



Sun N1 System Manager 1.1 Introduction

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Preface

The *Sun N1™ System Manager 1.1 Introduction* provides an overview of the N1 System Manager features and components, and a walkthrough describing the sequence of tasks required to implement N1 System Manager on your site.

Who Should Use This Book

This guide is intended for system administrators who are responsible for installing or upgrading the N1 System Manager software and hardware. The system administrators must have extensive knowledge and experience in the following areas:

- The Linux and Solaris™ operating systems, and the network administration tools provided by each operating system
- Network equipment and network devices from a variety of vendors such as Sun and Cisco
- DNS, DHCP, IP addressing, subnetworks, VLANs, and SNMP
- Network device interconnections and cabling

Related Documentation

This guide is part of a six-volume implementation reference set. The set should be read in the following order:

- *Sun N1 System Manager 1.1 Release Notes*
- *Sun N1 System Manager 1.1 Site Preparation Guide*

- *Sun N1 System Manager 1.1 Installation and Configuration Guide*
- *Sun N1 System Manager 1.1 Administration Guide*
- *Sun N1 System Manager 1.1 Command Line Reference Manual*

How This Book Is Organized

- [Chapter 1](#) provides an overview of the N1 System Manager.
- [Chapter 2](#) provides an overview of the steps required to install and configure the N1 System Manager and then to use the N1 System Manager to discover and provision servers.
- The [Glossary](#) provides definitions of the terms used in the N1 System Manager environment.

Documentation, Support, and Training

Sun Function	URL	Description
Documentation	http://www.sun.com/documentation/	Download PDF and HTML documents, and order printed documents
Support and Training	http://www.sun.com/supporttraining/	Obtain technical support, download patches, and learn about Sun courses

Typographic Conventions

The following table describes the typographic changes that are used in this book.

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories, and onscreen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name%</code> you have mail.
AaBbCc123	What you type, contrasted with onscreen computer output	<code>machine_name%</code> su Password:
<i>aabbcc123</i>	Placeholder: replace with a real name or value	The command to remove a file is <i>rm filename</i> .
<i>AaBbCc123</i>	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . Perform a <i>patch analysis</i> . Do <i>not</i> save the file. [Note that some emphasized items appear bold online.]

Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2 Shell Prompts

Shell	Prompt
C shell prompt	<code>machine_name%</code>
C shell superuser prompt	<code>machine_name#</code>
Bourne shell and Korn shell prompt	<code>\$</code>
Bourne shell and Korn shell superuser prompt	<code>#</code>

Sun N1 System Manager Overview

This chapter provides a summary of Sun N1 System Manager 1.0 functions and components.

Sun N1 System Manager Features

The Sun N1 System Manager is a system management tool that enables you to manage racks or other groupings of horizontally scaled servers using a single browser user interface. The Sun N1 System Manager browser interface provides an integrated command-line interface (CLI). A separate CLI is provided as well.

The Sun N1 System Manager system or *N1 System Manager* enables you to do the following tasks:

- Discover servers on the network that can be provisioned by the N1 System Manager
- Manage provisionable servers
- Provision operating system and application software to the provisionable servers
- Manage provisionable server firmware and patches
- Monitor provisionable server health
- Automate provisionable server configuration, recovery, and replacement
- Maximize server utilization
- Minimize user-visible hardware downtime
- Log N1 System Manager and provisionable server events

Sun N1 System Manager Components

The following figure provides a high-level overview of the hardware components of the N1 System Manager.

