Cluster Platform 280/3 Installation and Recovery Guide

SunTone™ Cluster Platforms

Send comments about this document to: docfeedback@sun.com

Please
Recycle

Adobe PostScript™

VERITAS Software Licenses

Depending on the product purchased, you may be required to purchase commercial licenses from VERITAS Software Corporation for the pre-installed VERITAS software. The terms and conditions of the software licenses are set forth in separate written documentation accompanying the product.

VERITAS customers can purchase commercial licenses from Sun Microsystems Inc., or by contacting a VERITAS account representative.

Please
Recycle

Adobe PostScript™

Contents

Preface

The Cluster Platform 280/3 system from the SunTone™ Platforms portfolio provides self-sustained building blocks integrated through Sun™ Cluster technology to support highly available applications.

This guide describes how to configure your Cluster Platform 280/3 system. It is intended for system administrators who are familiar with the Solaris™ operating environment and with the following software: Solstice DiskSuite™, Sun™ Management Center (Sun MC), Sun™ Enterprise Explorer, Sun StorEdge™ Component Manager, VERITAS Volume Manager (VxVM), and Sun™ Cluster 3.0.

For specific information about configuring disk sets, disk volumes, file systems, and data services, refer to the Sun Cluster 3.0 documentation.

How This Book is Organized

This guide is organized in the following manner:

- Chapter 1 contains an overview of the Cluster Platform 280/3 system and describes the pre-installed and pre-configured hardware and software of your factory-integrated system. It also provides the power and heating requirements for site preparation and planning.
- Chapter 2 contains the hardware and software setup instructions for your system.
- Chapter 3 contains the recovery procedures to restore the factory-integrated management server software environment in case of a serious failure that cannot be recovered from backups.
- Appendix A provides the settings for accessing the terminal concentrator from a laptop computer.
- Appendix B lists the connections for the factory-cabled hardware components.
- Appendix C describes how to configure a port for a `tip hardwire` connection.
- Appendix D provides instructions for running the Sun Explorer data collector and Sun Management Center software.
- Appendix E contains procedures for installing and using the Sun StorEdge Component Manager software.
- Appendix F provides instructions for configuring the Sun Ray™ server software and accessing the management server from a Sun Ray appliance.
- Appendix G discusses the highly available Network File System (HA-NFS) agent and its associated scripts.

Typographic Conventions

Typeface or Symbol	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`% `**`su`** `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type `rm` *filename*.

Shell Prompts

Shell	Prompt
C shell	*machine_name*`%`
C shell superuser	*machine_name*`#`
Bourne shell and Korn shell	`$`
Bourne shell and Korn shell superuser	`#`

Accessing Sun Documentation Online

A broad selection of Sun system documentation is located at:

`http://www.sun.com/products-n-solutions/hardware/docs`

A complete set of Solaris documentation and many other titles are located at:

`http://docs.sun.com`

Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can email your comments to Sun at:

`docfeedback@sun.com`

Please include the part number (816-2145-12) of your document in the subject line of your email.

Tools for Reading Online Documentation

The following tools for reading online documentation are preinstalled on the management server:

- Netscape Navigator™
- AnswerBook2™
- Acrobat Reader
- `man` command

Netscape Navigator Browser

Use the Netscape browser to read documentation provided as HTML files, view the output from an AnswerBook2 server, or read Sun product documentation at:

`http://docs.sun.com`

You can download Netscape browser at:

`http://www.netscape.com`

AnswerBook2 Server

The AnswerBook2 server software processes sets of online manuals into content that you can access, search, and view through the Netscape Navigator browser.

After the management server installation and setup is complete, you can access AnswerBook2 documentation collections at:

`http://`*name_of_management_server*`:8888`

Adobe Acrobat Reader

The Adobe Acrobat Reader 4.0 (`acroread`) software enables you to view documentation in Portable Document Format (PDF). The software is available on the management server as follows:

`/opt/Acrobat4/bin/acroread`

The `man` Command

The `man` command displays documentation about individual commands and files in the Solaris operating environment and other software products in the Cluster Platform 280/3. If the directory that contains `man` page files for a product is not automatically accessed by the `man` command, you can add that directory to the `MANPATH` environmental variable included in the `.profile` file (when using Bourne shell, or Korn shell environment), or the `.cshrc` file (when using the C shell environment).

Documentation Included With the Cluster Platform

A variety of manuals are supplied with the Cluster Platform 280/3 system. To access the AnswerBook2 collections and the PDF documents (once the management server is installed and setup), reference the following URL in a browser:

`http://management_server_name:8080`

FIGURE P-1 Access To Documentation

PDF Documents

Documentation about the following Cluster Platform components (hardware and software) is installed on the Cluster Platform management server in PDF:

- Solstice DiskSuite documentation
- Sun Cluster documentation
- Sun Management Center documentation
- Sun StorEdge Component Manager documentation
- VERITAS Volume Manager documentation

AnswerBook2 Documents

AnswerBook™ documentation about the Solaris 8 operating environment is installed on the Cluster Platform management server.

Hard Copy Documents

Printed documents about the Cluster Platform hardware components are supplied to you with the Cluster Platform.

Cluster Platform 280/3 Introduction

This chapter describes the following information:

Cluster Platform 280/3 System Overview

The Cluster Platform 280/3 system is a self-sustained platform, integrated through the Sun Cluster technology, with shared, mirrored Fibre-Channel Arbitrated Loop (FC-AL) storage to support highly available applications. You can use this two-node cluster system to implement a highly available file server, web server, mail server, or an Oracle® database server. Sun Cluster 3.0 provides global file systems, global devices, and scalable services. These features allow independent cluster nodes, running independent Solaris operating environment instances, to run distributed applications while providing client access through a single IP address.

Note – This cluster platform only provides a basic cluster environment. You must install and configure your data services after you have customized and configured the system.

FIGURE 1-1 is a basic block diagram of the system, which includes a two-node cluster with shared, mirrored storage, a terminal concentrator, and a management server. An Ethernet hub provides connection between the cluster nodes, management server, and Sun StorEdge™ T3 arrays. The interfaces on both nodes are cabled to provide multiple cluster interconnects between nodes.

The management server is the repository for the operating environment, software, and patches. The management server provides access to the cluster console and functions as a JumpStart™/Flash server (installation server) for the cluster nodes. For advanced system monitoring, the management server includes Sun Management Center software to monitor the cluster nodes.

The Cluster Platform does not have a monitor. You access the Cluster Platform using a system on the network that you provide (shown as *your local system* in FIGURE 1-1). The local system is simply used as a remote display to the management server. You do not need to dedicate any particular system as the local system. It can be any system that is convenient at the time.
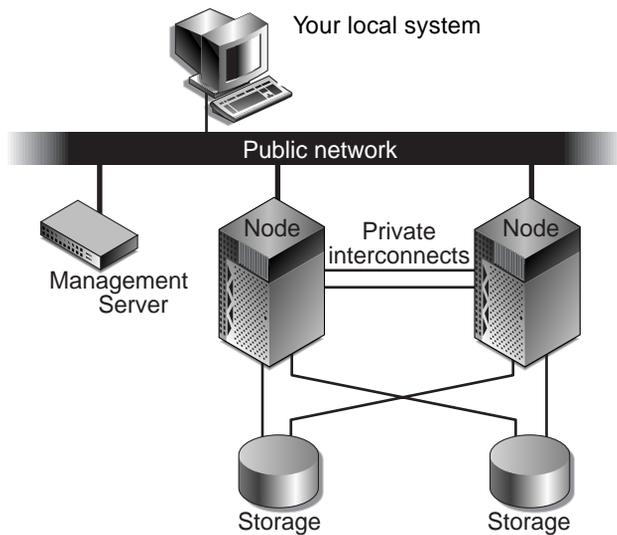
FIGURE 1-1   Cluster Platform 280/3 System Overview

Software Components

Once the Cluster Platform 280/3 system configuration is complete, the following software components are installed:

Management Server

- Solaris 8 10/01 operating environment with patches
- Apache 1.3 web server software
- Solstice DiskSuite 4.2.1 with patches, and data services
- Sun Cluster 3.0 12/01 and recommended patches
- Cluster Platform 280/3 node operating system software
- Sun Management Center 3.0 Update 4 software with Help desk
- AnswerBook2 software
- Sun Enterprise Explorer 3.5 software
- JumpStart/Flash server
- Sun StorEdge Component Manager 2.2 software
- Highly Available (HA) NFS application software
- SunRay Server 1.3 software

Cluster Nodes

- Solaris 8 10/01 operating environment
- Sun Cluster 3.0 12/01 software
- Solstice DiskSuite 4.2.1 or VERITAS Volume Manager 3.1.1 software[1]
- Sun™ Management Center 3.0 Update 2 agent software

[1] You must obtain two VERITAS license keys (one for each node) if you intend to use the VERITAS Volume Manager product on your Cluster Platform. You can obtain your VERITAS license and keys from Sun Microsystems, or from VERITAS Corporation. These license keys are not needed if you plan to use Solaris DiskSuite instead of VERITAS Volume Manager.

Note – To see the collection of patches that were installed on each cluster node, look in the `/jumpstart/Patches/8_recommended` directory of the management server.

Note – Recovery disks are included with the Cluster Platform 280/3 system. The two disks included are the Cluster Platform 280/3 Mini Root CD and Cluster Platform 280/3 Recovery DVD. See "To Use the Cluster Recovery Utility" on page 71 for recovery details.

Hardware Components

Your factory-integrated Cluster Platform 280/3 system includes the following hardware components:

- Consolidation expansion cabinet: One 72-inch Sun StorEdge™ expansion cabinet which includes two power sequencers, one front door option, one rear door, and one fan assembly
- Management server: One Netra™ T1 AC200 server configured with one 500 MHz UltraSPARC™ IIe CPU, 1-Gbyte of memory, two internal mirrored 18-Gbyte boot disks, and a DVD-ROM drive
- Terminal concentrator: One 8-port 10BASE-T terminal concentrator preinstalled in a Sun StorEdge expansion cabinet
- Cluster nodes: Two Sun Fire™ 280R servers, with two 750-MHz or 900-MHz UltraSPARC III CPUs, 2-Gbytes of memory, two mirrored 36-Gbyte boot disks, and a DVD-ROM drive
- Cluster node storage: Two Sun StorEdge™ T3 arrays, each with 1-Gbyte controller board cache and nine 36-Gbyte disks or 72.4-Gbyte disk drives.
- Four internal PCI cards per node; two Sun Quad FastEthernet™ PCI cards per node installed in PCI1 and PCI2 slots; two FC-AL PCI host adapter cards per node installed in PCI3 and PCI4 slots
- Two FC-AL StorEdge hubs, with three Gigabit Interface Converters (GBICs) installed in each hub, pre-cabled to the cluster nodes and to the Sun StorEdge T3 disk arrays
- One 3COM 12-port Ethernet hub for the internal administrative network
- All required mounting brackets, power cords, and cables.

Cluster Platform Component Location

FIGURE 1-2 shows how the Cluster Platform 280/3 is arranged in the expansion cabinet. The hardware components are placed in the dual-power sequenced 72-inch expansion cabinets.

System components are cabled in the expansion cabinet to provide power and connections between the hardware components.

Note – The expansion cabinet arrangement complies with weight distribution, cooling, electromagnetic interference (EMI), and power requirements.
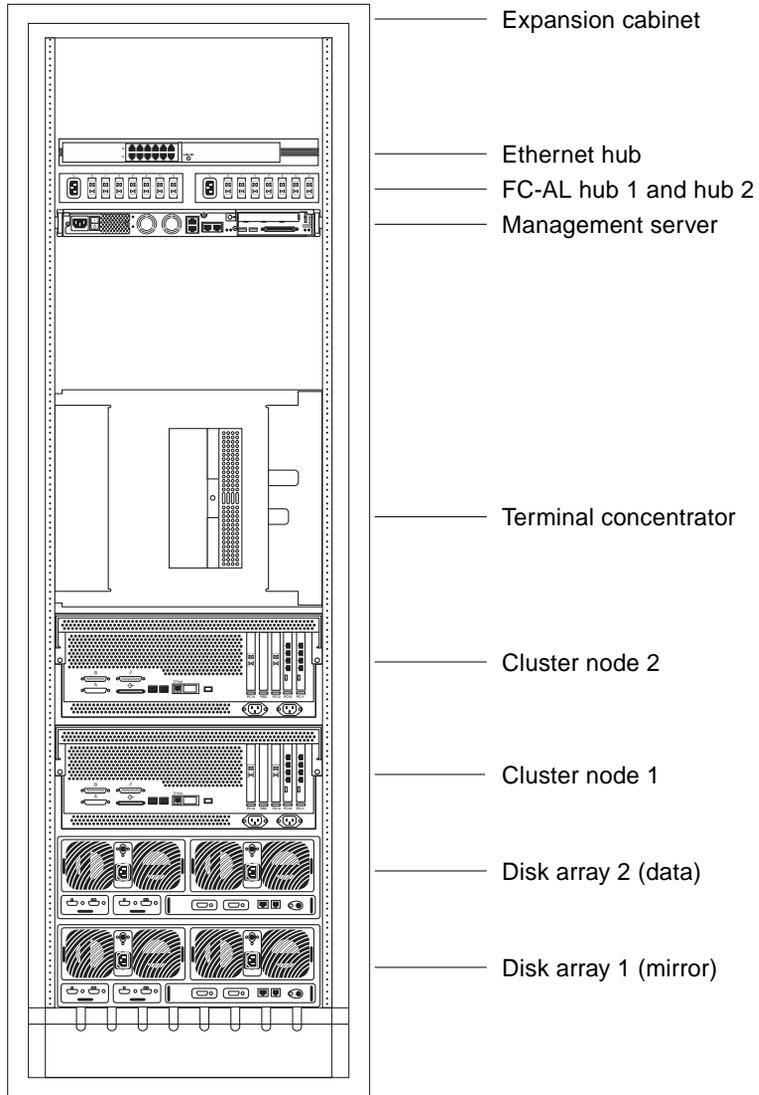
FIGURE 1-2 Cluster Platform Expansion Cabinet Placement

Connectivity

The Cluster Platform 280/3 provides maximum connectivity in your enterprise network using the following network implementations:

- Production network connectivity—You connect the cluster nodes to your main network using the Sun Fire Server 280R `qfe0` connectors. Network automatic failover (NAFO) is provided on separate Sun Quad FastEthernet controllers (`qfe4`) to avoid a single point of failure (SPOF).

- Administration network connectivity—Once you connect the management server and the terminal concentrator to your administration network, the management server has the connectivity needed to give you access to the administration software (Sun Management Center, Component Manager, and SunRay server software). This network configuration isolates the administrative functions from your production network. If your environment does not have an administration network, you can connect the management server and the terminal concentrator to your production network, maintaining the same cluster platform functionality, without the network isolation.

- Internal administration network—The management server, cluster nodes, and cluster storage are connected to each other through the built-in Ethernet hub. Internal administration connections are configured at the factory. This network is referred to as the *internal* administration network to distinguish it from the administration network (described above).

- Cluster interconnect—The cluster connectivity between nodes uses Ethernet patch cables (no Ethernet switch required), with multiple `qfe` 100BASE-T ports (`qfe1` and `qfe5`) on two separate controllers to avoid a controller SPOF.

Cluster Platform 280/3 System Cabling

The Cluster Platform 280/3 system is shipped with the servers, hubs, and each of the arrays already connected in the cabinet. You do not need to cable the internal system components. The next chapter describes how to connect the Cluster Platform to your enterprise network.

For factory configured cable connections, see Appendix B.

Production network

qfe0
qfe4
Node 1
PCI3
PCI4
eri0

A

2

Terminal concentrator

3

A

qfe1   qfe5

qfe1   qfe5

qfe0
qfe4
Node 2
PCI4
PCI3
eri0

10Base-T

1

5
4
FC-AL hub 1

Storage 1

mirror

5
4
FC-AL hub 2

Storage 2

data

4   3
Ethernet hub

1

2

A
Management server

eri1   5

eri0

Connections inside cabinet

External administration network

Production network
Production network for NAFO
External administration network

Internal administration network
Other internal connections

FIGURE 1-3   Cluster Platform Network Connections

Power and Heating Requirements

The Cluster Platform 280/3 hardware must have two dedicated AC breakers. The cabinet should not share these breakers with other, unrelated equipment. The system requires two L30-R receptacles for the cabinet, split between two isolated circuits. For international installations, the system requires two Blue 32AIEC309 (international) receptacles.

