



# Cluster Platform 4500/3 User's Guide

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A product from the SunTone™ Platforms portfolio

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# Preface

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Cluster Platform 4500/3 provides self-sustained building blocks integrated through Sun Cluster technology to support highly available applications.

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## Related Documentation

Application	Title	Part Number
Installation	<i>Sun Enterprise 6500/5500/4500 Systems Installation Guide</i>	805-2631
	<i>Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual</i>	805-1062
	<i>Sun StorEdge Component Manager 2.1 Installation Guide</i>	806-4811
User	<i>Sun StorEdge T3 Disk Tray Administrator's Guide</i>	806-1063
	<i>Netra T1 AC200 and DC200 Server User's Guide</i>	806-5978
	<i>Sun StorEdge Component Manager 2.1 User's Guide</i>	806-4813
Reference	<i>Sun Enterprise 6500/5500/4500 Systems Reference Manual</i>	805-2632
Release Notes	<i>Sun Enterprise 6500, 5500, 4500, and 3500 Servers Product Notes</i>	805-5713
	<i>Sun StorEdge T3 Disk Tray Release Notes</i>	806-1497

Application	Title	Part Number
	<i>Sun StorEdge Component Manager 2.1 Release Notes</i>	806-4814
Server cabinet (expansion rack) storage	<i>Sun StorEdge Expansion Cabinet Installation and Service Manual</i>	805-3067
Expansion cabinet	<i>Sun StorEdge Expansion Cabinet Installation and Service Manual</i>	805-3067
	<i>Sun StorEdge FC-100 Hub Installation and Service Manual</i>	805-0315
Configuring data services	<i>Sun Cluster 3.0 Data Services Installation and Configuration Guide</i>	806-1421
Development	<i>Sun Cluster 3.0 System Developers' Guide</i>	806-1422
Administering global devices and cluster file systems	<i>Sun Cluster 3.0 System Administrator's Guide</i>	806-1423
Concepts	<i>Sun Cluster 3.0 Concepts</i>	806-1424
Error messages	<i>Sun Cluster 3.0 Error Messages</i>	806-1426
Release Notes	<i>Sun Cluster 3.0 Release Notes</i>	806-1428

## Typographic Conventions

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

---

# Shell Prompts

Shell	Prompt
C shell	<i>machine_name%</i>
C shell superuser	<i>machine_name#</i>
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>

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# Ordering Sun Documentation

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<http://www.fatbrain.com/documentation/sun>

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Please include the part number (816-0445-10) of your document in the subject line of your email.

# Introduction

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This manual describes how to customize your Cluster Platform 4500/3 system. It is intended for the Solaris System Administrator who is familiar with the Solaris™ operating environment, Solstice DiskSuite™ software, and Sun Cluster software. For specific information about configuring disksets, disk volumes, file systems, and data services, refer to the Sun Cluster 3.0 documentation.

This system is shipped with hardcopy documentation for the Sun Enterprise™ 4500 system and the Sun StorEdge™ T3 array. The documentation for the Solaris software and the Sun Cluster 3.0 software are provided in online format.

---

## Tools for Reading Online Documentation

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

- 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>.

The Netscape browser can be downloaded from the following location:

<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 AnswerBook2 software is installed on the management server, it can be accessed at:

[http://name\\_of\\_management\\_server:8888](http://name_of_management_server:8888)

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**Note** – Review “Tools for Reading Online Documentation” on page 1 for additional details about AnswerBook2 server installation.

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# Adobe Acrobat Reader

The Adobe Acrobat Reader (acroread 4.0) software enables you to view documentation in PDF format. You can download it from the following location:

<http://www.adobe.com>

# 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 4500/3. If the directory that contains `man` page files for a product is not automatically accessed by the `man` command, you can add that location 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).

---

# Solaris Documentation

AnswerBook™ documentation about the Solaris 8 10/00 Operating Environment is included on the *Solaris™ 8 Documentation* CD. The following document collections are included:

The `/opt/answerbooks/english/solaris_8` directory contains the following document collections:

- SUNWadm—Solaris 8 System Administrator Collection
- SUNWabsdk—Solaris 8 Software Developer Collection
- SUNWabe—Solaris 8 User Collection
- SUNWaman—Solaris 8 Reference Manual Collection
- SUNWdtad—Solaris 8 Common Desktop Environment Developer Collection
- SUNWinab—Solaris 8 Installation Collection
- SUNWolrn—Solaris 8 Release Documents Collection
- SUNWopen—OpenBoot Collection
- SUNWakcs—KCMS Collection





## The Cluster Platform 4500/3 System

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The Cluster Platform 4500/3 system provides self-sustained platforms, integrated through the Sun Cluster technology, to support highly available applications. This two-node cluster system with shared, mirrored FC-AL storage can be used to implement a highly available file server, web server, mail server, or 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.

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**Note** – This Cluster platform only provides a basic cluster environment. Data services must be installed and configured by the customer.

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# Your Integrated System

Your system includes a two-node cluster with shared, mirrored storage, a terminal concentrator, and a management server. The Sun StorEdge T3 arrays are connected to two FC-AL hubs. An Ethernet hub provides connection to the management server and Sun StorEdge T3 arrays. These components are cabled to provide redundant cluster interconnect between nodes, and to provide access to shared storage and production networks.

For more information on the T3 arrays, refer to “Related Documentation” on page ix.

The management server is the repository for software and patches that are loaded on the system. The management server provides access to the cluster console, and it functions as a JumpStart™ server (installation server) for the cluster nodes.

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**Note** – The management server has sufficient CPU power and memory to implement a Sun™ Management Center server to monitor the cluster nodes, if advanced system monitoring is required.

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## Task Overview

To integrate your Cluster Platform 4500/3 into a production environment, you must:

1. Provide a name, IP address, and root password for the management server.
2. Provide a name and IP address for the terminal concentrator.
3. Provide a name for the cluster environment and a default router (gateway).
4. Provide names and IP addresses for individual cluster nodes.
5. Provide names and IP addresses for the Sun StorEdge T3 arrays.
6. Configure shared disk storage under Solstice DiskSuite or VERITAS volume manager. Configuration includes the creation of disksets (or disk groups), disk volumes, and file systems.
7. Select a quorum device from the shared disk storage.
8. Install and configure the required highly available applications.
9. Install and configure data services to support the highly available applications.
10. Configure network adapter failover (NAFO) for automatic failover.

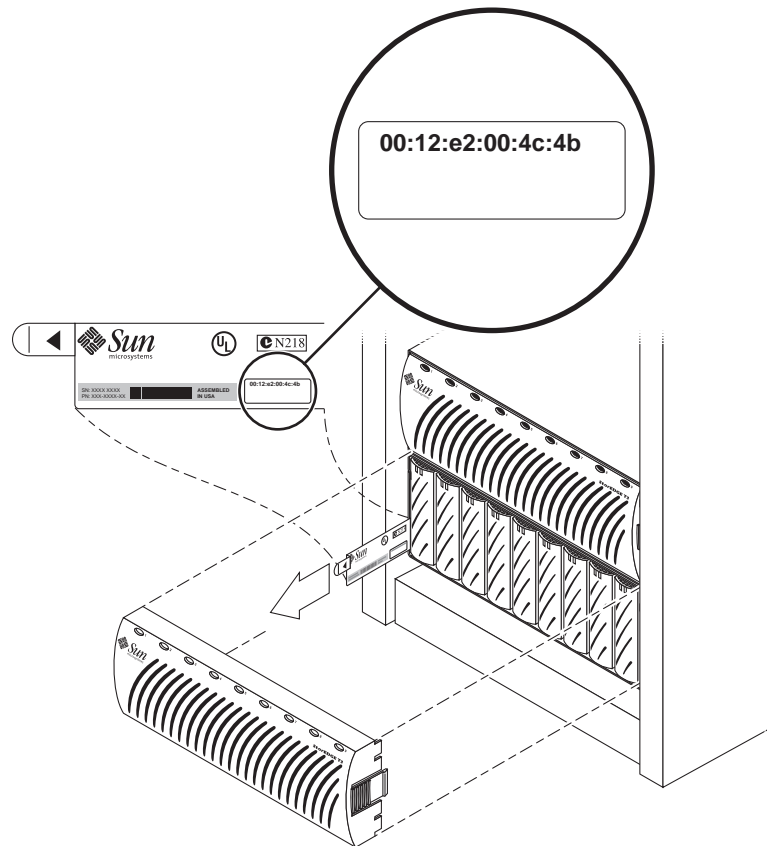
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**Note** – This document does not provide information to support items 6 through 9. For specific implementation details, refer to the Sun Cluster 3.0 documentation.

---

The Ethernet address for each cluster node is located on the Customer Information, System Record sheet. Use the serial number on the information sheet and on the back of each node to correctly identify the Ethernet address. (See Figure 2-4 for the placement of each cluster node.)

TABLE 2-1 shows the location of the Ethernet address for the disk array.



**FIGURE 2-1** Ethernet Address on the Disk Array Pull Tab

TABLE 2-1 provides a worksheet to assist with networking information. You will be referred back to the information you place in this table when you customize the cluster configuration.

