



# Sun™ N2000 Series Release 2.0 — Introduction Guide

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Sun Microsystems, Inc.  
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Part No. 817-7641-10  
October 2004, Revision A

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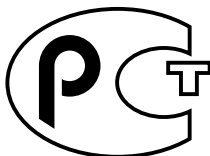
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# Contents

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**Preface xi**

**1. N2000 Series overview 1**

N2000 Series hardware overview 1

N2000 Series chassis views 2

External network and management connections 3

Ethernet ports 3

Console and Ethernet management ports 3

Internal hardware components 3

System board 4

Function card 4

System fan module 4

System power supply 5

System LEDs 6

System software and storage 7

System management 7

Command-line interface 7

Web interface 8

SNMP 8

New Features 8

<b>2. N2000 Series Web interface overview</b>	<b>9</b>
Web interface overview	9
Accessing the Web interface	10
Web interface main window	10
Main window components	11
Using the Web interface	11
Navigating in the Web interface	11
Command menu colors	12
Commands	12
Contexts	13
User profiles	13
Entering data	14
Viewing tooltips	14
Specifying values for configured or unconfigured items	15
Specifying values for configured and unconfigured items	16
Using Web interface commands	17
Displaying entries	18
Creating entries	18
Copying entries	19
Modifying entries	19
Deleting entries	20
Saving entries	21
Refreshing the display	21
Filtering command displays	21
Monitoring statistics and counters	22
Clear counters	23
Creating graphs	24
Exporting configurations to XML	25



Additional options in the Web interface	25
Masthead	26
Using the Switch View	26
Using the object rule editor	28
Using Help	29
Navigating Help	30
Navigation tabs	30
Additional Help features	31
<b>A. N2000 Series system specifications</b>	<b>33</b>
System specifications	33



# Preface

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## About this manual

The *Sun N2000 Series Release 2.0 - Introduction Guide* supports the Sun™ N2000 Series Release 2.0 hardware and software. The Sun N2000 Series system is an intelligent application switch that provides advanced Secure Sockets Layer (SSL) acceleration with reencryption and advanced Layer 4 to Layer 7 (L4 to L7) load balancing. The Sun N2000 Series system provides these services on a flexible, virtualized basis, within the convenience of a single enclosure, and with industry-leading speed, security, and availability. The N2000 Series comprises the N2040 switch and the N2120 switch. When it is necessary to differentiate between the two switches, the model numbers are used in this manual.

This manual may refer to the Sun N2000 Series system as the “N2000 Series,” the “application switch,” the “switch,” or the “system.”

This manual is intended for network administrators and system administrators who want a quick overview and introduction to the Sun N2000 Series system.

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## What is in this manual?

This manual includes the following topics:

- Chapter 1 gives a general overview of the Sun N2000 Series.
- Chapter 2 describes the Sun N2000 Series Web interface in detail.
- Appendix A details the system specifications of the Sun N2000 Series.

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## Related documentation

For complete information about the Sun N2000 Series system, see the following documents.

**TABLE P-1** Related Documentation

Title	Document Number	Location
<i>Sun N2000 Series Release 2.0 — Introduction Guide</i> (This document)	817-7641-10	Documentation CD
<i>Sun N2000 Series Release 2.0 — Quick Installation</i>	817-7640-10	Printed, in ship kit Documentation CD
<i>Sun N2000 Series Release 2.0 — Hardware Installation and Startup Guide</i>	817-7638-10	Printed, in ship kit Documentation CD
<i>Sun N2000 Series Release 2.0 — System Configuration Guide</i>	817-7637-10	Documentation CD
<i>Sun N2000 Series Release 2.0 — System Administration Guide</i>	817-7635-10	Documentation CD
<i>Sun N2000 Series Release 2.0 — Command Reference</i>	817-7636-10	Documentation CD
<i>Sun N2000 Series Release 2.0 — Release Notes</i>	817-7639-10	Printed, in ship kit

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## Abbreviations and acronyms

This manual contains the following industry-standard and product-specific abbreviations and acronyms.