Note – To eliminate any single point of failure (SPOF), you must provide two independent primary power sources. For details on power sources and power sequencers, refer to the *Sun StorEdge Expansion Cabinet Installation and Service Manual.* This document is supplied to you in hard copy format.

If the cabinet is installed on a raised floor, cool conditioned air should be directed to the bottom of the expansion cabinet through perforated panels.

The 72-inch cabinet in the Cluster Platform 280/3 consumes power and dissipates heat as shown in TABLE 1-1.

TABLE 1-1   Power and Heat Requirements for Cluster Platform 280/3

72-Inch Cabinet	Maximum Power Draw	Heat Dissipation
1	2320 W	7965 BTU/hr.

Configuring the Cluster Platform 280/3 System

While the hardware and software for your Cluster Platform is preinstalled at the factory, there are configuration and customization procedures you need to perform to tailor the system to your specific environment.

This chapter contains the configuration and customization procedures that you must perform when you first install your system.

Before you perform these procedures, you should record and save your site-specific information on the worksheet provided in this chapter.

Overview of Tasks

The following is an overview of the tasks required to add the cluster nodes to your network environment and to configure the shared storage.

To integrate your system into a production environment, you must:

1. Configure the hardware (connect power cords and network cables)

2. Configure the terminal concentrator.

3. Configure the management server.

4. Customize the cluster environment.

5. Boot up the Sun StorEdge™ T3 disk arrays.

6. Install the Sun Management Center software (optional).

7. Launch the Cluster Console for both nodes.

8. Install the software stack on both cluster nodes.

9. Configure the VERITAS volume manager (if used).

10. Configure the shared storage with Solstice DiskSuite or the VERITAS Volume Manager (VxVM). Configuration includes the creation of disk sets (or disk groups), disk volumes, and file systems.

11. Install and configure your highly available applications.

12. Establish the NAFO, resource groups, logical hosts, and data services required to support your highly available applications.

Note – Because each site has different needs, this document does not provide specific instructions for Task 10 through Task 12.

Collecting Site-Specific Information

Use FIGURE 2-1 to record site-specific information that is needed to complete the procedures in this guide. Names and addresses shown in the center column represent the examples used in this guide. Assign names and addresses (routed or non-routed) that are appropriate for your site.

TABLE 2-1   Worksheet

	Item	Example Used In this Guide	Your Value
Terminal concentrator	Name	*TC*	
	IP address (admin network)	*192.168.0.2*	
	Subnet mask[1]	*255.255.255.0*	
	Load host address[1]	*0.0.0.0*	
	Broadcast address	*192.168.0.255*	
	Dump address[1]	*0.0.0.0*	
Management Server	Host name	*sc3sconf1-ms*	
	IP address (eri0 on admin net)	*192.168.0.1*	
	Subnet mask[1]	*255.255.255.0*	
	Default router IP address (admin net)	*198.168.0.248*	
Cluster Environment	Name	*sc*	
	Default router IP address	*router_IP_address*	
	Network mask[1]	*255.255.255.0*	
Cluster Node 1	Name	*node1*	
	IP address (qfe0 on production network)	*node1_IP_address*	
	Ethernet address	*8:0:20:fb:29:8e*	
Cluster Node 2	Name	*node2*	
	IP address (qfe0 on production network)	*node2_IP_address*	
	Ethernet address	*8:0:20:fb:1a:55*	

TABLE 2-1 Worksheet *(Continued)*

	Item	Example Used In this Guide	Your Value
Internal Admin Network Addresses	Internal network IP address	*10.0.0.0*	
	Network mask[1]	*255.255.255.0*	
	Management server IP address (eri1)	*10.0.0.1*	
	network hostname	*MS-280R-admin*	Set automatically
	Cluster node 1, IP address	*10.0.0.2*	
	Cluster node 1, hostname	*node1-admin*	Set automatically
	Cluster node 2, IP address	*10.0.0.3*	
	Cluster node 2, hostname	*node2-admin*	Set automatically
T3 Array 1	Name	*T3-01*	
	Internal network IP address	*10.0.0.4*	
	Ethernet address[2] (must have two digits between each colon)	*00:20:f2:00:3e:a6*	
T3 Array 2	Name	*T3-02*	
	Internal network IP address	*10.0.0.5*	
	Ethernet address[2] (must have two digits between each colon)	*00:20:f2:00:04:d6*	
Other	Private interconnect IP address[1]	*172.16.0.0*	
	Private interconnect Netmask[1]	*255.255.0.0*	
	Choose one volume manager product: • Solstice DiskSuite • VERITAS Volume Manager[3]		
	(Optional) Two VERITAS license keys: node 1 node 2		

1. The default value is often an acceptable choice for this address.

2. The Ethernet address for each cluster node is located on the Customer Information, System Record sheet supplied with your system. Use the serial number on the information sheet and on the back of each node to correctly identify the Ethernet address. Ethernet addresses are located on the T3 arrays as shown in FIGURE 2-1.

3. You must obtain two VERITAS license keys if you intend to use the VERITAS Volume Manager product on your Cluster Platform. These license keys are not needed if you plan to use Solstice DiskSuite instead of VERITAS Volume Manager.

FIGURE 2-1 shows the location of the Ethernet address for the T3 arrays.
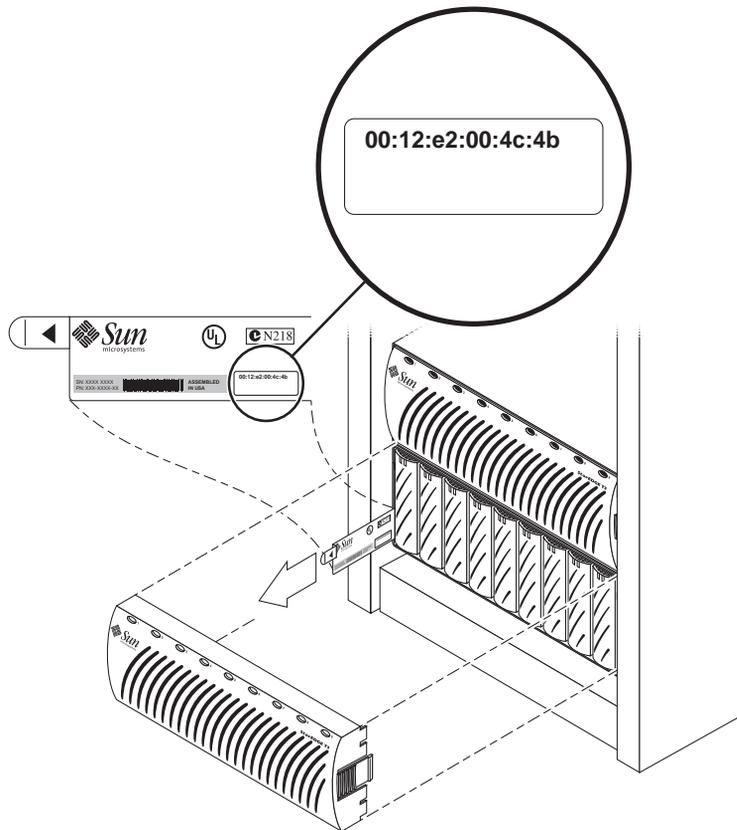
FIGURE 2-1 Location of Ethernet Address on Sun StorEdge Disk Array Pull Tab

Configuring the Hardware

▼ To Install the Cluster Platform 280/3 Hardware

1. **Connect the Cluster Platform 280/3 electrical cords to two separate power sources, but do not turn on the power to the Cluster Platform at this time.**

   See "Power and Heating Requirements" on page 8.

2. **Connect the Cluster Platform 280/3 to your network(s) as described in the following steps and shown in** FIGURE 2-2**:**

   a. **Connect the** `eri0` **port of the management server to your administration network.**

   If you do not have an administration network, connect `eri0` to your production network.

   b. **Connect the Ethernet port on the terminal concentrator to your administration network.**

   If you do not have an administration network, connect the Ethernet port to your production network.

   c. **Connect the** `qfe0` **port on node 2 to your production network.**

   d. **Connect the** `qfe4` **port on node 2 to your production network.**

   This connection provides connectivity for network automatic failover (NAFO).

   e. **Connect the** `qfe0` **port on node 1 to your production network.**

   f. **Connect the** `qfe4` **port on node 1 to your production network.**

   This connection provides connectivity for network automatic failover (NAFO).

Note – For details on the internal cable connections see Appendix B.

---

a. Management server eri0 to admin[1] network

b. Terminal concentrator Ethernet port to admin[1] network

c. Node 2, qfe0 to production network

d. Node 2, qfe4 to production network (NAFO)

e. Node 1, qfe0 to production network

f. Node 1, qfe4 to production network (NAFO)

Key:
Administration network
Production network
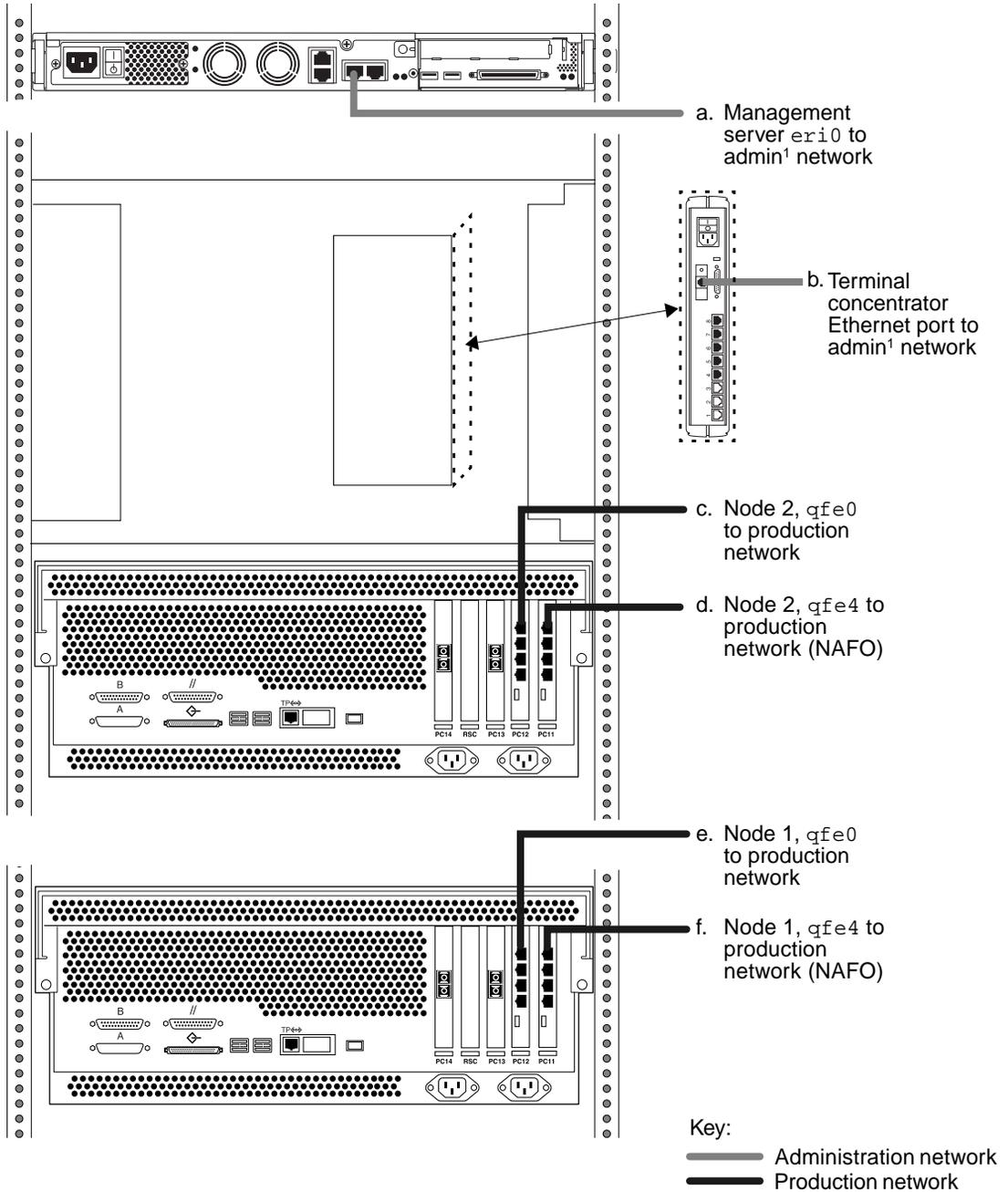
Note 1: If you do not have an admin. network, connect this port to your production network.

FIGURE 2-2   Cluster Platform 280/3 Connections to Your Networks

Configuring the Software

When your system is shipped from the factory, the management server is pre-loaded with all of the necessary software to install the Solaris operating environment and Sun Cluster software on the cluster nodes. You must configure the terminal concentrator first.

Caution – You must enter the correct parameters during the initial configuration, or the system will not configure properly.

▼ To Configure the Terminal Concentrator

Because the Cluster Platform does not have a monitor, it is only accessible from another system that you provide (referred to as the *local system* in this guide). The local system is simply used as a remote display to the management server, and it must be connected to the same network as the Cluster Platform. You do not need to permanently dedicate any particular system as the local system. It can be any system that is convenient at the time. For the first several steps, however, the local system needs to be in close proximity to the Cluster Platform (for connecting a temporary cable connection for `tip`) and it should be running Solaris (or use a laptop as described in Appendix A).

1. **Power on the expansion cabinet power sequencers, and then power on all individual system components, except for the Sun StorEdge T3 disk arrays.**

Caution – Do not power on the Sun StorEdge T3 disk arrays until instructed to do so on page 47.

2. Provide console connectivity from the local system to the terminal concentrator:

Note – The initial access to the terminal concentrator is performed using the `tip` command through a serial port of the local system to Port 1 of the terminal concentrator.

---

a. **Disconnect the serial cable (part no. 530-9524) from Port 1 of the terminal concentrator.**

b. **Connect the RJ-45 end of the serial cable (part no. 530-2151) to Port 1 of the terminal concentrator and the other end, DB-25 male, to serial port B of your local system.**
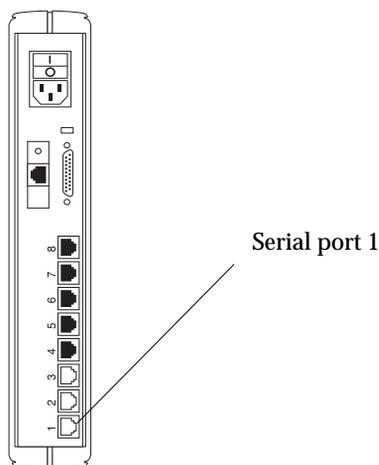
Serial port 1

FIGURE 2-3   Terminal Concentrator Serial Port 1

3. From a terminal window on the local system, type the following command:

```
# /usr/bin/tip hardwire
```

The `tip`(1M) command connects the local system I/O to the terminal concentrator I/O during an interactive session.

Note – If the port is busy, see Appendix C for information on configuring another port for a `tip` connection.

---

4. Configure the terminal concentrator:

- Power on the terminal concentrator.
- Within 5 seconds after power on, press and release the TEST button.

The terminal concentrator undergoes a series of diagnostics tests that take approximately 60 seconds to complete.

Following the diagnostics tests, the `tip` window of the local system displays:

```
System Reset - Entering Monitor Mode
monitor::
```

5. Configure the network addressing information for the terminal concentrator.

Use the addr, addr -d, and sequence commands to modify and verify the network configuration of the terminal concentrator. Refer to your completed worksheet for the network address information.

