

Clustered Database Platform 280/3 With Oracle 9i Database Real Application Clusters

Installation Guide



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Preface

This guide explains how to install and configure the software products that make up the Clustered Database Platform 280/3 system. This integrated product provides the infrastructure for implementing an Oracle9i database server in a Real Application Cluster (RAC) with VERITAS Volume Manager.

Note – For the latest and most current information on this clustered platform, refer to the *Clustered Database Platform 280/3 with Oracle9i and Sun™ Cluster High Availability Late-Breaking-News* document. See “Clustered Database Platform Documentation” on page xii for instructions on locating this document.

How This Book Is Organized

This guide is organized in the following manner:

Chapter 1 contains an introduction to the Clustered Database Platform 280/3 system.

Chapter 2 contains descriptions of the hardware components and procedures for cabling the system to your network.

Chapter 3 contains procedures on how to install and configure the software.

Appendix A contains descriptions of the factory installed cables.

Appendix B contains instructions on how to connect a laptop to the terminal concentrator.

Appendix C contains instructions on how to set of a `tip(1)` session.

Appendix D contains instructions on how to access software on the management server.

Appendix E contains instructions on how to install Sun Component Manager.

Appendix F contains instructions on how to configure the Sun Ray™ Server software.

Appendix G contains instructions on how to set up the NTP software.

Appendix H contains instructions on how to set up NAFO.

Appendix I contains the output of the Oracle9i™ RAC installation scripts.

Using UNIX Commands

This document does not contain information on basic UNIX™ commands and procedures.

See one or both of the following for this information:

- AnswerBook2™ online documentation for the Solaris™ software environment
- Other software documentation that you received with your platform

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. <code>%</code> You have mail.

Typeface or Symbol	Meaning	Examples
AaBbCc123	What you type, when contrasted with on-screen computer output	% su 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>

Note – Before you attempt to install the Clustered Database Platform software, you must read the *Clustered Database Platform 280/3 With Oracle9i Database Real Application Clusters Late-Breaking News* document, which is available at:

http://www.sun.com/products-n-solutions/hardware/docs/Integrated_Platforms/index.html

Several tools for reading documentation in online formats are preinstalled on your Clustered Database Platform 280/3 system.

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Please include the part number (816-4075-10) of your document in the subject line of your email.

Clustered Database Platform Documentation

The Clustered Database Platform 280/3 system comes with printed manuals, documentation on CDs, and AnswerBook2 and PDF documents that are accessible on the clustered platform once the clustered platform is setup. There are also documents available from the web. You will need them for the initial installation and for ongoing service of the system.

This section contains lists of available documentation and descriptions of the tools for viewing them.

Note – Before you attempt to install any Clustered Database Platform 280/3 system, you must read the *Clustered Database Platform 280/3 With Oracle9i Database Real Application Clusters Late-Breaking News* document, which is available at:

http://www.sun.com/products-n-solutions/hardware/docs/Integrated_Platforms/index.html

The Clustered Database Platform 280/3 system comes with printed manuals and CDs. The following table summarizes the printed manuals.

Application	Title	Part Number
Installation	<i>Clustered Database Platform 280/3 With Oracle9i Database Real Application Clusters Late-Breaking News</i> (online only)	816-4074
User	<i>Clustered Database Platform 280/3 Operations Guide</i> (in HTML on the management server only)	816-4080
Product Notes	<i>Clustered Database Platform 280/3 With Oracle9i Database Real Application Clusters Product Notes</i>	816-4073

The following table summarizes the type, access tool, and location of the online documentation.

Documentation Type	Access Tool	Documentation Location
PDF on CD	CD-ROM drive and a browser or Acrobat Reader software	<i>/cdrom/cd_directory_name</i>
PDF from the Web	Browser	http://www.sun.com/products-n-solutions/hardware/docs/Integrated_Platforms/index.html
AnswerBook2 collections	Browser	http://management_server_name:8888
PDF	Browser or Acrobat Reader software	http://managment_server_name:8080/local-docs.html

Management Server Splash Page

A variety of manuals are supplied with the Cluster Platform 280/3 system. To access the AnswerBook2 collections and the PDF documents (after the management server is installed and set up), use the Splash Page on the management server at the following URL in a browser:

`http://management_server_name:8080`



FIGURE P-1 Management Server Splash Page for Accessing Services and Documentation

Documentation Installed on the Clustered Database Platform

Documentation about the following software is available in PDF format (unless otherwise noted for AnswerBook2):

- Solstice DiskSuite™ 4.2.1
- Sun™ Cluster 3.0 7/01
- Sun™ Management Center
- Sun StorEdge™ Component Manager 2.2
- VERITAS Volume Manager 3.1.1
- Solaris documentation (in AnswerBook2 format)

Clustered Database Platform 280/3 Operations Guide

The *Clustered Database Platform 280/3 Operations Guide* is installed on the management server. This guide is HTML-based and includes installation, configuration, management, service, and recovery information.

Refer to the following management server URL in a browser:

http://management_server_name/opt/SUNWcdpgd/index.html

Solaris Operating Environment Documentation

Documentation about the Solaris 8 Operating Environment (Solaris OE) is available in the AnswerBook2 online format (see “AnswerBook2 Server” on page xvii for information on how to view AnswerBook collections).

The AnswerBook2 files reside in the `/opt/answerbooks/english/solaris_8` directory. This directory contains the following packages:

- SUNWadm – Solaris 8 System Administration Collection
- SUNWabe – Solaris 8 User Collection
- SUNWabsdk – Solaris 8 Software Developer 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™ PROM Collection

Sun Management Center Documentation

Installation instructions for the Sun Management Center 3.0 Update 2 (Sun MC) software are provided in the following text file:

```
/export/software/SunMC/cdl/sbin/INSTALL.README
```

Documentation about Sun MC is available from the Help menu in the Sun MC application.

VERITAS Documentation

Documentation about the VERITAS software is available the following directory:

- `/opt/VRTSvxvm/docs` (which contains the VERITAS Volume Manager documentation)

Clustered Database Platform 280/3 System Oracle Documentation

For the Oracle9i software, open the following file in your browser:

```
/export/home/oracle_base/doc/index.htm
```

The documents in this directory are specific the Clustered Database Platform. For Oracle9i specific software documentation, go to the following site:

```
http://download-west.oracle.com/otndoc/oracle9i/901\_doc/
```

Use the master index to look up a term. To use the search engine, however, you must be registered on the Oracle Technology Network. The registration is free, and the 901_doc page contains a link to the registration page.

Documentation Tools

Several tools for reading documentation in online formats are preinstalled on your Clustered Database Platform 280/3 system. If you are remotely logging in to the management server, use `xhost(1)` and set the display environmental variable to your machine so that external clients can access the display and so that the display is redirected to your machine.

Netscape Navigator Browser

You can access the Netscape Navigator™ browser through the Workspace menu if your workstation is running the Solaris Common Desktop Environment. You can also access the browser on the management server by using the following command:

```
% /usr/dt/bin/netscape &
```

Use the browser software to read documentation provided as HTML files, to view the output from an AnswerBook2 server or to read Sun product documentation at the <http://docs.sun.com> web site.

AnswerBook2 Server

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

After the clustered platform is set up, you can access the AnswerBook2 collections from a computer on your network with the following URL:

```
http://management_server_name:8888
```

Acrobat Reader

The Acrobat Reader software enables you to view documentation PDF files. You can access the Acrobat Reader software on the Clustered Database Platform 280/3 system by using the following command:

```
% /opt/Acrobat4/bin/acroread &
```

The man(1) Command

The man(1) command displays documentation about commands, utilities, and files in the Solaris Operating Environment and in other software products on the Clustered Database Platform 280/3 system. If the directory that contains the man page files for a product is not automatically accessed by the man(1) command, you can add that directory to the MANPATH environmental variable.

Introduction to the Clustered Database Platform 280/3

This guide explains how to install and to configure the software products that make up the Clustered Database Platform 280/3 system. This integrated product provides the infrastructure for implementing an Oracle9i Real Application Cluster (RAC) with VERITAS Volume Manager.

While the hardware and software for your database platform is preinstalled at the factory, there are a few initialization procedures you need to perform to tailor the system to your specific environment.

This document 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 software.

This chapter contains the following topics:

- “Clustered Database Platform Overview” on page 2
- “Hardware Components” on page 3
- “Software Components” on page 4
- “Volume Management Products” on page 5

For specific information about configuring disk sets, disk volumes, file systems, and data services, refer to the Sun Cluster 3.0 7/01 documentation.

Clustered Database Platform Overview

The Clustered 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.

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 to the management server, terminal concentrator, 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.