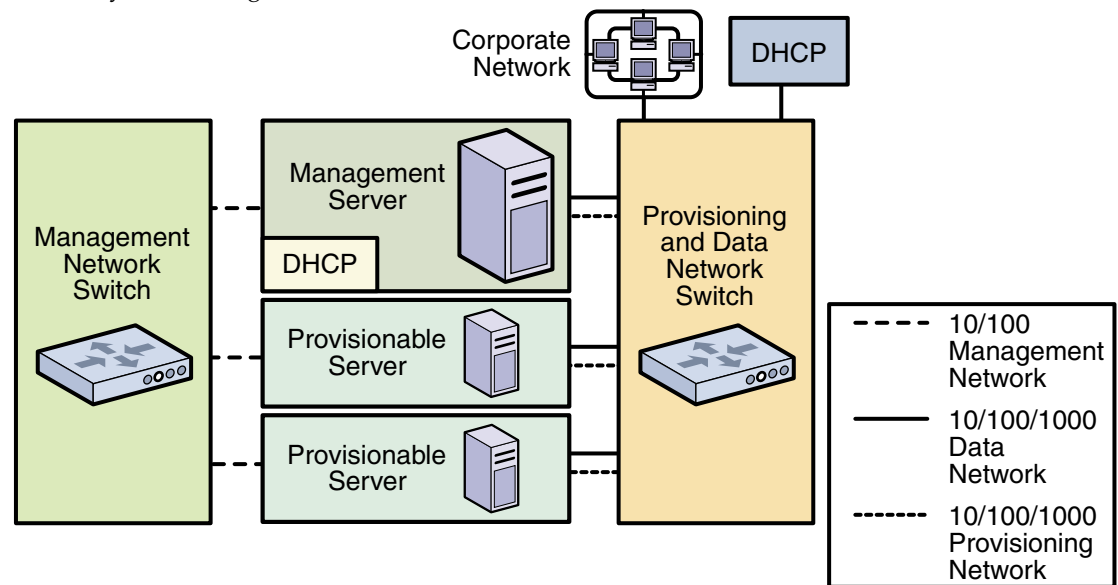


FIGURE 1-1 N1 System Manager Components

The following list describes each of the components.

- Management server and provisionable servers
 - The management server is the Solaris or Linux based server on which the N1 System Manager software is installed and run.
The management server DHCP service allocates IP addresses to the provisionable servers for loading operating systems and updates over the provisioning network, and for runtime monitoring of the provisionable server operating environment.
 - A provisionable server is one that has been successfully discovered by the N1 System Manager. Up to 32 provisionable servers can be installed in a single rack, and hundreds of provisionable servers can be managed by the N1 System Manager.

The management server and the provisionable servers can be any of the following machine types:

SPARC architecture: Sun Netra™ 240, and Sun Fire™ V210, V240, and V440 servers

x86 architecture: Sun Fire X4100 and X4200, and Sun Fire V20z and V40z servers

- The Corporate Network connection to the management server provides access to the data network and thus to the provisioned servers from the corporate network. An Ethernet connection of 100 megabits per second is the minimum requirement. A 1,000 megabits (1 Gbit) connection is advised.
- The Management Network provides the path to and from the management server and the provisionable servers management processor port. The management server uses the management network for server discovery, provisionable server firmware updates, and for provisionable server hardware management and monitoring. The management network should be a private network that is accessible by the management server, and not accessible by the data network. An Ethernet connection of 100 megabits per second is the required minimum.
- The management switch provides connectivity to a management port on each provisionable server, and should be a VLAN- programmable switch
- The data and provisioning switch provides provisioning network and data network connectivity to and from the management server and the provisionable servers. The provisioning and data switch should be a VLAN- programmable switch

Ethernet connections of 1 Gbit per second are the required minimum.

The provisioning network requirements are as follows.

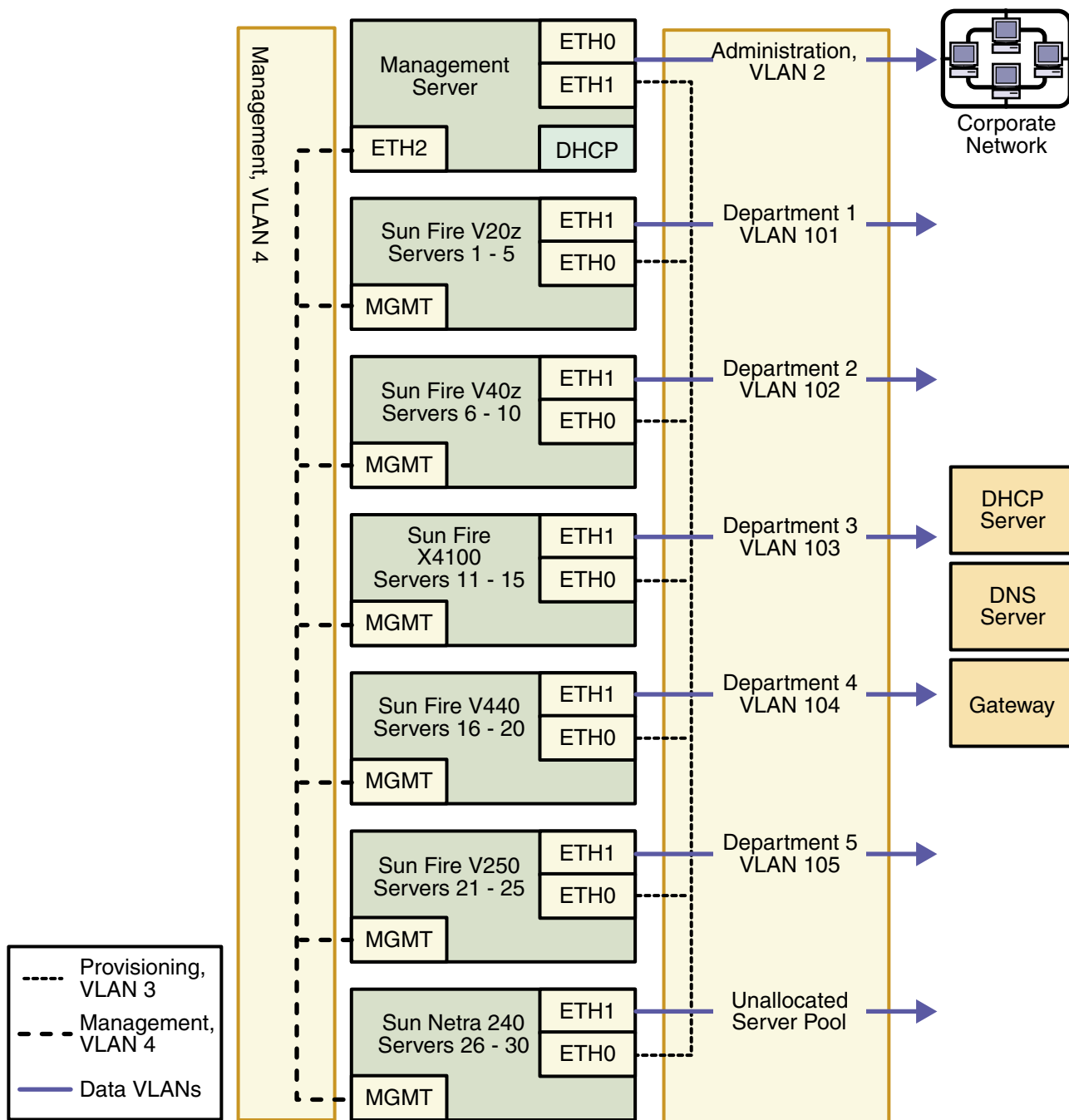
- The provisioning network is used by the management server to configure and provision the operating and application environments on the provisionable servers, to monitor provisionable server OS resources, and to apply OS updates to provisionable servers.