**TABLE 2-1** Ethernet IP Address Worksheet

Network Device	Ethernet Address	IP Address	Node Name
Netra™ T1 AC200			
Terminal concentrator			
Sun Enterprise 4500 system No. 1 (node 1)			
Sun Enterprise 4500 system No. 2 (node 2)			
Sun StorEdge T3 array No. 1 (node 1)			
Sun StorEdge T3 array No. 2 (node 2)			

## Hardware Components

Your Cluster Platform 4500/3 shipment includes the following hardware components (see FIGURE 2-5 for details on cable connectivity between components):

- Consolidation rack: One Sun StorEdge Expansion Cabinet which includes power sequencers, front and rear door options, and a fan assembly
- Management server: One Sun Netra T1 AC200 system configured with one 500 MHz UltraSPARC II CPU, 512 Mbytes of memory and two 18.2-Gbyte boot disks with mirroring
- Terminal concentrator: One 8-port terminal concentrator preinstalled in a Sun StorEdge expansion cabinet
- Two Sun Enterprise 4500 system servers, each configured with 400 MHz UltraSPARC II CPUs
- Four I/O boards with on-board DWIS, four on-board hme network interfaces, two qfe SBus network interface cards, two on-board FC-ALs with GBICs, internal DVD and internal 20 Gbyte 4mm DDS4 tape drive
- Four Netra st D130 boot disks
- Two Sun StorEdge T3 arrays

- Two FC-100 FC-AL hubs, with three installed GBICs in each hub

## Connectivity

- **Cluster interconnect:** The cluster connectivity uses Ethernet patch cables (no Ethernet switch required), with redundant qfe 100BASE-T ports (qfe0 and qfe4) on two separate SBus controllers to avoid a controller single point of failure.
- **Public networks:** The cluster nodes main network connection is implemented using the on-board hme0 (100BASE-T) primary port with hme1 (100BASE-T) as the failover port. The main network connection has a failover interface on separate controllers. Two hme ports, hme2 and hme3, are available to implement additional production networks.
- **Storage access:** Access to disk arrays is achieved through proper configuration of the FC-AL from each node.
- **Administration networks:** Sun StorEdge™ Component Manager 2.1, included with your Cluster Platform 4500/3, is used to administer the disk arrays.

## Network Administration

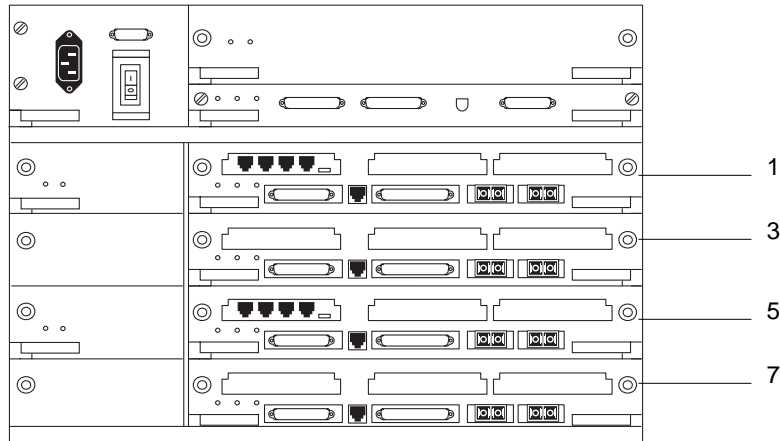
The administration network provides access to the Ethernet hub.

## Miscellaneous Hardware

The following miscellaneous hardware is used:

- Two one-meter RS-232C (DB-25/RJ-45) serial cables (Part No. 2151A) for the cluster nodes console (Part No. 530-2151)
- One one-meter RS-232C (RJ-45/RJ-45) serial cable for the management server (Part No. 530-9524) to connect the terminal concentrator to the management server
- Power cables provided with the power sequencers in the expansion cabinet
- Terminal concentrator mounting bracket
- Ethernet hub mounting brackets

By default, the I/O board slots in the servers are labeled 1, 3, 5, and 7 (FIGURE 2-2).



**FIGURE 2-2** Cluster Platforms I/O Board Placement

## Software Components

The Cluster Platform 4500/3 software packages include the following:

- Solaris 8 10/00 operating environment
- Sun Cluster 3.0 software with patches, and Sun Cluster 3.0 installation CDs
- Solstice DiskSuite 4.2.1
- UNIX<sup>®</sup> File System (UFS)
- Sun StorEdge Component Manager 2.1

---

**Note** – A collection of software patches is applied to each cluster node. The patches are located in the `/SOFTWARE/Solaris8_10-00/Patches` directory of the management server. Detailed information on how the software solution is integrated is provided at <http://www.sun.com/blueprints>.

---

FIGURE 2-3 shows cluster node interface hme1 providing network automatic failover (NAFO) for hme0 (production network). Interfaces hme2 and hme3 are available to expand application network services. Interfaces qfe0 and qfe4 are used for the cluster interconnect.

---

**Note** – See “Ethernet IP Address Worksheet” on page 8 to specify the appropriate information for your network environment.

---

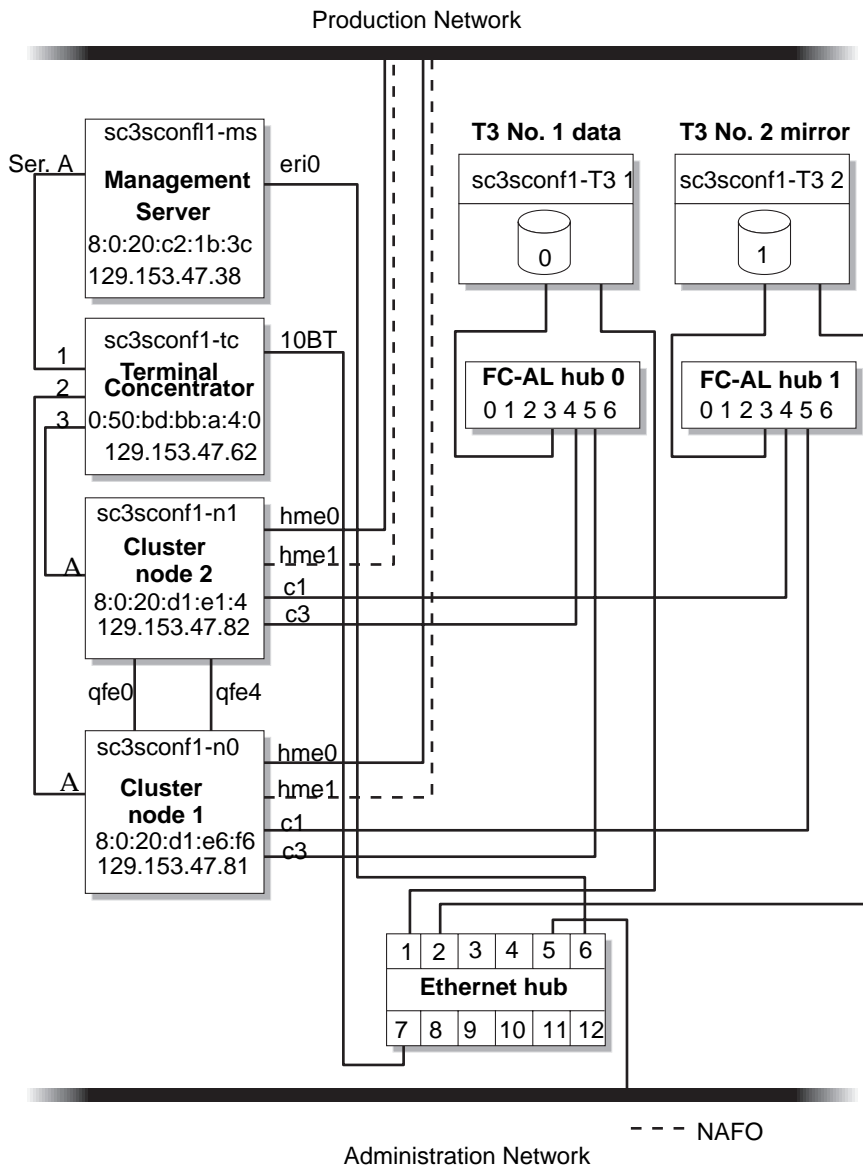


FIGURE 2-3 Cluster Platform Interconnections and NAFO



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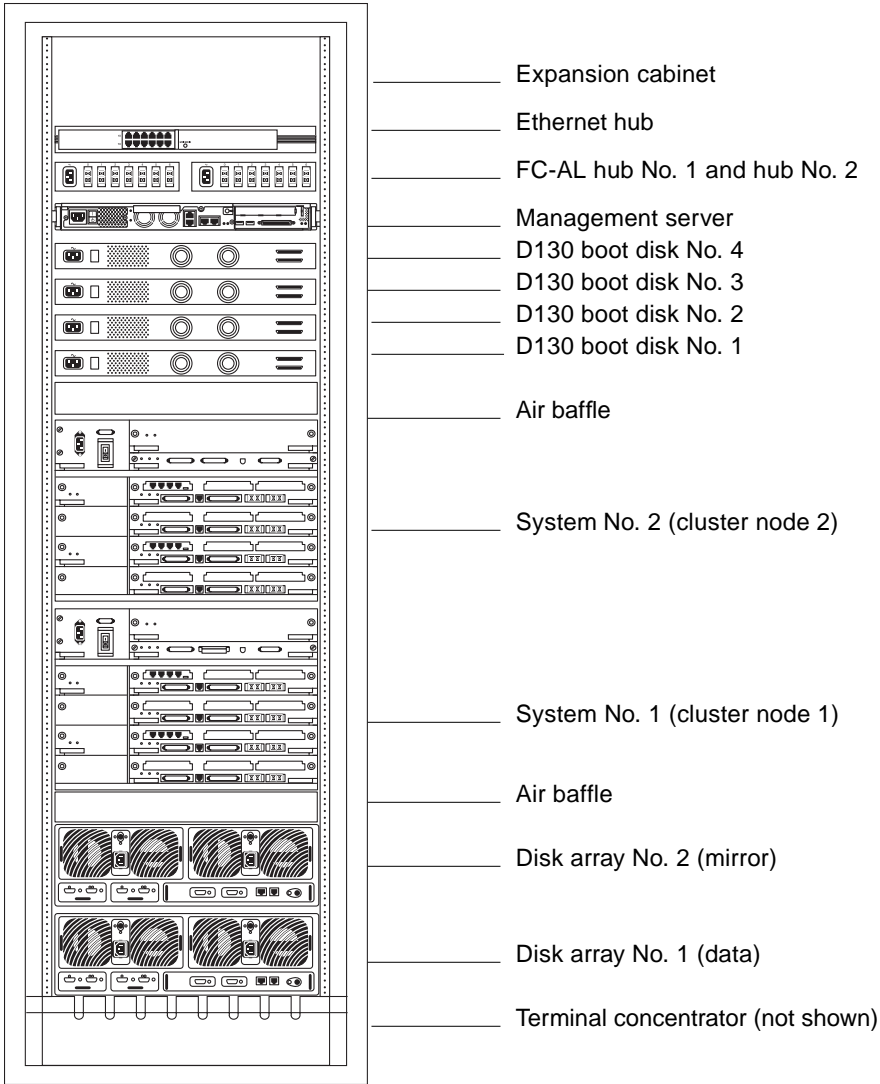
# Cluster Platform Component Location

FIGURE 2-4 shows how the Cluster Platform 4500/3 is arranged in the expansion cabinet. FIGURE 2-2 lists the rack components and the quantities required.

