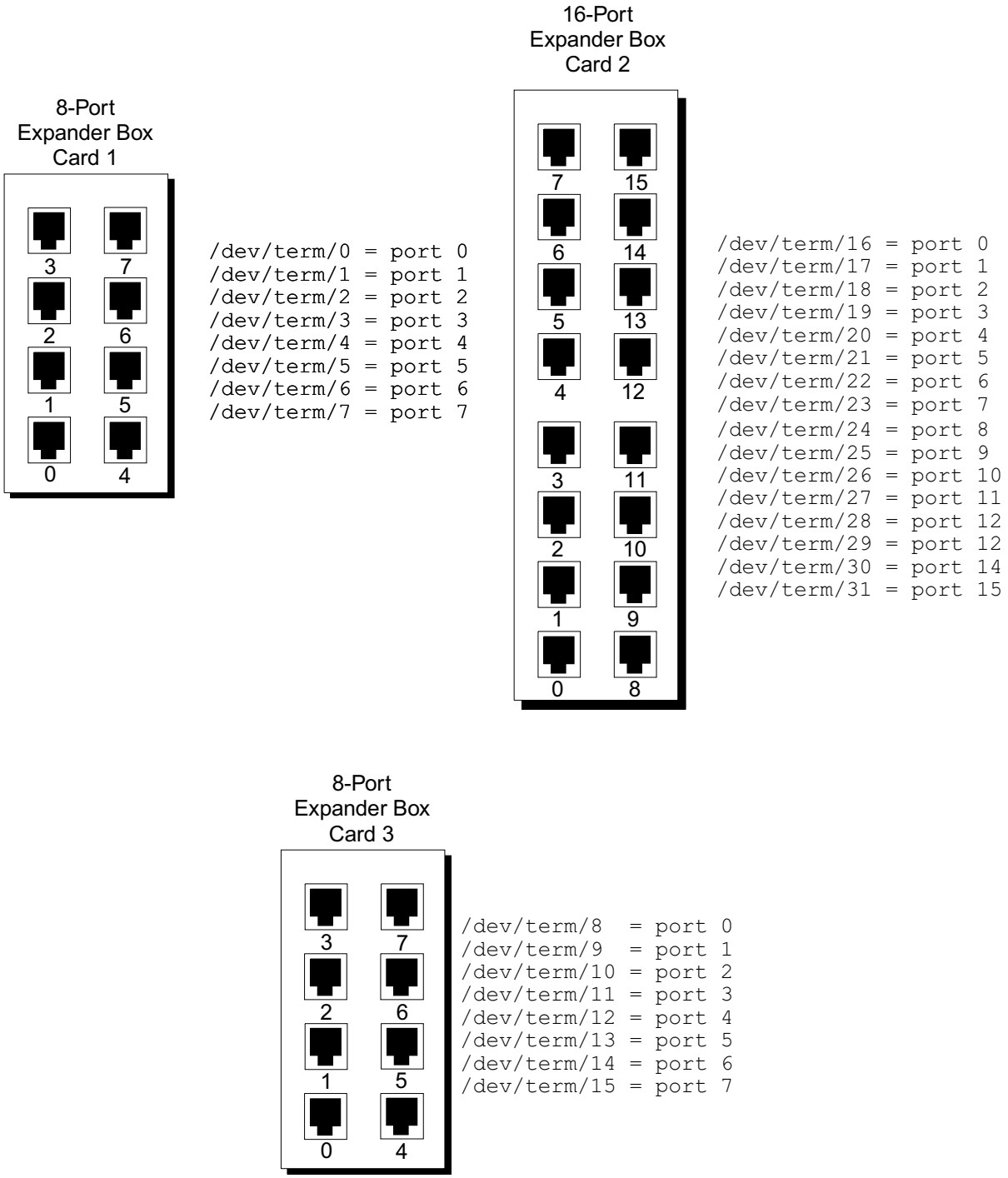
If an HSI card is installed in the system (prior to an Aurora SBus card), the HSI card is considered to be card 1 and uses device names **/dev/term/0** through **/dev/term/4**. An Aurora SBus Multiport card would be considered as card 2 and would begin at device name **/dev/term/5**.

When two Aurora SBus Multiport cards are installed, the system will create device names for all 8-port cards first followed by the 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.



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



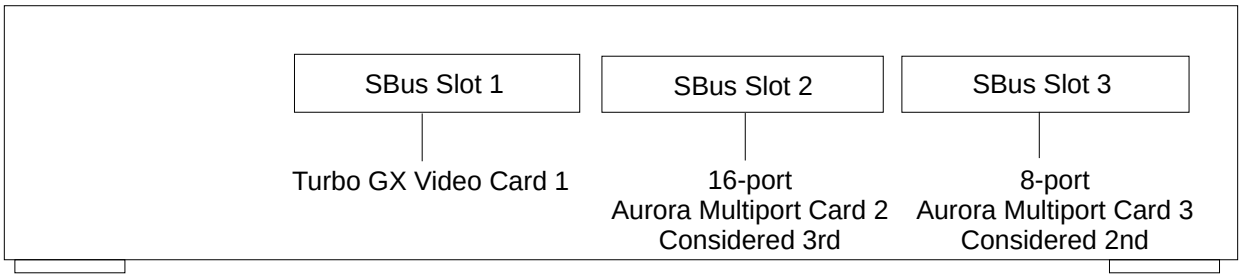
The order sequence of the Aurora SBus Multiport cards is determined by the SBus slot it occupies in the SPARCserver computer and the type of Aurora card (8-port or 16-port) it has. Each SBus slot in the SPARCserver computer is numbered.

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

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

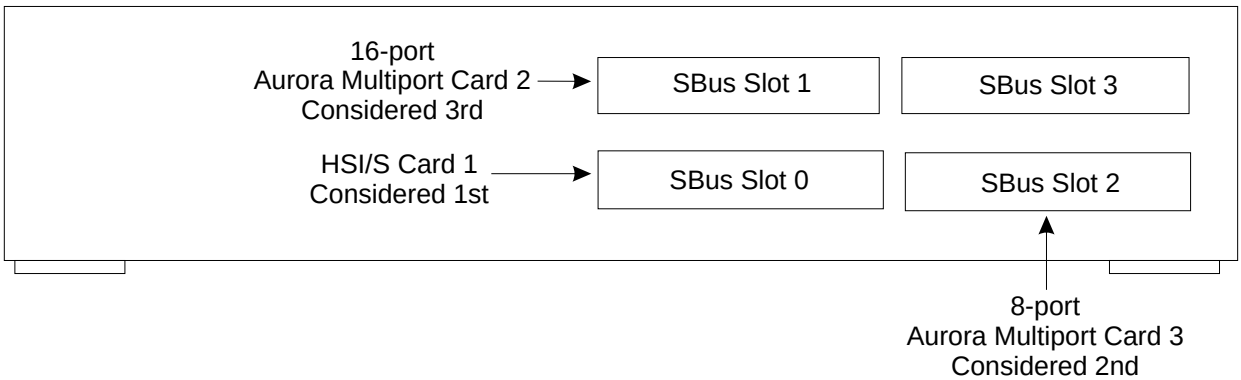
- 8-port Card 3- /dev/term/0-7
- 16-port Card 2- /dev/term/8-23

Sun SPARCserver 5 Computer



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).

Sun SPARCserver 20 Computer



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 drivers

To remove the Aurora SBus Multiport software drivers:

1. Determine which Aurora software drivers is installed on the system by entering the following command:

   pkginfo | grep AURA

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

   ```
   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 drivers 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 displays the following message:

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

   Do you want to remove this package?
   ```

4. Enter: **y**

   The system displays the following message:

   ```
   ## 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. Enter: **y**

   The system displays the following message:

```
## 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:

   /usr/sbin/shutdown -y -g0 -i6

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 SPARCserver.