Due to the use of the DHCP protocol and the bandwidth requirements for OS provisioning, isolating the provisioning network from the data network might be required.

- The data network provides the connections from the provisionable servers to the corporate network through the management server for the end user. The corporate DHCP service allocates IP addresses to the provisionable servers to provide end user access to the provisionable server.

The data network should not have access to any of the N1 System Manager networks.

The following diagram illustrates a sample production environment in which the data and provisioning network are on separate VLANs, and in which multiple VLAN assignments have been used to configure the data network for end user access.



Installing, Configuring, and Using the Sun N1 System Manager

This chapter provides summaries of the high-level steps that you will perform as part of the N1 System Manager preparation, installation, configuration, and run time processes. Although this chapter presents a serial-based set of steps, many of these steps can be done in parallel or in a different sequence.

The high-level steps described in this chapter are:

- “Sun N1 System Manager Installation, Configuration, and Production Flow” on page 13
- “Map Your Network and Determine System Requirements” on page 15
- “Prepare the Provisionable Servers” on page 15
- “Install an Operating System on the Management Server” on page 16
- “Install and Configure the N1 System Manager Software on the Management Server” on page 16
- “Access the N1 System Manager” on page 17
- “Set Up N1 System Manager Users and Roles” on page 19
- “Discover Provisionable Servers to Manage” on page 19
- “Set Up Notifications” on page 20
- “N1 System Manager Maintenance Tasks” on page 20

Sun N1 System Manager Installation, Configuration, and Production Flow

The following diagram illustrates the sequence of the high-level tasks from initial site planning, through installation and configuration of the Sun N1 System Manager software, to discovering, provisioning, and managing provisionable servers.