AAA authentication, authorization, and accounting

ACL	access control list
ARP	Address Resolution Protocol
BGP	Border Gateway Protocol
CA	Certificate Authority
CKM	Certificate and Key Manager
CLI	command-line interface
CSR	Certificate Signing Request
DER	Distinguished Encoding Rules format, ASN.1
DSA	Digital Signature Algorithm
DTE	data terminal equipment
ethMgmt.1	Ethernet management port on the N2000 Series
FQDN	fully qualified domain name
GE	Gigabit Ethernet
HMAC	Hash Message Authentication Code
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
IETF	Internet Engineering Task Force
IIS4	Microsoft Internet Information Server (IIS)
IP	Internet Protocol
IRDP	Internet Router Discovery Protocol
ISP	Internet service provider
L2 ...L7	Layers in the OSI model that the N2000 Series supports
L4SLB	Layer 4 Server Load Balancing
L4SLB_SSL	Layer 4 Server Load Balancing with Secure Sockets Layer
LAG	link aggregation group
LAN	local area network
LB	load balancer application on the N2000 Series
MD5	Message Digest 5

MIB	management information base
N2000 Series	Sun N2000 Series application switch
N2040	Sun N2000 Series model that provides 40 10/100-Mbps ports and 4 SFF pluggable Gigabit Ethernet ports
N2120	Sun N2000 Series model that provides 12 SFF pluggable Gigabit Ethernet ports
NAT	network address translation
NMON	network monitor
NTP	Network Time Protocol
OID	object identifier
OSPF	Open Shortest Path First
PEM	Privacy Enhanced Mail format
PKCS12	Public Key Cryptography Standard #12 format
QoS	Quality of Service
RIP	Routing Information Protocol
SFF	small form factor
SFTP	Secure Shell File Transfer Protocol
SLB	server load balancing
SNMP	Simple Network Management Protocol
SSH	Secure Shell
SSL	Secure Sockets Layer
STP	Spanning Tree Protocol
TACACS	Terminal Access Controller Access Control System
TCL	Tool Command Language
TCP/IP	Transmission Control Protocol/Internet Protocol
UDP	User Datagram Protocol
URL	Uniform Resource Locator
USM	User Security Model (SNMPv3)

UTC	coordinated universal time
VIP	virtual IP address
VLAN	virtual LAN
VPN	virtual private network
vRouter	virtual router on the N2000 Series
VRRP	Virtual Router Redundancy Protocol
VSRP	Virtual Service Redundancy Protocol
vSwitch	virtual switch on the N2000 Series



## N2000 Series overview

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This chapter introduces the N2000 Series application switch. Topics covered include the system's hardware, software, and management interfaces.

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## N2000 Series hardware overview

The Sun N2000 Series product family is a set of gigabit-scaled application switches that enables enterprises and service providers to deploy network load balancing and security services for multiple virtual switches in a single system within a network data center. Using these virtual switches, the N2000 Series provides high-speed TCP and SSL termination in the hardware, keeping the backend Web servers available to perform other network and application switching tasks.

The N2000 Series is available in two versions: the N2120 and the N2040. The Sun N2120 platform provides 12 small form factor (SFF) pluggable Gigabit Ethernet ports. The Sun N2040 provides 40 10/100-Mbps ports and 4 SFF pluggable Gigabit Ethernet ports.

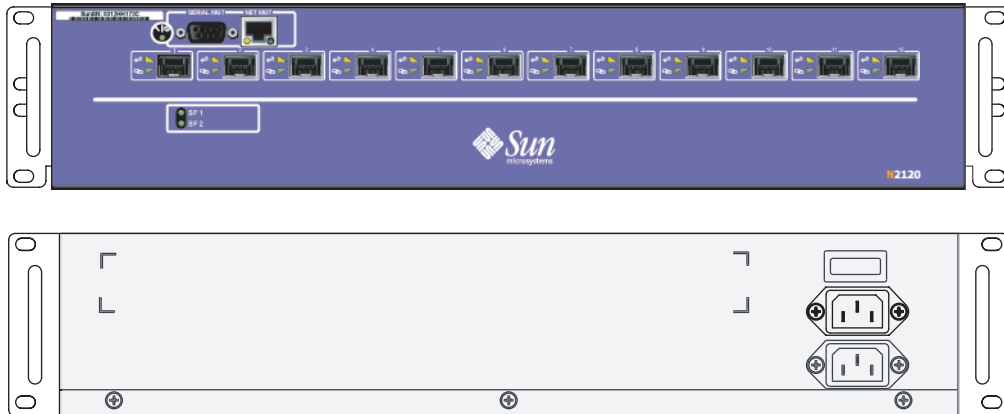
Both systems use a single RS-232 DB-9 serial port and a single RJ-45 10/100-Mbps port for system management. The RS-232 console port provides a direct connection to the command-line interface (CLI) for initial setup. The 10/100-Mbps management port allows network access to the onboard graphical Web interface, or to remote Telnet and Secure Shell (SSH) access to the CLI.