Adding an Aurora SBus Multiport card

CAUTION:
Only TSC PERSONNEL should perform the procedures in this section.

To add another Aurora SBus Multiport card to a system that is already up and running:

1. Enter:

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

2. Turn off the system.
3. Turn off the system monitor.
4. Turn off all external devices starting with the device closest to the computer and working toward the farthest device.
5. Identify the existing Aurora SBus Multiport cards installed in the system.
6. Decide where you will install the new Aurora SBus Multiport card. Insert the Aurora SBus Multiport card into the SPARCserver computer.
7. Connect the expander box to the new Aurora SBus Multiport card.

8. Turn on devices attached to the SPARCserver computer starting with the device at the end of the SCSI chain and working toward the computer.
9. Turn on the system monitor.
10. Turn on the system.
11. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
12. Enter:

    boot -r
13. Enter the following commands to get existing administration information. Record this information for later use.

    sacadm -l

    pmadm -l
14. Remove port administration for all Aurora SBus cards by using the following command examples:

    sacadm -r -p ttyaur2

    sacadm -r -p ttyaur3

    sacadm -r -p ttyaur4
15. Remove the Aurora SBus Multiport Software drivers. See Removing Aurora SBus Multiport software drivers on page 97.
16. Install the Aurora SBus Multiport software driver (the 8-port driver must be installed before the 16-port driver). See your current CMS software installation, maintenance, and troubleshooting document for details.
17. Administer all Aurora ports cards.
18. Perform a CMSADM file system backup to backup the updated system software and hardware configuration. See your current CMS software installation, maintenance, and troubleshooting document for details.

Removing an Aurora SBus Multiport card

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 Identifying device entry names for ports on the Aurora expander box on page 92.

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 readminister cards 2 and 3.

To remove an Aurora SBus Multiport card from a system that is already up and running:

1. Enter the following commands to get existing administration information. Record this information for later use.

   ```
   sacadm -l
   ```

   ```
   pmadm -l
   ```

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 command examples:

   ```
   sacadm -r -p ttyaur2
   ```

   ```
   sacadm -r -p ttyaur3
   ```

   ```
   sacadm -r -p ttyaur4
   ```

3. Remove the Aurora SBus Multiport Software drivers. See Removing Aurora SBus Multiport software drivers on page 97.

4. Enter:

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

5. Turn off the system.

6. Turn off the system monitor.

7. Turn off all external devices starting with the device closest to the SPARCserver computer and working toward the farthest device.

8. Remove the Aurora SBus Multiport card from the system.

9. Turn on devices attached to the computer starting with the device at the end of the SCSI chain and working toward the computer.

10. Turn on the system monitor.

11. Turn on the system.

12. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.

13. Enter:

    ```
    boot -r
    ```

14. Install the Aurora SBus Multiport software driver (the 8-port driver must be installed before the 16-port driver). See your current CMS software installation document for details.
15. Readminister all terminals, modems, and printers that are connected to the Aurora Expander Box(es) that were ordered *after* the card that was removed.
16. Perform a CMSADM file system backup to backup the updated system software and hardware configuration. See your current CMS software installation, maintenance, and troubleshooting document for details.

Moving 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 may need to move more than one card. See Identifying device entry names for ports on the Aurora expander box on page 92 to determine the ordering sequence.

To move an Aurora SBus Multiport card to a different SBus slot location in the SPARCserver computer:

1. Remove the Aurora SBus Multiport software driver. See Removing Aurora SBus Multiport software drivers on page 97.

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

   `/usr/sbin/shutdown -y -g0 -i0`
3. Turn off the system.
4. Turn off the system monitor.
5. Turn off all external devices starting with the device closest to the computer and working toward the farthest device.
6. Remove the Aurora SBus Multiport card from the SBus slot.
7. Install the Aurora SBus Multiport card into a different SBus slot. See Installing or removing I/O cards on page 83 for general information about installing I/O cards.

   CAUTION:
   the original ordering sequence of the Aurora SBus cards.
8. Turn on devices attached to the computer starting with the device at the end of the SCSI chain and working toward the computer.
9. Turn on the system monitor.
10. Turn on the system.
11. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.

12. Enter:

    `boot -r`

13. Reinstall the Aurora SBus Multiport software driver. See your current CMS software installation, maintenance, and troubleshooting document for details.
14. Perform a CMSADM file system backup to back up the updated system software and hardware configuration. See your current CMS software installation, maintenance, and troubleshooting document for details.

Maintaining disk drives

Overview

Procedures in this section include the following:

- Adding or replacing disk drives on page 104
- Partitioning nonboot disk drives on page 107
- Administering nonboot disk drives on page 112

Software installation and disk partitioning

Depending on whether you are replacing a boot disk drive, or replacing or adding a nonboot disk drive, you must do one of the following to set up the disk drive:

- After you replace a boot disk drive, you must reinstall the operating system and software. For these procedures, see the software installation or maintenance document for your current CMS release.
- After you add or replace a nonboot disk drive, you must partition and administer the drive so that it works with the existing disk drives. See Partitioning nonboot disk drives on page 107 and Administering nonboot disk drives on page 112.

Disk drive compatibility with CMS loads

When a new or replacement disk drive is installed in an older system, the CMS load may not be compatible with the disk drive if the CMS configuration files have not been updated. These configuration files (**/olds/disk.conf** and **/olds/olds-funcs**) must be edited or replaced with the correct information. Contact the Avaya technical support organization for assistance.

Prerequisites

Do a CMSADM backup, if possible, before you add or replace a disk drive. See your CMS software installation, maintenance, and troubleshooting document for this procedure.

Before you attempt to replace defective nonboot disks, try to print the current setup for all ACDs. This information must be readministered after you install replacement disks.

Required references

You need copies of the following documents to do the procedures in this section:

- *CMS R3V8 Software Installation, Maintenance, and Troubleshooting,* 585-210-941
- *CMS Software Installation and Setup* (R3V5 and R3V6), 585-215-866

Adding or replacing disk drives

To add a hard disk drive to a system that is currently in operation, or to replace a defective disk drive, follow the procedures in this section.

Powering down the system

To power down the system

1. Enter:

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

   The system shuts down and displays the `ok` prompt.
2. Turn off the system.
3. Turn off the system monitor.
4. If any external SCSI devices are installed, turn off the SCSI devices starting with the device that is closest to the system and working toward the farthest device.
5. Wait 30-60 seconds after removing power to allow the disk drives to spin down.

Installing the new drives

The SPARCserver computer has up to two internal disk drives and up to 12 external SCSI disk drives. For information about adding or replacing disk drives, see *CMS R3V6 Sun SPARCserver Computers Hardware Installation*, 585-215-857.

When you are adding disk drives, you may also need to install a new FSBE card. See Maintaining I/O cards on page 82 for general information about adding I/O cards.

WARNING:
You must wear an ESD wrist strap when installing or removing disk drives to prevent electrical discharge that can harm system components.

Use the information in the following table to set the SCSI IDs for the external SCSI disk drives.

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

Powering up the system

To power up the system:

1. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
2. Turn on the system monitor.
3. Turn on the system.
4. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.

   The system displays the `ok` prompt.
5. Enter the following commands:

   `setenv auto-boot? false`

   `reset-all`

   The system reboots to the `ok` prompt.

6. Enter:

   probe-scsi-all

   This verifies that the system recognizes all of the disk devices, including the newly installed ones.