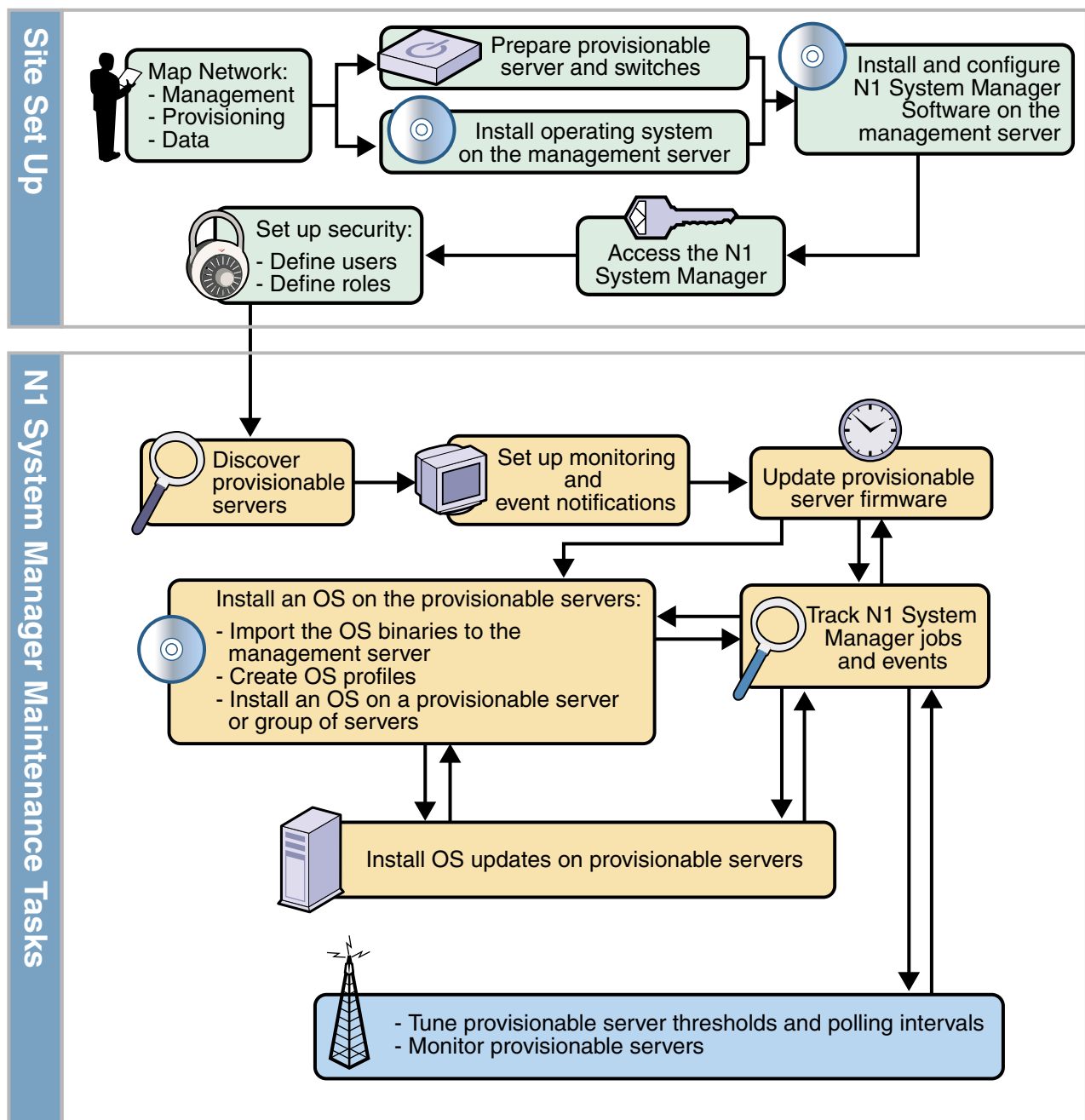


FIGURE 2-1 N1 System Manager Preparation through Production Flowchart

The following sections summarize each of the above tasks and provide links to the applicable manual and procedures for each.

Map Your Network and Determine System Requirements

Before you can prepare your equipment for the N1 System Manager, you need to determine your site architecture and system requirements as follows:

- Map your network and determine the subnet addresses that you will use for the management, provisioning, and data networks.
- Take inventory of the equipment you want to use with the N1 System Manager, and compare the inventory to the system requirements in “Sun N1 System Manager Hardware and OS Requirements” in *Sun N1 System Manager 1.1 Site Preparation Guide*.
- To assist you in determining whether you will use one switch or two switches, review “Reference Configurations” in *Sun N1 System Manager 1.1 Site Preparation Guide*.
- Based on the number of provisionable servers to be managed, determine the management server and switch requirements.

For management server sizing guidelines, see “Management Server Considerations” in *Sun N1 System Manager 1.1 Site Preparation Guide*.

For switch sizing guidelines and worksheets, see “Switch Considerations” in *Sun N1 System Manager 1.1 Site Preparation Guide*.

Based on the above information, decide:

- Which server will be used as the management server
- Which operating system will be installed on the management server
- Whether the N1 System Manager network will use a single switch or dual switch configuration

When you have completed your site planning, connect your equipment.

The next task is to prepare the provisionable servers and management server.

Prepare the Provisionable Servers

Before you can use the N1 System Manager N1 System Manager to discover provisionable servers, each provisionable server must be set up as follows:

- An IP address must be assigned to each provisionable server’s management port

- Each provisionable server's management processor credentials must be configured: An SSH account must be created, and a password assigned to the account. Where applicable, the management processor IPMI account must be configured and enabled.

For further information, see "Setting Up Provisionable Servers" in *Sun N1 System Manager 1.1 Site Preparation Guide*.

Tip – Install an OS and the N1 System Manager software on your management server at the same time you set up your provisionable servers.

Install an Operating System on the Management Server

Installation of the operating system on the management server can be completed using various methods: manual installation, jump start for Solaris, and kick start for Linux.

- For Solaris installation procedures, see "Installing Solaris on the Management Server" in *Sun N1 System Manager 1.1 Site Preparation Guide*
- For Linux installation procedures, see "Installing RedHat Enterprise Linux on the Management Server" in *Sun N1 System Manager 1.1 Site Preparation Guide*

Each section provides disk drive considerations for the chosen operating system, sample scripts for jump start or kick start, procedures for script configuration, and a procedure for manual installation of the chosen operating system.