In the following example, replace the addresses shown in italics with the appropriate addresses for your network environment.

```
monitor:: addr
 Enter Internet address [0.0.0.0]:: 192.168.0.2
 Internet address: 192.168.0.2
 Enter Subnet mask [255.255.0.0]:: 255.255.255.0
 Subnet mask: 255.255.255.0
 Enter Preferred load host Internet address [<any host>]::0.0.0.0
 Preferred load host address: 0.0.0.0
 Enter Broadcast address [0.0.0.0]:: 192.168.0.255
 Broadcast address: 192.168.0.255
 Enter Preferred dump address [0.0.0.0]::0.0.0.0
 Preferred dump address: 0.0.0.0
 Select type of IP packet encapsulation (ieee802/ethernet)
[<ethernet>]:: ethernet
 Type of IP packet encapsulation: <ethernet> :: ethernet
 Load Broadcast Y/N [Y]:: N
 Load Broadcast: N

monitor:: addr -d
 Ethernet address (hex): 00-80-2D-ED-21-23
 Internet address: 192.168.0.2
 Subnet masks: 255.255.255.0
 Preferred load host address: 0.0.0.0
 Broadcast address: 192.168.0.255
 Preferred dump address: 0.0.0.0
 Type of IP packet encapsulation: ethernet
 Load Broadcast: N

monitor:: sequence

Enter a list of 1 to 4 interfaces to attempt to use for downloading
code or upline dumping. Enter them in the order they should be
tried, separated by commas or spaces. Possible interfaces are:

 Ethernet: net
 SELF: self

Enter interface sequence [net]:: self
 Interface sequence: self
```

6. **Terminate your tip session by entering ~. (tilde and period).**

```
monitor:: ~.
```

7. **Power cycle the terminal concentrator to apply the IP address changes and wait at least two minutes for the terminal concentrator to activate its network.**

8. **Return the system to the factory cable configuration:**

   a. **Remove the cable that you connected for the earlier `tip` step.**

      Disconnect the serial cable (part no. 530-2151) from port 1 of the terminal concentrator and from the local system.

   b. **Reconnect the serial cable (part no. 530-9524) to Port 1 of the terminal concentrator.**

Note – At this time, the cluster configuration should be cabled as originally shipped from the factory.

---

9. **From the local system, type the following command to verify that the terminal concentrator responds to the new IP address:**

```
# /usr/sbin/ping 192.168.0.2
192.168.0.2 is alive
```

The local system must be connected to the same network to which the terminal concentrator was configured.

10. **Access the terminal concentrator using the** `telnet` **command:**

```
# telnet 192.168.0.2
Trying 192.168.0.2...
Connected to 192.168.0.2.
Escape character is '^]'.
cli

Enter Annex port name or number: cli
Annex Command Line Interpreter   *   Copyright 1991 Xylogics, Inc.
annex: su
Password: 192.168.0.2 (password defaults to the assigned IP address)
```

Note – The default password matches the IP address of the terminal concentrator. You can change the default password of the terminal concentrator to avoid unnecessary security exposure. Refer to the terminal concentrator documentation for more information.

11. **Edit the terminal concentrator** `config.annex` **file:**

```
annex#  edit config.annex
```

The terminal concentrator opens an editing session for the `config.annex` file.

12. **Type the following information into the** `config.annex` **file. Replace** *198.168.0.248* **with the appropriate default router address for the management server in your network.**

```
% gateway
net default gateway 198.168.0.248 metric 1 hardwired

Ctrl-W: save and exit  Ctrl-X: exit  Ctrl-F: page down  Ctrl-B:
page up
```

13. **Type Ctrl+W to save the changes and exit the** `config.annex` **file.**

14. **Enable access to all ports.**

```
annex# admin
Annex administration MICRO-XL-UX R7.0.1, 8 ports
admin: port all
admin: set port mode slave
       You may need to reset the appropriate port, Annex subsystem
        or reboot the Annex for changes to take effect.
admin: quit
```

15. **Reboot the terminal concentrator.**

```
annex#: boot
bootfile: <CR>
warning: <CR>
       *** Annex (192.168.0.2) shutdown message from port v1 ***
       Annex (192.168.0.2) going down IMMEDIATELY
```

After 90 seconds, the terminal concentrator and all ports will be accessible from outside the subnet. Use the /usr/sbin/ping 192.168.0.2 command to determine when the terminal concentrator is ready to be used.

▼ To Configure the Management Server

Caution – On the local system, you must set and export the TERM environment variable to a value that emulates the kind of terminal you are using. This setting should also correlate with the terminal emulation you choose on page 27 in Step 7. If this is not done, the text might not display properly on the screen.

When executing commands on the management server from the local system, verify that the DISPLAY shell environment variable (on the management server) is set to the IP address of the local system (local host).

In the following steps, replace the italicized examples with the appropriate names and addresses from the worksheet.

1. **From your local system, access the terminal concentrator:**

   Telnet to the terminal concentrator, and select Port 1. The following steps will assist you in the configuration of the management server; at the conclusion of the steps, the management server will reboot, and you will be asked a series of questions to configure the cluster.

   The following are the port designations:

   - Port 1 = management server
   - Port 2 = cluster node 1
   - Port 3 = cluster node 2

   ```
   # telnet 192.168.0.2
   Trying 192.168.0.2...
   Connected to 192.168.0.2.
   Escape character is '^]' <CR>

   Rotaries Defined:
       cli

   Enter Annex port name or number: 1
   ```

2. **Type Ctrl+] and type send brk at the telnet prompt to make sure that the management server is at the "ok" OpenBoot PROM prompt.**

3. **Set auto-boot? to true from the OBP prompt as follows:**

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

4. **Boot the management server from the OBP prompt to start the configuration process.**

The management server boots and begins asking you to define information that is specific to your site.

```
ok boot disk
Resetting ...
LOM event: +17h48m45s host reset

@
Netra T1 200 (UltraSPARC-IIe 500MHz), No Keyboard
OpenBoot 4.0, 1 GB memory installed, Serial #16641800.
Ethernet address 8:0:20:fd:ef:8, Host ID: 80fdef08.


Executing last command: boot disk
Boot device: /pci@1f,0/pci@1/scsi@8/disk@0,0  File and args:
SunOS Release 5.8 Version Generic_108528-12 64-bit
Copyright 1983-2001 Sun Microsystems, Inc.  All rights reserved.
Hostname: unknown
metainit: unknown: there are no existing databases

Configuring /dev and /devices
Configuring the /dev directory (compatibility devices)
The system is coming up.  Please wait.
```

Caution – The following steps provide critical information for configuring the cluster platform. Use the information you collected in the worksheet.

5. **Select a language.**

```
Select a Language

   0. English
   1. French
   2. German
   3. Italian
   4. Japanese
   5. Spanish
   6. Swedish

Please make a choice (0 - 6), or press h or ? for help: 0
```

6. Choose a locale.

```
 Select a Locale

   0. English (C - 7-bit ASCII)
   1. Albania (ISO8859-2)
   2. Australia (ISO8859-1)
   3. Belgium-Flemish (ISO8859-1)
   4. Belgium-Flemish (ISO8859-15 - Euro)
   5. Bosnia (ISO8859-2)
   6. Brazil (ISO8859-1)
   7. Bulgaria (ISO8859-5)
   8. Canada-English (ISO8859-1)
   9. Catalan, Spain (ISO8859-1)
  10. Catalan, Spain (ISO8859-15 - Euro)
  11. Croatia (ISO8859-2)
  12. Czech Republic (ISO8859-2)
  13. Denmark (ISO8859-1)
  14. Denmark (ISO8859-15 - Euro)
  15. Egypt (ISO8859-8)
  16. Estonia (ISO8859-15)
  17. Finland (ISO8859-1)
  18. Finland (ISO8859-15 - Euro)

Press Return to show more choices.
Please make a choice (0 - 52), or press h or ? for help: 0
```

Note – When the correct terminal type is used, the text at the bottom of most of the screens in steps 3 through 19 shows function keys instead of escape sequences for the options. If the terminal cannot interpret the function keys properly, the screens will show escape sequences. Most of the screens also have different options than those shown in the examples.

Selection screens have two options, escape sequences or:

```
F2_Continue   F6_Help
```

Confirmation screens have three options, escape sequences or:

```
F2_Continue   F4_Change   F6_Help
```

The only exception to these rules is the Time Zone selection screen, which has a Cancel option:

```
F2_Continue   F5_Cancel   F6_Help
```

7. **Select the appropriate terminal emulation:**

   Choose one of the terminal types from the list that best emulates the kind of terminal you are using on the local system.

   ```
   What type of terminal are you using?
    1) ANSI Standard CRT
    2) DEC VT52
    3) DEC VT100
    4) Heathkit 19
    5) Lear Siegler ADM31
    6) PC Console
    7) Sun Command Tool
    8) Sun Workstation
    9) Televideo 910
    10) Televideo 925
    11) Wyse Model 50
    12) X Terminal Emulator (xterms)
    13) Other
   Type the number of your choice and press Return: 3
   ```

   After you select the terminal emulation, network connectivity is acknowledged.

8. **Select Yes to the network connectivity question.**

   The `eri0` interface on the management server is intended for connectivity to the administration network.

   ```
   - Network Connectivity ------------------------------------------
   Specify Yes if the system is connected to the network by one of
   the Solaris or vendor network/communication Ethernet cards that
   are supported on the Solaris CD. See your hardware documentation
   for the current list of supported cards.
   Specify No if the system is connected to a network/communication
   card that is not supported on the Solaris CD, and follow the
   instructions listed under Help.

          Networked
          ---------
          [X] Yes
          [ ] No
   ------------------------------------------------------------------
   Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
   ```

9. **Deselect Dynamic Host Configuration Protocol (DHCP) services.**

Because the management server must have a fixed IP address and name recognized by outside clients, DHCP is not supported for this function:.

```
- DHCP ------------------------------------------------------------
On this screen you must specify whether or not this system should
use DHCP for network interface configuration.  Choose Yes if DHCP
is to be used, or No if the interfaces are to be configured
manually.

WARNING: Because this machine booted from the network, DHCP support
will not be enabled, if selected, until after the system reboots.


      Use DHCP
      --------
      [ ] Yes
      [X] No
--------------------------------------------------------------
Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

10. **Select the primary network interface.**

The management server configuration uses eri0 as the default primary network interface. This is the only interface you should configure at this time.

```
On this screen you must specify which of the following network
adapters is the system's primary network interface. Usually the
correct choice is the lowest number. However, do not guess; ask
your system administrator if you're not sure.

To make a selection, use the arrow keys to highlight the option and
press Return to mark it [X].

      Primary network interface
      -------------------------
      [X] eri0
      [ ] eri1
--------------------------------------------------------------
Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

11. Define the host name of the management server.

```
- Host Name ------------------------------------------------------
On this screen you must enter your host name, which identifies this
system on the network.  The name must be unique within your domain;
creating a duplicate host name will cause problems on the network
after you install Solaris.

A host name must be at least two characters; it can contain
letters, digits, and minus signs (-).


     Host name: sc3sconf1-ms



     ------------------------------------------------------------
Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

12. Type the IP address for the `eri0` **port of the management server.**

```
- IP Address ------------------------------------------------------

On this screen you must enter the Internet Protocol (IP) address
for this system.  It must be unique and follow your site's address
conventions, or a system/network failure could result.

IP addresses contain four sets of numbers separated by periods (for
example 129.200.9.1).


     IP address: 192.168.0.1




     ------------------------------------------------------------
Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

13. Select a subnet membership.

The default configuration is to provide network connectivity on a subnetted network.

```
- Subnets -----------------------------------------------------

On this screen you must specify whether this system is part of a
subnet.  If you specify incorrectly, the system will have problems
communicating on the network after you reboot.

To make a selection, use the arrow keys to highlight the option and
press Return to mark it [X].


      System part of a subnet
      -----------------------
      [X] Yes
      [ ] No


      ---------------------------------------------------------------
      Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

14. Specify a netmask.

```
- Netmask -----------------------------------------------------

On this screen you must specify the netmask of your subnet.  A
default netmask is shown; do not accept the default unless you are
sure it is correct for your subnet.  A netmask must contain four
sets of numbers separated by periods (for example 255.255.255.0).


      Netmask: 255.255.255.0




      ---------------------------------------------------------------
      Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

15. **Disable IPv6 support.**

    Currently, only version 4 of the IP software is supported. Verify that IPv6 support is disabled.

```
- IPv6 -------------------------------------------------------
On this screen you should specify whether or not IPv6, the next
generation Internet Protocol, will be enabled on this machine.
Enabling IPv6 will have no effect if this machine is not on a
network that provides IPv6 service. IPv4 service will not be
affected if IPv6 is enabled.

To make a selection, use the arrow keys to highlight the option and
press Return to mark it [X].


      Enable IPv6
      -----------
      [ ] Yes
      [X] No




---------------------------------------------------------------
Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

16. Confirm the site-specific information for the management server:

```
- Confirm Information -----------------------------------------
Confirm the following information.  If it is correct, press F2;
to change any information, press F4.


                       Networked: Yes
                       Use DHCP: No
      Primary network interface: eri0
                      Host name: sc3sconf1-ms
                     IP address: 192.168.0.1
       System part of a subnet: Yes
                        Netmask: 255.255.255.0
                    Enable IPv6: No







---------------------------------------------------------------
Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

17. **Deselect Kerberos security.**

    Only standard UNIX security is currently supported.

```
- Configure Security Policy: -----------------------------------

Specify Yes if the system will use the Kerberos security mechanism.

Specify No if this system will use standard UNIX security.

        Configure Kerberos Security
        ---------------------------
        [ ] Yes
        [X] No




        -----------------------------------------------------------------
Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

18. **Confirm your selection for Kerberos security.**

    Verify that Kerberos security is not configured.

```
  -Confirm Information ---------------------------------------

  Confirm the following information.  If it is correct, press F2;
  to change any information, press F4.



     Configure Kerberos Security: No



     -----------------------------------------------------------------
     Esc-2_Continue     Esc-4_Change     Esc-6_Help
```

19. **Select None for the name service menu.**

For this function, you must select None. After the management server and cluster nodes are configured, you can manually set up a name service.

```
 -Name Service -------------------------------------------------

On this screen you must provide name service information.  Select
the name service that will be used by this system, or None if your
system will either not use a name service at all, or if it will
use a name service not listed here.

To make a selection, use the arrow keys to highlight the option
and press Return to mark it [X].


      Name service
      ------------
      [ ] NIS+
      [ ] NIS
      [ ] DNS
      [ ] LDAP
      [X] None




 ----------------------------------------------------------------
 Esc-2_Continue     Esc-6_Help
```

20. Confirm the information for the name service.

> **Note –** The two cluster nodes are automatically configured to *not support* any name services. This default configuration avoids the need to rely on external services. After the cluster nodes are configured, name services can be manually configured.

```
 - Confirm Information -----------------------------------------

 Confirm the following information.  If it is correct, press F2;
 to change any information, press F4.


     Name service: None








 ---------------------------------------------------------------
 Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

21. **Select your region:**

```
- Time Zone ---------------------------------------------------

On this screen you must specify your default time zone.  You can
specify a time zone in three ways:  select one of the geographic
regions from the list, select other - offset from GMT, or other -
specify time zone file.

To make a selection, use the arrow keys to highlight the option and
press Return to mark it [X].


Regions
-------
[ ] Asia, Western
[ ] Australia / New Zealand
[ ] Canada
[ ] Europe
[ ] Mexico
[ ] South America
[X] United States
[ ] other - offset from GMT
[ ] other - specify time zone file


---------------------------------------------------------------
Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

22. Select your time zone.

Note – Verify that you select the correct time zone. The following is an example only.

```
- Time Zone ----------------------------------------------------

To make a selection, use the arrow keys to highlight the option and
press Return to mark it [X].


     Time zones
     --------------
     [ ] Eastern
     [ ] Central
     [ ] Mountain
     [X] Pacific
     [ ] East-Indiana
     [ ] Arizona
     [ ] Michigan
     [ ] Samoa
     [ ] Alaska
     [ ] Aleutian
     [ ] Hawaii




-----------------------------------------------------------------
Esc-2_Continue     Esc-5_Cancel     Esc-6_Help
```

23. Set the date and time:

```
- Date and Time ------------------------------------------------

Accept the default date and time or enter
new values.

  Date and time: 2001-10-05 11:15

    Year   (4 digits) : 2001
    Month  (1-12)     : 10
    Day    (1-31)     : 05
    Hour   (0-23)     : 11
    Minute (0-59)     : 04


----------------------------------------------------------------
Esc-2_Continue    Esc-5_Cancel    Esc-6_Help
```

24. Confirm the date and time, and time zone information:

```
- Confirm Information -------------------------------------------

Confirm the following information.  If it is correct, press F2;
to change any information, press F4.