   The system displays a message that is similar to the following example:

```
/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
```

   The devices listed depends on the number of disks that are installed in the system.

7. Enter the following commands:

   setenv auto-boot? true

   boot -r

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

8. Log in as root.

9. The disk drives must now be partitioned and formatted. For boot disk drives, see the software installation or maintenance document for the current CMS release. For nonboot disk drives, see Partitioning nonboot disk drives on page 107.

Partitioning nonboot disk drives

Once the new or replacement nonboot disk drives are installed, you must partition and format those disk drives. This section provides the following:

- Disk partition values
- Partitioning and formatting a disk on page 108

Disk partition values

During the disk partitioning procedure, you must enter the size, in cylinders, of each partition. The following table lists the nonboot disk drives that are currently used with the SPARCserver computers. Since disk models change often, see the software installation document for your current CMS release to verify the correct disk partitioning values.

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
18-GB SCSI[1]	0	un	wm	0	2c
	1	un	wm	2	7504c
	2	backup[2]	wm	0	7506c
	3-7	un	wm	0	0c
9.1-GB SCSI[3]	0	un	wm	0	2c
	1	un	wm	2	4922c
	2	backup[2]	wm	0	4924c
	3-7	un	wm	0	0c
4.2-GB SCSI	0	un	wm	0	2c
	1	un	wm	2	3878c
	2	backup[2]	wm	0	3880c
	3-7	un	wm	0	0c

1. The 18-GB disk is compatible with loads r3v6be.f or later, and r3v8al.g or later. For older systems, see Disk drive compatibility with CMS loads on page 103 for more information.
2. The *backup* value indicates the size of the disk drives. If the disk drive you are partitioning does not closely match the size of the disk your are partitioning, you have a nonstandard disk. Escalate the issue to Avaya technical support.
3. The 9.1-GB SCSI disk is compatible with loads r3v6ac.e or later, and loads r3v8aa.i or later. For older systems, see Disk drive compatibility with CMS loads on page 103 for more information.

Partitioning and formatting a disk

To partition a new disk or a replacement disk:

1. At the system prompt, enter:

   `format`

   The system displays a message that is similar to the following example:

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

2. Enter the disk number that corresponds to the disk that you added. Be sure to specify the number that **exactly** matches the disk added.

```
Specify disk (enter its number): 1
```

   The system displays the device number of the disk that you are partitioning, for example, `c0t1d0`, and the Format Menu:

```
selecting c0t1d0

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
        !<cmd>     - execute <cmd>, then return
        quit
format>
```

3. Enter:

   partition

   The system displays the partition menu:

```
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
        !<cmd> - execute <cmd>, then return
        quit
partition>
```

4. At the `partition>` prompt, enter:

   print

   The system displays the default partition table. The table for a 4.2-GB SCSI nonboot disk might look like the following example:

```
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)       4320
  1  unassigned    wm       2 - 3879     3.99GB     (3878/0/0)   8376480
  2      backup    wm       0 - 3879     4.00GB     (3880/0/0)   8380800
  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)
```

5. Partition the disk by completing the following Steps a through e for partitions 0, 1, and 2. Partitions 3 to 7 only require partitioning if they are not set to the factory defaults of `unassigned`, `wm`, `0`, and `0c`.

   a. At the `partition>` prompt, enter the partition number from the table. For example:

   ```
   partition> 0
   ```

   The system prompts for the partition ID tag.

   b. Enter the partition ID tag from the table. For partition 0, press **Enter** to accept the default of unassigned.

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

   The system prompts for permission flags.

   c. Press **Enter** to accept the default (`wm`). That indicates that the partition is writable and mountable.

   The system prompts for the starting cylinder.

   d. Enter the number of the starting cylinder from the table. For example:

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

   The system prompts for the partition size.

   e. Enter the partition size from the table. For example:

   ```
   Enter partition size [0b, 0c, 0mb]:  2c
   ```

   The system displays the `partition>` prompt.

6. When you have sized partitions 0, 1, and 2, enter:

   `print`

7. Compare the displayed partition table to the Disk partition values on page 107. If there are any discrepancies, correct them by repeating the disk partitioning.

8. When you determine that the disk partitioning is correct, enter:

   label

   Important:
   Do not forget to label the disk drive.

   The system prompts you to continue.

9. Enter: **y**

   The system displays the `partition>` prompt.

10. Enter: **q**

    The system displays the `format>` prompt.

11. Enter:

    format

    The system displays the following message:

```
Ready to format. Formatting cannot be interruped
and takes XX minutes (estimated). Continue? (y or n)
```

12. Enter: **y**

    The system displays a message similar to the following:

```
Begin format. The current time is <timestamp>

Formatting...
done

Verifying media...
        pass 0 - pattern = 0xc6dec6de
   4923/26/7

        pass 1 - pattern = 0x6db6db6d
   4923/26/7

Total of 0 defective blocks repaired.
format>
```

13. If you added more than one disk drive, enter **disk**, and repeat Step 2 through Step 12 for each drive.

14. After you have partitioned each drive, return to the system prompt by entering **q** at the `format>` prompt.

15. Continue with Administering nonboot disk drives on page 112.

Administering nonboot disk drives

After the nonboot disk drives have been installed, partitioned, and formatted, you must administer the disk drives. The procedures are different for CMS releases and whether the system is mirrored or nonmirrored.

The procedures in this section include:

- Administering a new nonboot disk
- Administering a replacement nonboot disk on page 116

Administering a new nonboot disk

To administer a new nonboot disk that you have added:

1. Turn off CMS. It is important that CMS remain off while you perform this procedure.
2. Verify that the disk has been partitioned.
3. Enter:

   df -k /cms

   The system displays the percentage of total space that CMS is currently occupying, as in the following example:

   ```
   # df -k /cms
   Filesystem            kbytes    used   avail capacity  Mounted on
   /dev/md/dsk/d19      6569538   670411 5899127     11%    /cms
   #
   ```

   Note the capacity percentage (in this example, 11%). The capacity used by **/cms** will be smaller after a new disk is added.
4. Enter the following commands to set the path variables:

   PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

   export PATH
5. Check the disk partitioning by entering the following commands:

   olds -check_disks *cxtydz*

   where ***cxtydz*** is the device name of the disk that you added (for example, c0t1d0).
6. Create a new **md.tab** file by entering the following command:

   olds -metadbs

   Ignore any error messages about failures while activating new replicas.
7. Enter:

   olds -mk_files *cxtydz*

8. Enter:

   pg /olds/md.tab.new

   This verifies that all the disk drives on your system have been recognized.

   The system displays a message that is similar to the following example, which shows three disk drives on the system:

```
   .
   .
   .
#/cms
d19 3 1 /dev/dsk/c0t1d0s1 1 /dev/dsk/c0t3d0s3 1 /dev/dsk/c0t2d0s2
```

9. Depending on what is displayed, perform one of the following actions:

   - If the file shows the exact number of drives that are on the system, continue with Step 10.
   - If the file does not show the exact number of drives on the system, complete the following steps:

     i. Enter:

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

        The system shuts down and displays the `ok` prompt.

     ii. Turn off the system.

     iii. Turn off the system monitor.

     iv. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

     v. Check all disk drive connections to make sure that they are secure.

     vi. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.

     vii. Turn on the system monitor.

     viii. Turn on the system.

     ix. The system begins to boot. Interrupt the boot by pressing **Stop** plus **A**.