When you have completed operating system installation on the management server, install the N1 System Manager software as described in the next section.

Install and Configure the N1 System Manager Software on the Management Server

When you have completed installing the operating system on the management server, the next step is to install and configure the N1 System Manager software on the management server. Once the N1 System Manager software has been successfully installed, you then configure the N1 System Manager for your operations environment.

The installation process probes your operating system installation to ensure all required software has been installed. If required software is not installed, the installation process notifies you and gives you the opportunity to resolve the error and then continue with installation. The installation process is automatic, and unless required software is not installed, does not require manual input. For further information, see Chapter 1, “Installing and Configuring the Sun N1 System Manager Software,” in *Sun N1 System Manager 1.1 Installation and Configuration Guide*

The configuration process prompts you for the management server port that is to be used for the provisioning network. The configuration process then prompts you for the range of addresses that the management server DHCP service is to use to assign IP addresses to each provisionable server for the provisioning network.

After you have specified how the management server DHCP process is to handle the provisioning network IP addresses for provisionable servers, you are asked to configure the search domains, SMTP service, and logging information for the provisionable servers. For further information, see “Configuring the N1 System Manager System” in *Sun N1 System Manager 1.1 Installation and Configuration Guide*.

When you have completed configuring the N1 System Manager, the last step is to tune the N1 System Manager performance based on the number of provisionable servers that are to be managed. For further information, see “N1 System Manager Performance Tuning” in *Sun N1 System Manager 1.1 Installation and Configuration Guide*.

When you have completed tuning the N1 System Manager, the final tasks are to prepare the N1 System Manager for production as described in the following sections. You will log in to the N1 System Manager, set up user accounts and roles, discover and provision the provisionable servers, set up maintenance, and maintain the N1 System Manager.

Access the N1 System Manager

Once you finish installing the N1 System Manager software, you should be able to access the N1 System Manager applications. Both a command line and browser interface are provided. The browser interface also has an integrated command line.

Note – Most of the information in this guide focuses on the command line part of the N1 System Manager. When appropriate, the text indicates when the browser interface can also be used for the same task. For detailed browser interface-related tasks and information, refer to the browser interface help.

The following figure provides a quick reference overview of the browser interface.