      Time zone: US/Pacific
  Date and time: 2001-10-05 11:04:00




----------------------------------------------------------------
Esc-2_Continue    Esc-5_Cancel    Esc-6_Help
```

25. Create a secure root password for the management server.

```
On this screen you can create a root password.

A root password can contain any number of characters, but only the
first eight characters in the password are significant. (For
example, if you create 'a1b2c3d4e5f6' as your root password, you
can use 'a1b2c3d4' to gain root access.)

You will be prompted to type the root password twice; for security,
the password will not be displayed on the screen as you type it.

If you do not want a root password, press RETURN twice.

Root password: abc

Re-enter your root password. abc

Press Return to continue.
```

The system reboots, and the cluster environment customization starts. After the
system customization is completed, the management server installs the Solstice
DiskSuite software and configures itself as an installation server for the cluster
nodes.

▼ To Customize the Cluster Environment

⚠️ **Caution –** The following steps provide critical information for configuring the cluster nodes. Use the information you added to the worksheet to answer the questions in the following procedure.

1. **Confirm (or deny) that the management server information you entered in the previous procedure is correct.**

   Before the cluster environment customization script starts, you are given the chance to decide if you want to continue, or if you want to re-enter the information from the previous procedure.

   ```
   You have just finished the system identification for the
   (MS) Management Server.

   Before continuing, the system identification information
   previously entered must be correct. It will be used for
   setup and configuration of the cluster environment and
   can not be changed with out a complete recovery from the
   recovery CD/DVD for the MS.

   Is the MS system ID information correct ?
   Do you want to continue with the setup ? (y/n)y

   System ID information is correct. Continuing with setup
   and configuration for cluster environment.
   ```

   Based on your response to this question, take the following action:

   - **y** (yes)—proceed to Step 2.
   - **n** (no)—the system will unconfigure the management server configuration information and halt. Return to page 24, Step 4 to repeat the previous procedure.

2. **Specify the default router address for the cluster:**

   ```
   Enter the Management Server's Default Router (Gateway) IP
   Address... 198.168.0.248
   ```

3. **Specify the terminal concentrator name and enter the IP address:**

   ```
   Enter the Terminal Concentrator Name...TC
   Enter the Terminal Concentrator's IP Address...192.168.0.2
   ```

4. Enter the following cluster environment names and addresses.

> **Note –** In the following examples, many of the default addresses are selected by pressing return. You can use the default internal admin network addresses as long as they do not conflict with the network addressing in your network environment.

```
-- Cluster Environment and Public Network Settings (Cluster Nodes) --
Enter the Cluster Nodes Default Router (Gateway) IP Address...
router_IP_address
Enter the Cluster Environment Name (node names will follow)... sc
Enter the Public Network Mask for the Cluster Nodes:
[255.255.255.0]... <cr>
Enter the First Cluster Node's Name... node1
Enter the First Cluster Node's IP Address... node1_IP_address

   NOTE: Please double check that you are entering the
   correct MAC address.  This cluster node will not setup
   correctly if the wrong MAC Address is entered

Enter the First Cluster Node's Ethernet Address... 8:0:20:fb:29:8e
Enter the Second Cluster Node's Name...node2
Enter the Second Cluster Node's IP Address...node2_IP_address

   NOTE: Please double check that you are entering the
   correct MAC address.  This cluster node will not setup
   correctly if the wrong MAC Address is entered

Enter the Second Cluster Node's Ethernet Address... 8:0:20:fb:1a:55
```

5. Enter the internal administration network addresses.

```
----- Internal Admin Network Settings (MS, Cluster Nodes and T3's)
------

>>> Network Address for the Internal Admin Network <<<
    The internal admin network uses the default address
    of 10.0.0.0.
    If this network address is already in use elsewhere within your
    enterprise, you must use another address from the range of
    recommended private addresses (see RFC 1918 for details).
    If you do select another network address, note that the
    last octet must be zero to reflect a network.

    The default netmask is 255.255.255.0; you can select another
    netmask, as long as it masks all of the bits in the network
    address.

Enter the Internal Admin Network Address: [10.0.0.0]... <cr>
Enter the Internal Admin Network Mask: [255.255.255.0]... <cr>

Enter the Admin Network IP Address for the Management Server:
[10.0.0.1]...<cr>

 NOTE: The assigned admin network hostname will be MS-280R-admin
Enter the Admin Network IP Address for the First Cluster Node:
[10.0.0.2]... <cr>

    NOTE: The assigned admin network hostname will be node1-admin

Enter the Admin Network IP Address for the Second Cluster Node:
[10.0.0.3]... <cr>

    NOTE: The assigned admin network hostname will be node2-admin
```

6. Enter the T3 array names and internal network addresses.

You can accept the default values if they do not conflict with existing addresses in your network environment.

```
Enter the First T3's Name... T3-01
Enter the admin network IP address for the first T3...
[10.0.0.4]...<cr>

    NOTE: Please double check that you are entering the correct
     MAC address. This T3 will not function correctly if the wrong
     MAC Address is entered

Enter the First T3's Ethernet Address... 00:20:f2:00:3e:a6

Enter the Second T3's Name... T3-02
Enter the admin network IP address for the second T3...
[10.0.0.5]...<cr>

    NOTE: Please double check that you are entering the correct
     MAC address. This T3 will not function correctly if the wrong
     MAC Address is entered

Enter the Second T3's Ethernet Address... 00:20:f2:00:04:d6
```

Note – The T3 ethernet addresses must include both digits of each octet as shown in the following example, for example, `00:12:e2:00:4c:4b` is typed instead of `0:12:e2:0:4c:4b`. If this is not entered correctly, the T3 host information may not be set properly.

7. **Specify the network address of the private interconnect:**
   - To accept the default network address, type **y**.
   - To specify a different address, type **n**, followed by the network address.

     Refer to the worksheet.

   ```
    >>> Network Address for the Cluster Transport <<<

   The private cluster transport uses a default network address of
   172.16.0.0. But, if this network address is already in use
   elsewhere within your enterprise, you may need to select another
   address from the range of recommended private addresses (see RFC
   1597 for details).

   If you do select another network address, please bear in mind that
   the Sun Clustering software requires that the rightmost two octets
   always be zero.

   The default netmask is 255.255.0.0; you may select another netmask,
   as long as it minimally masks all bits given in the network address
   and does not contain any holes.

   Is it okay to accept the default network address [172.16.0.0]
   (y/n) y
   ```

   Note – For the range of recommended private addresses, refer to Section 3 of the
   Request for Comments (RFC) 1918 Internet standard from the Internet Engineering
   Task Force (IETF).

8. **Specify the netmask address of the private interconnect:**
   - To accept the default netmask address, type **y**.

   - To specify a different netmask address, type **n**, followed by the netmask address.

   ```
   Is it okay to accept the default netmask [255.255.0.0] (y/n) y
   ```

9. **Confirm the assigned names and addresses:**
   - If all are correct, type `y`.
   - If any of the values are not correct, type `n`, and the line number of the item to change, followed by the correct value.
   - Type `99` to quit the update mode when all values are displayed correctly.

```
Management Server "MS-280R" (192.168.0.1) at 8:0:20:fd:ef:8
Option   External Admin Network Setting
-------  ----------------------------------------------------------------
     1) Management Server's Default Router= 192.168.0.248
     2) Terminal Server's Name= TC
     3) Terminal Server's IP Address= 192.168.0.2
Option   Cluster Environment and Public Network Settings
------   ----------------------------------------------------------------
     4) Cluster Name= sc
     5) Cluster Nodes Default Router= router_IP_address
     6) Public Network Mask for the Cluster Nodes= 255.255.255.0
     7) First Node's Name= node1
     8) First Node's IP Address= node1_IP_address
     9) First Node's Ethernet Address= 8:0:20:fb:29:8e
    10) Second Node's Name= node2
    11) Second Node's IP Address= node2_IP_addres
    12) Second Node's Ethernet Address= 8:0:20:fb:1a:55
Option   Internal Admin Network Settings Network Settings
------   ----------------------------------------------------------------
    13) Internal Admin Network address= 10.0.0.0
    14) Internal Admin Netmask= 255.255.255.0}
    15) Admin IP Address for the Management Server= 10.0.0.1
    16) Admin IP Address for the First Cluster Node= 10.0.0.2
    17) Admin IP Address for the Second Cluster Node= 10.0.0.3
    18) First T3's Host Name= T3-01
    19) First T3's Admin Network IP Address= 10.0.0.4
    20) First T3's Ethernet Address= 00:20:f2:00:3e:a6
    21) Second T3's Host Name= T3-02
    22) Second T3's Admin Network IP Address= 10.0.0.5
    23) Second T3's Ethernet Address= 00:20:f2:00:04:d6
Option   Cluster Private Interconnect Settings
------   ----------------------------------------------------------------
    24) Private Interconnect Network Address= 172.16.0.0
    25) Private Interconnect Netmask= 255.255.0.0
Option   Finish Updates
------   ----------------------------------------------------------------
    99) quit update mode....

  Are all variables correctly set y/n? y
```

10. **When prompted, choose one of the following volume manager products:**

- Solstice DiskSuite—type **y**
- VERITAS Volume Manager—type **n**

```
Storage Software Configuration <

The Cluster nodes can be configured with either
*Solstice DiskSuite 4.2.1 or Veritas VM 3.1.1*

The default is Solstice DiskSuite 4.2.1 .
If the installer does not except the default,
Veritas Volume Manager 3.1.1 will be installed.
By choosing VXVM 3.1.1 you will be making a choose
to encapsulate your boot disk.

A Veritas license is required for each node running
VXVM 3.1.1 . You will be prompted during the install
of each cluster node to enter the license key.

Please have the license keys ready.


Do you want to install Solaris Volume Manager 4.2.1 (y/n) y
```

The configuration files for the management server are configured for root and swap mirroring.

```
===================================================================
PLEASE WAIT: Setting up Management Server configuration files for
jumpstart services
Preparing Management Server for root and swap mirroring.

System will reboot after setup!
===================================================================
Netra T1 200 (UltraSPARC-IIe 500MHz), No Keyboard
OpenBoot 4.0, 1 GB memory installed, Serial #16641800.
Ethernet address 8:0:20:fd:ef:8, Host ID: 80fdef08.
```

The management server reboots.

▼ To Boot Up the T3 Arrays

1. **Power on the Sun StorEdge T3 disk arrays.**

```
==============================================================
Power on T3's at this point. If T3's are already powered up,
Power cycle them and let them reboot.

This will take 3-4 minutes !!

Please Wait until T3's have completely rebooted.

Press the Return key when T3's are ready!
==============================================================
```

The disk arrays boot.

2. **Press Return when the Sun StorEdge T3 disk arrays are finished booting.**

▼ To Set Up the Sun Management Center Software

Refer to the *Sun Management Center 3.0 Installation Guide* for additional details.

1. **Choose to set up, or not set up the Sun Management Center (Sun MC) software:**

   - Type **y** to set up Sun Management Center software (server, agent, and console) on the management server, and continue with Step 2.

   - Type **n** to set up the management server without configuring the Sun Management Center software, and proceed to "To Launch the Cluster Console for Both Cluster Nodes" on page 57. You can install the Sun Management Center software at another time by running the Sun Management Center setup script (`/opt/SUNWsymon/sbin/es-setup`).

```
 - Do you want to setup Sun MC 3.0 (y/n) y
```

Note – If you receive an error that reports `Missing Product License`, you can do one of the following:
-Ignore the error, and run the SunMC software as usual. The license is used for SunMC advanced monitoring features. The standard features do not require a license.
-Obtain a SunMC license. Visit:
`http://www.sun.com/solaris/sunmanagementcenter`

2. **Answer the Sun Management Center installation questions as shown in the following example:**

```
-----------------------------------
Sun Management Center Setup Program
-----------------------------------


This program does setup of Sun Management Center components that
are installed on your system.

Checking for Sun Management Center components installed on your
system.

You have the following Sun Management Center components installed

Sun Management Center Server
Sun Management Center Agent
Sun Management Center Console

Sun Management Center successfully configured for java:
"Solaris_JDK_1.2.2_08"

Configuring the system for setup, please wait.

This part of setup generates security keys used for communications
between processes. A seed must be provided to initialize the keys.
Please make sure you use the same seed for all the machines you
install.
You may like to keep record of this seed for future use.

Please enter the seed to generate keys:abc123
Please re-enter the seed to confirm:abc123

You should setup a user as a Sun Management Center administrator.
This person will be added to the esadm and esdomadm groups.
Please enter a user to be the Sun Management Center
administrator:root

The Sun Management Center base URL is relative to the Sun
Management Center Console.
The Sun Management Center Console is able to request help
documentation via the network.
```

```
If you have installed Sun Management Center help documentation in
an http-accessible location within your network, you may specify
this location. If Sun Management Center help is installed on the
console host, simply accept the default value.
Please enter base URL to Sun Management Center help [local]: <cr>

The base URL has been set to file:/opt/SUNWsymon/lib/locale

Starting Advanced System Monitoring setup

Checking config reader support for Advanced System Monitoring ...
Checking for required config reader done.

Creating /var/opt/SUNWsymon/cfg/console-host-apps.cfg ...

Add Advanced System Monitoring as Sun Management Center
application ...
Using /var/opt/SUNWsymon/cfg/console-host-apps.cfg
/var/opt/SUNWsymon/cfg/details-applications-j.x updated.

Finished with Advanced System Monitoring setup

----------------------------------------------------------------
Starting Sun Management Center Service Availability Manager Setup
----------------------------------------------------------------
Setup for Service Availability Manager in progress, please wait.
Setup of Service Availability Manager complete.
```

3. **Specify whether you want to install the Sun Management Center Sun Fire 15K administration module.**

   - Type **y** if you have Sun Fire 15K servers in your enterprise and you want to monitor them with Sun Management Center.
   - Type **n** if you do not have Sun Fire 15K servers in your environment.

```
--------------------------------------------------------
Starting Sun Management Center Sun Fire 15000 Server Setup
--------------------------------------------------------

Would you like to setup this Sun Management Center package? [y|n|q] n
```

4. **Specify whether you want to install the Sun Management Center Sun Fire 15K system controllers administration module.**

   ■ Type **y** if you have Sun Fire 15K system controllers in your enterprise and you want to monitor them with Sun Management Center.

   ■ Type **n** if you do not have Sun Fire 15K system controllers in your environment.

   ```
   --------------------------------------------------
   Starting Sun Management Center Sun Fire 15000 System Controller
   Server Setup
   --------------------------------------------------

   Would you like to setup this Sun Management Center package? [y|n|q] n
   ```

5. **Specify whether you want to install the Sun Fire 6800/4810/4800/3800 administration module.**

   ■ Type **y** if you have Sun Fire 6800/4810/4800/3800 servers in your enterprise and you want to monitor them. Answer the additional installation prompts.

   ■ Type **n** if you do not have these Sun Fire servers in your environment.

   ```
   For setting up Sun Fire (6800/4810/4800/3800) platform
   administration module you need to provide SC IP address, community
   strings, port numbers for domain agent etc.

   Do you want to setup Sun Fire (6800/4810/4800/3800) platform
   administration
   module [y|n|q] n
   ```

6. **Press y to install the Sun Management Center Netra t administration module for monitoring the management server and Sun StorEdge T3 arrays.**

   ```
   ----------------------------------------------------------
   Starting Sun Management Center Netra t Setup
   ----------------------------------------------------------
   ---> Platform Found: Netra T1
   ---> Netra t add-on Agent package found! <---
   Do you want to setup Netra t Config Reader for this platform?
   [y|n|q] y
   ```

7. Press y to monitor the T3 arrays.

```
Do you want to setup T3 module [y|n|q] y
```

8. Press 3 to select the Add managed T3 routine.

Selecting 3 causes the script to prompt you with T3 setup questions.

```
----------------------------------
Sun Management Center
StorEdge T3 Module Setup Program
----------------------------------


This program will configure the StorEdge T3,
so that they can be managed by T3 Module


[1] List managed T3
[2] List available T3
[3] Add managed T3
[4] Remove managed T3
[5] Reconfigure managed T3
[6] Quit


Select the function you want to perform [1-6]: 3
```

9. Select 1 to display the list of available T3 arrays.