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

The Clustered Database Platform 280/3 system does not have a monitor. You access the Clustered Platform using a system on the network that you provide (shown as *your local system* in FIGURE 1-1). The local system is used as a remote display to the management server. You do not need to dedicate any particular system as the local system.

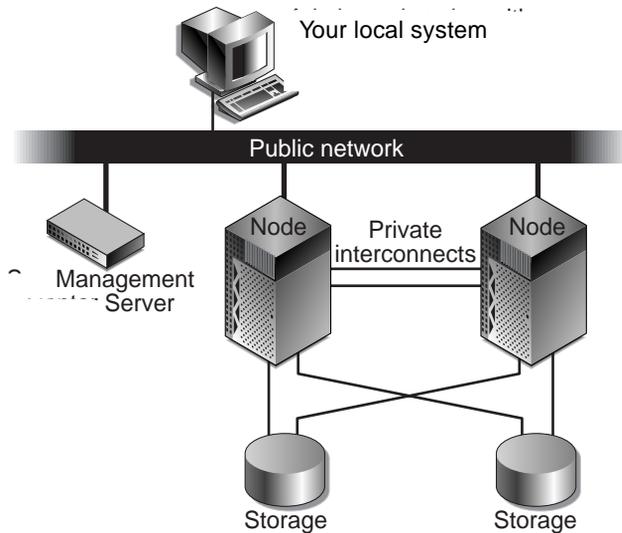


FIGURE 1-1 Cluster Platform 280/3 System Overview

Hardware Components

Your factory-integrated Clustered 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, each with two 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 or 72.4-Gbyte disk drives
- Four internal PCI cards per node; two 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 administrative hub
- All required mounting brackets, power cords, and cables.

Software Components

The Clustered Database Platform 280/3 system includes the following major software components on the management server:

- Solaris 8 10/01 Operating Environment with the appropriate patches
- Sun Cluster software console
- Sun Management Center 3.0 Update 4 with help desk
- Solstice DiskSuite 4.2.1 software
- Sun StorEdge Component Manager 2.2 software
- Sun Ray™ hardware server 1.3 software
- AnswerBook2 1.4.4 software
- Apache 1.3 server software
- Enterprise Services Explorer 3.5 software
- Flash server software

The following major software components to be installed on the cluster nodes:

- Solaris 8 10/01 Operating Environment with the appropriate patches
- Sun Cluster 3.0 12/01 software
- Solstice DiskSuite 4.2.1 or VERITAS Volume Manager 3.1.1 software¹
- Sun™ Management Center 3.0 Update 2 agent software
- Oracle9i™ Server Enterprise Edition, 32-bit, release 1, patch set 2

¹You 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.

Volume Management Products

The Clustered Database Platform 280/3 system is shipped with two volume management products: You choose, during the initial configuration, whether to use VERITAS Volume Manager 3.1.1 or Solstice Disk Suite 4.2.1 to mirror the data on the cluster nodes. Solstice Disk Suite software is used to mirror the boot disk on the management server.

Note – You must obtain two license keys (one for each node) from VERITAS if you intend to use the VERITAS Volume Manager product on your Clustered Platform. These license keys are not needed if you plan to use Solaris DiskSuite instead of VERITAS Volume Manager.

Clustered Platform 280/3 Hardware Installation

This chapter contains the following topics:

- “Power and Heating Requirements” on page 7
 - “Clustered Platform Component Location” on page 8
 - “Connectivity” on page 10
 - “Connecting the Hardware” on page 12
-

Power and Heating Requirements

The Clustered 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 (SPOFs), 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 Clustered Platform 280/3 system consumes power and dissipates heat as shown in TABLE 2-1.

TABLE 2-1 Power Consumption and Heat Dissipation Specifications

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

Clustered Platform Component Location

FIGURE 2-1 shows how the Clustered 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, connections between the hardware components, and access to the production and administration networks.

Note – The expansion cabinet arrangement complies with weight distribution, cooling, electromagnetic interference (EMI), and power requirements.

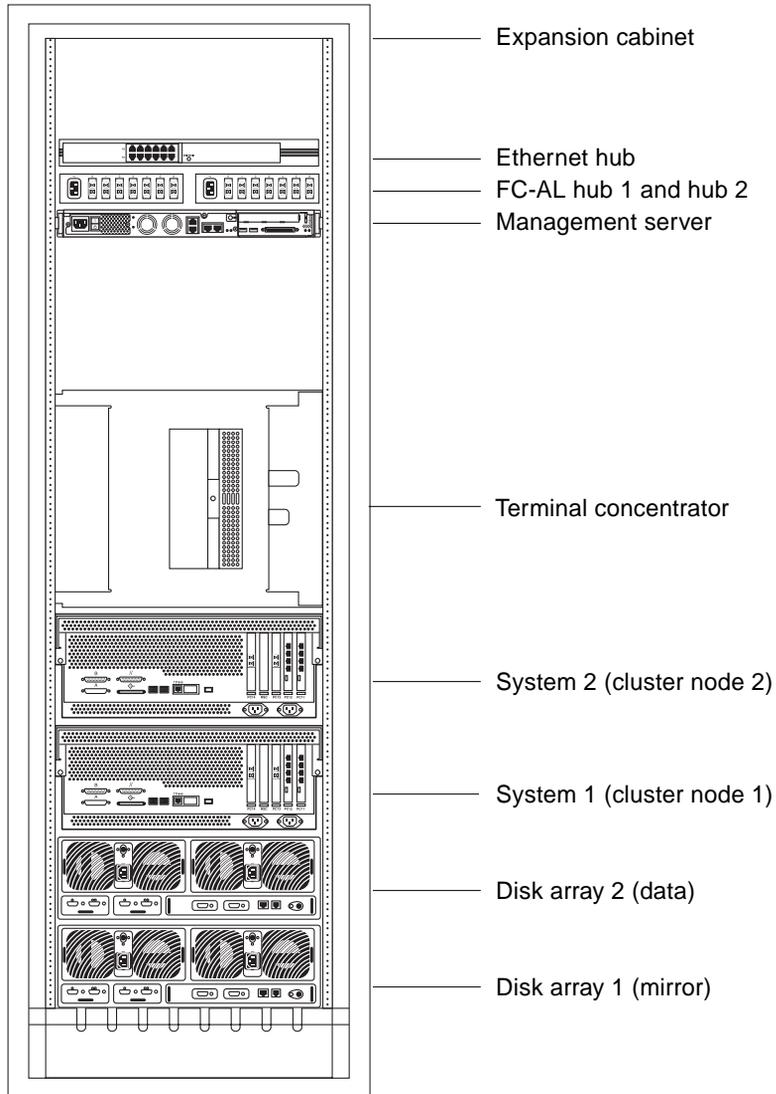


FIGURE 2-1 Clustered Platform Expansion Cabinet Placement

Connectivity

The Clustered Database Platform 280/3 system 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 280R server `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**—After 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.

Clustered Database Platform 280/3 System Cabling

The Clustered Database 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 A.