        The `ok` prompt displays.

     x. Enter the following commands:

        setenv auto-boot? false

        reset-all

        The system reboots to the `ok` prompt.

xi. To verify that the system recognizes all the disk devices, including the newly installed ones, enter:

probe-scsi-all

The system displays a message that is similar to the following example:

```
/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
```

The devices that are listed depends on the number of disk drives that are installed in the system. Check to make certain that all of the disk drives are listed.

xii. Enter the following commands:

setenv auto-boot? true

boot -r

CAUTION:

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

The system reboots and the system displays the login window.

xiii. Log in as root.

xiv. Enter the following commands to set the path variables:

PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

export PATH

10. Enter:

    olds -setup *cxtydz*

    This attaches the new disk and grow the **/cms** file system, where ***cxtydz*** is the device name of the disk that you added.

    The system displays a series of messages similar to the following that reflect the disk drive setup process. The system eventually reports success.

```
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.
#
```

11. Enter:

    df -k /cms

    The system displays the percentage of total space that CMS is currently occupying, as in the following example:

```
# df -k /cms
Filesystem            kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d19      15271904  670412 14601492     5%    /cms
#
```

    Compare the capacity figure now with what was displayed in Step 3. In this example, the capacity percentage went down from 11% to 5% because the system has more disk space. This shows that the new disk drive was indeed added successfully to the system.

12. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

13. Turn on CMS when finished adding disks.

Administering a replacement nonboot disk

To administer a new disk drive that is a replacement for a defective disk drive:

1. Verify that the disk has been partitioned.
2. Enter the following commands to set the path variables:

   PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

   export PATH
3. Enter:

   olds -check_disks

   This checks the disk partitioning.

   The system displays a message similar to the following:

```
disk:cot0d0 is partitioned ok
disk:cot1d0 is partitioned ok
disk:cot2d0 is partitioned ok
Warning: Current Disk has mounted partitions
disk:cot0d0 is partitioned ok
Success, checking disks
#
```

4. Enter:

   olds -mk_files

   The system displays the following message:

```
Success, creating md.tab.new and/or vfstab.new
#
```

5. Enter:

   olds -metadbs

   This sets up the metadevices. Ignore any error messages about failures while activating new replicas.

6. Enter:

   nohup olds -setup | tee

   This sets up the **/cms** metadevice.

   The system displays the following message:

```
     .  .  .
prtvtoc:  c0t6d0s0:  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
#
```

7. Enter:

   mount /cms

   This mounts the **/cms** file system.

8. Enter:

   df -k /cms

   The system displays file system information for **/cms**. For example:

```
# df -k /cms
Filesystem            kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d19      15271904  670412 14601492     5%    /cms
#
```

   The `kbytes` figure should be somewhat smaller than the total disk space on the entire system. In this example, the filesystem space is 15-GB for a system that has four 4.2-GB disk drives. This implies that the replacement disk drive has been successfully administered.

9. For an R3V6 or earlier system, install the swap file by entering:

   olds -addswapfile /cms

10. Enter:

    /usr/sbin/shutdown -y -i6 -g0

    The system reboots.

11. Continue with one of the following:
    - Restoring the /cms filesystem (R3V8)
    - Restoring the /cms filesystem (R3V6 and earlier) on page 119

Restoring the /cms filesystem (R3V8)

After administering the replacement disk, you must now restore the **/cms** filesystem. This procedure is for CMS R3V8.

To restore the **/cms** filesystem on the replacement disk drive:

1. Restore the most recent CMSADM backup by loading the backup tape into the tape drive and entering the following command on a single line at the command prompt:

   ```
   nohup cpio -icmudv -C 10240 -I /dev/rmt/<dev#> -M "Insert
     tape number %d" "cms" "cms/*" | tee
   ```

   The device number (**<*dev#*>**) is usually 0c, but could be 0, 1, or 1c.

   Note:

   You may get four error messages concerning the **/home** directory. These errors are displayed when the directory is already present, so you can ignore them.

2. You must run CMS setup to reinstall the data tables before you do a maintenance restore. Use the information you collected before you installed the replacement disk. See the software installation document for CMS setup procedures.
3. Turn on CMS.
4. Restore any CMS maintenance backups you have that are dated *after* the latest CMSADM backup. See the CMS Administration document for more information.
5. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Restoring the /cms filesystem (R3V6 and earlier)

After administering the replacement disk, you must now restore the **/cms** filesystem. This procedure is for CMS R3V6 and earlier.

To restore the **/cms** filesystem on the replacement disk drive:

1. Enter:

   ulimit unlimited

2. Restore the most recent CMSADM backup by loading the backup tape into the tape drive and entering the following command on a single line at the command prompt:

   nohup cpio -icmudv -C 10240 -I /dev/rmt/<*dev#*> -M "Insert tape number %d" "/cms" "/cms/*" | tee

   The device number (**<*dev#*>**) is usually 0c, but could be 0, 1, or 1c.

   Note:

   You may get four error messages concerning the **/home** directory. These errors are displayed when the directory is already present, so you can ignore them.

3. Turn on CMS.

4. Restore any CMS maintenance backups you have that are dated *after* the latest CMSADM backup. See the CMS Administration document for more information.

5. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Maintaining tape drives

Overview

This section describes the following tape drive maintenance procedures:

- Adding or replacing a tape drive
- Removing a tape drive on page 123
- Fix for the UniPack 2.5-GB QIC tape drive on page 124
- Ordering tapes on page 125

Adding or replacing a tape drive

When adding a newer model tape drive to a system, you may have to edit the **/kernel/drv/st.conf** file to add information about the new tape drive. If editing the file is required, you will receive a Design Change Letter (DCL) instructing you how to change the file.

To add or replace a tape drive:

1. Log in to the system as root.
2. Enter the following commands:

   `cd /dev/rmt`

   `pwd`

   The **pwd** command verifies that you are in the **/dev/rmt** directory.
3. Enter:

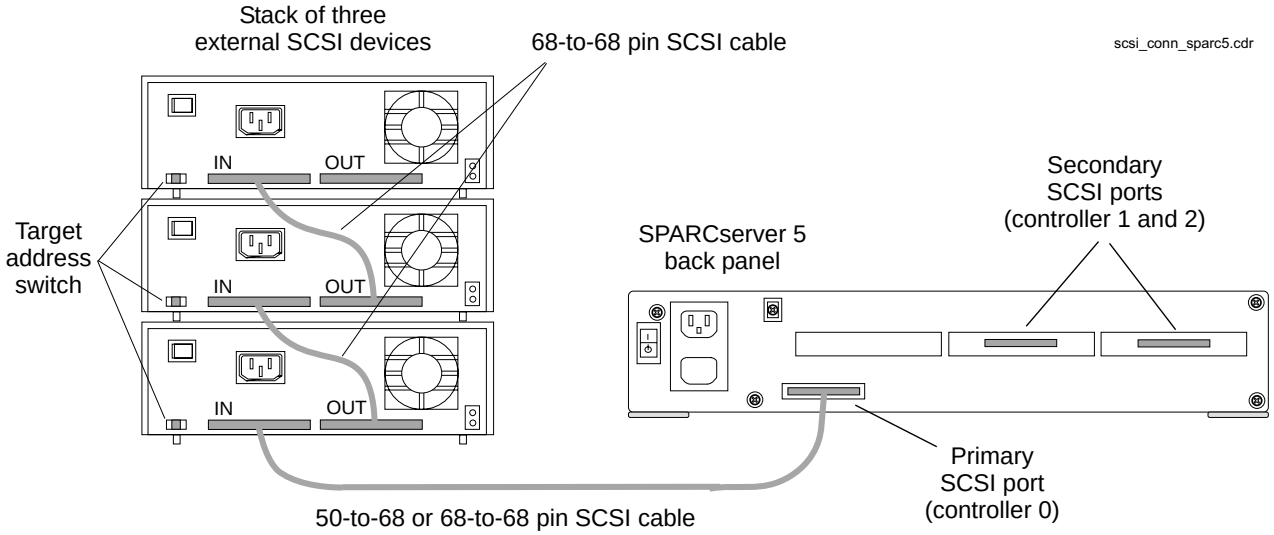
   `rm *`

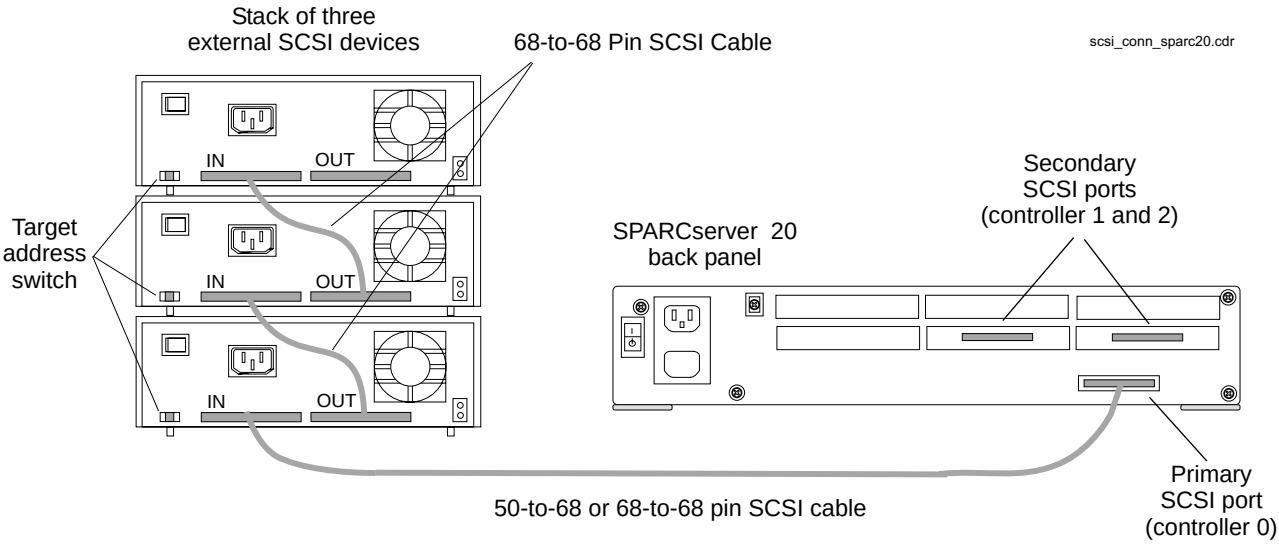
   This removes SCSI tape drive device files. If you do not remove the tape drive device files before rebooting the system, the SCSI tape drive device files may not match the hardware configuration.
4. Enter:

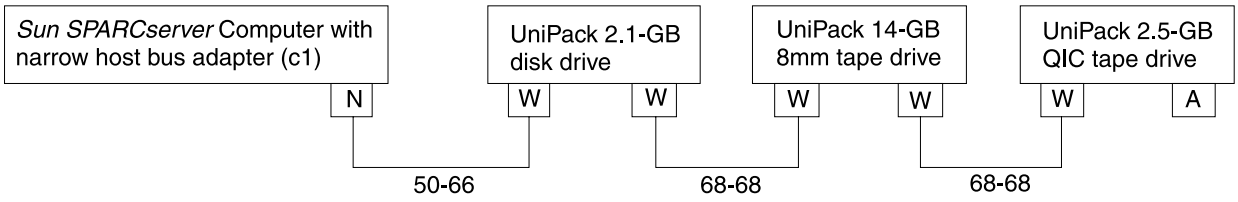
   `/usr/sbin/shutdown -y -i0 -g0`

   The system shuts down.
5. Turn off the system.
6. Turn off the system monitor.
7. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

8. If replacing a defective tape drive, disconnect the drive.
9. Using the Target Address Switch on the back of the new external SCSI tape drive, set the SCSI ID to target 4 or target 5.
10. Connect the SCSI cable from the SCSI port to the in-connector on the back of the tape drive. The following figures shows SCSI cabling.







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

11. Connect the power cord from the tape drive to a power source.
12. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
13. Turn on the system monitor.
14. Turn on the system.
15. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
16. Enter the following commands:

    `setenv auto-boot? false`

    `reset-all`

    The system resets.
17. Enter:

    `probe-scsi-all`

    This checks to see that the system recognizes the new tape drive. The resulting display should list the new drive as Target 4 or Target 5. If the new drive is not listed, check for a secure connection between the SCSI port and the new drive.
18. Reboot the system by entering the following commands:

    `setenv auto-boot? true`

    `boot -r`

    CAUTION:

    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    The system reboots.
19. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Removing a tape drive

To remove a tape drive:

1. Log in to the system as root.
2. Enter the following commands:

   cd /dev/rmt

   pwd

   The **pwd** command verifies that you are in the **/dev/rmt** directory.
3. Enter:

   rm *

   This removes SCSI tape drive device files. If you do not remove the tape drive device files before rebooting the system, the SCSI tape drive device files may not match the hardware configuration.
4. Enter:

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

   The system shuts down.
5. Turn off the system.
6. Turn off the system monitor.
7. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
8. Disconnect the tape drive from the SCSI port or SCSI chain.
9. Turn on all external SCSI devices starting with the device farthest from the system and working toward the system.
10. Turn on the system monitor.
11. Turn on the system.
12. Press **Stop** plus **A** simultaneously after the system displays the console banner, but before the system starts booting.
13. Enter the following commands:

    setenv auto-boot? false

    reset-all

    This resets the system.

14. Enter:

    probe-scsi-all

    The system displays the SCSI drives. The removed tape drive should not appear in the list.

15. Reboot the system by entering the following commands:

    setenv auto-boot? true

    boot -r

    CAUTION:

    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    This reboots the system so that it recognizes the new configuration.

16. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Fix for the UniPack 2.5-GB QIC tape drive

When adding a 2.5-GB QIC tape drive to a 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).

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

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.

Ordering tapes

Use the following information to order replacement tapes for Sun computers.

North America ordering process

E-mail: avayaparts@arrow.com (recommended method for ordering)

Voice: 1-800-833-3557, 7am-6pm, Monday through Friday

Fax: +1-952-976-7135

Non-North America ordering process

E-mail: avayaparts@arrow.com (recommended method for ordering)

Voice: +1-631-843-5000, 8am-5pm, eastern time, Monday through Friday

Fax: +1-631-843-5040

Part numbers

Use the following part numbers to order blank tapes and cleaning tapes:

Part number	Description	Tape drive
40963-1pk	DDS4 20/40-GB, 4mm	DDS4
45382	DDS4 cleaning cartridge	DDS4
312629-001	Mammoth 20/40-GB, 8mm	Mammoth 8mm
315205-001	Mammoth cleaning cartridge	Mammoth 8mm
SLR5-8GB	SLR5, 4/8-GB QIC	SLR5
5678-2	SLR5 cleaning cartridge	SLR5
307265-001	14-GB, 8mm	DX, XL, XS 8mm
309258-003	8mm cleaning cartridge	DX, XL, XS 8mm
QD9250	Magnus 2.5-GB QIC	2.5-GB

Installing memory

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

Note:

You need to perform a CMSADM backup before continuing. Refer to your current CMS software installation, maintenance, and troubleshooting document for details.