```
[1] add T3 from available T3 list.
[2] add new T3
[3] return to the main menu
Please press [1-3] 1
```

10. **Type the line number of the first T3 array.**

Note – Do not select any line numbers associated with the nodes.

```
Available T3:
              Name              IP Address

       1       node1            10.0.0.2
       2       node2            10.0.0.3
       3       T3-01            10.0.0.4
       4       T3-02            10.0.0.5

Add available T3 [1-4] 3
```

11. **Type the root password for the selected T3 array, and press Return.**

```
Input root password of T3-01:abc

Check SunMC token files...
Check SunMC token files success.
Check logging status...
Check logging status success.

Press Enter to return: <CR>
```

12. **Type 3 to configure Sun Management support for the second T3 array:**

```
----------------------------------
Sun Management Center
StorEdge T3 Module Setup Program
----------------------------------

This program will configure the StorEdge T3,
so that they can be managed by T3 Module

[1] List managed T3
[2] List available T3
[3] Add managed T3
[4] Remove managed T3
[5] Reconfigure managed T3
[6] Quit

Select the function you want to perform [1-6]: 3
```

13. **Type 1 to display the list of available arrays:**

```
[1] add T3 from available T3 list.
[2] add new T3
[3] return to the main menu
Please press [1-3] 1
```

14. **Type the line number of the second T3 array:**

Note – Do not select any line numbers associated with the nodes.

```
Available T3:
              Name             IP Address

        1       node1            10.0.0.2
        2       node2            10.0.0.3
        3       T3-02            10.0.0.5

Add available T3 [1-3] 3
```

15. **Type the root password for this T3 array, and press** `Return.`

```
Input root password of T3-02:abc

Check SunMC token files...
Check SunMC token files success.
Check logging status...
Check logging status success.

Press ENTER to return: <CR>
```

16. Type 6 to exit the T3 module setup program.

The Sun Management Center software will install the module that supports monitoring of T3 arrays.

```
----------------------------------
Sun Management Center
StorEdge T3 Module Setup Program
----------------------------------


This program will configure the StorEdge T3,
so that they can be managed by T3 Module


[1] List managed T3
[2] List available T3
[3] Add managed T3
[4] Remove managed T3
[5] Reconfigure managed T3
[6] Quit


Select the function you want to perform [1-6]: 6
```

17. **Specify whether you want to install the Sun Management Center CP2000 administration module.**

   - Type `y` to use Sun Management Center to monitor any CP2000 systems (SPARCengine based systems with compact PCI) in your enterprise network and you want to monitor them with Sun Management Center.
   - Type `n` if you do not have CP2000 systems in your environment.

```
----------------------------------------------------------
Starting Sun Management Center CP2000 Application Setup
----------------------------------------------------------
PLATFORM_FILE= /var/opt/SUNWsymon/platform/platform.prop
/var/opt/SUNWsymon/platform
---> Visa application add-on Agent package found! <---
Do you want to setup the CP2000 applications for this platform?
[y|n|q] n
```

18. **If you receive the following question, specify whether you want to install the Sun Management Center CP2000/CP1500 server module.**

   - Type `y` to use Sun Management Center to monitor any CP2000/CP1500 platforms in your enterprise and you want to monitor them with Sun Management Center.
   - Type `n` if you do not have CP2000/CP1500 platforms in your environment.

```
----------------------------------------------------------
Starting Sun Management Center CP2000/CP1500 Server Setup
----------------------------------------------------------
PLATFORM_FILE= /var/opt/SUNWsymon/platform/platform.prop
/var/opt/SUNWsymon/platform
---> Visa Server add-on package found! <---
Do you want to setup the Server Package for the CP2000/CP1500
platforms? [y|n|q] n
```

19. Press y (mandatory) to start the Sun Management Center components, and wait for the Sun Management Center database setup to complete.

```
-----------------------------------------------------------
Starting Sun Management Center WGS Setup
-----------------------------------------------------------
Using /var/opt/SUNWsymon/cfg/console-tools.cfg
/var/opt/SUNWsymon/cfg/tools-extension-j.x updated.

Sun Management Center setup complete.
 Please wait, Sun Management Center database setup in progress. It
may take 15
to 20 minutes

Do you want to start Sun Management Center agent and server
components now
[y|n|q] y

  Waiting for service registration... Running Services...
```

▼ To Launch the Cluster Console for Both Cluster Nodes

1. Type the command /usr/openwin/bin/xhost *192.168.0.1* **(the administration IP address of the management server) to allow your windows manager to display screens from remote systems.**

2. After the management server reboots, log in as root **to start the installation of the cluster software stack described in the following steps.**

```
MS-280R console login: root

Password: abc
Last login: Thu Sep 20 22:53:51 on console
Sun Microsystems Inc.   SunOS 5.8      Generic February 2000

You can produce console windows for each cluster node.
Set DISPLAY variable, export DISPLAY then execute:

ccp $CLUSTER &
```

3. **Type the following command to ensure that the DISPLAY environment variable on the management server is set to the IP address of the local host (the local system):**

```
# DISPLAY=local_host_IP:0.0; export DISPLAY
```

When executing the `ccp`(1M) command remotely, you must ensure that the `DISPLAY` shell environment variable is set to the IP address of the local host.

4. **Type the following command to launch the Cluster Control Panel:**

```
# ccp $CLUSTER &
```

When the `ccp $CLUSTER &` command is executed, the Cluster Control Panel window is displayed (see FIGURE 2-4).

FIGURE 2-4   Cluster Control Panel Window

5. **In the Cluster Control Panel window, double-click the Cluster Console (`cconsole`) icon to display a Cluster Console window for each cluster node (see FIGURE 2-5).**
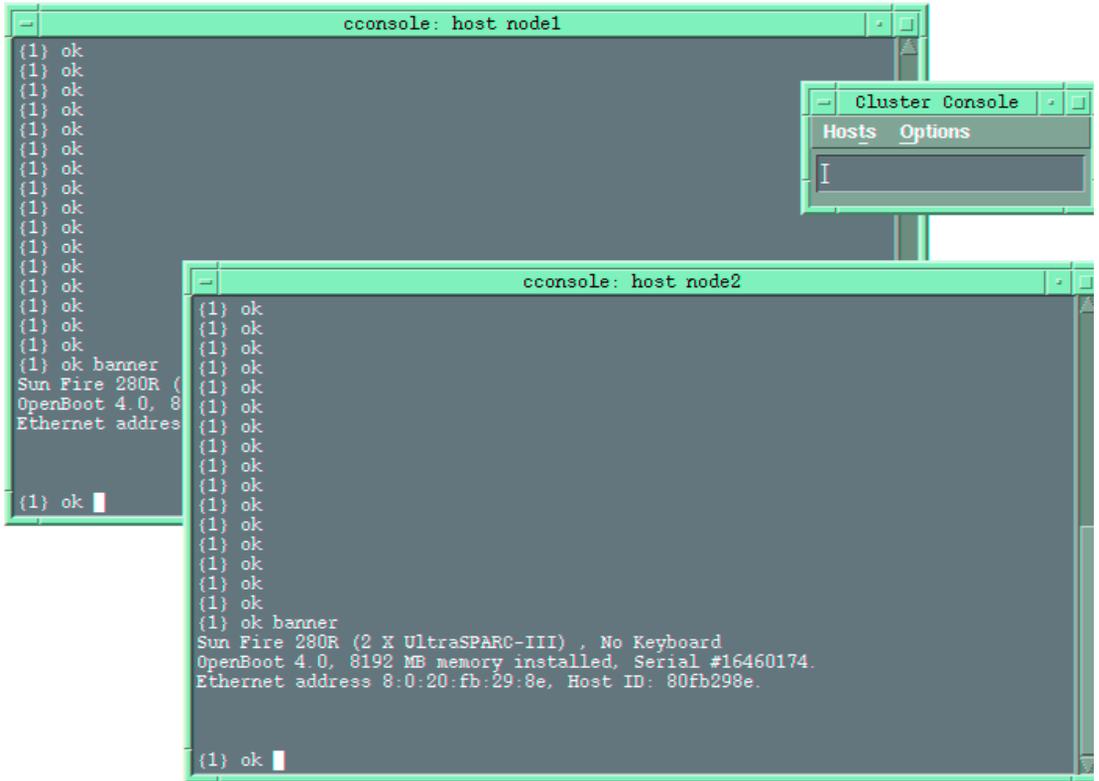
FIGURE 2-5 Cluster Nodes Console Windows

To type text into both node windows simultaneously, type commands in the Cluster Console window.

The text does not display in the Cluster Console window, but displays in both node windows. This ensures that both nodes execute the commands simultaneously.

The console windows for both cluster nodes are grouped (the three windows move in unison—FIGURE 2-5). To ungroup the Cluster Console window from the cluster node console windows, select Options from the Hosts menu (FIGURE 2-6) and deselect the Group Term Windows checkbox.

Note – You can stop the cluster nodes and access the OpenBoot PROM (OBP) prompt by positioning the cursor in the Cluster Console window and typing **Ctrl+].** This control character sequence displays the telnet prompt. Typing **send brk** (equivalent to a stop-a) at the telnet prompt forces access to the OBP prompt.

FIGURE 2-6   Cluster Console Window

▼ To Install the Software Stack on Both Cluster Nodes

1. **Use the Cluster Console window to type the following command into both nodes simultaneously:**

```
boot net - install
```

Note – You must use spaces before and after the dash (-) character in the "boot net - install" command string.

The following software is automatically installed on both cluster nodes:

- Solaris 8 10/01 operating environment
- Solstice DiskSuite 4.2.1 or VERITAS Volume Manager 3.1.1, depending on your selection on page 46 in Step 10.
- Sun Cluster 3.0 and recommended patches

All patches are applied and system files are configured to produce a basic cluster environment.

2. **Take one of the following actions based on the volume manager product you chose on** page 46 **in** Step 10:
   - Solstice DiskSuite—continue with Step 3 below.
   - VERITAS Volume Manager—proceed to "To Configure VERITAS Volume Manager" on page 62.

3. **Log in to each cluster node as a superuser (password is *abc*) and change the default password to a secure password:**

```
# passwd
passwd: Changing password for root
New password: secure-password-choice
Re-enter new password: secure-password-choice
```

4. **Install the Sun Management Center agent on the cluster nodes.**

   Installing the Sun Management Center agent enables you to use Sun Management Center software to monitor the nodes. For installation instructions, refer to the *Sun Management Center 3.0 Installation Guide*.

5. **Configure the Sun StorEdge T3 array shared disk storage.**

   Configure the T3 array volume configuration if you do not plan to use the default T3 configuration. Refer to the T3 documentation that shipped with your Cluster Platform.

   Configure the storage using Solstice DiskSuite, then create disk sets, metadevices, and file systems that suit your needs. Refer to the Solstice DiskSuite documentation.

6. **Proceed to "Finishing Up" on page 66.**

▼ To Configure VERITAS Volume Manager

> ⚠️ **Caution –** The following instructions only apply to configurations that are using VERITAS Volume Manager instead of Solstice DiskSuite. Only follow this procedure if you selected to use VERITAS Volume Manager on page 46 in Step 10, and you have your two VERITAS license keys.

You must have two valid VERITAS license keys (one for each node) to complete this procedure.

1. **In the Cluster Console window (cconsole) choose to encapsulate the root disk, and type the pathname of the jumpstart program:**

```
=======================================================
Configuring Quorum device and VXVM install
=======================================================

Oct  8 13:10:49 node1 cl_runtime: NOTICE: CMM: Cluster members: node1 node2.
Oct  8 13:10:49 node1 cl_runtime: NOTICE: CMM: node reconfiguration #4 completed.
Oct  8 13:10:51 node1 cl_runtime: NOTICE: CMM: Votecount changed from 0 to 1 for
node node2.
Oct  8 13:10:51 node1 cl_runtime: NOTICE: CMM: Cluster members: node1 node2.
Oct  8 13:10:51 node1 cl_runtime: NOTICE: CMM: node reconfiguration #5 completed.
Oct  8 13:10:53 node1 cl_runtime: NOTICE: CMM: Quorum device 1
(/dev/did/rdsk/d2s2) added; votecount = 1, bitmask of nodes with
configured paths = 0x3.
Oct  8 13:10:53 node1 cl_runtime: NOTICE: CMM: Registered key on and acquired
quorum device 1 (gdevname /dev/did/rdsk/d2s2).
Oct  8 13:10:53 node1 cl_runtime: NOTICE: CMM: Quorum device /dev/did/rdsk/d2s2:
owner set to node 1.
Oct  8 13:10:53 node1 cl_runtime: NOTICE: CMM: Cluster members: node1 node2.
Oct  8 13:10:53 node1 cl_runtime: NOTICE: CMM: node reconfiguration #6 completed.

Do you want Volume Manager to encapsulate root [yes]? yes

Where is the Volume Manager cdrom?
/net/ManagementServer-ip-address/jumpstart/Packages/VM3.1.1
```

> **Note –** Ignore references to "cdrom" in the computer output.

2. **In each individual node window, enter the license key for that node (obtained from VERITAS) to register your version of VERITAS Volume Manager:**

Note – You must enter your own valid VERITAS license keys for the script to complete successfully. A VERITAS license key is made up of 23 digits and is formatted as follows:
1234 5678 1234 5678 1234 567 (This is an example only. Do not use this number)**.**

Caution – You must enter valid license keys. If the script detects an error in the license key, the script will not complete successfully.

```
(For node 1)
Volume Manager installation is complete.
Oct  8 15:34:03 node1 vxdmp: NOTICE: vxvm:vxdmp: added disk array
60020f20000004d60000000000000000
Oct  8 15:34:03 node1 vxdmp: NOTICE: vxvm:vxdmp: added disk array
60020f2000003ea00000000000000000

Please enter a Volume Manager license key: node_1_VERITAS_license_key
```

```
(For node 2)
Volume Manager installation is complete.
Oct  8 15:34:03 node2 vxdmp: NOTICE: vxvm:vxdmp: added disk array
60020f20000004d60000000000000000
Oct  8 15:34:03 node2 vxdmp: NOTICE: vxvm:vxdmp: added disk array
60020f2000003ea00000000000000000

Please enter a Volume Manager license key: node_2_VERITAS_license_key
```

3. **In the Cluster Console window, wait for the installer script to display the login prompt:**

```
===============================================================
      Setting up root mirror. This will take approximately 45min's

                            Please wait ....
===============================================================

The system is ready.
node1 console login:
```

4. **In each individual node window, log in to each cluster node as a superuser (password is *abc*) and change the default password to a secure password:**

```
node1 console login: root
Password: abc
# passwd
passwd: Changing password for root
New password: secure-password-choice
Re-enter new password: secure-password-choice
```

```
node2 console login: root
Password: abc
# passwd
passwd: Changing password for root
New password: secure-password-choice
Re-enter new password: secure-password-choice
```

5. **Install the Sun Management Center agent on the cluster nodes.**

Installing the Sun Management Center agent enables Sun Management Center to monitor the nodes. For installation instructions, refer to the *Sun Management Center 3.0 Installation Guide.*

6. **Configure the Sun StorEdge T3 array shared disk storage.**

Configure the storage using VERITAS Volume Manager. Configure the volumes and file systems to suit your needs. Refer to the VERITAS Volume Manager documentation.

Note – The VERITAS Volume Manager VMSA packages are available on the management server in the `/jumpstart/Packages/VM3.1.1` directory. If you want to use the VERITAS GUI, install the VMSA packages with the `pkgadd` command. Once installed, the Volume Manager man pages will be placed in the `/opt/VRTS/man` directory. Add this directory to your `MANPATH` variable to access these pages with the `man` command.

---

7. **Proceed to "Finishing Up" on page 66.**

Finishing Up

1. Install and configure your highly available application(s) for the cluster environment.

   For additional details, refer to the manufacturers' documentation that accompanied your highly available application(s).

   Refer to the following appendices for additional information about configuring the following software that came with your cluster platform:

   - Appendix E, "Installing Sun Component Manager 2.2 on the Management Server" on page 91
   - Appendix F, "Configuring the Sun Ray Server Software on the Management Server" on page 97
   - Appendix G, "Using the HA-NFS File System Agent" on page 103

Note – If you are planning to configure and run Oracle OPS on this cluster platform, you need to download and install patch 111158-03. Read the patch README file before installing this patch. This patch is a supplement patch to 111118-02. Patch 111118-02 is automatically installed on your cluster platform if you choose VERITAS Volume Manager as your choice of volume management product.

---

2. Establish network automatic failover (NAFO), resource groups, logical hosts, and data services to enable your application(s) under the Sun Cluster 3.0 infrastructure. Refer to the Sun Cluster 3.0 documentation. The path to the Sun Cluster data services is:

```
/net/sc3sconf1-ms/jumpstart/Packages/SC3.0u2/scdataservices_3_0_u2
```

   NAFO configuration and activation information is in the *Sun Cluster 3.0 System Administration Guide* that is installed on the management server.

Note – Before you use an editor in a Cluster Console window, verify that the TERM shell environment value is set and exported to a value that emulates the kind of input terminal your are using on the local system.

Cluster Platform 280/3 System Recovery

The recovery disks are used as a last resort because they return the Cluster Platform to its factory shipped configuration and all site specific configuration data is lost. The recovery disks are intended for use ONLY when recovery from your site specific backups have failed.

Caution – Because the recovery results in a generic, from the factory configuration, initiate a recovery only at the direction of technical support.

Caution – Do not use the recovery disks for initial installation and configuration of the Cluster Platform 280/3 system management server.

Recovering the Management Server

The bootable recovery disks enable you to replace the factory-installed Cluster Platform 280/3 environment on the management server in the event of a system disk failure. This chapter does not discuss recovering the cluster nodes.

Before You Begin the Recovery

Before you attempt to restore the management server software environment, you must know your system configuration information and the state of your system backups.

Your system configuration information must include the following:

- System name
- IP address
- Time zone
- Name service
- Subnet information
- Ethernet addresses

Refer to the completed worksheet (TABLE 2-1) for details about your customized setup.

Contents of the Recovery Disks

The recovery disks contain a bootable copy of the Solaris 8 10/01 operating environment, configured to execute the recovery software.

The recovery disks install the following management server software:

- Solaris 8 10/01 operating environment
- Solstice DiskSuite 4.2.1 with patches, and data services
- Sun Cluster 3.0 and recommended patches
- Cluster Platform 280/3 software operating system
- Sun Management Center 3.0 update 4 with Help desk
- AnswerBook2 1.4.4
- Apache 1.3
- Sun Enterprise Explorer 3.5
- JumpStart/Flash server
- Sun StorEdge Component Manager 2.2
- Highly Available (HA) NFS application
- SunRay Server 1.3

The Cluster Platform 280/3 software operating system enables you to jump start the nodes for mirroring. This software also contains information to build the management server and loads the mirroring script.

The Jumpstart/Flash server automates the installation of the Solaris 8 10/01 operating environment, Sun Cluster 3.0 software, and Solstice DiskSuite 4.2.1 software or VERITAS Volume Manager 3.1.1 software on the cluster nodes.

▼ To Perform a Recovery of the Management Server Software

1. **Access the management server console through the terminal concentrator:**

```
# telnet TC
Trying 192.168.0.2 ...
Connected to TC.
Escape character is '^]' <CR>

Rotaries Defined:
    cli

Enter Annex port name or number: 1
```

2. **Take the cluster nodes to the OpenBoot PROM prompt.**

   a. **Position the cursor in the Cluster Console window.**

   b. **Type Ctrl+].**

      This character sequence forces access to the telnet prompt.

   c. **Take the system to the OBP level as follows (equivalent to performing the** Stop-A **command key sequence):**

```
telnet> send brk
```

3. **Mount the Mini Root CD in the DVD-ROM drive on the management server.**

4. **Boot the system from the disk drive:**

```
ok boot cdrom
```

The system boots from the disk drive and prompts you for the Mini Root location (Mini Root is a small temporary operating system used during the installation and configuration of the Solaris operating environment).

▼ To Use the Cluster Recovery Utility

1. **Select the disk you want to use as the new boot disk.**

```
SunTone Cluster Platform Environment Recovery Utility
Starting...
| Searching the systems hard disks for a
location to place the SunTone Cluster Platform Recovery
Environment.

| You must select a disk to become your system's new boot
disk.
Please select a disk for restoring the SunTone Cluster Platform
software:
1 c1t0d0s0
2 c1t1d0s0
Enter selection [?,??,q]: 1
You have selected c1t0d0s0 as the disk on which to restore the
SunTone Cluster Platform software. Please remember your selection.
```

2. **Confirm the selected boot disk.**

```
Do you wish to format and erase c1t0d0s0? [y,n,?,q] y
```

3. **Verify that you want to format and erase the boot disk.**

```
CONFIRM: c1t0d0s0 WILL BE FORMATTED AND ERASED. CONTINUE?
[y,n,?,q] y
```

4. **Confirm the disk slice selection and verify that you want to erase the selected disk.**

```
Formatting c1t0d0s0 for restore...

fmthard: New volume table of contents now in place.

Disk c1t0d0s0 now is formatted to SunTone Cluster Platform
specifications. The Recovery (Disk) Mini root will now be installed
on the swap slice of your choice, and the system will be rebooted.
When the Recovery Mini root prompts you for a disk on which to
install the SunTone Cluster Platform software, remember to choose
c1t0d0s0.

Looking for swap slice on which to install the SunTone Cluster
Platform Recovery Environment...

The Recovery Utility will use the disk slice, c1t0d0s1, labeled as
swap.

WARNING: All information on this disk will be lost
Can the Recovery Utility use this slice [y,n,?] y
```

5. **Wait for the files to copy from the CD to the disk slice.**

```
The recover utility will use disk slice, /dev/dsk/c1t0d0s1.
After files are copied, the system will automatically reboot, and
the
installation will continue.
Please Wait...
```

The system reboots after copying the recovery files, and continues the installation.

```
Copying mini root to local disk....done.

Copying platform specific files....done.

Preparing to reboot and continue installation.
Rebooting to continue the installation
```

Note – Messages that are displayed when a suitable disk slice is found may vary, depending upon the state of your disks. Select a suitable disk slice; the Mini Root is only used temporarily for the recovery boot-up.

---

6. **Select the DVD drive.**

   After the Cluster Platform 280/3 system recovery utility has placed a copy of the Solaris operating environment onto a suitable disk slice, the system reboots. You are prompted to specify the DVD drive.

   ```
   SunTone Cluster Platform Environment Recovery Utility V. 1.0

   Please identify the DVD drive:

   1 c0t0d0s0

   Enter selection [?,??,q]: 1
   ```

7. **Select the boot disk on which you want the recovery files installed.**

   ```
   Please select a disk for restore:

   1 c1t0d0s0
   2 c1t1d0s0 Enter selection [?,??,q]: 1
   You have chosen c1t0d0s0 as your new boot disk.
   ```

8. **Verify that you want to format and erase the specified boot disk.**

   ```
   This disk must be formatted before use.

   Do you wish to format and erase c1t0d0s0? [y,n,?,q] y
   ```

9. **Confirm that you want to use the selected disk.**

   ```
   CONFIRM: c1t0d0s0 WILL BE FORMATTED AND ERASED. CONTINUE?
   [y,n,?,q] y
   ```

The disk is reformatted before you install the recovery files in the next step.

```
Formatting c1t0d0s0 for restore...

newfs: /dev/rdsk/c1t0d0s0 last mounted as /a
newfs: construct a new file system /dev/rdsk/c1t0d0s0: (y/n)? y
Cylinder groups must have a multiple of 2 cylinders with the given
parameters
Rounded cgsize up to 230
/dev/rdsk/c1t0d0s0: 26971488 sectors in 5724 cylinders of 19
tracks, 248 sectors
13169.7MB in 261 cyl groups (22 c/g, 50.62MB/g, 6208 i/g)
super-block backups (for fsck -F ufs -o b=#) at:
32, 103952, 207872, 311792, 415712, 519632, 623552, 727472,
831392, 935312,
```

10. **Install the Solaris operating environment software.**

You are prompted to remove the disk and mount the recovery DVD. After the DVD is mounted, press Return. The Solaris operating environment files are copied from the DVD onto the management server boot disk.

```
Preparing to recover Management Server.
Please place the Recovery DVD in the DVD drive.  Press <Return>
when mounted.
<CR>
Restoring files from the DVD....
Installing boot block on c1t0d0s0.
Root environment restore complete.
```

All files are copied from the recovery DVD. The software and patch files are copied from the recovery DVD onto the management server boot disk. After the system copies the files from the DVD, the system shuts down:

```
Management Server restore complete; now shutting down system.
INIT: New run level: 0
The system is coming down.  Please wait.
System services are now being stopped.
umount: /dev busy
The system is down.
syncing file systems... done
Program terminated
```

11. **Reboot the management server.**

Completing the Recovery of the Management Server

Once the management server recovery software is loaded, you must reconfigure the system as you did when you first received the cluster platform.

● **Perform the following procedures as described in Chapter 2:**

- Step 4, "Boot the management server from the OBP prompt to start the configuration process." on page 24 to Step 25 on page 39
- "To Customize the Cluster Environment" on page 40
- "To Boot Up the T3 Arrays" on page 47
- "To Set Up the Sun Management Center Software" on page 48
- "To Launch the Cluster Console for Both Cluster Nodes" on page 57

Recovering the Cluster Nodes

This recovery process is a last resort. All site specific data will be lost. This procedure is intended for use ONLY when recovery from your site specific backups have failed.

Caution – Because the recovery results in a generic, from the factory configuration, initiate a recovery only at the direction of technical support.

● **Perform the following procedures as described in Chapter 2:**

- "To Install the Software Stack on Both Cluster Nodes" on page 60
- If your Cluster Platform uses VERITAS software, perform "To Configure VERITAS Volume Manager" on page 62

Laptop Settings to Access Monitor Mode

This appendix provides the settings you must use to access monitor mode using a laptop computer. These settings are different from those described in Chapter 2.

▼ To Access the Terminal Concentrator from a Laptop

1. **Provide monitor mode connectivity into the terminal concentrator using a laptop computer running the Microsoft Windows 98 Operating System.**

   a. **Attach a DB-9 to DB-25 female-female, customer-supplied adapter into the Serial COM1 port of the laptop computer.**

   b. **Connect the RJ-45 end of the serial cable (Part No. 2151A) to Port 1 of the terminal concentrator; connect the other end to the DB-25 to DB-9 female-female adapter.**
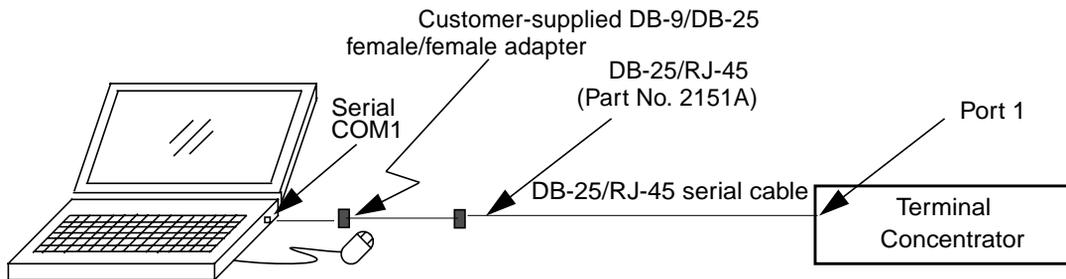
FIGURE A-1   Monitor Mode Connectivity Using a Laptop Computer

2. **Click Start ➤ Programs ➤ Accessories ➤ Communications ➤ HyperTerminal to open the HyperTerminal folder.**

3. **In the HyperTerminal folder, double-click the HyperTerm icon to display the Connection Description window.**

4. **In the Connection Description window, type** StandardConfig **in the Name field, and click the icon that you want. Click OK to display the Connect To window.**

5. **In the Connect To window, select the Direct to Com1 option from the Connect using field. Click OK to open the Connect To window and to display the COM1 Properties window.**

6. **In the COM1 Properties window, select the following options:**