Sun N2000 Series systems are rackmountable and operate on standard AC voltages (115 or 230 VAC) in redundant power configurations.

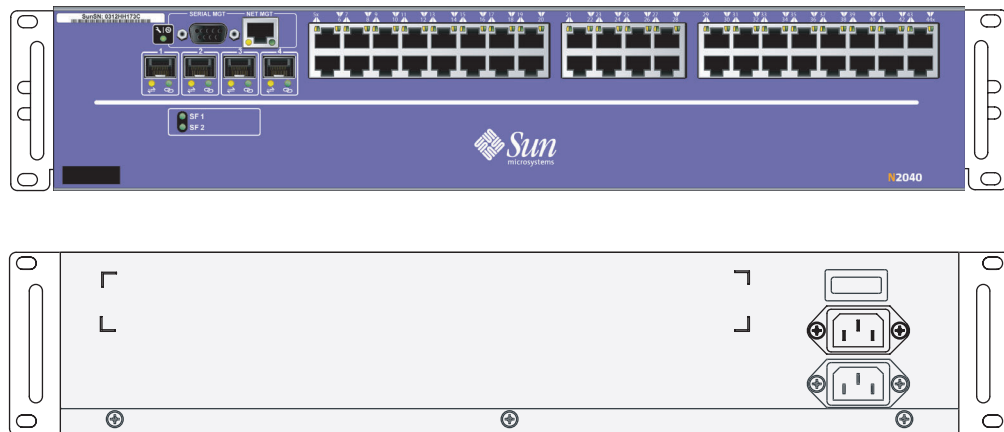
# N2000 Series chassis views

Figure 1-1 illustrates the front and rear views of the N2120 system, and Figure 1-2 illustrates the front and rear views of the N2040 system.

**FIGURE 1-1** Sun N2120 chassis



**FIGURE 1-2** Sun N2040 chassis



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# External network and management connections

## Ethernet ports

Ethernet 10/100BASE-T ports require standard unshielded twisted-pair/shielded twisted-pair (UTP/STP) network cable, Category 5 or 5E, with RJ-45 8-pin modular connectors.

Gigabit Ethernet ports require small form factor (SFF) pluggable LC or MT-RJ fiber-optic connectors on multimode fiber-optic cable.

## Console and Ethernet management ports

The console port requires a standard EIA-232 (RS-232) data terminal equipment (DTE) crossover serial cable with a DB-9 connector.

The 10/100-Mbps management port requires a standard UTP/STP network cable, Category 5 or 5E, with an RJ-45 8-pin modular connector.

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# Internal hardware components

Sun N2120 and N2040 system platforms use the following internal hardware components:

- System board
- Function card
- System fan module
- System power supply

# System board

The system board controls the following N2000 Series features:

- Ethernet data ports (10/100-Mbps and Gigabit Ethernet)
- Serial DB-9 console port with full signaling to an external modem
- 10/100-Mbps Ethernet management port
- Light-emitting diode (LED) indicators for all Ethernet ports
- System status indicator LED
- Universal AC power input with Power ON/OFF switch
- 600W power supply input
- System temperature sensors and cooling fans
- Interface to function card

# Function card

The Service Load Balancing with SSL Function card (Fx-SSL) is preinstalled in the N2000 Series system. For detailed information on the Sun N2000 Series features and capabilities, refer to the *Sun N2000 Series Release 2.0 – System Configuration Guide*.

# System fan module

Sun N2000 Series systems require a normal operating environment for computing equipment. The system contains seven fans to ensure adequate airflow. Looking at the N2000 Series system from the front, the fans are on the left side and intake vents are on the right. The fans exhaust to the left. Allow at least 3 inches (7.5 cm) of unobstructed space on both sides. The chassis requires no air space above or below. If you install the system within an enclosed equipment rack, ensure that there is adequate airflow. Adhere to the following environmental requirements:

- Operating ambient air temperature: 32° to 104° F (0° to 40° C)
- Non-operating ambient air temperature: -22° to 176° F (-30° to 80° C)
- Relative humidity: 0 to 95% non-condensing
- Operating altitude: -200 to 6000 ft (69.96 m to 1828 m)
- Heat dissipation: 2050 BTU/hour, maximum

# System power supply

The Sun N2000 Series system includes two 600W power supplies. Each power supply uses a separate power cord that you connect to the power source. If a failure occurs in the redundant power configuration, the N2000 Series sends an event message to the system log file to notify you that one of the power supplies is out of service.