To add memory to the system:

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

   prtconf | grep Memory

   ```
   Memory size: xx Megabytes
   ```

2. To shut down the system, enter:

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

3. Turn off the system.
4. Turn off the system monitor.
5. Turn off all external devices starting with the device that is closest to the system and working toward the farthest device.
6. Install the DSIMM into the computer using the procedures described in *CMS R3V6 Sun SPARCserver Computers Hardware Installation*, 585-215-857.
7. Turn on the SCSI devices attached to the computer starting with the device at the end of the SCSI chain and working toward the computer.
8. Turn on the system monitor.
9. Turn on the computer.
10. After the machine is booted, log in as root.
11. Enter:

    prtconf | grep Memory

    ```
    Memory size: xx Megabytes
    ```

12. Verify that the displayed memory size is correct, comparing it to the value recorded before you added the new memory. If the new figure is not correct, power down the system and check that all memory modules are properly seated.

After adding memory to a system that is running CMS R3V6 or earlier, the system must be administered to allow the swap function to use the additional memory.

To add swap space on a CMS R3V6 or earlier system:

1. Enter:

   swap -a /cms/swap

2. Enter:

   swap -l

Do not use these commands on a CMS R3V8 system.

Troubleshooting

Overview

This chapter describes the following troubleshooting procedures that apply to both the Enterprise 3000 and SPARCserver computers:

Using the remote console

Overview

If your system does not boot, or the system cannot be diagnosed locally, remote support personnel might want to redirect control of the console port from the local console to a dialed-in remote console. Redirecting the console allows support personnel to do remote maintenance as if they were at the local console. You can redirect the console using *either*:

- The Solaris operating system
- OpenBoot diagnostics

This section consists of the following procedures:

- Redirecting the console using Solaris on page 130. Use this procedure when the system will boot up to the Solaris operating system.
- Redirecting the console using OpenBoot mode on page 133. Use this procedure when the system will not boot up to the Solaris operating system.

Redirecting the console using Solaris

This procedure describes how to use the Solaris operating system to redirect the local console to serial port A. This procedure is usually done from the remote console that has dialed in to the system.

CAUTION:

Use this procedure only when absolutely necessary. If the console redirects and the modem line drops, you may not be able to get back into the system.

Redirecting the local console to the remote console

To redirect control of the console port from the local console to a dialed-in remote console:

1. Dial in from the remote console to the remote console modem, and log in as root.
2. At the remote console, enter:

   /cms/install/bin/abcadm -r ttya

   The system displays the following message at the remote console:

   ```
   ttya is currently set to be incoming
   Are you sure you want to change it? [y,n,?]
   ```

3. At the remote console, enter: **y**

   The system displays the following message at the remote console:

   ```
   ttya administration removed
   ```

4. At the remote console, enter:

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

   The system displays the following message at the remote console:

   ```
   This change requires a reboot to take affect
   Are you ready to reboot? [y,n,?]
   ```

5. At the remote console, enter: **y**

   The system displays the following message at the remote console:

   ```
   done
   desktop auto-start disabled
   Proceeding to reboot.
   ```

   The following occurs:

   - The system begins to shut down.
   - Shutdown, reset, and reboot messages display on the local console.
   - When the system starts to come back up, the local console goes blank.
   - The system boot diagnostics are displayed on the remote console.
   - After the system reboots, a `console login:` prompt is displayed on the remote console.

6. Log in to the remote console as root.

CAUTION:

Do not enter Ctrl-D from the remote console to exit the system without first redirecting control back to the local console. If you do, you may lock yourself from using the console locally or remotely.

Redirecting the remote console back to the local console

To redirect control of the console port from the remote console back to the local console:

1. At the remote console, enter:

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

   The system displays the following message at the remote console:

```
Console set to local

This change requires a reboot to take affect

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

2. At the remote console, enter: **`y`**

   The following occurs:

   - The system begins to shut down.
   - Shutdown, reset, and reboot messages display on the remote console.
   - When the system starts to come back up, the system boot diagnostics are displayed on the local console.
   - After the system reboots, the `console login:` prompt is displayed on the remote console.
   - The login screen is displayed on the local console.

3. Log in to the local console as root.
4. Log in to the remote console as root.

   Control of the console port is redirected from the remote console back to the local console.

Redirecting the console using OpenBoot mode

This procedure describes how to use the OpenBoot mode to redirect the local console to serial port A. Use the OpenBoot mode to redirect the remote console port when the Solaris method does not work. This typically occurs when the system will not boot.

Redirecting the local console to the remote console

To redirect control of the console port from the local console to a dialed-in remote console:

1. If the system is not already at the `ok` prompt, enter:

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

   The system shuts down to the `ok` prompt.

   CAUTION:

   If the shutdown command fails, press **Stop** plus **A** simultaneously after the display console banner is displayed, but before the operating system starts booting.

2. At the local console, enter the following commands to set the remote console configuration parameters:

   `setenv input-device ttya`

   `setenv output-device ttya`

   `setenv ttya-rts-dtr-off true`

   `setenv ttya-ignore-cd true`

   `setenv ttya-mode 9600,8,n,1,-`

3. To verify the parameter changes, enter:

   `printenv`

   The system displays the following message:

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

4. If not already dialed in, dial in to the system from the remote console.
5. Log in to the system as root.

6. At the local console, enter: **`boot`**

   The following occurs:

   - The system begins to shut down.
   - Shutdown, reset, and reboot messages display on the local console.
   - When the system starts to come back up, the local console goes blank.
   - The system boot diagnostics are displayed on the remote console.
   - After the system reboots, a `console login:` prompt is displayed on the remote console.

7. Log in to the remote console as root.

   CAUTION:

   Do not enter Ctrl-D from the remote console to exit the system without first redirecting control back to the local console. If you do, you may lock yourself from using the console locally or remotely.

Redirecting the remote console back to the local console

Using OpenBoot mode, there are two ways to redirect control of the console port from the remote console back to the local console:

- From the remote console (recommended)
- From the local site (not recommended)

Method 1: from the remote console

To redirect control of the console port from the remote console back to the local console:

1. Do one of the following:
   - At the remote console, if the system is in UNIX, enter the following commands:

     ```
     eeprom output-device=screen
     eeprom input-device=keyboard
     eeprom ttya-rts-dtr-off=true
     eeprom ttya-ignore-cd=false
     /usr/sbin/shutdown -y -i6 -g0
     ```

   - At the remote console, if the system is in OpenBoot mode, enter the following commands:

     ```
     setenv output-device screen
     setenv input-device keyboard
     setenv ttya-rts-dtr-off true
     setenv ttya-ignore-cd false
     reset
     ```

     The following occurs:

     - The system begins to shut down.
     - Shutdown, reset, and reboot messages display on the remote console.
     - When the system starts to come back up, the system boot diagnostics are displayed on the local console.
     - The login screen is displayed on the local console.
2. At the remote console, hang up the modem connection.
3. Log in to the system as root at the local console.
4. To see what is on the ttya port, enter:

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

5. To start a port monitor on ttya, enter:

   ```
   /cms/install/bin/abcadm -i -b 9600 ttya
   ```

Method 2: from the local site

The onsite technician will use this procedure from the local site**.** Use this method only when Method 1 will not work.

CAUTION:

This method of redirecting the console port should only be done as a last resort. This procedure resets the NVRAM defaults to the Sun factory settings.

To redirect control of the console port from the remote console back to the local console:

1. Cycle power on the CMS computer.
2. As the computer begins to boot up, press **Stop** plus **N** simultaneously. Continue to press **Stop** plus **N** until a prompt displays on the local console.
3. At the `ok` prompt, enter: **`boot`**
4. When the system boots up, log in to the system as root at the local console.
5. To see what is on the ttya port, enter:

   `/cms/install/bin/abcadm -k`
6. To start a port monitor on ttya, enter:

   `/cms/install/bin/abcadm -i -b 9600 ttya`

   The system displays the following message:

```
ttya set to incoming port 9600 baud
```

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 CMS software.

Hardware diagnostic tools and resources

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

- POST diagnostic messages (requires console redirection)
- OpenBoot firmware tests on page 138 (requires console redirection)

POST diagnostic messages

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

1. At the `ok` prompt, enter:

   `boot`

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

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.

OpenBoot firmware tests

The OpenBoot PROM (OBP) On-Board firmware performs a routine set of firmware and hardware tests.

Note:

Different versions of Solaris have different versions of the OpenBoot commands. Not all commands are available with every version.

Using the OpenBoot PROM tests

To use the OpenBoot PROM tests:

1. From the root login, turn off CMS.
2. Enter:

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

   The system shuts down.
3. At the `ok` prompt, enter the following commands:

   `setenv auto-boot? false`

   `reset-all`

   The system resets and displays the `ok` prompt.
4. Use the commands that are shown in Test descriptions on page 139.
5. When you finish testing, enter the following commands:

   `setenv auto-boot? true`

   `boot -r`

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

Test descriptions

The following table lists some of the OpenBoot PROM On-Board firmware test commands. Note that some commands give responses for the tests. Other tests just display the `ok` prompt when the test passes.

<table>
<tr><th>Command</th><th colspan="2">Description</th></tr>
<tr><td>probe-ide-all</td><td colspan="2">This command identifies the devices attached to the IDE bus.</td></tr>
<tr><td>probe-scsi-all</td><td colspan="2">This command identifies the devices attached to the SCSI bus.</td></tr>
<tr><td>probe-fcal-all</td><td colspan="2">This command identifies the devices attached to the FC-AL bus.</td></tr>
<tr><td>test-all</td><td colspan="2">This command runs a series of tests on the network and on hardware components. It may take several minutes to complete.</td></tr>
<tr><td rowspan="9">test [alias]</td><td colspan="2">This command executes the specified self-test method. Possible values for device-specifier are listed in the Alias column:</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>tape0-1</td><td>tape drives</td></tr>
<tr><td>disk0-5</td><td>SCSI drives</td></tr>
<tr><td>floppy</td><td>floppy</td></tr>
<tr><td>screen</td><td>video</td></tr>
<tr><td>keyboard</td><td>keyboard</td></tr>
<tr><td>watch-clock</td><td colspan="2">This command tests the clock function.</td></tr>
<tr><td>watch-net
watch-net-all</td><td colspan="2">This command runs a loopback test, a transceiver test, and a packet transmission test.</td></tr>
</table>

Additional references

See the *Sun OpenBoot 3.x Command Reference Manual* for more information.

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.

Preserving data after a system failure

Enter the **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 fails or is interrupted before preserving all data.

The **sync** command returns control to the operating system and performs the data-saving operations. After the disk data is 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 by pressing **Stop** plus **A**.

Keyboard commands

The following table describes the OpenBoot initialization command sequences that are provided by the system. These commands are useful in some situations in which the system fails to boot. 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 `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 **Stop** plus **A** to start POST.
Stop plus **A**	Abort.
Stop plus **D**	Enter diagnostic mode (set `diag-switch?` to `true`).
Stop plus **F**	Enter Forth on TTYB instead of probing. Use `exit` to continue with the initialization sequence. This is useful if hardware is broken.
Stop plus **N**	Reset NVRAM contents to default values. If this is done, you must readminister the NVRAM options. **CAUTION:** Do not use this command under normal operation. Running this command causes a system to lose the Avaya factory NVRAM settings and the system will not boot properly.

System will not boot from disk

Symptom

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.

Symptom

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 command warnings

Symptom

When using any of the “probe” commands, the system displays 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].
```

CAUTION:
Do not continue. Answer **n**. Do not answer **y**.

Solution

To recover from this condition:

1. Enter: **n**

   This stops the probe command.

2. Enter the following commands:

   setenv auto-boot? false

   reset-all

3. Now it is acceptable to execute any of the “probe” commands and perform any other boot PROM-level diagnostics.

4. After you finish probing the system devices, enter the following commands:

   setenv auto-boot? true

   boot -r

   CAUTION:
   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

SCSI problems

Symptom

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

Solution

To check the SCSI-related errors:

1. Enter the following commands:

   setenv auto-boot? false

   reset-all

   The system resets.

2. Enter:

   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.

3. Fix any obvious errors.

4. After you finish probing the system devices, enter the following commands:

   setenv auto-boot? true

   boot -r

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

Symptom

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.

Solution

To check for duplicate SCSI IDs:

1. Unplug all but one of the disks.
2. Enter the following commands:

   setenv auto-boot? false

   reset-all

   The system resets.
3. At the ok prompt, enter:

   probe-scsi-all

   Note:

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

7. After you finish probing the system devices, enter the following commands:

   `setenv auto-boot? true`

   `boot -r`

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

Solving power-related problems

Overview

This section provides some troubleshooting solutions to power-related problems (for example, when the system loses power). If you cannot solve the power-related problems, escalate through normal channels.

When system loses power

If the system loses power, it is recommended (but not required) that you empty the CD-ROM and tape drives. The system boots from the disk by default.

Power-on sequence

To turn the power back on:

1. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
2. Turn on the system monitor.
3. Turn on your system.

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

```
|------| <Product Name>, Keyboard Present
|      | OpenBoot 3.xx, XXX MB memory installed, Serial #XXXXXXXXX
|      | Copyright 2000 Sun Microsystems, Inc. All rights reserved.
|------| Ethernet address X:X:XX:XX:XX:XX, Host ID: XXXXXXXX
```

Power-off sequence

To turn off the power:

1. Log in to the system as root.
2. Enter:

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

   This shuts down the system.
3. Turn off the system.
4. Turn off the system monitor.
5. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

System fails to auto-boot

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:

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, continue with the next steps.
3. Enter:

   `setenv auto-boot? true`
4. Enter:

   `boot`

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

Solving clock synchronization problems

Each I/O board has its own clock that must be synchronized with the system clock board for proper system operation. After adding, removing, or replacing an I/O board or the system clock board, the clock on the I/O board might become unsynchronized with the clock on the system clock board.

If the clocks need resynchronizing, the system displays the following message when you reboot:

```
Clock board TOD does not match TOD on any IO board
```

To synchronize the clocks:

1. If CMS is running, turn it off.
2. Enter:

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

   The system shuts down and displays the `ok` prompt.
3. Enter:

   copy-clock-tod-to-io-boards

   This synchronizes the clocks.
4. Enter:

   boot -r

   This reboots the system and resynchronizes the clocks.
5. Turn CMS on.

Diagnosing 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 serial port A

Scenario 2:

The remote user gets `Answered` and `Connected` responses displayed on the screen, but no login.

Solution:

a. Enter **one** of the following commands to make sure that a monitor is running:

`pmadm -l; sacadm -l`

<or>

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

b. If no port monitor is running, start a port monitor by entering the following command:

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

c. If a port monitor is running, make sure that the port monitor is set up at the correct speed relative to the local modem.

d. If the speed is not correct, remove the current port monitor, and start a new port monitor at the correct speed. Enter the following commands:

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

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

e. If the port monitor is running and is at the correct speed, try to fix the problem by disabling and enabling the port monitor by entering the following commands:

`pmadm -d -p ttymona -s ttya`

`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 press a few keys (any keys), and see if it clears up the problem. If this does not clear up the problem, the port monitor is probably not the same speed as the modem.