---

**Note** – The rack arrangement complies with weight distribution, cooling, EMI, and power requirements.

---



**FIGURE 2-4** Cluster Platform Rack Placement

**TABLE 2-2** Cluster Platform Rack Components

Component	Quantity
Sun StorEdge expansion cabinet	1
Ethernet hub	1
Netra T1 AC200 management server	1
Netra st D130 boot disks	4
Air baffle	2
Sun Enterprise cluster node	2
Sun StorEdge T3 array	2
Terminal concentrator	1

## Power and Heating Requirements

The Cluster Platform 4500/3 hardware should have two dedicated AC breaker panels. The cabinet should not share these breaker panels 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.

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

The 72-inch cabinet in the Cluster Platform 4500/3 consumes power and dissipates heat, as shown in TABLE 2-3.

**TABLE 2-3** Power and Heat Requirements for Cluster Platforms

72-Inch Cabinet	Maximum Power Draw	Heat Dissipation
1	10480 W	33786 BTUs/hr.

---

# Cabling the System

The Cluster Platform 4500/3 is shipped with the servers, hubs, and each of the arrays already connected in the cabinet. You should not need to cable the system. Refer to FIGURE 2-4 for servicing the cables.

This section describes how the Cluster Platform 4500/3 components are cabled when shipped from the factory. The integrated platform provides FC-AL cables connected to the on-board GBICs on the I/O board. Serial cables connect the Ethernet hub to the management server and 10BASE-T ports on the disk arrays.

For specific cabling connections, refer to Appendix C.

**TABLE 2-4** Cluster Platform Cables

Component	Part Number	Quantity
SCSI cable	530-2834*	4
DB-25/RJ-45 serial cable	2151A	2
Null Ethernet cable	3837A	2
F100 cable	9715A	6
Serial cable	9524A	1
RJ-45 Ethernet cable	1871A	4

\*530-2834 is a manufacturing part number.



---

**Caution** – Partner pairs are not supported at this time. Do not connect the partner-pair loop cables.

---

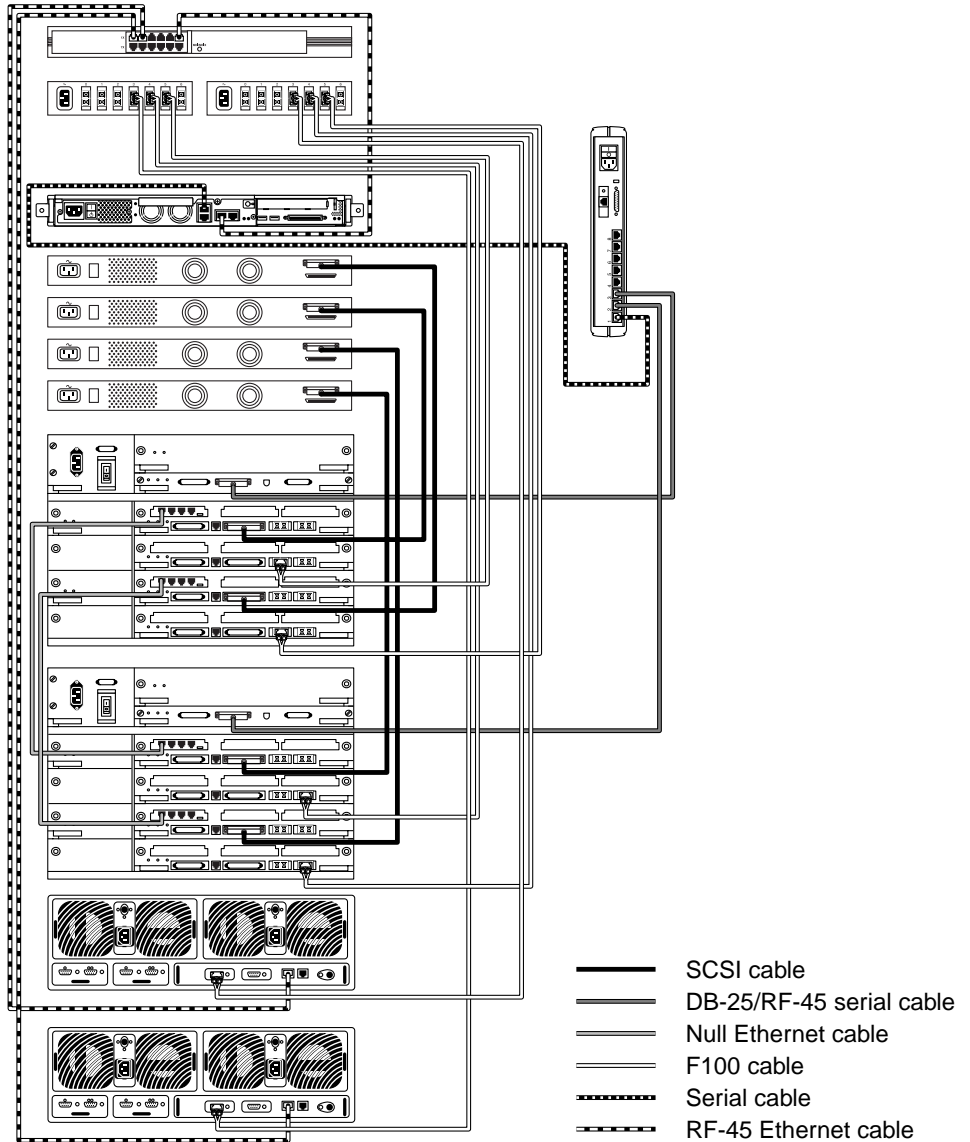


FIGURE 2-5 Cluster Platform Internal Cabling

---

# Customizing the Cluster Platform 4500/3

When the Cluster Platform 4500/3 is shipped from the factory, the Netra 200 AC is preloaded with all of the necessary software to install the cluster nodes with the Solaris operating environment and Sun Cluster 3.0 software.

Because all of the cables are connected and labeled in the factory, configuring the terminal concentrator first will enable the cluster administrator to easily configure the cluster.

---

**Note** – You must enter the correct parameters for the initial customization, or the configuration will not initialize properly.

---

## ▼ Customizing the Terminal Concentrator

---

**Note** – To produce a console terminal using a laptop computer, refer to Appendix A.

---

1. **Power up the main circuit breaker, and then power up all individual system components.**
2. **Provide console connectivity into the terminal concentrator:**
  - a. **Disconnect the serial cable (Part No. 9524A) from Port 1 of the terminal concentrator.**
  - b. **Connect the RJ-45 end of the serial cable (Part No. 5121A) to Port 1 of the terminal concentrator and the other end, DB-25 male, to serial port A of a Sun™ workstation.**

---

**Note** – The `tip(1)` command connects the Sun workstation I/O with the terminal concentrator I/O during an interactive session.

---

RJ-45 Ethernet cable

- c. From a terminal window on the Sun workstation, enter the following command:

```
# /usr/bin/tip hardware
```

---

**Note** – If the port is busy, refer to “Troubleshooting the Cluster Platform 4500/3 Installation” on page 69 in Appendix D.

---

**3. Configure the terminal concentrator device:**

- 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 administration workstation should display:

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

4. Modify the default IP address that will be used in your network. Use the `addr` command to modify the network configuration of the terminal concentrator. Use the `addr -d` command to verify the network configuration:

```
monitor:: addr
Enter Internet address [0.0.0.0]:: 192.212.87.62
Internet address: 192.212.87.62
Enter Subnet mask [255.255.0.0]:: 192.255.255.0
Subnet mask: 192.255.255.0
Enter Preferred load host Internet address [<any host>]:: 0.0.0.0
Preferred load host address: <any host>0.0.0.0
Enter Broadcast address [0.0.0.0]:: 192.212.87.255
Broadcast address: 192.212.87.255
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: 192.212.87.62
Subnet masks: 192.255.255.0
Preferred load host address: <any host>
Broadcast address: 192.212.87.255
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
```

5. Copy the Ethernet address entered above for the terminal concentrator, and add it to “Ethernet IP Address Worksheet” on page 8 for later reference when configuring the cluster.



6. Terminate your tip session by entering ~ . (tilde and period). Power-cycle the terminal concentrator to enable the IP address changes and wait at least two minutes for the terminal concentrator to activate its network.

```
monitor:: ~ .
```

---

**Note** – Double-check to ensure that the Ethernet hub is connected to the local area network. An RJ-45 cable must connect the Ethernet hub to the administration network backbone.

---

- a. Disconnect the RJ-45 serial cable (Part No. 5121A) from Port 1 of the terminal concentrator and from the Sun workstation.
- b. Reconnect the serial cable (Part No. 9524A) back into Port 1 of the terminal concentrator.

---

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

---

7. From the Sun workstation, verify that the terminal concentrator responds to the new IP address:

```
# usr/sbin/ping -I 5 148.212.87.62
PING 148.212.87.62: 56 data bytes
64 bytes from scotch (148.212.87.62): icmp_seq=0. time=1. ms
64 bytes from scotch (148.212.87.62): icmp_seq=1. time=0. ms
64 bytes from scotch (148.212.87.62): icmp_seq=2. time=0. ms
64 bytes from scotch (148.212.87.62): icmp_seq=3. time=0. ms
^C
```

---

**Note** – The Sun workstation must be connected to the same subnet to which the terminal concentrator was configured.

---

**8. To access the terminal concentrator, include the default router in the terminal concentrator configuration, and telnet to the terminal concentrator:**

```
# telnet 192.212.87.62
Trying 192.212.87.62...
Connected to 192.212.87.62.
Escape character is '^]'.
cli

Enter Annex port name or number: cli
Annex Command Line Interpreter * Copyright 1991 Xylogics, Inc.
annex: su
Password: 148.212.87.62 (password defaults to the assigned IP address)
annex# edit config.annex
```

---

**Note** – Change the default terminal concentrator password to avoid unnecessary security exposure. The terminal concentrator password matches the IP address of the terminal concentrator.