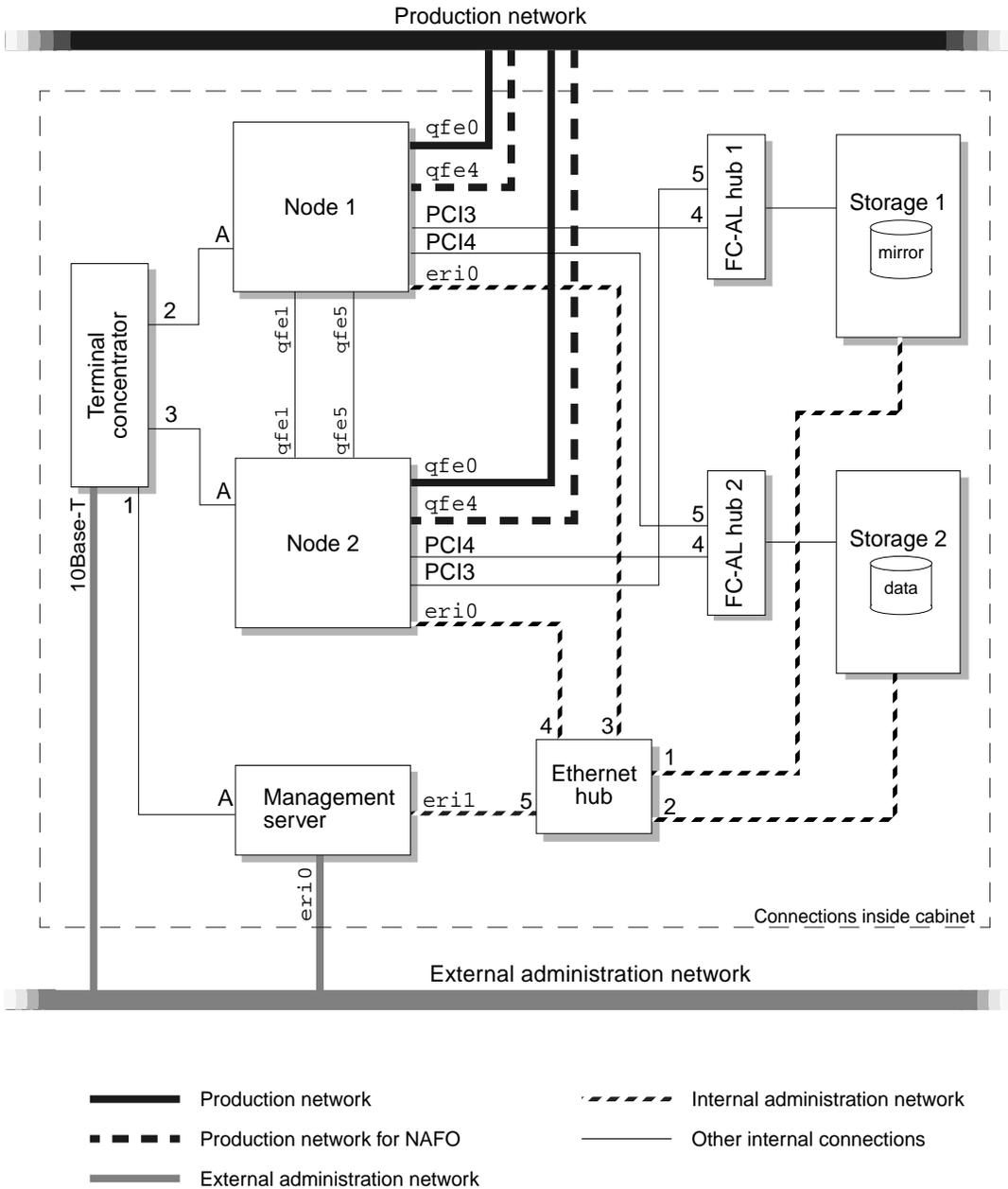


FIGURE 2-2 Clustered Platform Network Connections

Connecting the Hardware

This section contains a procedure for connecting the hardware at the customer site.

▼ To Install the Clustered Database Platform 280/3 Hardware

- 1. Connect the Clustered Database 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 7.
- 2. Connect the Clustered Database Platform 280/3 to your network(s) as described in the following steps and shown in FIGURE 2-3:**
 - 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).

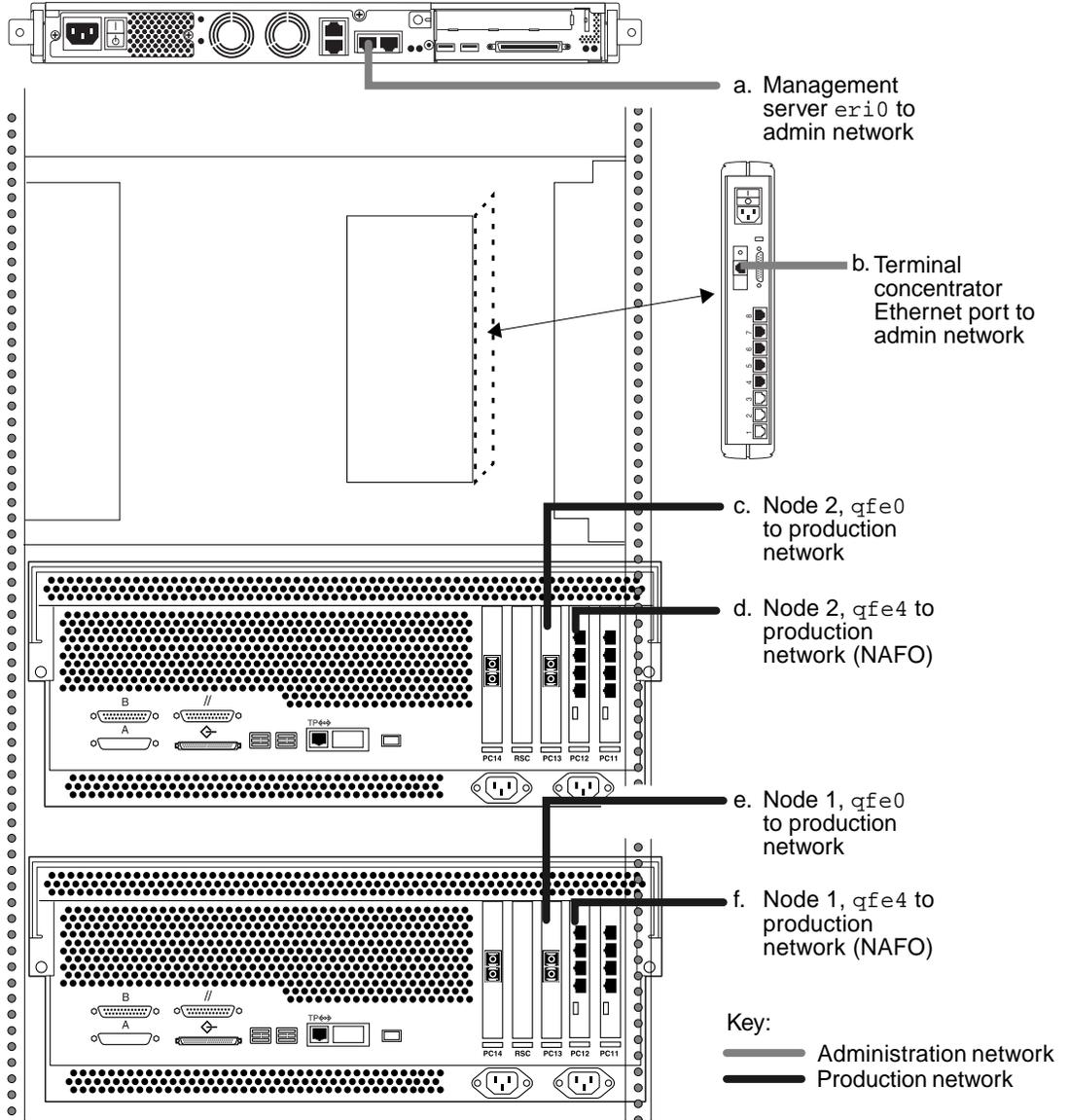


FIGURE 2-3 Clustered Database Platform 280/3 Connections to Your Networks

If you do not have an administration network, connect the management server and the terminal concentrator to your production network.

Configuring the Clustered Database Platform

This chapter covers the configuration and setup of the hardware and preinstalled software on the Clustered Database Platform 280/3 system, which includes the following topics:

- “Before You Begin” on page 15
- “Collecting Site-Specific Information” on page 16
- “Configuring the Software” on page 19
- “Finishing Up” on page 60

Before You Begin

Before performing the steps in this chapter, you must have already completed the following:

- Recorded your site-specific configuration information
- Unpacked the hardware
- Connected the cables
- Connected the power cords
- Connected the external storage
- Obtained the VERITAS license key from VERITAS (required for RAC)
- Obtained a computer that runs the Solaris Operating Environment, or other X Windows compatible operating system, with a graphics terminal

Refer to the clustered platform documentation that came with the system for instructions on how to perform these tasks.

Note – The software installation and configuration instructions in this guide supersede equivalent instructions in the other manuals you might have received. For the latest and most current information on this clustered platform, refer to the *Clustered Database Platform 280/3 With Oracle9i Database Real Application Clusters, Late-Breaking News* document. See “Clustered Database Platform Documentation” on page xii for instructions on locating this document.