Diagnosing 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 CMS software installation, maintenance, and troubleshooting document for more details.
- Check modem setup — see the following figure. Refer to the hardware installation document for your platform and the CMS software installation, maintenance, and troubleshooting document for more details.
- Check serial port administration. Refer to the hardware installation document for your platform and the CMS software installation, maintenance, and troubleshooting 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 Diagnosing dial-in access problems on page 150 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:

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

Dial-In returns random characters

The dial-in gives you random characters instead of a login.

Solutions:

- Try pressing a few keys to see if the problem corrects itself.
- Check the speed of the remote console by doing the following:
  1. Have an on-site person run the following command:

     /cms/install/bin/abcadm -k
  2. Make sure the speed is consistent with the modem connected on-site and the modem and console at the remote site.
  3. If there is a speed inconsistency on-site, reconfigure the machine with the appropriate speed for the modem with the following command:

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

     The system reboots.
  4. If there is a speed inconsistency with the remote site, reconfigure the remote site and redial.
- Set the console back to local by switching to the local console via the OpenBoot method. See Using the remote console on page 130 for details.

SunVTS diagnostics

The SunVTS™ supports diagnostics in the following areas:

- Connection test – Minimal access of device to verify its accessibility and availability.
- Functional test (default) – Detailed tests to thoroughly test the device or system when offline the system is offline (CMS must be turned off). A stress mode in the system or test option can be set only within the offline mode. The stress mode is an extension of offline.
- Functional test (from system monitor) – Safe tests that can be executed on the device or system when it is online (CMS can be on, but testing is safer when it is turned off).

There are two ways to run SunVTS. We recommend that you use either local access through the Common Desktop Environment (CDE) interface, or remote access using an ASCII interface.

Prerequisites

CMS must be turned off.

Procedure

To use SunVTS:

1. Enter:

   `BYPASS_FS_PROBE=1; export BYPASS_FS_PROBE`

   This bypasses the file system probe.

2. Do one of the following:

   - Enter:

     `/opt/SUNWvts/bin/sunvts`

     This accesses the CDE interface.

   - Enter:

     `/opt/SUNWvts/bin/sunvts -t`

     This accesses the TTY mode (ASCII interface).

Additional references

For more information about using VTS, see **/opt/SUNWvts/README** and **/opt/SUNWvts/bin/vtstty.help**.

Checking error log files

System messages can alert you to system problems, such as a device that is about to fail. By default, many of the messages are displayed on the system console and are stored in **/var/adm**.

You can display system messages with the **dmesg** command. The system displays a list of the most recent messages. The **/var/adm** directory contains several message files. The most recent messages are in **/var/adm/messages** and in **/var/adm/messages.0**. The oldest are in **/var/adm/messages.3**. Periodically a new file is created, and the **/var/adm/messages.3** file is deleted, **/var/adm/messages.2** is renamed **/var/adm/messages.3**, **/var/adm/messages.1** is renamed **/var/adm/messages.2**, and **/var/adm/messages.0** is renamed **/var/adm/messages.1**.

The message files may contain not only system messages, but also core dumps and other data, which can cause **/var/adm** to grow quite large. To keep the directory to a reasonable size and ensure that future core dumps can be saved, you should remove unneeded files periodically. You can automate the task by using **crontab**. See your Sun system documentation for information on **crontab**.

Checking tape-related problems

The **mt** command can be useful if you are having tape problems.

To test the tape drive:

1. Insert a tape into the tape drive being tested.
2. Enter:

   mt -f /dev/rmt/*X* status

   X represents the device number. It is usually **0**, **1**, **0c**, or **1c**. The system displays a message similar to the following, depending on the tape drive being tested.

```
Tandberg 2.5 Gig QIC tape drive:
  sense key (0x0)= No Additional Sense residual= 0 retries= 0
  file no= 0  block no= 0
```

```
Exabyte EXB-8500 8mm tape drive:
  sense key (0x0)= No Additional Sense residual= 0 retries= 0
  file no= 0  block no= 0
```

Note:

If you run the **mt -f /dev/rmt/0 status** command with no tape in the drive you get the following message:

```
/dev/rmt/0:   no tape loaded or drive offline
```

Troubleshooting a blank (no output) monitor

The local monitor is blank.

Solution:

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. If no one is dialed-in, continue to Step 3.
3. If all else fails, power-down and turn the machine on again. Immediately press **Stop** and **N** until something displays 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.

If nothing is seen after a minute or so, there is probably a hardware failure. Do the following:

1. Verify that the keyboard is attached. If the keyboard is unplugged, the output goes to ttya instead. To fix this problem, power down the system.
2. Turn off the system.
3. Turn off the system monitor.
4. Turn off all external devices starting with the device closest to the system and working toward the farthest device.
5. Plug in the keyboard.
6. Turn on devices attached to the system, starting with the device at the end of the SCSI chain and working toward the system.
7. Turn on the system monitor.
8. Turn on the system.
9. 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 and turn the monitor on.

10. 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`. Do one of the following:

    - Power down the system. Turn it back on and immediately press **Stop** plus **N**. This sets all NVRAM parameters to the Sun factory default values. As a result, the `output-device` parameter is set to `screen`.

      WARNING:
      When the NVRAM settings are reset to the Sun factory default values, some of the settings must be changed to the EEPROM parameter values required by CMS. For a listing of the correct CMS settings, see “Displaying and setting the EEPROM parameters” in the CMS software installation, maintenance, and troubleshooting document.

    - Connect a console to ttya, 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.

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

Refer to your system documentation and call the TSC.

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:

- Core 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 describing factory installation procedures for details.
- Output of the **prtconf -pv** command (put the information in a file).
- Possibly output from the **/var/adm/messages** file.

To put all the files on one tape:

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 core dump in question.
4. To retrieve the output from the **showrev -p** buffer, enter the following command:

   showrev -p > showrev.out
5. To create a **dmesg.out** file, enter:

   dmesg > dmesg.out
6. To retrieve the output from the **prtconf -pv** buffer, enter:

   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 /dev/rmt/0 unix.n vmcore.n dmesg.out showrev.out prtconf.out messages

   Note:

   The letter ***n*** represents the number of the core dump.

   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 core dump.

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

Recovering from an unplugged keyboard

If the console keyboard cable becomes unplugged during normal operation, the system stops running and no ACD data is collected from the switch.

To recover from this problem:

1. Plug in the keyboard cable.

   The system beeps and the current display “freezes” on the monitor. The system displays a small window that shows the following:

   ```
   Type ‘go’ to resume
   ok
   ```

2. Enter: **go**

   The system resumes normal operation.

3. Refresh the terminal screen.

   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.

Glossary

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).
Boot	To load the system software into memory and start it running.
CMS	Call Management System (CMS). A software product used by business customers that have an Avaya telecommunications switch and receive a large volume of telephone calls that are processed through the Automatic Call Distribution (ACD) feature of the switch.
DSIMM	Dynamic random access memory Single In-line Memory Module. A small printed circuit card that contains Dynamic Random Access Memory (DRAM)
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.
Non-Volatile Random Access Memory (NVRAM)	A random access memory (RAM) system that holds its contents when external power is lost.
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 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 an Avaya implementation, the Host Adapter card (with a SCSI ID of 7) is preset. The remainder can be set with external device 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.

Small Computer System Interface A hardware interface that allows the connection of peripheral devices (such as hard disks, tape drives and CD-ROM drives) to a computer system.

TSC Technical Service Center. The Avaya organization that provides technical support for Avaya products.

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