---

The terminal concentrator opens an editing session and displays an editing `config.annex` file.

9. Type the following information into the `config.annex` file; replace the following variable with the IP address obtained from your network administrator.

```
%gateway
net default gateway 148.212.87.248 metric 1 active
```

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

10. Enter the `<ctrl>w` command to save changes and exit the `config.annex` file.
11. Enable access to all ports, and reboot the terminal concentrator.

```
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

annex#: boot
bootfile: <CR>
warning: <CR>
      *** Annex (148.212.87.62) shutdown message from port v1 ***
      Annex (148.212.87.62) going down IMMEDIATELY
```

---

**Note** – After 90 seconds, the terminal concentrator and all ports will be accessible from outside the subnet. Use the command `usr/sbin/ping -I 5 148.212.87.62` to determine when the terminal concentrator is ready to be used.

---



**Caution** – The following steps display critical information for configuring the cluster nodes. Use the “Ethernet IP Address Worksheet” on page 8 to collect the Ethernet addresses. Consult your system administrator to obtain the IP addresses and node names for your cluster devices.

---

**Note** – Make sure all network interfaces for node 1 and node 2 are attached to the production network. (See Figure 2-3 on page 12 for connection details.)

---

## 12. From the Sun workstation, access the terminal concentrator:

```
# telnet 192.212.87.62
Trying 192.212.87.62...
Connected to 192.212.87.62.
Escape character is '^]' <CR>

Rotaries Defined:
    cli

Enter Annex port name or number:
```

Port designations follow:

- Port 1 = management server
  - Port 2 = cluster node 1
  - Port 3 = cluster node 2
- a. Enter the command `/usr/openwin/bin/xhost 192.212.87.38` to allow your windows manager to display screens from remote systems.
  - b. Telnet to the telnet 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.
  - c. To terminate the telnet session, type `<ctrl>`.

## 13. Boot the management server from the OBP prompt to start the customization process.

The management server boots into the Open Boot Prom (OBP) environment. The following examples show the customization process. The sample parameters may not fit your specific environment. Note the introduction on each code box, and select the best choice for your environment.

```
{0} ok setenv auto-boot? true
(0) ok boot disk0
Boot device: /pci@1f,0/pci@1/scsi@8/disk@0,0 File and args:
SunOS Release 5.8 Version Generic_108528-06 64-bit
Copyright 1983-2000 Sun Microsystems, Inc. All rights reserved.
Hostname: unknown
metainit: unknown: there are no existing databases

Configuring /dev and /devices
```

---

**Note** – Because the management server is not provided with a monitor, it is only accessible over the network from another Sun workstation. When executing commands on the management server that require a local display, verify that the `DISPLAY` shell environment variable is set to the local hostname.

---

#### 14. Choose a specific localization.

At this time, only the English and U.S.A. locales are supported. Select a supported locale.

```
Select a Locale
0. English (C - 7-bit ASCII)
1. Canada-English (ISO8859-1)
2. Thai
3. U.S.A. (en_US.ISO8859-1)
4. U.S.A. (en_US.ISO8859-15)
5. Go Back to Previous Screen

Please make a choice (0 - 5), or press h or ? for help: 0
```

## 15. Select the appropriate terminal emulation:

```
What type of terminal are you using?
 1) ANSI Standard CRT
 2) DEC VT100
 3) PC Console
 4) Sun Command Tool
 5) Sun Workstation
 6) X Terminal Emulator (xterms)
 7) Other
Type the number of your choice and press Return: 2
```

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

The eri0 interface on the management server is intended for connectivity to the production network. You can obtain the management server name, IP address, and root password information from your network administrator:

```
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
```

## 16. Select 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:

```
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
```

## 17. Select the primary network interface.

The management server configuration uses eri0 as the default primary network interface:

```
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
```

**18. Enter the name of the management server.**

Consult your local network administrator to obtain the appropriate host name. The following management server name is an example.

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

**19. Enter the IP address of the management server.**

To specify the management server IP address, obtain it from your local network administrator and enter it at the prompt.

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: *192.212.87.38*

<esc>2



## 20. Deselect IPv6 support.

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

```
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
```

## 21. Confirm the customization information for the management server:

```
> 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: 192.212.87.38
Enable IPv6: No
```

```
<esc>2
```

## 22. Deselect and confirm Kerberos security.

Only standard UNIX security is currently supported. Verify that Kerberos security is disabled.

```
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
```

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

```
Configure Kerberos Security: No
```

```
<esc>2
```

## 23. Select and confirm a naming service.

Consult your network administrator to specify a naming service. No naming services are selected for the following example.

---

**Note** – The two cluster nodes will be automatically configured to *not support* any naming services. This default configuration avoids the need to rely on external services.

---

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
[X] None
```

<esc>2

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

```
Name service: None
```

<esc>2

#### 24. Select a subnet membership.

The default standard configuration communicates with network interfaces as part of a subnet.

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

## 25. Select a netmask.

Consult your network administrator to specify the netmask of your subnet. The following shows an example of a 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: *192.255.255.0*

**<esc>2**

## 26. Select the appropriate time zone and region.

Select the time zone and region to reflect your environment:

```
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
```

```
> 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
```

## 27. Set the date and time, and confirm all information.

```
> Accept the default date and time or enter
  new values.

Date and time: 2000-12-21 11:47

Year   (4 digits) : 2000
Month  (1-12)     : 12
Day    (1-31)     : 21
Hour   (0-23)     : 11
Minute (0-59)     : 47
<esc>2
> Confirm the following information.  If it is correct, press F2;
to change any information, press F4.

System part of a subnet: Yes
                        Netmask: 255.255.255.0
                        Time zone: US/Pacific
                        Date and time: 2000-12-21 11:47:00
<esc>2
```

## 28. Select a secure root password.

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 'alb2c3d4e5f6' as your root password, you can use 'alb2c3d4' 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*

After the system reboots, 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.

---

**Note** – Use TABLE 2-1 on page 8 as a reference to input data for Step 29 through Step 36. The variables shown in Step 29 through Step 32 are sample node names and parameters.

---

**29. Add the router name and IP address:**

```
Enter the Management Server's Default Router (Gateway) IP
Address... 192.145.23.248
```

**30. Add the cluster environment name:**

```
Enter the Cluster Environment Name (node names will follow)...
sc3sconf1
```

**31. Enter the terminal concentrator name (node names will follow):**

```
Enter the Terminal Concentrator Name...sc3conf1-tc
Enter the Terminal Concentrator's IP Address...192.145.23.90
```

**32. Add the cluster node names and IP addresses:**

```
Enter the First Cluster Node's Name... sc3sconf1-n1
Enter the First Cluster Node's IP Address... 192.145.23.91
Enter the First Cluster Node's Ethernet Address... 9:8:50:bf:c5:91
Enter the Second Cluster Node's Name... sc3sconf1-n2
Enter the Second Cluster Node's IP Address... 192.145.23.92
Enter the Second Cluster Node's Ethernet Address... 8:9:10:cd:ef:b3
```

Your network administrator can provide the remaining parameters for your environment.

**33. Add the disk array host names and IP addresses.:**

```
Enter the First T3's Name... t3-data
Enter the First T3's IP Address... 192.145.23.93
Enter the First T3's Ethernet Address... 00:12:e2:00:4c:4b
Enter the Second T3's Name... t3-mirror
Enter the Second T3's IP Address... 192.145.23.94
Enter the Second T3's Ethernet Address... 00:10:f2:00:3e:4f
```

- 34. When prompted to confirm the variables, type *y* if all of the variables are correct. Type *n* if any of the variables are not correct, and re-enter the correct variables. Enter **99** to quit the update mode, once all variables are displayed correctly.**

```
Option          Variable Setting
-----
1) Management Server's Default Router= 192.212.87.248
2) Cluster Name= sc3sconf1
3) Terminal Server's Name= sc3sconf1-tc
4) Terminal Server's IP Address= 192.145.23.90
5) First Node's Name= sc3sconf1-n1
6) First Node's IP Address= 192.145.23.91
7) First Node's Ethernet Address= 9:8:50:bf:c5:91
8) Second Node's Name= sc3sconf1-n2
9) Second Node's IP Address= 192.145.23.92
10) Second Node's Ethernet Address= 8:9:10:cd:ef:b3
11) First T3's Name... t3-data
12) First T3's IP Address... 192.145.23.93
13) First T3's Ethernet Address... 00:12:e2:00:4c:4b
13) Second T3's Name... t3-mirror
13) Second T3's IP Address... 192.145.23.94
13) Second T3's Ethernet Address... 00:10:f2:00:3e:4f
99) quit update mode....

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



### 35. Error messages indicate that the devices did not start completely.

Any error messages that you receive are normal, at this point.

```
Boot device: /pci@1f,0/pci@1/scsi@8/disk@0,0 File and args:
SunOS Release 5.8 Version Generic_108528-06 64-bit
Copyright 1983-2000 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.
MOBoot: ERROR: station "MOStation" start error on realm "StoreX".
esm_nonet: Notice: Unable to locate process id
           Info: Station may have died prematurely
esm_nonet: Error: Did not start completely.
MCBoot: ERROR: station "MCStation" start error on realm "StoreX".
esm_nonet: Notice: Unable to locate process id
           Info: Station may have died prematurely
esm_nonet: Error: Did not start completely.
```

---

**Note** – The error messages are expected as part of the standard configuration customization process. Do not attempt to reconfigure the devices. The error messages will not return after reboot.

---

**36. When the management server reboots, log in as root user to start the terminal concentrator customization.**

```
sc3sconf1-ms console login: root
Password:
Last login: Thu Jan  4 15:40:24 on console
Jan  4 15:51:14 sc3sconf1-ms login: ROOT LOGIN /dev/console
Sun Microsystems Inc.   SunOS 5.8           Generic February 2000
```

Check the "Cluster Platform 4500/3 User's Guide" (referred to in the software as "Sun Cluster Standard Configuration User's Guide, Sun Enterprise E4500 Server and StorEdge T3 Array") for instructions on how to set up the terminal concentrator.