```
Bits per second: 9600
Data bits: 8
Parity: None
Flow Control: None
```

7. **Click OK to open the StandardConfig—HyperTerminal application window and to support monitor mode.**

8. **In the StandardConfig—HyperTerminal window, select File ➤ Properties to open the StandardConfig Properties window.**

9. In the StandardConfig Properties window, click the Settings option, and select VT100 for the Emulation option.

At this point, the HyperTerminal window provides monitor mode access to the terminal concentrator.

Note – To set up the terminal concentrator, see "To Configure the Terminal Concentrator" on page 16.

Cluster Platform 280/3 Cabling

This appendix describes the arrangement of the cables in the Cluster Platform 280/3 system. This information is provided to assist in restoring the hardware to its original configuration after service.

FIGURE B-1 Cluster Platform Cables

Cable	Part Number	Manufacturing part number	Quantity
RJ-45 Ethernet cable	1871A	530-1871	8
Fiber optic cable	n/a	537-1034	2
DB-25/RJ-45 serial cable	2151A	530-2151	2
Null Ethernet cable	3837A	530-2150	2
Serial port adapter	6973A	530-2889	1
Fiber optic cable	9715A	537-1020	4
Serial cable	9524A	530-9524	1

Ethernet hub

FC-AL hub
1 and 2

Management
server

Cluster
node 2

Cluster
node 1

T3 array 2

T3 array 1

To external
admin network

Terminal
concentrator

To external
admin network

DB25/RJ45 serial cable (2151A)
Fiber optic cable (9715A or 9724A)
Serial cable (9524A)
Ethernet cable (1871A)
Ethernet cable (3837A)
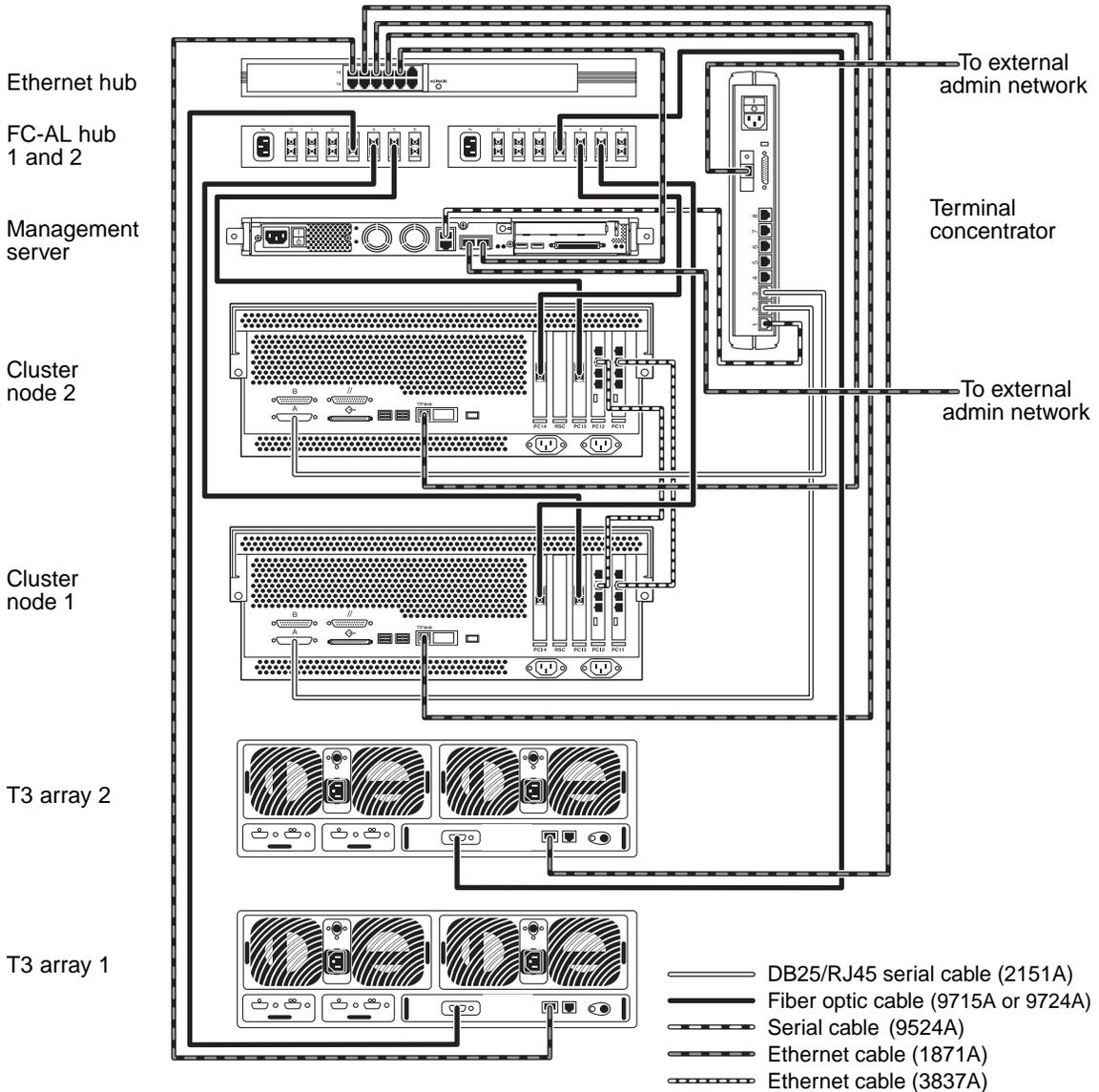
Note: Cable connections to the production network and NAFO not shown.

FIGURE B-2   Cluster Platform 280/3 Cabling
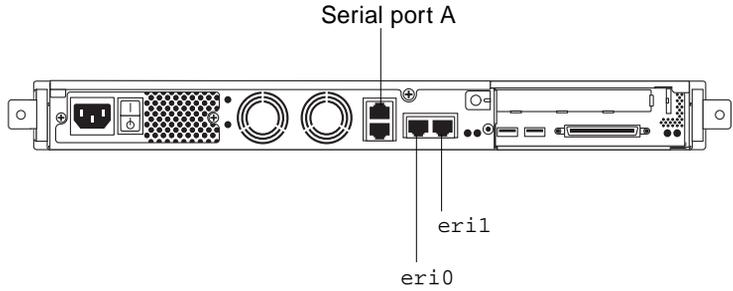
**FIGURE B-3** Netra T1 AC200 Server (Management Server) Rear View Connectors
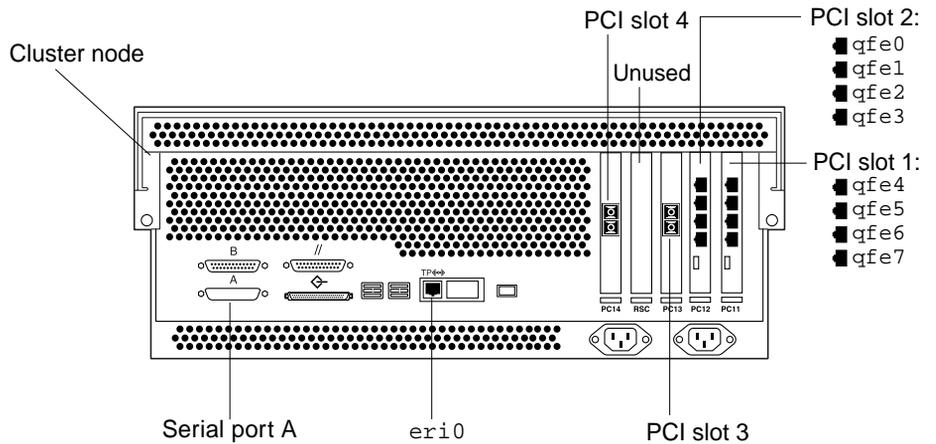
FIGURE B-4 Sun Fire 280R Server (Cluster Nodes) Rear View Connectors

The following table lists the connections you make when you install the Cluster Platform in your network environment as described in Chapter 2 and in FIGURE 2-2.

TABLE B-1   Connections Made On Site

From Device	From Location	To Customer Network	Cable Type
Management server	`eri0`	Administration network[1]	Ethernet
Terminal concentrator	Ethernet port	Administration network[1]	Ethernet
Node 1	`qfe0`	Production network	Ethernet
Node 1	`qfe4`	Production network	Ethernet
Node 2	`qfe0`	Production network	Ethernet
Node 2	`qfe4`	Production network	Ethernet

1.If you do not have an administration network, make this connection to your production network.

The following tables list factory configured cable connections.

TABLE B-2   Disk Array to Hub Connections

From Device	From Location	To Device	To Location	Cable Length/Type
Disk array 1 (mirror)	FC-AL port	FC-AL hub 1	Port 3	15 m/FC-AL
Disk array 2 (data)	FC-AL port	FC-AL hub 2	Port 3	15 m/FC-AL
Disk array 1 (mirror)	10BASE-T	Ethernet hub	Port 1	4 m/Ethernet
Disk array 2 (data)	10BASE-T	Ethernet hub	Port 2	4 m/Ethernet

TABLE B-3   FC100 Hub to Server Connections

From Device	From Location	To Device	To Location	Cable Length/Type
FC-AL hub 1	Port 4	Node 1	PCI slot 3	5 m/FC-AL
FC-AL hub 1	Port 5	Node 2	PCI slot 3	5 m/FC-AL
FC-AL hub 2	Port 5	Node 1	PCI slot 4	5 m/FC-AL
FC-AL hub 2	Port 4	Node 2	PCI slot 4	5 m/FC-AL

TABLE B-4   Management Server Connections

From Device	From Location	To Device	To Location	Cable Type
Management server	Serial port A	Terminal concentrator	Serial port 1	Serial
Management server	`eri1`	Ethernet hub	Port 5	Ethernet
Management server	`eri0`	See TABLE B-1		

TABLE B-5   Terminal Concentrator Connections

From Device	From Location	To Device	To Location	Cable Type
Terminal concentrator	Serial port 1	Management server	Serial port A	Serial
Terminal concentrator	Serial port 2	Node 1	Serial port A	DB-25 serial/RJ-45
Terminal concentrator	Serial port 3	Node 2	Serial port A	DB-25 serial/RJ-45
Terminal concentrator	Ethernet port	See TABLE B-1		

TABLE B-6   Node to Node Connections

From Device	From Location	To Device	To Location	Cable Length/Type
Node 1	PCI slot 2, `qfe1`	Node 2	PCI slot 2, `qfe1`	5 m/Null Ethernet
Node 1	PCI slot 1, `qfe5`	Node 2	PCI slot 1, `qfe5`	5 m/Null Ethernet

TABLE B-7   Ethernet Hub Connections

From Device	From Location	To Device	To Location	Cable Type
Ethernet hub	Port 1	Disk array 1 (node 1)	10/100 BASE-T port	Ethernet
Ethernet hub	Port 2	Disk array 2 (node 2)	10/100 BASE-T port	Ethernet

TABLE B-7   Ethernet Hub Connections

From Device	From Location	To Device	To Location	Cable Type
Ethernet hub	Port 5	Management server	`eri1`	Ethernet
Ethernet hub	Port 3	Node 1	`eri0`	Ethernet
Ethernet hub	Port 4	Node 2	`eri0`	Ethernet

Configuring the `tip hardwire` Port

▼ To Configure the `tip hardwire` Port

If you experience problems connecting to the terminal concentrator port while configuring the terminal concentrator using the `tip hardwire` command, you can connect to an alternate serial port and modify the `/etc/remote` file on the local system.

1. On the local system, edit the `/etc/remote` file, as follows:

Replace the port number (shown as *n* in the example below) with the port designation letter of the port you plan to use.

```
hardwire:\
:dv=/dev/term/n:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D
{{In the above line, substitute the serial port letter you are
using for n - for example, if using ttya, replace n with a}}
```

2. Verify that the connected cable matches the selected serial port.

Accessing Software on the Management Server

Starting the Sun Explorer Software

The Sun Explorer 3.5.0 data collector software allows you to collect data before you speak to a Customer Call Center representative, who can help troubleshoot any problems you may experience with the Cluster Platform 280/3 system.

Also see the Sun Explorer data collector man pages.

▼ To Run the Sun Explorer on the Management Server

Type the following command:

```
# /opt/SUNWexplo/bin/explorer
```

Starting the Sun Management Center Software

Sun Management Center 3.0 software provides a powerful single point for management of the enterprise by providing the ability to monitor the following:

- Sun hardware
- Solaris operating environment
- System load, disk space, and network statistics

For more details visit the following URL:

```
http://www.sun.com/solaris/sunmanagementcenter
```

▼ To Access the Sun Management Center Software

If you configured the management server as a Sun Management Center server, you can access the Sun Management Center software by accessing the following URL in a browser:

```
http://management_server_name:80
```

Installing Sun Component Manager 2.2 on the Management Server

▼ To Install Sun Component Manager 2.2

Note – You must be superuser on the management server to perform the following commands.

1. **Start the installation script:**

```
# cd /jumpstart/Packages/CM2.2
# ./install_cm
```

2. Press Y to accept Sun's licensing agreement.

Note – You must accept the licensing agreement to continue.

```
Sun StorEdge(TM) Component Manager

This product provides a graphical interface to the monitoring and
configuring
of Component Manager.  It is assumed that you agree to the legal
terms
explained in:

        http://www.sun.com/share/text/SMICopyright.html

DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR
SYSTEM
[y,n] (y)? y
```

3. To configure the Sun StorEdge Management Console Web Server, press Y. Otherwise, press N and continue with Step 5.

```
Would you like to configure the StorEdge(TM) Management Console
Web Server during this installation? (Default: y) [y,n,?,q] y
```

4. From the list of available web servers, type the value associated with the web server you would like to configure:.

```
Select the type of Web Server you would like to configure from the
following list:

        1. esm_detached
        2. esm_embedded

Which type Web Server would you like to configure (Default: 1)
[1,2,?,q]? 1
```

5. **Type the password to log in as user** `admin`.

```
For security you must enter a password for use on your initial
login as administrator.

New Password: abc
Re-enter new password: abc
```

6. **Type the port ID of the selected non-secure port.**

   The Cluster Platform 280/3 product web page is set to port 8180. Make sure that you type the default port of 8180 to proceed.

```
Enter the non-secure port ID for esm_detached to listen on?
(Default: 8180) [?,q] 8180
```

7. **To configure an additional non-secure port ID, press Y and enter information at the prompts. Otherwise, press N to continue.**

```
Do you want to configure an additional non-secure port ID?
(Default: n) [y,n,?,q] n
```

8. **Enter the port ID of the selected secure port.**

```
Enter the secure port Id for esm_detached to listen on? (Default:
8443) [?,q] 8443
```

9. **To configure an additional secure port, press Y and enter information at the prompts. Otherwise, press N to continue.**

```
Do you want to configure an additional secure port ID? (Default: n)
[y,n,?,q] n
```

10. Wait for the installation of the Sun Component Manager packages.

```
An install log can be found at /var/tmp/cm_install.log.03Oct01-
12:06:36

Starting installation of Java packages.
Installation of SUNWj2rt was successful.

Starting installation of Jiro packages.
Installation of SUNWjiror was successful.

Starting installation of Sun StorEdge(TM) Platform packages.
Installation of SUNWesm was successful.
Installation of SUNWdaert was successful.
Installation of SUNWesmrt was successful.
Installation of SUNWmjacf was successful.
Installation of SUNWmjmai was successful.
Installation of SUNWmjhlp was successful.
Installation of SUNWesmru was successful.

Starting installation of Component Manager Core packages
Installation of SUNWencl was successful.

Starting installation of Component Manager packages
Installation of SUNWencm was successful.
Installation of SUNWencc was successful.
Installation of SUNWencu was successful.
Installation of SUNWencmr was successful.
Installation of SUNWenccr was successful.

Installation of Sun StorEdge(TM) Component Manager was successful.
```

Note the location of the uninstall script.

```
Starting installation of Component Manager Core packages
Installation of SUNWencl was successful.

Starting installation of Component Manager packages
Installation of SUNWencm was successful.
Installation of SUNWencc was successful.
Installation of SUNWencu was successful.
Installation of SUNWencmr was successful.
Installation of SUNWenccr was successful.

An un-install script has been generated to aid in the removal of
this
software.  The location of the un-install script is:

        /var/tmp/uninstall_cm
```

11. **To use Sun Component Manager to manage one or more A5x00s, press Y and enter information at the prompts. Otherwise, press N to continue.**

```
 Do you plan to use Component Manager to manage one or more A5x00?
(Default: y) [y,n,?] n
```

12. **To manage one or more Sun StorEdge T3 arrays using Sun Component Manager software, press Y and continue.**

```
Do you plan to use Component Manager to manage one or more T3?
(Default: y) [y,n,?] y
```

13. **Wait for the installation of the Sun StorEdge T3 array patches.**

```
Verifying T3 patches are installed and at the minimum revision.
Please wait...

Please verify your T3 firmware has been updated to revision 1.16
or greater
before starting Component Manager.
#
```

14. **Use a text editor to edit the** `/etc/opt/SUNWesm/mo/hosts` **file.**

```
# vi /etc/opt/SUNWesm/mo/hosts
```

15. **Add the IP addresses and names of the arrays to the** `hosts` **file, save your changes, and exit the editor.**

```
###############################################################
#
# Component Manager 2.2 - Component table
#
# Each component entry is specified by its IP address and name,
#       IP address      Name
#
# Example:
#       127.0.0.1       localhost
#
###############################################################
10.0.0.4 T3-01
10.0.0.5 T3-02
```

16. **Reboot the management server.**

The Sun Component Manager 2.2 software is now installed on the management server. Refer to the Sun StorEdge Component Manager 2.2 documents listed in the Preface under "PDF Documents" on page xv for information on using this software.

Configuring the Sun Ray Server Software on the Management Server

The Sun Ray™ server software is preinstalled on the Cluster Platform management server. To use this feature you must:

- Install an Ethernet interface card in the Netra T1 AC200 server empty card slot.
- Configure the software as described in this appendix.

This appendix provides the settings and cable connections required to set up and configure the Sun Ray™ server software with an optional Sun Ray appliance.

FIGURE F-1 shows the management server with an additional Ethernet interface used for the interconnect.
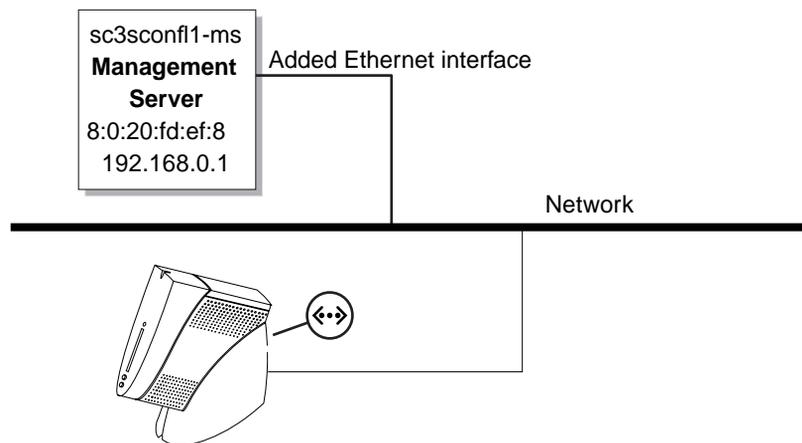

FIGURE F-1 Cluster Platform 280/3 Interconnections Using a Sun Ray Server

▼ To Access the Management Server from the Sun Ray

1. **Access the configuration file from the management server.**

```
# cd /opt/SUNWut/sbin
# ./utconfig
```

2. **Type y to run the configuration script to install the Sun Ray server software:**

```
Configuration of Sun Ray server Software

This script automates the configuration of the Sun Ray server
software and related software products.

Before proceeding, you should have read the Sun Ray server 1.3
Installation Guide and filled out the Configuration Worksheet.

This script will prompt you for the values you filled out on the
Worksheet.

For your convenience, default values(where applicable) are shown
in brackets.

Continue ([y]/n)? y
```

3. **Enter the administrator password to access the Sun Ray server:**

```
Enter UT admin password: abc123
Re-enter UT admin password: abc123
```

4. **Type y to configure the Sun Ray server:**

```
Configure Sun Ray Admin Server 1.0 ([y]/n)? y
```

5. **Type the port number to access the Sun Ray server.**

```
Enter Sun Ray Admin Server port number [1660]: 1660
```

6. **Type the user name to access the CGI server:**

```
Enter CGI username [utwww]: utwww
```

7. **To enable remote administration for the Sun Ray server, type y. Otherwise, type n:**

```
Enable remote server administration? (y/[n])? y
```

8. **Type n to disable SSL (Secure Socket Layer) connectivity.**

```
Selecting remote administration without SSL poses a potential
security risk and is not advised.