Collecting Site-Specific Information

Use FIGURE 3-1 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 3-1 Site-Specific Information Worksheet

	Item	Example Used In this Guide	Your Value
Terminal concentrator	Name	<i>TC</i>	
	IP address (admin network)	<i>192.168.0.2</i>	
	Subnet mask ¹	<i>255.255.255.0</i>	
	Load host address ¹	<i>0.0.0.0</i>	
	Broadcast address	<i>192.168.0.255</i>	
	Dump address ¹	<i>0.0.0.0</i>	
Management Server	Host name	<i>sc3sconf1-ms</i>	
	IP address (<i>eri0</i> on admin net)	<i>192.168.0.1</i>	
	Subnet mask ¹	<i>255.255.255.0</i>	
	Default router IP address (admin net)	<i>198.168.0.248</i>	
Cluster Environment	Name	<i>sc</i>	
	Default router IP address	<i>router_IP_address</i>	
	Network mask ¹	<i>255.255.255.0</i>	

TABLE 3-1 Site-Specific Information Worksheet (Continued)

	Item	Example Used In this Guide	Your Value
Cluster Node 1	Name	<i>node1</i>	
	IP address (qfe0 on production network)	<i>node1_IP_address</i>	
	Ethernet address	<i>8:0:20:fb:29:8e</i>	
Cluster Node 2	Name	<i>node2</i>	
	IP address (qfe0 on production network)	<i>node2_IP_address</i>	
	Ethernet address	<i>8:0:20:fb:1a:55</i>	
Internal Admin Network Addresses	Internal network IP address	<i>10.0.0.0</i>	
	Network mask ¹	<i>255.255.255.0</i>	
	Management server IP address (eril)	<i>10.0.0.1</i>	
	network hostname	<i>MS-280R-admin</i>	Set automatically
	Cluster node 1, IP address	<i>10.0.0.2</i>	
	Cluster node 1, hostname	<i>node1-admin</i>	Set automatically
	Cluster node 2, IP address	<i>10.0.0.3</i>	
T3 Array 1	Name	<i>T3-01</i>	
	Internal network IP address	<i>10.0.0.4</i>	
	Ethernet address ² (two digits between each colon)	<i>00:20:f2:00:3e:a6</i>	
T3 Array 2	Name	<i>T3-02</i>	
	Internal network IP address	<i>10.0.0.5</i>	
	Ethernet address ² (must have two digits between each colon)	<i>00:20:f2:00:04:d6</i>	

TABLE 3-1 Site-Specific Information Worksheet (*Continued*)

	Item	Example Used In this Guide	Your Value
Other	Private interconnect IP address ¹	<i>172.16.0.0</i>	
	Private interconnect Netmask ¹	<i>255.255.0.0</i>	
	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 3-1.
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 3-1 shows the location of the Ethernet address for the arrays.

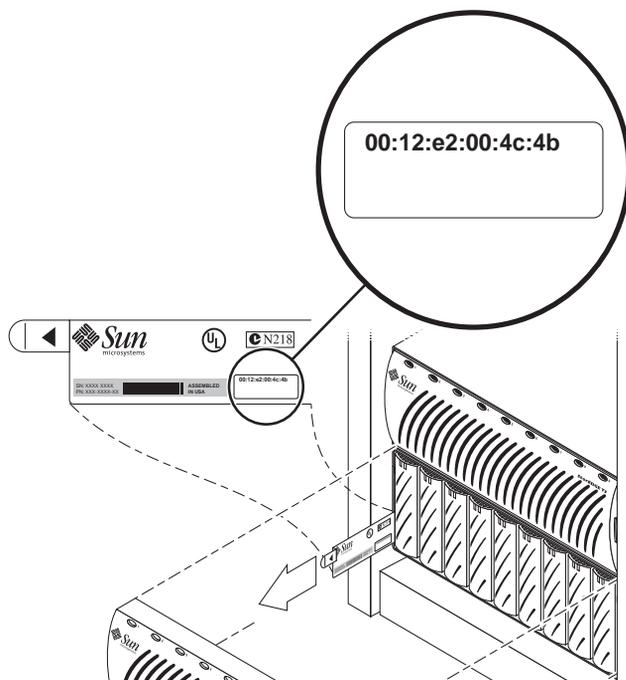


FIGURE 3-1 Location of Ethernet Address on Sun StorEdge Disk Array Pull Tab

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 B).

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 43.

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.**

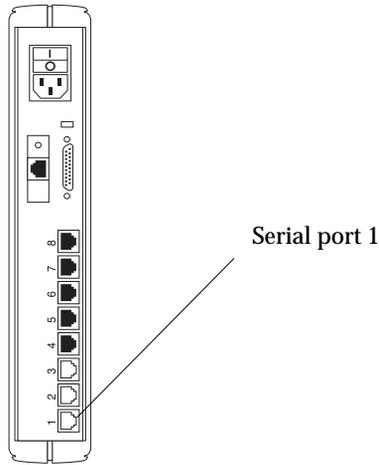


FIGURE 3-2 Terminal Concentrator Serial Port 1

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

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

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.

1. 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::
```

2. 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
```

3. Terminate your tip session by entering `~.` (tilde and period).

```
monitor:: ~.
```

4. 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.
5. 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.

6. 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.

7. 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.

8. Edit the terminal concentrator `config.annex` file:

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

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

9. 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
```

10. Press `Ctrl+W` to save the changes and exit the `config.annex` file.

11. 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
```

12. 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

This section contains the procedure for configuring the management server. You must perform the steps exactly as they appear.

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).



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 28 in Step 7. If this is not done, the text might not display properly on the screen, nor match what is in the examples in this guide.

If the `TERM` value is not set properly, the screen text might display garbled and prevent you from interacting with the installation script after you boot the management server. If this occurs, you must stop the installation and start over.

To stop the installation and start over, perform the following steps:

1. In the telnet window of your local system, press `Ctrl+]`, then type `send brk` to take the management server to the OpenBoot PROM prompt.
2. At the OpenBoot PROM prompt, boot the management server to single-user mode.
3. Execute the `sys-unconfig(1M)` command to remove previously defined system parameters.
4. Press `Y` to confirm the `sys-unconfig(1M)` questions.
5. Restart the installation of the management server by using the following command:

```
ok boot disk -s # sys-unconfig
```



Caution – Do *not* interrupt the installation process during the installation. There are several times that one or more of the cluster components will boot or download software. These activities take time (approximately 15 minutes for the management server to reboot, for example) and must not be interrupted. Do not interrupt the installation process at any time (this includes issuing a Ctrl-C key sequence), or the cluster platform will be left in an unpredictable state.

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. Press 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 OpenBoot PROM prompt as follows:

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

4. Boot the management server from the OpenBoot PROM 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.

6. Choose a locale.

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 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.



Caution – Some of the following terminal types cause unpredictable results. The procedures in this book contain code examples based on the DEC VT100 terminal type.

```

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

```

The terminal selection may affect the output displayed during the configuration process. It also may not match the examples in this document. 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-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-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-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-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-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-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-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-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-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-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-6_Help
```

21. Select your region.

22. Select your time zone.

23. Set the date and time.
24. Confirm the date and time, and time zone information.
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 '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*

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 Set Up 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.

You must also enter the values prescribed in this procedure. Do not press Return to accept a default value unless otherwise noted.

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 27, 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, press Y.
- To specify a different address, press 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, press Y.
- To specify a different netmask address, press 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, press Y.
- If any of the values are not correct, press N, and the line number of the item to change, followed by the correct value.

- Press 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_address
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:

- For Solstice DiskSuite, press Y.

- For VERITAS Volume Manager, press 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, 512 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



Caution – During a recovery, do not power cycle the Sun StorEdge T3 arrays as mentioned in Step 1. Instead, proceed to Step 2.

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:

- Press Y to set up Sun Management Center software (server, agent, and console) on the management server, and continue with Step 2.
- Press N to set up the management server without configuring the Sun Management Center software, and proceed to “To Install the Oracle Software” on page 53. 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 Sun MC software as usual. The license is used for Sun MC advanced monitoring features. The standard features do not require a license.

Obtain a Sun MC 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 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.

- Press Y if you have Sun Fire 15K servers in your enterprise and you want to monitor them with Sun Management Center.
- Press 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.

- Press Y if you have Sun Fire 15K system controllers in your enterprise and you want to monitor them with Sun Management Center.
- Press 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.

- Press 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.
- Press 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. Press 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.



Caution – During a recovery of the management server, the Sun StorEdge T3 arrays retain the passwords and IP addresses that you assigned during the initial installation. Resetting them during a recovery is not needed. If you are prompted for the array passwords and IP addresses, ignore the questions. The recovery process will continue after a time-out of a few seconds.

```
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. Press 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. Press 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. Press 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.



Caution – During a recovery of the management server, the Sun StorEdge T3 arrays retain the passwords and IP addresses that you assigned during the initial installation. Resetting them during a recovery is not needed. If you are prompted for the array passwords and IP addresses, ignore the questions. The recovery process will continue after a time-out of a few seconds.

```
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. Press 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.

- Press 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.
- Press 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.

- Press 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.

- Press 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 n to skip starting the Sun MC components.



Caution – You should press N to the following prompt. Pressing Y causes a list of exception errors that interfere with the script output. If you press Y, wait until the error messages complete, then press Return to be prompted to install the Oracle software, as in the next step. After the nodes have completed their configuration, you can manually start the Sun MC server and agent components on the management server. Alternatively, you can wait until the management server is rebooted, at which time the server and agent will be started automatically.

```
-----  
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] n
```

▼ To Install the Oracle Software

1. Press **n** to install the Oracle9i RAC software.