Installed on this Management Server is the SunCluster Control Panel and Sun StorEdge Component Manager 2.1 software. Once the terminal concentrator is configured, you can produce console windows for each cluster node and the StorEdge Management Console for the T3's by exporting your local DISPLAY variable and executing: `ccp cluster` and `esm_gui&`

## ▼ Starting the Cluster Console

1. Start cluster console windows for both cluster nodes by entering the following command on the management server:

```
# /opt/SUNWcluster/bin/ccp cluster
```

---

**Note** – Replace the `sc3sconf1` variable name displayed above with your cluster name. When executing the `ccp(1)` command remotely, ensure that the `DISPLAY` shell environment variable is set to the local hostname.

---

When the `/opt/SUNWcluster/bin/ccp` command is executed, the Cluster Control Panel window displays (see FIGURE 2-6).



FIGURE 2-6 Cluster Control Panel Window

2. In the Cluster Control Panel window, double-click the Cluster Console (console mode) icon to display a Cluster Console window for each cluster node (see FIGURE 2-7).

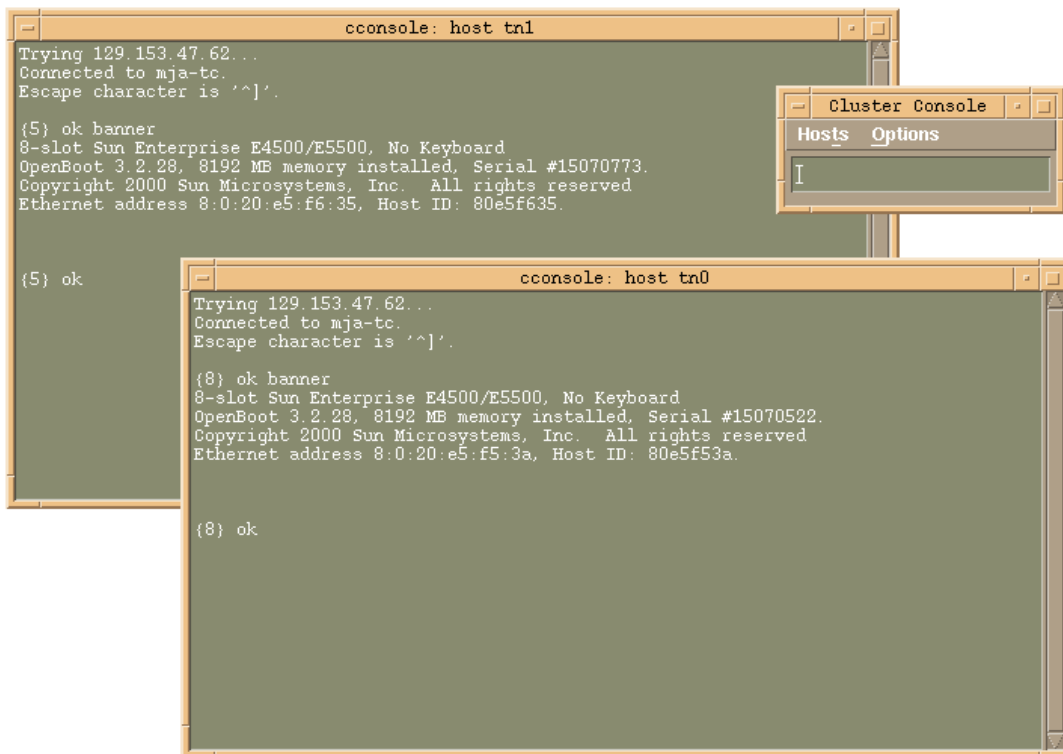
---

**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 of `vt220`. FIGURE 2-8 shows the terminal emulation in the Cluster Console window.

---

To issue a `stop-A` command to the cluster nodes and to access the OpenBoot™ PROM (OBP) prompt, position the cursor in the Cluster Console window, and enter the `<ctrl>] character sequence. This character forces access to the telnet prompt. Enter the stop-A command, as follows:`

```
telnet> send brk
ok>
```



**FIGURE 2-7** Cluster Nodes Console Windows

**3. To enter text into both node windows simultaneously, click the cursor in the Cluster Console window and enter the text.**

The text does not display in the Cluster Console window, and will display in both node windows. For example, the `/etc/hosts` file can be edited on both cluster nodes simultaneously. This ensures that both nodes maintain identical file modifications.

---

**Note** – The console windows for both cluster nodes are grouped (the three windows move in unison—FIGURE 2-7). To ungroup the Cluster Console window from the cluster node console windows, select Options from the Hosts menu (FIGURE 2-8) and deselect the Group Term Windows checkbox.

---



FIGURE 2-8 Cluster Console Window

## ▼ Installing the Software Stack on Both Cluster Nodes

1. Use the `ccp(1M)` Cluster Console window to enter the following command into both nodes simultaneously:

```
{0} ok setenv auto-boot? true
{0} ok boot net - install
```

---

**Note** – You must use spaces between the dash (-) character in the “boot net - install” string.

---

The Solaris operating environment, Solstice DiskSuite, and Sun Cluster 3.0 are automatically installed. All patches are applied and system files are configured to produce a basic cluster environment.

See Appendix B for sample output of the automatic installation of the first cluster node.

---

**Note** – Ignore any error messages received during the initial cluster installation. Do not attempt to reconfigure the nodes.

---

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

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

3. **Configure the Sun StorEdge T3 array shared disk storage, using the Solstice DiskSuite software.**  
Solstice DiskSuite configuration involves creating disksets, metadevices, and file systems. (Refer to the included Solstice DiskSuite documentation.)
4. **Select a quorum device to satisfy failure fencing requirements for the cluster. (Refer to the included Sun Cluster 3.0 documentation.)**
5. **Install and configure the highly available application for the cluster environment. (Refer to the Sun Cluster 3.0 documentation.)**
6. **Establish resource groups, logical hosts, and data services to enable the required application under the Sun Cluster 3.0 infrastructure. (Refer to the Sun Cluster 3.0 documentation.)**

Your customized Cluster Platform 4500/3 is completed.

---

## Cluster Platform 4500/3 Recovery

The recovery CDs enable you to replace the factory-installed Cluster Platform 4500/3 software environment on the management server in the event of a system disk failure.



---

**Caution** – Initiate a recovery only at the direction of technical support.

---

These CDs are intended only for recovering from a disaster. They are *not* needed for initial installation and configuration of the Cluster Platform 4500/3 management server.

### Before You Begin Recovery

Before you attempt to restore the management software environment, you must know your system configuration information and the state of your system backups. See TABLE 2-1 on page 8 for information on your customized configuration.

Your system configuration information must include the following:

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

- Ethernet addresses

---

**Note** – Because the recovery results in a generic, unconfigured system, you must restore all site-specific configuration files from backup. If your site uses special backup software such as VERITAS NetBackup, you must reinstall and configure that software.

---

## Recovery CD-ROMs

- CD0: Cluster Platform 4500/3 Recovery Environment Boot CD

Contains a bootable copy of the Solaris 8 10/00 Operating Environment, configured to execute recovery software

- CD1: Cluster Platform 4500/3 Recovery Operating System CD 2

Installs software for the Solaris operating environment, Solstice DiskSuite, Sun Cluster 3.0, and recommended patches.

- CD2: Cluster Platform 4500/3 Node Software Operating System CD.

Contains software for the Cluster Environment to jump-start the nodes for performing mirroring and hotsparring. Installs the Solaris operating environment and recommended patches onto each node.

Contains information to build the management server and loads the mirroring script.

## ▼ Installing the Recovery CD

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

```
# telnet sc3sconf1-tc
Trying 148.212.87.62...
Connected to sc3sconf1-tc.
Escape character is '^]' <CR>

Rotaries Defined:
  cli

Enter Annex port name or number: 1
```

2. To issue a `stop-A` command to the cluster nodes and to access the OpenBoot PROM (OBP) prompt, position the cursor in the Cluster Console window and enter the `<ctrl>]` character sequence.

3. This character forces access to the `telnet` prompt. Enter the `Stop-A` command, as follows:

```
telnet> send brk
```

4. Boot the system from the CD-ROM:

```
ok boot cdrom
```

The system boots from the CD-ROM and prompts you for the mini-root location (a minimized version of the Solaris operating environment). This procedure takes approximately 15 minutes.

```
Standard Cluster Environment Recovery Utility
...
Starting the Standard Cluster Recovery Utility
...
Searching the systems hard disks for a
location to place the Standard Cluster Recovery Environment.
...
Looking for swap slice on which to install the Standard Cluster
Recovery Environment...
...
Looking for swap slice on which to install the Standard Cluster
Recovery Environment...
...
The Recovery Utility will use the disk slice, c0t0d0s1, labeled as
swap.
WARNING: All information on this disk will be lost

Can the Recovery Utility use this slice [y,n,?] y
```

---

**Note** – Messages which display when a suitable disk slice is found may vary, depending upon the state of your disks. Disregard any messages and select *any* suitable disk slice; the mini-root is only used during system boot.