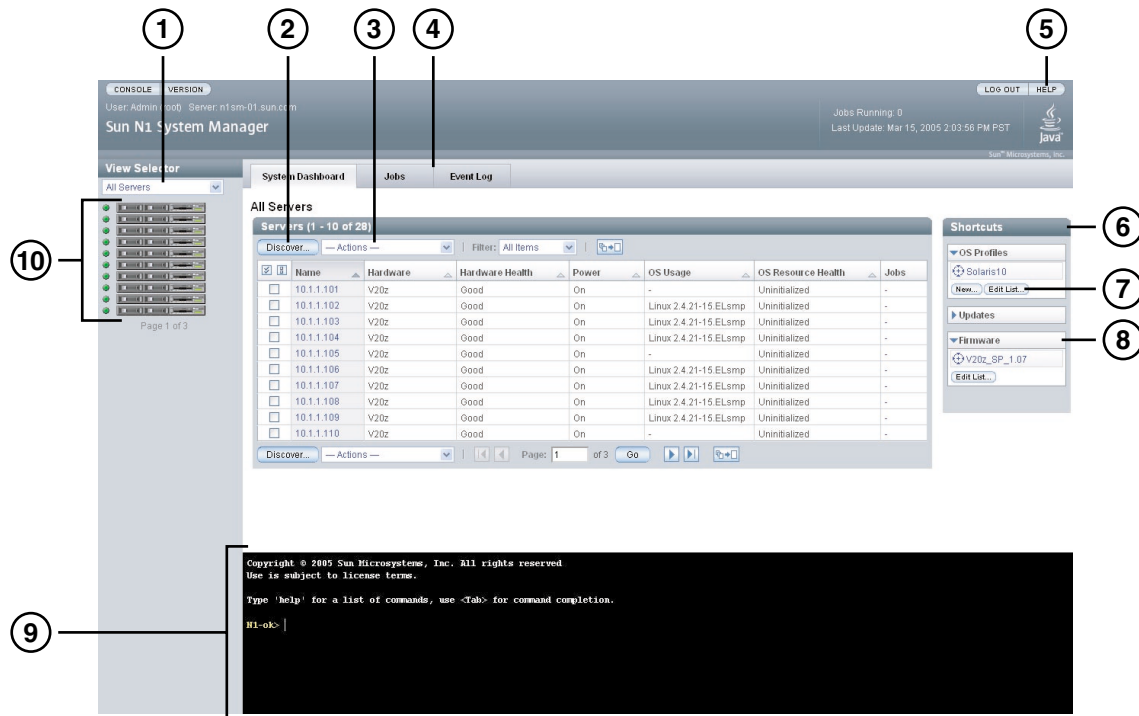


FIGURE 2-2 Sun N1 System Manager Browser Interface Highlights

1. Use the View Selector menu to change between viewing all of the servers, the servers by health state, or the servers by group in the N1 System Manager.
2. Click the Discover button to launch a wizard that enables you to add servers to the N1 System Manager. Click the System Dashboard tab to view all discovered servers in the All Servers table.
3. Use the Actions menu to perform operations on servers selected in the table, such as loading (installing) software, enabling monitoring, and managing power.
4. Click the Jobs or Event Log tabs to see a listing of jobs or events in the N1 System Manager, respectively. The Jobs tab enables you to track the status of the operations and commands being performed on the system.
5. Click the Help button to launch a searchable help system that includes instructions for browser interface tasks and corresponding command line examples.
6. Drag-and-drop the software icons onto a server or server group in the table to begin the installation.
7. Click the Edit List button to change the list of software icons that appear in the Shortcuts pane.
8. Click the arrows to expand or collapse the Shortcut lists.

9. Use the command line pane to issue commands provided by the N1-ok> shell. Use this integrated shell to issue commands or to view the command output of operations initiated from the Actions menu or wizards.

You can type **help** *topic* in the command line pane to display help for a command, where *topic* is the command for which you want more information.

You can also type a command and then press the Tab key to display completion information. For example:

```
N1-ok> create os [press the Tab key]
Potential matches (create os):
    os          Create (copy) an OS distribution
    osprofile    Create or copy an OS profile
N1-ok>
```

10. Use the server icons to view power status and running jobs. Click a server icon to view the Server Details page.

See [“Access the N1 System Manager” on page 17](#) for more details on accessing the N1 System Manager.

Set Up N1 System Manager Users and Roles

The management server’s superuser (root) account is automatically set up to access the N1 System Manager. This step is required if you want other users to manage your provisional servers. You can set up new users at any time. The N1 System Manager provides role-based security to enable you to limit users’ access to the system.

See “Managing Users” in *Sun N1 System Manager 1.1 Administration Guide* and “Managing Roles” in *Sun N1 System Manager 1.1 Administration Guide* for details on creating new users and the roles that enable them to use N1 System Manager features.

Discover Provisionable Servers to Manage

Before you can manage the provisionable servers, the N1 System Manager must know they exist and be able to access them. The discovery process enables you to add the servers to the N1 System Manager and group them based on your business or organizational needs. You access the discovery process through the Discover button (browser interface) or the `discover` command.

Once discovered, the provisionable servers are displayed in the System Dashboard tab in the browser interface or by using the `show server all` command. You can perform the following management tasks on the provisionable servers from the N1 System Manager browser interface or command line:

- Power management (booting, power on, power off)
- Event notification
- Monitoring (setting thresholds and polling)
- OS installations
- Firmware update installations
- OS update installations (Solaris packages and patches and RedHat RPMs)

See “Discovering Servers” in *Sun N1 System Manager 1.1 Administration Guide* for more details.

Set Up Notifications

The N1 System Manager provides the ability to set up email or SNMP notifications when events occur either within the N1 System Manager itself or on the provisionable servers. You can set up customized notification rules for as many different scenarios as you need. Setting up notifications can be done only through the command line.

See “Setting Up Notifications” in *Sun N1 System Manager 1.1 Administration Guide* for details on setting up notifications.

N1 System Manager Maintenance Tasks

This section provides overviews of the major repetitive tasks that you can use the N1 System Manager to perform when you have completed the tasks described in the previous sections. After your provisionable servers have been discovered, you can perform the tasks described in the following sections:

- “Install Firmware Updates on Servers” on page 21
- “Install an OS on the Provisionable Servers” on page 21
- “Install OS Updates on Provisionable Servers” on page 22
- “Track N1 System Manager Jobs” on page 22
- “Monitor the Provisionable Servers” on page 23

Install Firmware Updates on Servers

Updating the firmware on the provisionable servers is a primary administrative task. Installing a firmware update on a provisionable server for the first time is a two-step process:

1. Import the firmware update into the N1 System Manager. The N1 System Manager must have system access to the firmware update before the update can be installed on the provisionable servers.

By using the `create firmware` command, you can import a firmware update from a web site or an accessible file system on the management server. Once a firmware update is imported, you can display it in the browser interface under Shortcuts, or you can use the `show firmware` command.

2. Install the firmware update on the appropriate provisionable servers by using the browser interface or the `load server` or `load group` commands.

See “Managing Firmware SP, BIOS, and ALOM Updates” in *Sun N1 System Manager 1.1 Administration Guide* for details.