```
Do you want to install Oracle9i HA (y/n) n
Oracle9i RAC and Volume Manager 3.1.1 will be installed.
```

The Oracle software license will be printed.

2. When prompted, press **Return** to review the Oracle license terms.
3. Press **y** to agree to the Oracle license terms.

The login prompt will appear.

▼ To Install the Cluster Node Software

Note – 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.

1. Type the command `/user/openwin/bin/xhost 192.168.0.1` (the administration IP address of the management server) to enable your windows manager to display screens from the management server.
2. Log in to the management server as the superuser (`root`).
3. Set and export the `DISPLAY` shell environment variable to the IP address of the local host:

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

4. Launch the Cluster Control Panel:

```
# ccp $CLUSTER &
```

This command displays the Cluster Control Panel (FIGURE 3-3).



FIGURE 3-3 Cluster Control Panel

5. In the Cluster Control Panel window, double-click on the cconsole icon to display a Cluster Console window for each cluster node (FIGURE 3-4).

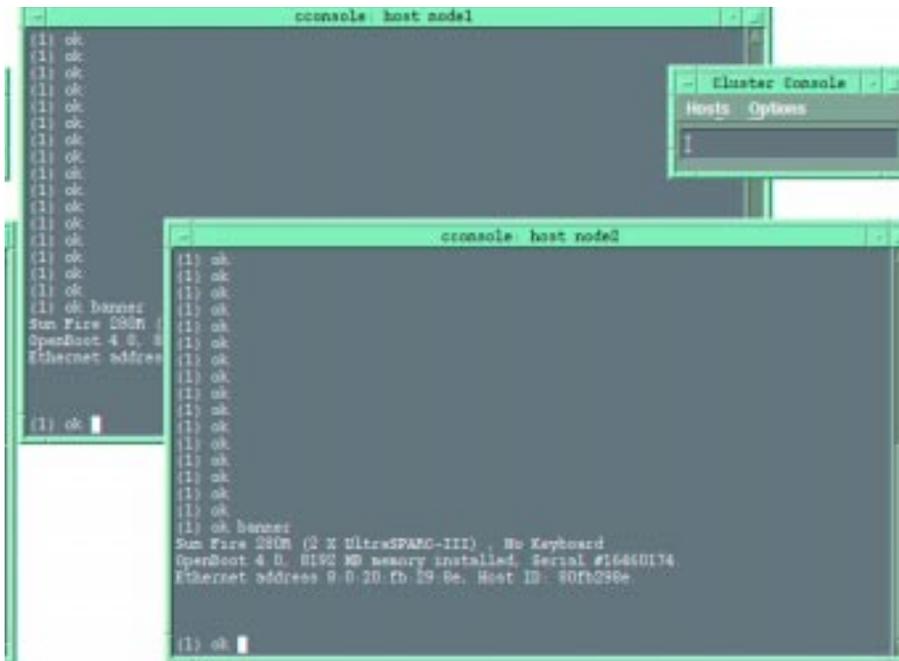


FIGURE 3-4 Cluster and Node Console Windows

To type text into both node windows simultaneously, click the cursor in the Cluster Console window and type the text. The text does not display in the Cluster Console window. This ensures that both nodes execute the commands simultaneously.

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

6. In the Cluster Console window, type the following command into both nodes simultaneously:

```
boot net - install
```

Note – You must use spaces before and after the hyphen (-) character in the “boot net - install” command.

The following software is automatically installed on both cluster nodes:

- Solaris 8 10/01 operating environment
- VERITAS Volume Manager 3.1.1
- Sun Cluster 3.0 7/01 and recommended patches
- Oracle9i Database RAC, version 9.0.1.2

All patches are applied and system files are configured to produce a basic cluster environment. In addition, the Oracle 9i Database RAC software is configured and a sample database is set up.

You may see the following error:

```
Boot device: /pci@8,700000/network@5,1: File and args:
Timeout waiting for ARP/RARP packet
Timeout waiting for ARP/RARP packet
Timeout waiting for ARP/RARP packet
.
.
.
```

If so, it is likely that you need to correct one of the following:

- Naming service conflict—A naming service was selected during the configuration of the management server.
- No network route—For network environments with a production and an administration network, the two network backbones must be routed so that the cluster nodes can jump start from the management server. If this is the case, you need to temporarily provide two Ethernet cables and connect the `eri0` network interfaces on both cluster nodes to the supplied ethernet hub in the Clustered

Platform. Once the installation and setup is complete, remove the temporary connections from the ethernet hub and the nodes, and reconnect the cables from the cluster nodes `eri0` to the production network.

Note – Press `Ctrl+] and send brk` to stop the Timeout waiting for ARP/RARP packet errors.

After you execute the `boot(1M)` command, you should see output as the management server installs and configures the Oracle software. Refer to for an example of the output.

7. **Take one of the following actions based on the volume manager product you chose:**
 - Solstice DiskSuite—continue with the next step.
 - VERITAS Volume Manager—proceed to “To Configure VERITAS Volume Manager” on page 57.
8. **Log into each cluster node as the 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
```

9. **Install the Sun Management Center agent.**

For instructions, refer to the Sun Management Center documentation.

10. **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 Clustered 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.

11. **Proceed to “Finishing Up” on page 60.**

▼ 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.

Note – You will not see these questions if you chose to install Solstice DiskSuite.

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:**

```
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
60020f20000003ea00000000000000000
```

Please enter a Volume Manager license key: ***node1_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
60020f20000003ea00000000000000000
```

Please enter a Volume Manager license key: ***node2_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:
```

- 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
```

- 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*.

- 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.

- Proceed to “Finishing Up” on page 60.**

Finishing Up

You need to perform additional steps depending on your environment. This section contains references to additional steps that may be needed.

▼ To Finish the Installation

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 clustered platform:

- Appendix E, "To Install Sun Component Manager 2.2" on page 79
- Appendix F, "To Access the Management Server from the Sun Ray" on page 86

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/SC3.0u1/scdataservices_3_0_ul
```

NAFO configuration and activation information is in the *Sun Cluster 3.0 U1 System Administration Guide (806-7073)*, Chapter 5, "Administering Cluster Interconnects and Public Networks," section "Administering the Public Network," starting on page 93.

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 you are using on the local system.

Note – You can stop the cluster nodes and access the OpenBoot PROM prompt by positioning the cursor in the Cluster Console window and pressing `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 OpenBoot PROM prompt.

3. Optionally, enable the Oracle GUI configuration assistant to access the nodes.

Certain Oracle GUI configuration assistants such as `dbca` and `netca` require the ability to issue a remote shell (`rsh`) to the nodes. For this to take place, a `.rhosts` file must reside in the home directory of each node (for security reasons, the default configuration does not create a `.rhosts` file). The `.rhosts` file for each node is populated with the node name of each node, and private interconnect IP addresses (for the local node), followed by the `oracle` UNIX user name. For security, delete both `.rhosts` files when you are finished running `dbca` or `netca`.

Content for a `.rhosts` file:

```
cluster_node1_name oracle
cluster_node2_name oracle
node_private_interconnect_IP_1 oracle
node_private_interconnect_IP_2 oracle
```

Note – You can run `/usr/sbin/ifconfig -a` on a node to determine the private interconnect IP addresses.

4. Place the Oracle database into archive log mode.

Choose a location where the Oracle redo log files are copied, and specify the location in the server parameter file. An area on the shared storage device can be used for this purpose. This location should be specified on a UFS file system, not on a raw partition. For more information on these topics, refer to the Oracle documentation.

5. Determine and set up your backup strategy and methods.

For backing-up the Oracle database, if you chose not to place the database into archive log mode, then only offline backups can be performed. In this case, you need to shutdown the instance during the backup, and recovery is only available back to the time of the last offline backup. For more information on these topics, refer to the Oracle documentation.

You are now done installing and configuring the Clustered Database Platform software.

After the Installation

This section contains information about what has been installed and configured on the cluster nodes and what you can do with the software.

Post-Installation Modification of the `/etc/hosts` File

After the management server finishes installing the software on the nodes, you must update the `/etc/hosts` file so that it corresponds to the cluster platform network configuration.