---



## 5. Select a CD-ROM drive from the menu.

Once the Cluster Platform 4500/3 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 CD-ROM drive. Completing this process takes approximately 15 minutes.

```
Standard Cluster Environment Recovery Utility V. 1.0

Please identify the CD-ROM drive:
  1 c0t2d0s0
Enter selection [?,??,q]: 1
Please select a disk for restore:
  1 clt0d0s0
  2 clt1d0s0
  3 c0t2d0s0
Enter selection [?,??,q]: 1
Do you wish to format and erase clt0d0s0? [y,n,?,q] y
CONFIRM: clt0d0s0 WILL BE FORMATTED AND ERASED. CONTINUE?
[y,n,?,q] y
Formatting clt0d0s0 for restore...
...
fmthard: New volume table of contents now in place.
Cylinder groups must have a multiple of 2 cylinders with the given
parameters
Rounded cgsiz up to 230
/dev/rdsk/clt0d0s0: 34129016 sectors in 7243 cylinders of 19
tracks, 248 sectors 16664.6MB in 330 cyl groups (22 c/g, 50.62MB/
g, 6208 i/g)
```

## 6. Install the Solaris operating environment software.

You are prompted to remove CD0 and mount CD1 on the CD-ROM drive. After CD1 is mounted, press the Return key. The Solaris operating environment files are copied from CD1 onto the management server boot disk. This process takes approximately 20 minutes.

```
Preparing to recover Management Server.
Please place Recovery CD #1 in the CD-ROM drive. Press <Return>
when mounted.
<CR>
Restoring files from CD 1....
Installing boot block on clt0d0s0.
Root environment restore complete.
```

## 7. Install the second data CD.

When all files are copied from the first data CD, you are prompted to remove CD 1 and mount CD 2 on the CD-ROM drive. After CD 2 is mounted, press the Return key. The software and patch files are copied from CD 2 onto the management server boot disk. When all files are copied from both CDs, the system automatically shuts down. You must reboot the system. This process takes approximately 20 minutes.

```
Please place Recovery CD #2 in the CD-ROM drive. Press <Return>
when mounted.
<CR>
Restoring files from CD 2....
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
```

## Completing the Recovery Process

Once the management server recovery software is loaded, you must configure the system to match your environment. Refer to “Customizing the Cluster Platform 4500/3” on page 18 to customize your cluster environment. If the recovery process involves the replacement of cluster nodes, refer to “Ethernet IP Address Worksheet” on page 8 to verify that the first cluster node’s FC-AL is properly set up.

# Laptop Settings to Access Monitor Mode

---

This appendix provides the settings you must use to access monitor mode using a laptop computer. These are different from those used by a Sun workstation.

## ▼ 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. 5121A) to Port 1 of the terminal concentrator; connect the other end to the DB-25 to DB-9 female-female adapter.**

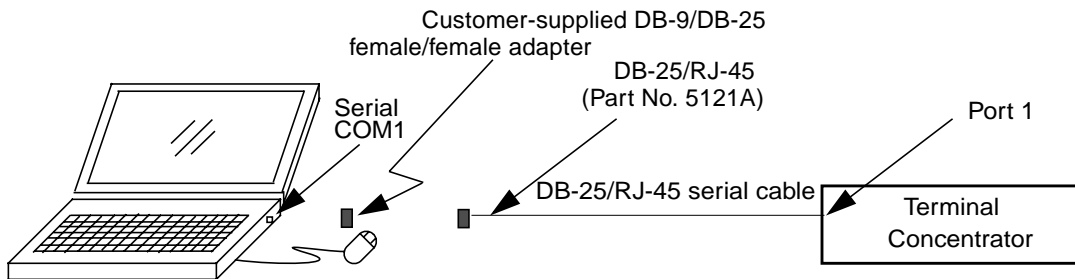


FIGURE A-1 Monitor Mode Connectivity Using a Laptop Computer

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, enter `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 “Customizing the Terminal Concentrator” on page 18.

---



# Console Output for the Automatic Software Install on the Cluster Nodes

---

The first portion of the installation installs the Solaris operating environment and configuration files, Solstice DiskSuite software, and patches on cluster node 1.

---

**Note** – Disregard the message, *WARNING: Failed to register application "DiskSuite Tool" with solstice launcher. Solstice Launcher application is not installed.*

---

After the first reboot, the second portion of the installation sets up the Solstice DiskSuite software.

## CODE EXAMPLE B-1 Solaris Software, Solstice DiskSuite, and Patches

```
{4} ok boot net - install
Resetting...
Software Power ON
screen not found.
Can't open input device.
Keyboard not present. Using ttya for input and output.
8-slot Sun Enterprise E4500/E5500, No Keyboard
OpenBoot 3.2.28, 8192 MB memory installed, Serial #15070773.
Copyright 2000 Sun Microsystems, Inc. All rights reserved
Ethernet address 8:0:20:e5:f6:35, Host ID: 80e5f635.
Rebooting with command: boot net - install
Boot device: /sbus@3,0/SUNW,hme@3,8c00000 File and args: -
install
SunOS Release 5.8 Version Generic_108528-03 64-bit
Copyright 1983-2000 Sun Microsystems, Inc. All rights
reserved.
whoami: no domain name
```

## CODE EXAMPLE B-1 Solaris Software, Solstice DiskSuite, and Patches

```
Configuring /dev and /devices
Using RPC Bootparams for network configuration information.
SUNW,hme3 : No response from Ethernet network : Link down -
- cable problem?
Skipping interface hme3
NOTICE: SUNW,qfe7: No response from Ethernet network : Link Down
- cable problem?
Skipping interface qfe7
NOTICE: SUNW,qfe6: No response from Ethernet network : Link Down
- cable problem?
Skipping interface qfe6
NOTICE: SUNW,qfe5: No response from Ethernet network : Link Down
- cable problem?
Skipping interface qfe5
Skipping interface qfe4
SUNW,hme2 : No response from Ethernet network : Link down -
- cable problem?
Skipping interface hme2
SUNW,hme1 : No response from Ethernet network : Link down -
- cable problem?
Skipping interface hme1
NOTICE: SUNW,qfe3: No response from Ethernet network : Link Down
- cable problem?
Skipping interface qfe3
NOTICE: SUNW,qfe2: No response from Ethernet network : Link Down
- cable problem?
Skipping interface qfe2
NOTICE: SUNW,qfel: No response from Ethernet network : Link Down
- cable problem?
Skipping interface qfel
Skipping interface qfe0
Configured interface hme0
Using sysid configuration file
129.153.47.38:/SOFTWARE/Solaris8_10-00/sysidcfg
The system is coming up. Please wait.
Starting remote procedure call (RPC) services: sysidns done.
Starting Solaris installation program...
Searching for JumpStart directory...
Using rules.ok from 192.153.47.38:/SOFTWARE/Solaris8_10-00.
Checking rules.ok file...
Using profile: Profiles/sc3sconf1-n0.profile
Using finish script: Drivers/sc3sconf1-n0.driver
Executing JumpStart preinstall phase...
Searching for SolStart directory...
Checking rules.ok file...
Using begin script: install_begin
```



## CODE EXAMPLE B-1 Solaris Software, Solstice DiskSuite, and Patches

```
Using finish script: patch_finish
Executing SolStart preinstall phase...
Executing begin script "install_begin"...
Begin script install_begin execution completed.

Processing default locales

Processing profile
- Selecting cluster (SUNWCXall)
- Deselecting package (SUNWpmowm)
- Deselecting package (SUNWpmowu)
- Deselecting package (SUNWpplr)
- Deselecting package (SUNWpplr)
- Deselecting package (SUNWpplr)
- Deselecting package (SUNWpplr)
- Deselecting package (SUNWpplr)
- Selecting locale (en_US)
Installing 64 bit Solaris packages
- Selecting all disks
- Configuring boot device
- Configuring (c0t2d0s0)
- Configuring swap (c0t2d0s1)
- Configuring /globaldevices (c0t2d0s7)
- Configuring (c2t2d0s0)
- Configuring (c2t2d0s1)
- Configuring (c2t2d0s7)
- Configuring (c0t3d0s0)
- Configuring (c0t3d0s1)
- Configuring (c0t3d0s7)
- Configuring (c2t3d0s0)
- Configuring (c2t3d0s1)
- Configuring (c2t3d0s7)
- Configuring / (c0t2d0s3)
- Configuring (c2t2d0s3)
- Configuring (c0t3d0s3)
- Configuring (c2t3d0s3)
- Deselecting unmodified disk (c1t0d0)
- Deselecting unmodified disk (c3t0d0)

Verifying disk configuration

Verifying space allocation
- Total software size: 734.50 Mbytes

Preparing system for Solaris install

Configuring disk (c0t2d0)
- Creating Solaris disk label (VTOC)
```

## CODE EXAMPLE B-1 Solaris Software, Solstice DiskSuite, and Patches

```
Configuring disk (c0t3d0)
- Creating Solaris disk label (VTOC)

Configuring disk (c2t2d0)
- Creating Solaris disk label (VTOC)

Configuring disk (c2t3d0)
- Creating Solaris disk label (VTOC)

Creating and checking UFS file systems
- Creating / (c0t2d0s3)
- Creating /globaldevices (c0t2d0s7)
Beginning Solaris software installation

Starting software installation

=====
----Long list of packages at this spot----
=====

Completed software installation

Solaris 8 software installation succeeded

Customizing system files
- Mount points table (/etc/vfstab)
- Unselected disk mount points
(/var/sadm/system/data/vfstab.unselected)
- Network host addresses (/etc/hosts)

Customizing system devices
- Physical devices (/devices)
- Logical devices (/dev)

Installing boot information
- Installing boot blocks (c0t2d0s3)

Installation log location
- /a/var/sadm/system/logs/install_log (before reboot)
- /var/sadm/system/logs/install_log (after reboot)

Installation complete
Executing SolStart postinstall phase...
Executing finish script "patch_finish"...
```

## CODE EXAMPLE B-1 Solaris Software, Solstice DiskSuite, and Patches

```
Finish script patch_finish execution completed.
Executing JumpStart postinstall phase...
Executing finish script "Drivers/sc3sconf1-n0.driver"...

ROOT_DIR is set to /a.
FINISH_DIR is set to /tmp/install_config/Finish.
FILES_DIR is set to /tmp/install_config/Files.

Management Server "MStest01" (192.153.47.38) at
8:0:20:c2:1b:3c

Variable Settings (Final)
-----
Management Server's Default Router= "192.153.47.248"
Cluster Name= "sc3sconf1"
Terminal Server's Name= "sc3sconf1-tc"
Terminal Server's IP Address= "192.153.47.62"
First Node's Name= "sc3sconf1-n1"
First Node's IP Address= "192.145.23.91"
First Node's Ethernet Address= "9:8:50:bf:c5:91"
Second Node's Name= "sc3sconf1-n2"
Second Node's IP Address= "192.145.23.92"
Second Node's Ethernet Address= "8:9:10:cd:ef:b3"

building the /.profile file...
building the /etc/motd file to include cluster messages...
building the /.rhosts file to allow SDS rsh root access...
establishing the default router on the cluster node...
disabling software routing on the cluster node...
including customized environment in the /etc/hosts file...
UNAME is set to 5.8.
PACKAGE_MOUNT is set to 129.212.87.38:/SOFTWARE/Solaris8_10-
00/Packages.
PACKAGE_DIR is set to /tmp/jumpstart-packages.
PATCH_MOUNT is set to 129.212.87.38:/SOFTWARE/Solaris8_10-
00/Patches/.
PATCH_DIR is set to /tmp/install_config/Patches.

=====
sc3sconf1-n0.driver: Driver started.
=====

NOTICE: Mounting 192.153.47.38:/SOFTWARE/Solaris8_10-00/Packages
on /a//tmp/jumpstart-packages.
NOTICE: Mounting 192.153.47.38:/SOFTWARE/Solaris8_10-00/Patches/
on /a//tmp/install_config/Patches.
```