Install an OS on the Provisionable Servers

The capability of installing an OS on multiple provisionable servers from a single interface is one of the core features of the N1 System Manager. Installing an OS on a provisionable server for the first time is a three-step process:

1. The N1 System Manager must have system access to an OS distribution before it can be installed on the provisionable servers. Import the OS binary (or OS distribution) into the N1 System Manager. By using the `create os` command, you can import an OS distribution from the actual OS installation CD-ROMs or DVD or an ISO image. Once imported, you can use the `show os` command to view the available OS distributions on the N1 System Manager.

See “Managing OS Distributions” in *Sun N1 System Manager 1.1 Administration Guide* for details.

2. An OS profile specifies which operating system components to install, which additional files and programs to install with the operating system, and configuration information such as root password and disk partitioning specifications. Create an OS profile, which is a template that specifies how to install an OS distribution. OS profiles enable you to install and configure a group of servers consistently. You create one or more OS profiles depending on how many different ways the servers need to be installed.

Note – A default OS profile is automatically created for each newly created OS distribution, with the same name as the OS distribution.

The browser interface provides a step-by-step wizard to help you create an OS profile. You can also create an OS profile using the command line. In both instances, once an OS profile is created, you can display it in the browser interface under Shortcuts or by using the `show osprofile` command.

See “To Create an OS Profile” in *Sun N1 System Manager 1.1 Administration Guide* for details.

3. The browser interface provides a step-by-step wizard to help you install an OS distribution on a provisionable server. Install the OS distribution through an OS profile on a single server or group of servers. You can also use the `load server` or `load group` commands.

See “Installing OS Distributions by Deploying OS Profiles” in *Sun N1 System Manager 1.1 Administration Guide* for details.

After you perform step 1 for an particular OS and create the appropriate OS profiles mentioned in step 2, installing an OS becomes a single step, even on multiple servers.

Install OS Updates on Provisionable Servers

Once you have an OS installed on a provisionable server, the N1 System Manager enables you to install OS updates, which consist of either Solaris packages and patches or RedHat RPMs depending on the OS on the provisionable server. Installing OS updates on servers for the first time is a two-step process:

1. The N1 System Manager must have system access to the OS update before the update can be installed on the provisionable servers. Import the required OS update into the N1 System Manager.

Use the `create update` command to import an OS update from a web site or from an accessible file system on the management server. Once an OS update is imported, you can display it in the browser interface under Shortcuts or you can use the `show update` command.

2. Install the OS update on the appropriate provisionable servers by using the browser interface or the `load server` or `load group` commands.

See “Managing Packages, Patches, and RPMs” in *Sun N1 System Manager 1.1 Administration Guide* for details.

Track N1 System Manager Jobs

Each major action you take in the N1 System Manager starts a job. You can use the job log to track status on a currently running action or to verify whether a job has finished. Monitoring jobs is especially useful for N1 System Manager actions that might take a long time to finish, such as installing an OS distribution on one or more provisionable servers.

You can track jobs through the Jobs tab in the browser interface or the `show job` command. If you are using the browser interface, the number of running jobs is displayed in the Masthead at the top of the page.

See “Managing Jobs” in *Sun N1 System Manager 1.1 Administration Guide* for details on managing and tracking jobs.

Monitor the Provisionable Servers

The N1 System Manager provides monitoring of hardware health attributes, OS resource utilization attributes, file systems, and network connectivity. Polling intervals and threshold values can be modified for monitored OS resource utilization attributes. Monitoring enables you to track the status of all your provisionable servers from a single access point.

Note – By default, hardware health is monitored on a discovered server. You must enable monitoring to be able to view a server’s OS resource utilization.

For more information on monitoring, see Chapter 5, “Monitoring Your Servers,” in *Sun N1 System Manager 1.1 Administration Guide*.

Glossary

admin file	An ASCII administration file that defines default installation actions for Solaris packages.
boot	To load the system software into memory and start it. In the N1 System Manager, you can use the <code>start</code> command to power on and boot a server if needed. See also Reset.
bootip	Also known as the provisioning IP. IP addresses that are used during the installation process for Linux based provisionable servers. This IP address may be temporary just for the duration of the installation process. Some sites may reuse the same range of bootip addresses for subsequent provisioning operations.
browser interface	A web-based user interface for the N1 System Manager that provides a subset of the command line features.
command line	The <code>N1-ok></code> shell that enables you to run N1 System Manager commands. The <code>N1-ok></code> shell is available from the browser interface or through the <code>n1sh</code> command on the management server.
data network	The network that is used to access provisionable servers from other machines in the data center or enterprise. This network might not be visible to the management node.
data network interface	This interface provides access from the provisionable server to the data center network. Multiple data network interfaces might exist.
data network switch	One or more switches used for data transfers outside the horizontally scaled system (HSS). Both GigE and Infiniband switches are supported.
deployed profile	An OS profile that is currently being installed on a provisionable server. A deployed profile cannot be modified, and OS distributions associated with a deployed profile cannot be deleted.
distribution group	A collection of software clusters and packages that is to be installed on a provisionable server.