▼ To Update the `/etc/hosts` File

1. On the management server, use a text editor to open the `/etc/hosts` file.
2. Delete the first two occurrences of the `-admin` text string (shown highlighted in the following example):

```
# Physical Hosts (Physical Addresses)
129.153.47.181 test #Management Server
129.153.47.71 TC #Terminal Concentrator
129.153.47.120 node1-admin #First Cluster Node
129.153.47.121 node2-admin #Second Cluster Node
10.0.0.1 test-admin #Admin Network
10.0.0.2 node1 #First Cluster Node admin network
10.0.0.3 node2 #Second Cluster Node admin network
10.0.0.4 T3-01 #First T3 Host Name
10.0.0.5 T3-02 #Second T3 Host Name
```

3. Append `-admin` to the two internal administration node names (shown highlighted in the following example):

```
# Physical Hosts (Physical Addresses)
129.153.47.181 test #Management Server
129.153.47.71 TC #Terminal Concentrator
129.153.47.120 node1 #First Cluster Node
129.153.47.121 node2 #Second Cluster Node
10.0.0.1 test-admin #Admin Network
10.0.0.2 node1-admin #First Cluster Node admin network
10.0.0.3 node2-admin #Second Cluster Node admin network
10.0.0.4 T3-01 #First T3 Host Name
10.0.0.5 T3-02 #Second T3 Host Name
```

4. Save your changes and quit the editing session.

Post-Installation Removal of the `/.rhosts` File

For security reasons, when the installation and setup of the cluster platform is complete, remove the root user `/.rhosts` file on each cluster node to prevent unauthorized access to the nodes. This file is not typically needed after the cluster installation is complete. However, some cluster agents may require the root user to have remote access to the cluster nodes. Refer to the agent documentation for more details.

Oracle9i Packages

The following packages are installed on the cluster nodes:

- `SUNWraco`—Oracle 9i RAC, version 9.0.1.2, with Intelligent Agent Patch 1918073
- `SUNWraccf`—Scripts to configure RAC database at node install time

Starter Database

The starter database is configured with the default Oracle passwords. For the `sys` user, the password is `change_on_install`. For the `system` user, the password is `manager`. You should change these passwords by using the `alter user` command in `SQL*Plus`.

Database Recovery

You should place each starter database provide with the Clustered Database Platform into archive log mode. You must choose a location to which the redo log files may be copied and to specify it in the server parameter file. For Oracle9i RAC, you must set it up on each instance.

Backup Method

You should choose a backup method to be performed on a regular basis, such as offline or online. You must provide the scripts. If you choose not to place the database into archive log mode, then only offline backups can be performed. An offline backup involves a shutdown of the instance, which means that the recovered data would only reflect the last offline backup. For more information on these topics or to read about Oracle Recovery Manager, refer to your Oracle software documentation.

Redo Log Groups

The RAC redo log files are not set up in redo log groups. You can, however, create the redo log groups and add the RAC redo log files so that each group acts as mirrors for redundancy. Use the `ALTER DATABASE ADD LOGFILE MEMBER` command to add the RAC redo log files to the groups.

If you add the RAC redo files and the database is placed into archive log mode, the Archiver background process can take advantage of the multiple copies to perform pre-fetching of redo log blocks from each group member in a round-robin fashion. For more information, refer to your Oracle software documentation, as well as Doc. ID 45042.1 on <http://metalink.oracle.com>. (You must be registered to use this site.)

Operation Instructions

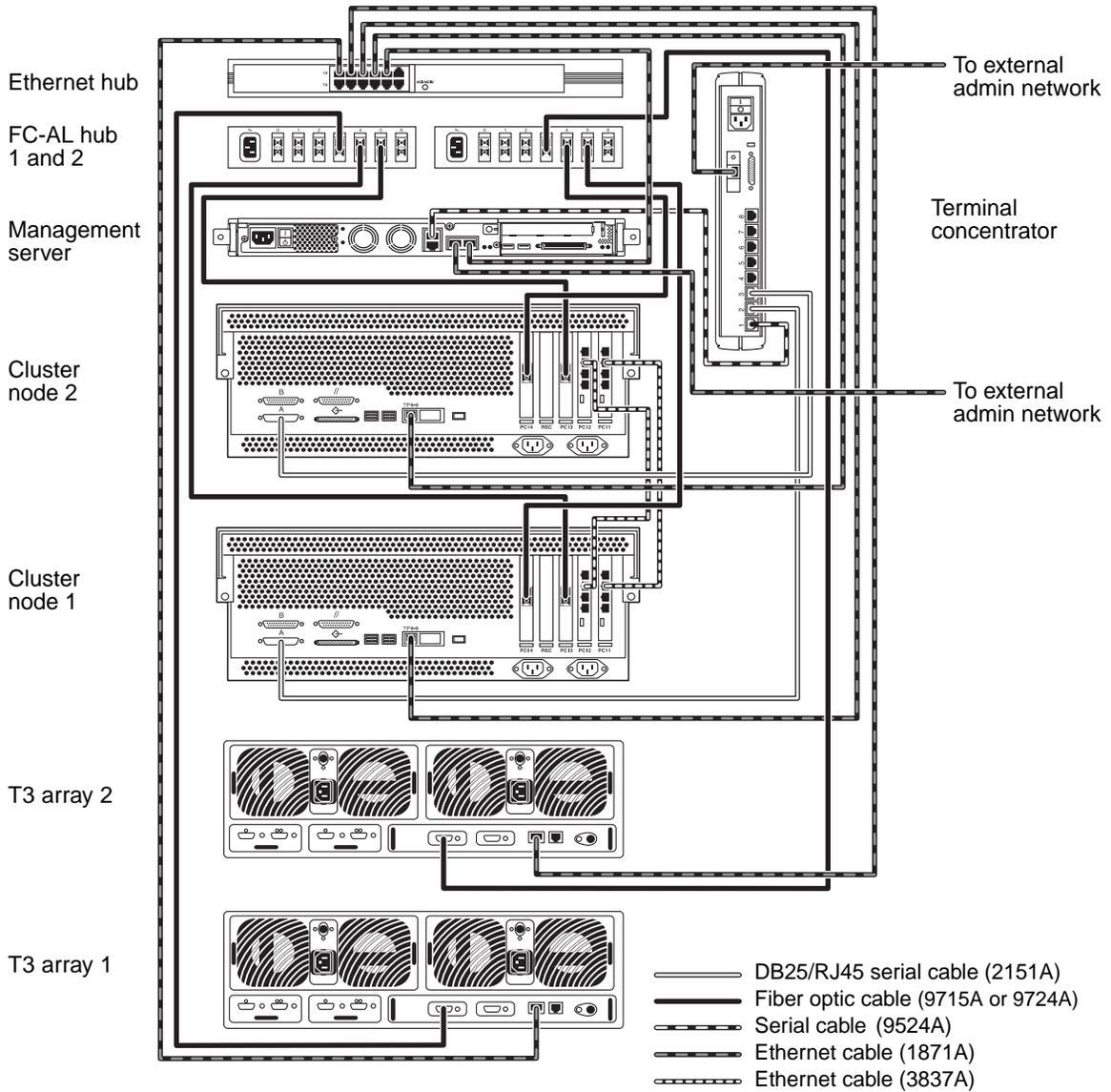
You can access operation instructions in the Clustered Database Platform 280/3 system documentation and the Oracle documentation (see “Clustered Database Platform Documentation” on page xii).

Clustered Platform 280/3 Cabling

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

TABLE A-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



Note: Cable connections to the production network and NAFO not shown.

FIGURE A-1 Cluster Platform 280/3 Cabling

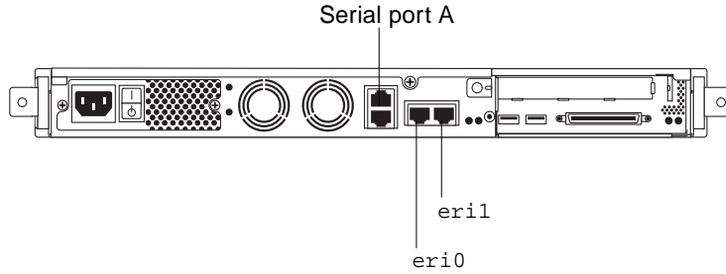


FIGURE A-2 Netra T1 200 Server (Management Server) Rear View Connectors

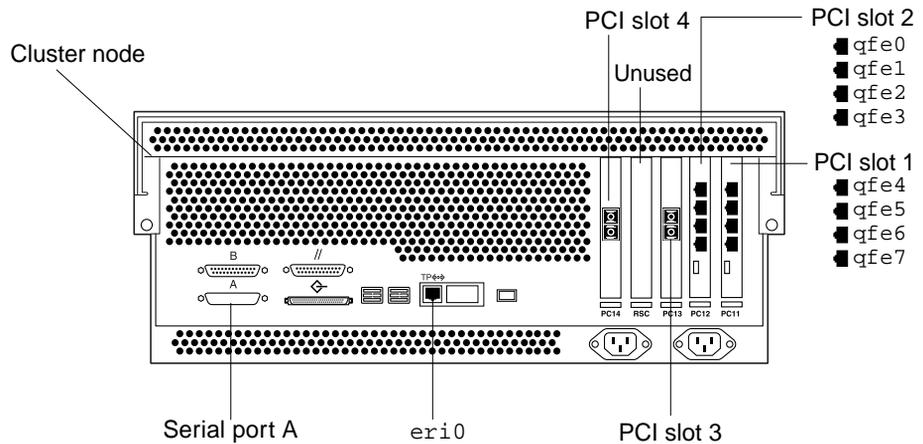


FIGURE A-3 Sun Fire 280R Server (Cluster Nodes) Rear View Connectors

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 A-2 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

TABLE A-2 Connections Made On Site

From Device	From Location	To Customer Network	Cable Type
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 A-3 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 A-4 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 A-5 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 A-2		

TABLE A-6 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 A-2		

TABLE A-7 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 A-8 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
Ethernet hub	Port 5	Management server	eri1	Ethernet
Ethernet hub	Port 3	Node 1	eri0	Ethernet
Ethernet hub	Port 4	Node 2	eri0	Ethernet

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 3.