Enable Secure Socket Layer (SSL) connection ? ([y]/n)? n
```

9. **Type y to configure controlled access mode:**

```
Configure Controlled Access Mode? (y/[n])? y
```

10. **Enter the user prefix:**

```
Enter user prefix [utcu]: utcu
```

11. **Type the starting range for the user ID:**

```
Enter userID range start [150000]: 150000
```

12. **Enter a value for the number of users accessing system administration:**

```
Enter number of users [25]: 25
```

Note – Refer to the Sun Ray Server 1.3 Installation Guide, included with your Sun Ray*.

---

*Available if you purchased the Sun Ray option.

13. Type y to configure the Sun Ray server for a failover group. Otherwise, type n:

```
Configure this server for a failover group? (y/[n])? n
```

14. Wait for the Sun Ray server configuration to complete. Type y to continue with the configuration:

```
Creating Sun Ray server Configuration ...

About to configure the following software products:

Sun Directory Services 3.1
    Hostname: sc3sconf1-ms
    UT root entry: o=utdata
    UT root name: utdata
    UT utdata admin password: (not shown)
    SunDS 'rootdn': cn=admin,o=utdata

Sun Ray Admin Server 1.0
    Sun Ray Admin Server instance name: utadmin
    Sun Ray Admin Server port number: 1660
    Remote server administration: Enabled
    Secure Socket Layer: Disabled
    CGI username: utwww

Sun Ray server 1.3
    Failover group: no
    Controlled Access Mode: yes

Controlled Access Mode Configuration
    User prefix: utcu
    First userID number: 150000
    Number of users: 25

Continue ([y]/n)? y
```

15. Type the following at the Sun Ray server:

```
# ./utadm -a Ethernet-interface
```

16. Verify the configuration files, services, and network addresses. To accept the configuration files, type y. To change any of the values, type n, and enter information at the prompts.

Caution – To select a different IP address, type n, and enter the IP address for your enterprise.

```
### Configuring /etc/nsswitch.conf
### Configuring DHCP Service for Sun Ray
### stopped DHCP daemon
### started DHCP daemon
### Disabling Routing
### configuring qfe2 interface at subnet 128
  Selected values for interface "qfe2"
    host address:       192.168.128.1
    net mask:           255.255.255.0
    net address:        192.168.128.0
    host name:          MS12345-qfe2
    net name:           SunRay-qfe2
    first unit address: 192.168.128.16
    last unit address:  192.168.128.240
    firmware server:    192.168.128.1
    router:             192.168.128.1
    alternate servers:
  Accept as is? ([Y]/N): y
```

17. **Wait for the setup of the configuration files.**

```
### successfully setup "/etc/hostname.qfe2" file
### successfully setup "/etc/inet/hosts" file
### successfully setup "/etc/inet/netmasks" file
### successfully setup "/etc/inet/networks" file
### finished install of "qfe2" interface
### Building network tables - this will take a few minutes
### Configuring firmware version for Sun Ray
        All the units served by "MS12345" on the 192.168.128.0
        network interface, running firmware other than version
        "1.3_12.c,REV=2001.07.16.20.52" will be upgraded at their
next power-on.

### Configuring Sun Ray Logging Functions
syslog service starting.
### stopped DHCP daemon
### started DHCP daemon
```

The setup files are created.

```
### successfully setup "/etc/hostname.qfe2" file
### successfully setup "/etc/inet/hosts" file
### successfully setup "/etc/inet/netmasks" file
### successfully setup "/etc/inet/networks" file
### finished install of "qfe2" interface
### Building network tables - this will take a few minutes
```

18. **Create user accounts on the management server.**

Note – If you need to log into the management server as root, you must edit the
/etc/default/login file and comment out CONSOLE=/dev/console.

Using the HA-NFS File System Agent

This appendix describes how to set up the HA-NFS service for the Cluster Platform 280/3 system using the automated installation scripts. These scripts, which are contained on a supplemental CD, are:

- `setup-hanfs-node1.sh`
- `setup-hanfs-node2.sh`

The scripts are located at `/jumpstart/Packages/HA-NFS`. They are executed after the SunTone cluster is installed using the jump start mechanism. Because setting up the HA-NFS data service requires configuration modifications to both cluster nodes, two separate scripts are provided, one for each cluster node. The `setup-hanfs-node1.sh` script must be run to completion on the first cluster node before the `setup-hanfs-node2.sh` script is run on the second cluster node.

The shared Sun StorEdge T3 array, which the HA-NFS data service uses for the exported NFS file system and administration files, is configured using the same volume manager that was used to mirror the boot disk of the cluster nodes during the JumpStart installation. The pair of arrays are assumed to be configured as a single LUN with hardware RAID 5. If you wish to reconfigure the T3s, you will have to modify the scripts to recognize the new array.

The scripts are designed to be run immediately after a fresh install, but you can run them later if no device groups were defined on the shared storage. Only minimal information is required by the scripts. This information includes:

- NAFO group adapters (if not configured before running the script)
- HA-NFS data service logical host IP address

Default values are used for most configuration parameters. These values can be changed by modifying the values in each of the scripts before they are executed.

What the Scripts Do

Setting up the HA-NFS data service requires both local changes to each node and global changes to the cluster configuration database. The local changes are performed in each script while some of the global changes are performed in the first script and some in the second. The reason it was split this way is that the local changes must occur before the global changes are made. If all of the global changes were contained in one script then you would have to run a script on each node before running the script containing the global changes. By splitting them up, you only have to run one script on each node and not go back and forth.

Local changes include:
- Creating a NAFO group
- Installing the `SUNWscnfs` package (HA-NFS Data Service)
- Modifying `/etc/vfstab`
- Creating the `/global/nfs` mount point directory
- Adding the HA-NFS logical host to `/etc/hosts`

Global changes include:
- Creating a mirrored volume on the shared storage
- Creating a UFS file system on that volume
- Mounting the file system on /global/nfs
- Registering the volume as a device group
- Registering the `SUNW.nfs` and `SUNW.HAStorage` resource types
- Creating the HA-NFS resource group
- Putting the HA-NFS resource group online

Tunable Parameters

The following parameters can be modified before running the scripts:
- `METASET` - Solstice DiskSuite disk set used when running Sun DiskSuite
- `VXDG` - VxVM disk group used when running VERITAS volume manager
- `VXVOL` - name of the VxVM volume
- `VOLSIZE` - size of the VxVM NFS volume
- `RESGRP` - NFS resource group

- `NFSRES` - NFS resource
- `HASRES` - HA storage resource

The default values for these parameters are:

- `METASET=nfsds`
- `VXDG=nfsdg VXVOL=hanfsdisk01`
- `VOLSIZE=500m RESGRP=nfs-rg`
- `NFSRES=nfs-res`
- `HASRES=has-res`

▼ To Run the Scripts

The setup scripts must be run as root on each node.

1. **First run the** `setup-hanfs-node1.sh` **script on the first cluster node.**

   When it completes, run the `setup-hanfs-node2.sh` script on the other node.

2. **If you are unsure of each node's identity, run the** `scstat -n` **command and observe the output.**

   ```
   bur280rn0# scstat -n
   -- Cluster Nodes --
   Node name Status
   --------- ------
   Cluster node: bur280rn0 Online
   Cluster node: bur280rn1 Online
   ```

   In this example, *bur280rn0* is node 1, and *bur280rn1* is node 2.

   Note – In theory, the scripts do not have to run on specific nodes as long as they are run in the correct order. However, because they were only tested on specific nodes, the scripts check to verify they are executed on the recommended node.

Sample Output

CODE EXAMPLE G-1   Setup for First Cluster Node

```
# /net/ManagementServer-ip-address/jumpstart/Packages/HA-NFS/setup-hanfs-node1.sh

CAUTION: This script can only be run on node 1 before the setup-hanfs-node2.sh
script has been run on node 2. Node 1 is the second node listed in the output
of the scstat -n command.
Continue? (y/n) y

Nodename Status
-------- ------
bur280rn0 Online
bur280rn1 Online

No NAFO groups are configured. Configure now? (y/n) y

In the following, you will be prompted to do configuration for network adapter
failover

Do you want to continue ... [y/n]: y

How many NAFO groups to configure [1]: <Return>

Enter NAFO group number [0]: <Return>
Enter space-separted list of adapters in nafo0: qfe0 qfe4

Checking configuration of nafo0:
Testing active adapter qfe0...
Testing adapter qfe4...

NAFO configuration completed
SUNWscnfs not installed. Install now? (y/n) y
Enter Management Server name (default=bur280ms)
```

```
The following packages are available:
1 SUNWscnfs Sun Cluster NFS Server Component
(sparc) 3.0.0,REV=2000.10.01.01.00

Select package(s) you wish to process (or all to process all
packages). (default: all) [?,??,q]: 1

Processing package instance <SUNWscnfs> from </net/bur280ms/
jumpstart/Packages/SC3.0u2/scdataservices_3_0_u2/components/
SunCluster_HA_NFS_3.0/Packages>

Sun Cluster NFS Server Component
(sparc) 3.0.0,REV=2000.10.01.01.00
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements. ## Checking for conflicts
with packages already installed.
## Checking for setuid/setgid programs.

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

Do you want to continue with the installation of <SUNWscnfs>
[y,n,?] y

Installing Sun Cluster NFS Server Component as <SUNWscnfs>

## Installing part 1 of 1.
## Executing postinstall script. Installation of <SUNWscnfs> was
successful.

The following packages are available:
1 SUNWscnfs Sun Cluster NFS Server Component
(sparc) 3.0.0,REV=2000.10.01.01.00

Select package(s) you wish to process (or  all  to process all
packages). (default: all) [?,??,q]: q
```

```
The hostname used for the NFS service is: bur280r-nfs
Enter IP Address of bur280r-nfs: HA_NFS_IP_address
About to configure the T3 Arrays with VxVM, continue? (y/n) y
newfs: /dev/vx/rdsk/nfsdg/hanfsdisk01 last mounted as /global/nfs
newfs: construct a new file system /dev/vx/rdsk/nfsdg/hanfsdisk01:
(y/n)? y /dev/vx/rdsk/nfsdg/hanfsdisk01: 1024000 sectors in 500
cylinders of 32 tracks, 64 sectors
500.0MB in 32 cyl groups (16 c/g, 16.00MB/g, 7680 i/g)
super-block backups (for fsck -F ufs -o b=#) at:
32, 32864, 65696, 98528, 131360, 164192, 197024, 229856, 262688,
295520, 328352, 361184, 394016, 426848, 459680, 492512, 525344,
558176, 591008,623840, 656672, 689504, 722336, 755168, 788000,
820832, 853664, 886496,919328, 952160, 984992, 1017824,

You should now run setup-hanfs-node2.sh on cluster node 2
```

CODE EXAMPLE G-2   Setup for Second Cluster Node

```
# /net/ManagementServer-ip-address/jumpstart/Packages/HA-NFS/setup-
hanfs-node2.sh

CAUTION: This script can only be run on node 2 after the
setup-hanfs-node1.sh script has been run on node 1. Node 2
is the second node listed in the output of the scstat -n
command. Continue? (y/n) y
Nodename Status
-------- ------
bur280rn0
Online bur280rn1 Online
No NAFO groups are configured. Configure now? (y/n) y
In the following, you will be prompted to do configuration for
network adapter failover

Do you want to continue ... [y/n]: y

How many NAFO groups to configure [1]: <Return>

Enter NAFO group number [0]: <Return>
Enter space-separted list of adapters in nafo0: qfe0 qfe4

Checking configuration of nafo0:
Testing active adapter qfe0...
Testing adapter qfe4...

NAFO configuration completed SUNWscnfs not installed.
Install now? (y/n) y
Enter Management Server name (default=bur280ms)
```

```
The following packages are available:
1 SUNWscnfs Sun Cluster NFS Server Component
(sparc) 3.0.0,REV=2000.10.01.01.00
Select package(s) you wish to process (or  all  to process all
packages). (default: all) [?,??,q]: <Return>

Processing package instance <SUNWscnfs> from </net/bur280ms/
jumpstart/Packages/SC3.0u2/scdataservices_3_0_u2/components/

SunCluster_HA_NFS_3.0/Packages> Sun Cluster NFS Server Component
(sparc) 3.0.0,REV=2000.10.01.01.00
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

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

Do you want to continue with the installation of <SUNWscnfs>
[y,n,?] y
Installing Sun Cluster NFS Server Component as <SUNWscnfs>
## Installing part 1 of 1.
## Executing postinstall script.

Installation of <SUNWscnfs> was successful.

The following packages are available:
1 SUNWscnfs Sun Cluster NFS Server Component (sparc) 3.0.0,REV=
2000.10.01.01.00

Select package(s) you wish to process (or  all  to process all
packages). (default: all) [?,??,q]: q
```

```
The hostname used for the NFS service is: bur280r-nfs
Enter IP Address of bur280r-nfs: HA_NFS_IP_address
Setup complete. Run https://bur280rn0:3000 or https://
bur280rn1:3000 to administer the HA-NFS service
```

HA-NFS Administration

Once the setup scripts have been run, you can either manage the HA-NFS service from the command line or through the SunPlex Manager GUI. By default, each cluster node is configured with an Apache web server that listens on port 3000. Since a password is required to run SunPlex Manager, a secure port is used.

▼ To Invoke SunPlex Manager

1. **Enter the name of one of the cluster nodes in a web browser.**

   For example:

   ```
   https://node1.siroe.com:3000
   ```

   After entering a login (root) and password, the cluster configuration data is displayed.

2. **To examine the HA-NFS resource group that was set up, click on `Resource Groups` in the left window pane.**

FIGURE G-1 The `nfs-rg` resource group

The `Action Menu` allows you to perform common cluster administration functions like switching the service to the other cluster node. A nice feature of SunPlex Manager is that the command that is executed for the chosen action is displayed. You can use this output as a guide to developing scripts for common administration functions.

Troubleshooting Tips

Before the setup scripts make any modification to the cluster configuration, a check of the current configuration is performed. If the check finds an unexpected configuration, the scripts terminate.

Some of the errors that might occur are:

```
ERROR: Must be run as root
```

The setup scripts require root privileges. If you want to run the script as a user other than root, the script has to be modified.

```
ERROR:node1 is not node 1
```

An attempt to run `setup-hanfs-node1.sh` on node 2 occurred.

```
ERROR:node2 is not node 2
```

An attempt to run `setup-hanfs-node2.sh` on node 1 occurred.

```
ERROR: Both nodes need to be online
```

The setup scripts assume that both nodes are online. If they are not, then they must be brought online before running the scripts.

```
ERROR: Script must be run with no device groups
```

It is assumed that no global device groups were created on the shared storage before running the scripts. You can ignore this message and have the script attempt to create another one. This is only recommended if the script is re-run on a system.

```
ERROR: Expected number of DID devices not present
```

It is assumed that ten DID mappings will be present, representing the physical device on the Cluster Platform 280/3 system. If ten do not exist, then the scdidadm command is run to probe the devices. If ten still are not present, there could be a hardware problem with the shared storage.

```
ERROR: Unexpected DID mapping
```

The arrays are expected to be mapped to c1t1d0 and c2t1d0. If these devices do not show up in the DID mappings, there could be a hardware problem.

```
ERROR: Unable to identify cluster name
```

The cluster name is used to construct the name for the logical IP address used by the HA-NFS data service. This error could mean a corrupted cluster database.

```
ERROR: Both VxVM and SDS configured
```

The script will not run if more than one volume manger is configured. This will only occur if the shared storage was configured with a different volume manager than the boot disk.

```
ERROR: Neither VxVM and SDS configured
```

This will only occur if the boot disk mirroring was unconfigured.

```
ERROR: Can't initialize disk c1t1d0
```

This error occurs when VERITAS tries to initialize one of the arrays. If the array was previously configured with Solstice DiskSuite, then it will need to be re-labeled with a volume manager label that predates Solaris.

```
ERROR: Can't initialize disk c2t1d0
```

This error occurs when VERITAS tries to initialize one of the arrays. If the array was previously configured with Solstice DiskSuite, then it will need to be re-labeled with a volume manager label that predates Solaris.