## CODE EXAMPLE B-1 Solaris Software, Solstice DiskSuite, and Patches

```
=====
sc3sconf1-n0.driver: Starting finish script: add_sds.fin
=====

=====
Installing Package: SUNWmdg
=====

Processing package instance <SUNWmdg> from
</a/tmp/jumpstart-packages>

Solstice DiskSuite Tool
(sparc) 4.2.1,REV=1999.11.04.18.29
Copyright 2000 Sun Microsystems, Inc. All rights reserved.
## Executing checkinstall script.
Using </a> as the package base directory.
## Processing package information.
## Processing system information.
  4 package pathnames are already properly installed.
## Verifying disk space requirements.

Installing Solstice DiskSuite Tool as <SUNWmdg>

## Executing preinstall script.
## Installing part 1 of 1.
/a/usr/lib/lvm/X11/app-defaults/Metatool
/a/usr/lib/lvm/metatool-toolsmenu
[ verifying class <preserve> ]
## Executing postinstall script.
Killed
Killed
WARNING: Failed to register application "DiskSuite Tool" with
solstice launcher.

Installation of <SUNWmdg> was successful.

=====
Installing Package: SUNWmdja
=====

Processing package instance <SUNWmdja> from
</a/tmp/jumpstart-packages>

Solstice DiskSuite Japanese localization
(sparc) 4.2.1,REV=1999.12.09.15.37
```

### CODE EXAMPLE B-1 Solaris Software, Solstice DiskSuite, and Patches

```
Copyright 2000 Sun Microsystems, Inc. All rights reserved.
## Executing checkinstall script.
Using </a> as the package base directory.
## Processing package information.
## Processing system information.
 8 package pathnames are already properly installed.
## Verifying disk space requirements.

Installing Solstice DiskSuite Japanese localization as
<SUNWmdja>

## Executing preinstall script.
## Installing part 1 of 1.
709 blocks
/a/usr/lib/lvm/X11/ja/app-defaults/Metatool
/a/usr/lib/lvm/locale/ja/metatool-toolsmenu
[ verifying class <preserve> ]
## Executing postinstall script.
Killed
Killed
WARNING: Failed to register application "DiskSuite Tool" with
solstice launcher.

Installation of <SUNWmdja> was successful.
```

After the second reboot, the system boots as a cluster node and joins the cluster. The mirror metadevices are attached for the boot, swap, and global devices partitions.

Finally, node 1 is mirrored and rebooted.

### CODE EXAMPLE B-2 Solstice DiskSuite Configuration

```
syncing file systems... done
rebooting...
Resetting..
Software Power ON
screen not found.
Can't open input device.
Keyboard not present. Using ttya for input and output.

8-slot Sun Enterprise E4500/E5500, No Keyboard
OpenBoot 3.2.28, 8192 MB memory installed, Serial #15070773.
Copyright 2000 Sun Microsystems, Inc. All rights reserved
Ethernet address 9:8:50:bf:c5:91, Host ID: 98bfc591.

Rebooting with command: boot
```

## CODE EXAMPLE B-2 Solstice DiskSuite Configuration

```
Boot device: disk2:d File and args:
SunOS Release 5.8 Version Generic_108528-05 64-bit
Copyright 1983-2000 Sun Microsystems, Inc. All rights reserved.
configuring IPv4 interfaces: hme0.
Hostname: sc3sconf1-n1
Configuring /dev and /devices
Configuring the /dev directory (compatibility devices)
The system is coming up. Please wait.
checking ufs filesystems
/dev/rdisk/c0t2d0s7: is clean.
Configuring network interface addresses: hme0 hme1SUNW,hme1 : No
response from Ethernet network : Link down -- cable problem?
hme2SUNW,hme2 : No response from Ethernet network : Link down --
cable problem?
hme3SUNW,hme3 : No response from Ethernet network : Link down --
cable problem?
qfe0SUNW,qfe0: 100 Mbps full duplex link up - internal
transceiver
qfe1NOTICE: SUNW,qfe1: No response from Ethernet network : Link
Down - cable problem?
qfe2NOTICE: SUNW,qfe2: No response from Ethernet network : Link
Down - cable problem?
qfe3NOTICE: SUNW,qfe3: No response from Ethernet network : Link
Down - cable problem?
qfe4 qfe5NOTICE: SUNW,qfe5: No response from Ethernet network :
Link Down - cable problem?
qfe6NOTICE: SUNW,qfe6: No response from Ethernet network : Link
Down - cable problem?
qfe7NOTICE: SUNW,qfe7: No response from Ethernet network : Link
Down - cable problem?

.
starting rpc services: rpcbind done.
Setting netmask of hme0 to 255.255.255.0
Setting default IPv4 interface for multicast: add net 224.0/4:
gateway sc3sconf1-n1
syslog service starting.
Print services started.
Feb 27 12:02:23 sc3sconf1-n0 sendmail[596]: My unqualified host
name (sc3sconf1-n1) unknown; sleeping for retry
volume management starting.

=====
Setting up Meta DB's
=====
```

## CODE EXAMPLE B-2 Solstice DiskSuite Configuration

```
=====
PLEASE WAIT: Setting up system for root and swap mirroring.
System will reboot after setup!
=====

hsp001: Hotspare pool is setup
hsp002: Hotspare pool is setup
d2: Concat/Stripe is setup
d3: Concat/Stripe is setup
d6: Concat/Stripe is setup
d7: Concat/Stripe is setup
d11: Concat/Stripe is setup
d12: Concat/Stripe is setup
d1: Mirror is setup
d10: Mirror is setup

=====
Modifying /etc/vfstab
=====

Dump content: kernel pages
Dump device: /dev/md/dsk/d5 (dedicated)
Savecore directory: /var/crash/sc3sconf1-n0
Savecore enabled: yes
installing cluster software on the cluster nodes...
Found the sc3sconf1-n1 to be the first cluster node

** Installing SunCluster 3.0 **
SUNWscr.....done
SUNWscdev...done
SUNWscu.....done
SUNWscman...done
SUNWscsal...Feb 27 12:03:23 sc3sconf1-n1 sendmail[596]: unable to
qualify my own domain name (sc3sconf1-n1) -- using short name
done
SUNWscsam...done
SUNWscvm...done
SUNWmdm.....done

Initializing cluster name to "sc3sconf1" ... done
Initializing authentication options ... done
Initializing configuration for adapter "qfe0" ... done
Initializing configuration for adapter "qfe4" ... done
```

## CODE EXAMPLE B-2 Solstice DiskSuite Configuration

```
Setting the node ID for "sc3sconf1-n1" ... done (id=1)

Checking for global devices global file system ... done
Checking device to use for global devices file system ... done
Updating vfstab ... done

Verifying that NTP is configured ... done
Installing a default NTP configuration ... done
Please complete the NTP configuration after scinstall has
finished.

Verifying that "cluster" is set for "hosts" in nsswitch.conf ...
done
Adding the "cluster" switch to "hosts" in nsswitch.conf ... done

Verifying that "cluster" is set for "netmasks" in nsswitch.conf
... done
Adding the "cluster" switch to "netmasks" in nsswitch.conf ...
done

Verifying that power management is NOT configured ... done

Ensure network routing is disabled ... done

Please re-boot this machine.

Log file - /var/cluster/logs/install/scinstall.log.642

Checking installed patches...
Verifying sufficient filesystem capacity (dry run method)...
Installing patch packages...

Patch number 110648-02 has been successfully installed.
See /var/sadm/patch/110648-02/log for details

Patch packages installed:
  SUNWscdev
  SUNWscr
  SUNWscu

Updating the /etc/inet/ntp.conf file....

=====
System will reboot now!
=====

syncing file systems... done
```



### CODE EXAMPLE B-2 Solstice DiskSuite Configuration

```
rebooting...
Resetting..
Software Power ON
screen not found.
Can't open input device.
Keyboard not present. Using ttya for input and output.

8-slot Sun Enterprise E4500/E5500, No Keyboard
OpenBoot 3.2.28, 8192 MB memory installed, Serial #15070773.
Copyright 2000 Sun Microsystems, Inc. All rights reserved
```

### CODE EXAMPLE B-3 Metadevice Mirror Attachment and Cluster Node Booting

```
removing /etc/rc2.d/S94n0-sds-mirror script...
Apr 20 14:30:50 nodel reboot: rebooted by root
Apr 20 14:30:50 nodel syslogd: going down on signal 15
syncing file systems... done
rebooting...
Resetting..
Software Power ON

screen not found.
Can't open input device.
Keyboard not present. Using ttya for input and output
8-slot Sun Enterprise E4500/E5500, No Keyboard
OpenBoot 3.2.28, 8192 MB memory installed, Serial #15070773.
Copyright 2000 Sun Microsystems, Inc. All rights reserved
Ethernet address 9:8:50:bf:c5:91, Host ID: 98bfc591.
Rebooting with command: boot
Boot device: disk2:d File and args:
SunOS Release 5.8 Version Generic_108528-06 64-bit
Copyright 1983-2000 Sun Microsystems, Inc. All rights reserved.
WARNING: forceload of misc/md_trans failed
WARNING: forceload of misc/md_raid failed
configuring IPv4 interfaces: hme0
Hostname: nodel
/usr/cluster/bin/scdidadm: Could not load DID instance list.
Cannot open /etc/cluster/ccr/did_instances.
Booting as part of a cluster
NOTICE: CMM: Node nodel (nodeid = 1) with votecount = 1 added.
NOTICE: CMM: Node nodel: attempting to join cluster.
NOTICE: CMM: Cluster has reached quorum.
NOTICE: CMM: Node nodel (nodeid = 1) is up; new incarnation number
= 987802510.
NOTICE: CMM: Cluster members: nodel.
NOTICE: CMM: node reconfiguration #1 completed.
NOTICE: CMM: Node nodel: joined cluster.
```