▼ 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.**

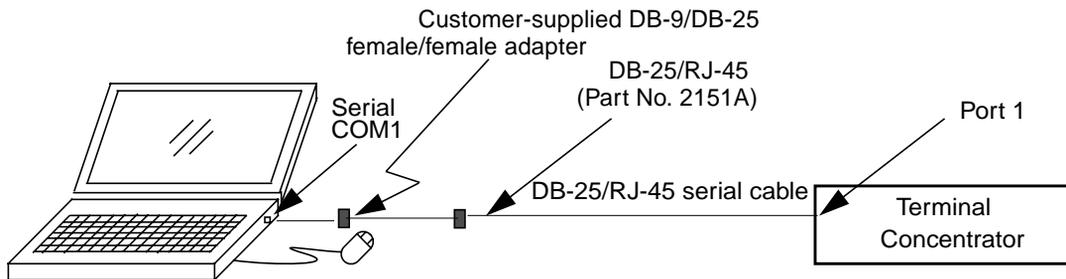


FIGURE B-1 Monitor Mode Connectivity Using a Laptop Computer

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 20.

Configuring the tip hardware Port

▼ To Configure the tip hardware Port

If you experience problems connecting to the terminal concentrator port while configuring the terminal concentrator using the `tip hardware` 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.

```
hardware:\
: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. Type `install_cm` at the Jumpstart packages prompt:

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

2. Press Y to accept the 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 Clustered 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 SUNWenc1 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  
#  
#####  
10.0.0.5 T3-01  
10.0.0.6 T3-02
```

16. Reboot the management server.

The Sun Component Manager 2.2 software is now installed on the management server.

Configuring the Sun Ray Server Software on the Management Server

The Sun Ray™ server software is preinstalled on the management server in Clustered Database Platform 280/3 system. To use this feature, you must:

- Install an Ethernet interface card in an empty slot on the Netra T1 server.
- 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 interface `eri1` for the interconnect.

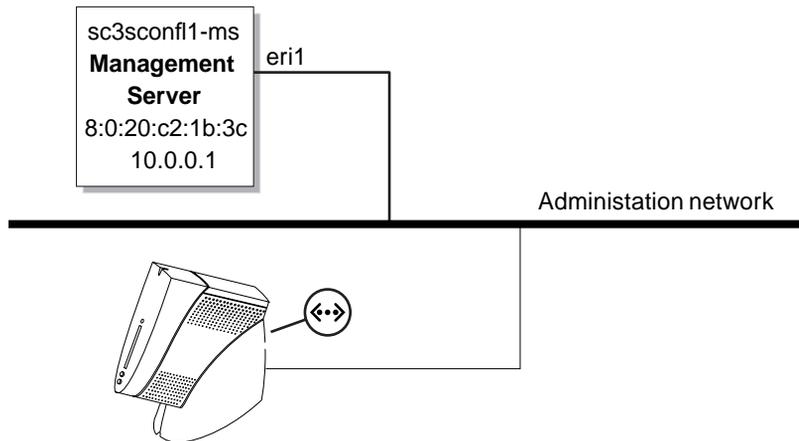


FIGURE F-1 Clustered Platform 280/3 Interconnections Using a Sun Ray Server

▼ To Access the Management Server from the Sun Ray

1. Access the configuration file from the management server.

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

2. Press **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: abc
Re-enter UT admin password: abc
```

4. Press **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 username to access the CGI server:

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

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

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

8. Press 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. Press 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. Press **y** to configure the Sun Ray server for a failover group. Otherwise, press **n**:

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

Wait for the Sun Ray server configuration to complete.

14. Press **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 eril
```

16. Verify the configuration files, services, and network addresses.

To accept the configuration files, press Y. To change any of the values, press 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 eril interface at subnet 128
  Selected values for interface "eril"
    host address:      192.168.128.1
    net mask:         255.255.255.0
    net address:      192.168.128.0
    host name:        MS12345-eril
    net name:         SunRay-eril
    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.eril" file
### successfully setup "/etc/inet/hosts" file
### successfully setup "/etc/inet/netmasks" file
### successfully setup "/etc/inet/networks" file
### finished install of "eril" 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.eril" file
### successfully setup "/etc/inet/hosts" file
### successfully setup "/etc/inet/netmasks" file
### successfully setup "/etc/inet/networks" file
### finished install of "eril" 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`.

Setting Up the NTP Server on the Management Server

After the installation of the system, you should set up the management server as the NTP server and the nodes as the NTP clients. This appendix contains a procedure for setting up the management server as the NTP server.

▼ To Set Up the Management Server as the NTP Server

1. **As superuser, change the directory to the `/etc/inet` directory.**
2. **Replace the `ntp.conf` file with the `ntp.server` file.**

```
cp ntp.server ntp.conf
```

3. **Open the `ntp.conf` file on a text editor.**
4. **Find the line with the `XType` value, as in the following example.**

```
server 127.127.XType.0 prefer
```

5. **Change the `XType` value to match your requirements.**
The following is an example for an undisciplined local clock only.

```
server 127.127.1.0 prefer
```

6. **Save the changes.**
7. **Change the directory to the `/etc/inet.d` directory.**

8. Stop, then start the `xntpd` daemon.

```
./xntpd stop  
./xntpd start
```

Setting Up the NAFO Public Network

This appendix contains a procedure for configuring network adapter failover (NAFO) interfaces for the public network on the cluster nodes.

Before you configure the NAFO adapters, pay attention to the following:

- Avoid unconfiguring (unplumbing) or bringing down the active adapter of a NAFO group without first switching over the active adapter to a backup adapter in the group. Refer to the *Sun Cluster 3.0 System Administration Guide* for instructions on how to switch the adapter.
- Avoid rewiring backup adapters to different subnets without first removing them from their respective NAFO groups.
- Logical adapter operations can be done on the active adapter even if monitoring is on for the group.
- You must maintain at least one public network connection for each node in the cluster. The cluster is inaccessible without a public network connection.

Before you create a NAFO group, the following requirements must be met:

- All public network adapters must be configured to belong to a NAFO group.
- A node can have only one NAFO group on a given subnet.
- All adapters in a given NAFO group must be connected to the same subnet.
- Only one adapter in a given NAFO group can have a host name association (that is, an `/etc/hostname.adapter` file).
- A public network adapter can belong only to one NAFO group.

▼ To Create a NAFO Group

1. On the node being configured, log in as superuser.
2. Note the public network adapters that are physically connected to the same subnet.

These adapters form the backup adapters for the NAFO group.

3. Create an `/etc/hostname.adapter` file for one of the public network adapters.

```
# vi /etc/hostname.adapter
hostname
```

4. Edit the `/etc/inet/hosts` file to add the IP address and host name of the public network adapter.

```
# vi /etc/inet/hosts
IP_address hostname
```

Note – If a naming service is used, this information should also exist in the naming service database.

5. Create the NAFO group.

```
# pnmset -c nafoN -o create adapter [adapter ...]
```

The `-c nafoN` option performs a configuration subcommand for the specified NAFO group. NAFO groups must be named `nafoN`, where `N` is a nonnegative integer for the group.

6. Verify the status of the NAFO group, as in the following example.

```
# pnmstat -l
group      adapters      status      fo_time      act_adp
nafo0      qfe0:qfe1    OK          NEVER        qfe0
```

Cluster Node Installation Output

This appendix contains an example of the installation output when you install the Oracle software.

Note – It is possible that the first node, which does the majority of the work of creating the VERITAS volumes and copying the data out of them, may be listed as the second node in the `/etc/hosts` file. Thus, in the output for the first node, you may see the following message:

```
orcl2 warm started
```

The second node would then see that the volumes are in place and start its Oracle instance, which would cause the following message to appear:

```
orcl1 warm started
```

The number of the Oracle instance depends on the order in the `/etc/hosts` file, not the order in which they were installed.