event	A change in the N1 System Manager system or a provisionable server, which is tracked in the Sun N1 System Manager event log and may initiate a notification message to external systems.
fault	An identified problem with a component, usually at the field replaceable unit (FRU) level.
firmware	Software stored in read-only memory (ROM) or programmable ROM (PROM). Firmware is usually used to help with the initial booting stage.
FRU	Field Replaceable Unit. An assembly that a manufacturer replaces on failure of an assembly component.
job	A user-defined task to be completed by a computer system. In the N1 System Manager, an asynchronous action initiated and tracked by a user to perform a task.
IP	IP addresses that are used after the installation process. This is intended to be a more permanent address for the interface.
IPMI	Intelligent Platform Management Interface. A common management interface used by the N1 System Manager to discover servers. IPMI credentials can be used to authenticate servers and accounts during discovery.
load	Installing software to a provisionable server, such as the operating system, firmware updates, and software updates.
log	A single logical location of events in the N1 System Manager network.
management agents	The Sun N1 System Manager management features that must be added to a provisionable server to provide remote command functionality, OS resource monitoring, package deployment, and inventory management.
management IP address	The IP address of a provisionable server that the N1 System Manager uses to manage the server.
management name	A unique name used to denote a provisionable server within the N1 System Manager environment. By default, the name is set to the server's management IP address determined during discovery. However, a user-defined name can be assigned.
management network interface	This interface provides access to the management information and functions primarily for the provisionable server's hardware and firmware. This interface is the interface to the provisionable server's service processor or ALOM processor.
management network switch	An Ethernet switch used for sending management signal data within the horizontally scaled system (HSS).
management server	The server on which the N1 System Manager software is installed.

N1 System Manager	Software running on the management server that acts as the entry and control point for provisioning and managing servers. A browser interface and a command-line interface are provided.
notification message	A message sent using email or SNMP traps to notify an external entity of server events.
notification rule	A user-specified configuration for when, where, and how to send a class of notification messages .
operating system	A collection of programs that monitor the use of the system and supervise the other programs executed by the operating system. The N1 System Manager enables you to install a operating system such as RedHat Linux and Solaris x86 to a provisionable server or server group.
OS	See operating system .
OS distribution	A binary image of an operating system. In the N1 System Manager, an OS distribution is stored in a database, and can be installed on a provisionable server or group of servers. See also OS profile .
OS management agents	See management agents .
OS profile	Specifies how to install an operating distribution, including which operating system components to install, which additional files and programs to install with the operating system, and configuration information such as root password and disk partitioning specifications. See also OS distribution .
physical server	A FRU server such as a Sun Fire V20z machine.
privilege	A predefined set of permissions enabling a user to perform certain operations within the N1 System Manager. A privilege is granted to a user by assigning to a role and then assigning the role to the user.
provision	The process of using the N1 System Manager to install a preconfigured operating system on a server managed by the N1 System Manager.
provisioning network	The network used to provision the server from the N1 System Manager management server. This network must be visible to the management node.
provisioning network interface	This interface provides access to the provisionable server's OS management functions. This interface is used to provision an operating system and OS updates to a provisionable server, monitor provisionable serverOS resources, and for remote command execution on theprovisionable server. Typically only one provisionable network interface exists.
provisionable server	A physical server that has been successfully discovered and is subsequently managed by the N1 System Manager.
reboot	See reset .

reset	Power off and power on a hardware device. In the N1 System Manager, you can use the reset command to reboot a server (power off, power on, and boot a server).
response file	A file that provides the interaction responses that would be requested during a Solaris package installation in interactive mode onto a provisionable server. A response file enables a package to be installed without user intervention.
role	A set of permissions and privileges regarding what a user may do to the system.
server	See provisionable server .
server group	A user-defined group of servers for the purpose of creating a logical target for management operations. For example, server groups enable operations such as reboot and OS install to be performed on multiple servers with a single command.
shutdown	The process of taking a system from a multiuser OS state to a single user state and a complete halt and power down. In the N1 System Manager, you can use the <code>stop</code> command to shut down and power off a server.
SNMP	Simple Network Management Protocol. A preferred network management protocol for TCP/IP-based networks.
SSH	Secure shell. An encrypted remote login protocol that provides strong authentication and secure communications over insecure channels.
start	See boot .
terminal server	A network device that provides a serial connection to the switches, management server, and servers.
update	A software update for an OS. In the N1 System Manager, a RedHat Linux RPM or a Solaris package or patch.
user	A person who is authorized to log in to and use the N1 System Manager.

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