### CODE EXAMPLE B-3 Metadevice Mirror Attachment and Cluster Node Booting

```
Configuring /dev and /devices
Configuring the /dev directory (compatibility devices)
Configuring DID devices
did instance 1 created.
did subpath /dev/rdisk/c0t2d0s2 created for instance 1.
did instance 2 created.
did subpath /dev/rdisk/c0t3d0s2 created for instance 2.
did instance 3 created.
did subpath /dev/rdisk/c0t6d0s2 created for instance 3.
did instance 4 created.
did subpath /dev/rdisk/clt0d0s2 created for instance 4.
did instance 5 created.
did subpath /dev/rdisk/c2t2d0s2 created for instance 5.
did instance 6 created.
did subpath /dev/rdisk/c2t3d0s2 created for instance 6.
did instance 7 created.
did subpath /dev/rdisk/c3t0d0s2 created for instance 7.
obtaining access to all attached disks
The system is coming up. Please wait.
starting rpc services: rpcbind done.
Setting netmask of lo0:1 to 192.255.255.255
Setting netmask of hme0 to 192.255.255.0
Setting default IPv4 interface for multicast: add net 192.0/4:
gateway node1
syslog service starting.
obtaining access to all attached disks
Configuring the /dev/global directory (global devices)
Apr 20 14:36:55 sc3sconf1-n1 cl_runtime: NOTICE: CMM: Node tn1
(nodeid =
2) with votecount = 0 added.
Apr 20 14:36:55 sc3sconf1-n1 cl_runtime: NOTICE: CMM: Cluster
members:
Apr 20 14:36:41 sc3sconf1-n1 xntpd[288]: couldn't resolve
'clusternode2-
priv', giving up on it
sc3sconf1-n1.
Apr 20 14:36:55 sc3sconf1-n1 cl_runtime: NOTICE: CMM: node
reconfiguration
#2 completed.
Apr 20 14:36:56 sc3sconf1-n1 cl_runtime: NOTICE: clcomm: Adapter
qfe0
constructed
Apr 20 14:36:56 sc3sconf1-n1 cl_runtime: NOTICE: clcomm: Path
sc3sconf1-n10:qfe0 -
tn1:qfe0 being constructed
Apr 20 14:36:57 sc3sconf1-n1 cl_runtime: NOTICE: clcomm: Adapter
qfe4
```

### CODE EXAMPLE B-3 Metadevice Mirror Attachment and Cluster Node Booting

```
constructed
Apr 20 14:36:57 sc3sconf1-n1 cl_runtime: NOTICE: clcomm: Path
sc3sconf1-n1:qfe4 -
tn1:qfe4 being constructed
Apr 20 14:37:38 sc3sconf1-n1 qfe: SUNW,qfe0: 100 Mbps full duplex
link up
- internal transceiver
Apr 20 14:37:38 sc3sconf1-n1 qfe: SUNW,qfe4: 100 Mbps full duplex
link up
- internal transceiver
Apr 20 14:37:47 sc3sconf1-n1 cl_runtime: WARNING: Path sc3sconf1-
n1:qfe0 - tn1:qfe0
initiation encountered errors, errno = 62. Remote node may be down
or unreachable through this path.
Apr 20 14:37:47 sc3sconf1-n1 cl_runtime: NOTICE: clcomm: Path
sc3sconf1-n1:qfe0 -
tn1:qfe0 errors during initiation
Apr 20 14:37:47 sc3sconf1-n1 cl_runtime: NOTICE: clcomm: Path
sc3sconf1-n1:qfe4 -
tn1:qfe4 errors during initiation
Apr 20 14:37:47 sc3sconf1-n1 cl_runtime: WARNING: Path sc3sconf1-
n1:qfe4 - tn1:qfe4
initiation encountered errors, errno = 62. Remote node may be down
or unreachable through this path.
obtaining access to all attached disks
Print services started.
d1: submirror d3 is attached
d5: submirror d7 is attached
d10: submirror d12 is attached
volume management starting.
The system is ready.
sc3sconf1-n1 console login:

removing /etc/rc2.d/S94n0-sds-mirror script...
```



## Connections Within the Cluster Platform 4500/3

This appendix describes the preinstalled arrangement of some cables within the Cluster Platform 4500/3. This information is provided to assist in restoring the hardware to its original configuration after service.

Cables that connect the servers to their storage components are run between the I/O system boards on the Sun Enterprise 4500 system cluster nodes to the FC-AL hubs or disk arrays. The I/O system boards for the Sun Enterprise 4500 system cluster nodes are numbered 1, 3, 5, and 7, top to bottom, respectively, on the rear sides of the Sun Enterprise 4500 system nodes.

The following tables contain lists of cable destinations. The fiber optic and SCSI cables are labeled at each end, identifying the source to destination.

TABLE C-1 through TABLE C-8 identify the primary connections from eri0 on node 1 and node 2 to the NAFO failover on your production network.

**TABLE C-1** Boot Disk to Server Connections

From Device	To Device	To Location	Cable Length/Type
D130 disk No. 1	System node 1, I/O board No. 1	Onboard SCSI	2m SCSI
D130 disk No. 2	System node 1, I/O board No. 3	Onboard SCSI	2m SCSI
D130 disk No. 3	System node 2, I/O board No. 1	Onboard SCSI	2m SCSI
D130 disk No. 4	System node 2, I/O board No. 3	Onboard SCSI	2m SCSI

**TABLE C-2** Disk Array to Hub Connections

<b>From Device</b>	<b>From Location</b>	<b>To Device</b>	<b>To Location</b>	<b>Cable Length/Type</b>
Disk array No. 1 (data)	F100 No. 1	FC-AL hub No. 1	Port No. 3	5m/F100 fiber optic
Disk array No. 2 (mirror)	F100 No. 2	FC-AL hub No. 2	Port No. 3	5m/F100 fiber optic
Disk array No. 1 (data)	10BASE-T	Ethernet hub	Port No. 0	RJ-45
Disk array No. 2 (mirror)	10BASE-T	Ethernet hub	Port No. 1	RJ-45

**TABLE C-3** FC-AL Hub to Server Connections

<b>From Device</b>	<b>From Location</b>	<b>To Device</b>	<b>To Location</b>	<b>Cable Length/Type</b>
FC-AL No. 1	Port No. 4	System No. 1 (node 1)	System board 3, onboard FC-AL host adapter, port No. 0	F100 fiber optic
FC-AL No. 1	Port No. 5	System No. 2 (node 2)	System board 7, onboard FC-AL host adapter, port No. 1	F100 fiber optic
FC-AL No. 2	Port No. 4	System No. 1 (node 1)	System board 3, onboard FC-AL host adapter, port No. 0	F100 fiber optic
FC-AL No. 2	Port No. 5	System No. 2 (node 2)	System board 7, onboard FC-AL host adapter, port No. 1	F100 fiber optic

**TABLE C-4** Management Server Connections

<b>From Device</b>	<b>From Location</b>	<b>To Device</b>	<b>To Location</b>	<b>Cable Length/Type</b>
Management server	Serial port A	Terminal concentrator	Serial port No. 1	Serial cable
Management server	Onboard Ethernet eri0	Ethernet hub	10BASE-T Port 5	RJ-45

**TABLE C-5** Terminal Concentrator to Management Server and Cluster Nodes Connections

From Device	From Location	To Device	To Location	Cable Length/Type
Terminal concentrator	Serial port 1	Management server	Serial port A	Serial cable
Terminal concentrator	Serial port 2	System No. 1 (node 1)	Serial port A	RJ-45/DB-25 serial
Terminal concentrator	Serial port 3	System No. 2 (node 2)	Serial port A	RJ-45/DB-25 serial

**TABLE C-6** Node to Node Connections

From Device	From Location	To Device	To Location	Cable Length/Type
System No. 1 (node 1)	System board No. 1, SBus 0, qfe0	System No. 2 (node 2)	System board No. 1, SBus 0, qfe0	Null Ethernet
System No. 1 (node 1)	System board No. 5, SBus 0, qfe4	System No. 2 (node 2)	System board No. 5, SBus 0, qfe4	Null Ethernet
System No. 2 (node 2)	System board No. 1, SBus 0, qfe0	System No. 1 (node 1)	System board No. 1, SBus 0, qfe0	Null Ethernet
System No. 2 (node 2)	System board No. 5, SBus 0, qfe4	System No. 1 (node 1)	System board No. 5, SBus 0, qfe4	Null Ethernet

**TABLE C-7** Ethernet Cables to Production Network Connections

From Device	From Location	To Device	To Location	Cable Length/Type
System No. 1 (node 1)	System board No. 1, onboard Ethernet	hme0	Production Network	Variable length Ethernet
System No. 1 (node 1)	System board No. 3, onboard Ethernet	hme1	NAFO Failover	Variable length Ethernet
System No. 2 (node 2)	System board No. 1, onboard Ethernet	hme0	Production Network	Variable length Ethernet
System No. 2 (node 2)	System board No. 3, onboard Ethernet	hme1	NAFO Failover	Variable length Ethernet

**TABLE C-8** Ethernet Hub Connections

<b>From Device</b>	<b>From Location</b>	<b>To Device</b>	<b>To Location</b>	<b>Cable Length/Type</b>
Ethernet hub	Port No. 0	Disk array No. 1 (node 1)	10BASE-T port	RJ-45
Ethernet hub	Port No. 1	Disk array No. 2 (node 2)	10BASE-T port	RJ-45
Ethernet hub	Port No. 5		Administration network	RJ-45
Ethernet hub	Port No. 7	Network port	Terminal concentrator	RJ-45



## Troubleshooting the Cluster Platform 4500/3 Installation

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This appendix provides steps for troubleshooting the Cluster Platform 4500/3 installation.

### Configuring the Terminal Concentrator

To connect to an alternate port for communication with the terminal concentrator, edit the `etc/remote` file, as follows:

```
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}}
```

Ensure the connected cable matches the selected serial port.