Here is the output from Node 1:

```
Nov 19 14:33:59 nexus sendmail[331]: My unqualified host name (nexus) unknown;
sleeping for retry
Nov 19 14:34:14 nexus ID[vxclust]: starting start time: 11/19 14:34:14.683: seq
# 0
Nov 19 14:34:15 nexus ID[vxclust]: max nodes defined in the cluster=2
Nov 19 14:34:15 nexus ID[vxclust]: ending step start time: 11/19 14:34:15.272:
Nov 19 14:34:17 nexus ID[vxclust]: starting step1 time: 11/19 14:34:17.317: seq
# 1
Nov 19 14:34:17 nexus ID[vxclust]: members 3 joiners 3 leavers 0
Nov 19 14:34:17 nexus ID[vxclust]: ending step step1 time: 11/19 14:34:17.319:
Nov 19 14:34:17 nexus ID[vxclust]: starting step2 time: 11/19 14:34:17.727: seq
# 1
Nov 19 14:34:17 nexus ID[vxclust]: calculating master time: 11/19 14:34:17.729:
, nnodes = 2
Nov 19 14:34:17 nexus ID[vxclust]: port number is 5569
Nov 19 14:34:17 nexus ID[vxclust]: smallest member time: 11/19 14:34:17.729:
Nov 19 14:34:18 nexus ID[SUNWudlm.udlm]: Unix DLM version (2) and SUN Unix DLM
library version (1): compatible.
Nov 19 14:34:19 nexus ID[vxclust]: link 1 connected 7
Nov 19 14:34:19 nexus ID[vxclust]: link 1, votes -1
Nov 19 14:34:19 nexus ID[vxclust]: CVM:MASTER=0 SELF=0
Nov 19 14:34:19 nexus ID[vxclust]: ending step step2 time: 11/19 14:34:19.693:
Nov 19 14:34:25 nexus ID[vxclust]: starting step3 time: 11/19 14:34:25.783: seq
# 1
Nov 19 14:34:25 nexus ID[vxclust]: ending step step3 time: 11/19 14:34:25.925:
Nov 19 14:34:26 nexus ID[vxclust]: starting step4 time: 11/19 14:34:26.339: seq
# 1
```

```
vxvm:vxconfigd: NOTICE: master: cluster join complete for node 1
Nov 19 14:34:27 nexus ID[vxclust]: ending step step4 time: 11/19 14:34:27.346:
Nov 19 14:34:59 nexus sendmail[331]: unable to qualify my own domain name (nexus)
-- using short name
8448+0 records in
8448+0 records out
8448+0 records in
8448+0 records out
7680+0 records in
7680+0 records out
6912+0 records in
6912+0 records out
12288+0 records in
12288+0 records out
5376+0 records in
5376+0 records out
9216+0 records in
9216+0 records out
384+0 records in
384+0 records out
30720+0 records in
30720+0 records out
7680+0 records in
7680+0 records out
896+0 records in
896+0 records out
vxvm:vxconfigd: WARNING: library and vxconfigd disagree on existence of client
10294
vxvm:vxconfigd: WARNING: library and vxconfigd disagree on existence of client
29870
vxvm:vxconfigd: WARNING: library and vxconfigd disagree on existence of client
11445
23936+0 records in
23936+0 records out
23936+0 records in
23936+0 records out
```

```
9216+0 records in
9216+0 records out
7680+0 records in
7680+0 records out
Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.

Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.

Successfully started the daemon on the local node.
Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.

Successful deletion of cluster database: orcl
Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.
Successful addition of cluster database: orcl
Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.
Instance successfully added to node: nexus
Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.

Instance successfully added to node: pris
Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.

Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.

LSNRCTL for Solaris: Version 9.0.1.2.0 - Production on 19-NOV-2001 14:44:45

Copyright (c) 1991, 2001, Oracle Corporation.  All rights reserved.

Starting /export/home/oracle/bin/tnslsnr: please wait...
```

```

TNSLSNR for Solaris: Version 9.0.1.2.0 - Production
System parameter file is /export/home/oracle/network/admin/listener.ora
Log messages written to /export/home/oracle/network/log/listener.log
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=EXTPROC)))
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=nexus)(PORT=1521)))
Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=IPC)(KEY=EXTPROC)))
STATUS of the LISTENER
-----
Alias                LISTENER
Version              TNSLSNR for Solaris: Version 9.0.1.2.0 - Production
Start Date           19-NOV-2001 14:44:46
Uptime                0 days 0 hr. 0 min. 0 sec
Trace Level           off
Security              OFF
SNMP                  OFF
Listener Parameter File /export/home/oracle/network/admin/listener.ora
Listener Log File    /export/home/oracle/network/log/listener.log
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=EXTPROC)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=nexus)(PORT=1521)))
Services Summary...
Service "PLSExtProc" has 1 instance(s).
  Instance "PLSExtProc", status UNKNOWN, has 1 handler(s) for this service...
Service "orcl1" has 1 instance(s).
  Instance "orcl1", status UNKNOWN, has 1 handler(s) for this service...
The command completed successfully
Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.

Successfully started the daemon on the local node.
The system is ready.
Sun Microsystems Inc.   SunOS 5.8           Generic February 2000

Make sure the "default-root-password" is changed to preserve security.

```

```

nexus console login:
SQL*Plus: Release 9.0.1.0.0 - Production on Mon Nov 19 14:44:48 2001

(c) Copyright 2001 Oracle Corporation. All rights reserved.

SQL> Connected to an idle instance.
SQL> ORACLE instance started.

Total System Global Area 252478540 bytes
Fixed Size 279628 bytes
Variable Size 184549376 bytes
Database Buffers 67108864 bytes
Redo Buffers 540672 bytes
Database mounted.
Database opened.
SQL> Disconnected from Oracle9i Enterprise Edition Release 9.0.1.2.0 -
Production
With the Partitioning and Real Application Clusters options
JServer Release 9.0.1.2.0 - Production

Database "orcl1" warm started.

```

Here is the output from Node 2:

```

vxvm:vxconfigd: NOTICE: slave: cluster join operation complete
Nov 19 14:34:27 pris ID[vxclust]: ending step step4 time: 11/19 14:34:27.178:
Nov 19 14:34:58 pris sendmail[327]: unable to qualify my own domain name (pris)
-- using short name
cfg_RAC_database: waiting on nexus to configure Oracle.
cfg_RAC_database: starting up Oracle on pris.
Sun Microsystems Inc. SunOS 5.8 Generic February 2000

```

Make sure the "default-root-password" is changed to preserve security.

LSNRCTL for Solaris: Version 9.0.1.2.0 - Production on 19-NOV-2001 14:45:26

Copyright (c) 1991, 2001, Oracle Corporation. All rights reserved.

Starting /export/home/oracle/bin/tnslsnr: please wait...

TNSLSNR for Solaris: Version 9.0.1.2.0 - Production

System parameter file is /export/home/oracle/network/admin/listener.ora

Log messages written to /export/home/oracle/network/log/listener.log

Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=EXTPROC)))

Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=pris)(PORT=1521)))

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=IPC)(KEY=EXTPROC)))

STATUS of the LISTENER

```
-----
Alias                LISTENER
Version              TNSLSNR for Solaris: Version 9.0.1.2.0 - Production
Start Date           19-NOV-2001 14:45:27
Uptime                0 days 0 hr. 0 min. 0 sec
Trace Level          off
Security              OFF
SNMP                  OFF
Listener Parameter File  /export/home/oracle/network/admin/listener.ora
Listener Log File     /export/home/oracle/network/log/listener.log
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=EXTPROC)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=pris)(PORT=1521)))
Services Summary...
Service "PLSExtProc" has 1 instance(s).
  Instance "PLSExtProc", status UNKNOWN, has 1 handler(s) for this service...
Service "orcl2" has 1 instance(s).
  Instance "orcl2", status UNKNOWN, has 1 handler(s) for this service...
The command completed successfully
Sun Microsystems Inc.  SunOS 5.8           Generic February 2000
```

Make sure the "default-root-password" is changed to preserve security.

SQL*Plus: Release 9.0.1.0.0 - Production on Mon Nov 19 14:46:22 2001

(c) Copyright 2001 Oracle Corporation. All rights reserved.

SQL> Connected to an idle instance.

SQL> ORACLE instance started.

Total System Global Area	252478540 bytes
Fixed Size	279628 bytes
Variable Size	184549376 bytes
Database Buffers	67108864 bytes
Redo Buffers	540672 bytes

Database mounted.

Database opened.

SQL> Disconnected from Oracle9i Enterprise Edition Release 9.0.1.2.0 -
Production

With the Partitioning and Real Application Clusters options
JServer Release 9.0.1.2.0 - Production

Database "orcl2" warm started.