To protect the equipment, use a conditioned power source or uninterruptible power supply (UPS). The power source must provide a reliable Earth ground, and provide the following:

- Voltage: 115 or 230 VAC (90–135 or 180–265 VAC), 60 Hz (47–63 Hz); automatic selection
- Current: 10A @ 115 VAC, 5A @ 230 VAC

The power supply connector uses a standard 3-prong keyed IEC receptacle. The power cord is supplied with an IEC connector on one end, NEMA 5-15 plug (U.S. domestic) on the other end.

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# System LEDs

Table 1-1 lists and describes the LEDs that are available on the N2120 and N2040 systems. On the N2040 system, the LEDs point to the referenced 10/100-Mbps Ethernet port.

**TABLE 1-1** System LEDs

LED	State	Description
<b>System</b>		
	Green	Normal operation, system OK
	Yellow	System startup or system fault
<b>Ethernet Ports</b>		
Activity (A)	Yellow	Blinking when there is transmit (TX) or receive (RX) activity on the line
	Off	No packet traffic present on the line
Link (L)	Green	Ethernet link active
	Off	Carrier is not detected, no traffic possible
<b>Function card</b>		
SF1 and SF2	Blinking Green	System function card is booting up
	Green	System function card working normally
	Off	System function card not booting up or error

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## System software and storage

The system software is loaded on the N2000 Series internal flash disk when shipped from Sun. When released by Sun, software upgrades are available on a software distribution CD-ROM. Software can then be downloaded or copied from a PC using Telnet, TFTP, or other file transfer mechanism.

For information on upgrading the N2000 Series operating system software, refer to the *Sun N2000 Series Release 2.0 – Release Notes* that accompanies the software.

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## System management

Administrators can use multiple management tools to support the N2000 Series in a network. These tools include:

- Command-line interface
- Web interface
- SNMP applications

## Command-line interface

The command-line interface (CLI) uses an industry-standard design that allows you to configure and manage the N2000 Series by entering keyboard commands. You access the CLI over a direct console connection to the RS-232 port on the front of the system, or over a Telnet or SSH connection. A connection to the CLI is indicated by the `sun>` prompt on your screen.

The CLI uses a hierarchical design that allows you to move deeper into the hierarchy as you build the configuration. The CLI uses the command prompt to display the current hierarchy where you are working. Simple commands allow you to navigate to the appropriate context.

For detailed information on using the CLI, refer to the following manuals:

- *Sun N2000 Series Release 2.0 – Command Reference*
- *Sun N2000 Series Release 2.0 – System Administration Guide*

## Web interface

The Sun Application Switch Manager Web interface is a graphical user interface (GUI) that allows you to configure and manage the N2000 Series using a browser. The Web interface supports all management capabilities provided by the CLI. Instead of entering information on a command line, you navigate menus and supply information in menu fields.

For detailed information on using the Web interface, refer to Chapter 2, “N2000 Series Web interface overview” on page 9.

## SNMP

The Simple Network Management Protocol (SNMP) allows you to communicate with the SNMP agent on the N2000 Series system from a remote management station. This allows you to retrieve information about managed objects on the system as well as change configuration settings.

The N2000 Series supports the following SNMP versions:

- SNMPv1
- SNMPv2c
- SNMPv3

The N2000 Series supports the standard SNMP commands: GET, GETNEXT, GETBULK, SET. It does not, however, support any of the INFORM commands.

For detailed information on using SNMP to manage the N2000 Series, refer to the following manuals:

- *Sun N2000 Series Release 2.0 – Command Reference*
- *Sun N2000 Series Release 2.0 – System Administration Guide*

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## New Features

For a complete listing of the new features and functionality with this release, refer to the *Sun N2000 Series Release 2.0 – Release Notes* for information.



# N2000 Series Web interface overview

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This chapter introduces the N2000 Series Web interface called the Sun Application Switch Manager. Detailed descriptions of the interface are provided, along with procedures that explain how to use the interface.

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## Web interface overview

The Sun Application Switch Manager Web interface provides a GUI for managing and configuring the N2000 Series. You can access the Web interface using a Web browser. Refer to the *Sun N2000 Series Release 2.0 – Release Notes* for a list of the most up to date tested and supported browsers that work with the N2000 Series.

After you start the Web interface, you can access all of the commands that manage and configure the N2000 Series. The command access that the Web interface provides is equivalent to the Configuration access mode in the CLI. For detailed information on using the CLI, refer to the *Sun N2000 Series Release 2.0 – Command Reference* manual.

A user profile determines what operations you can perform on the system when you log in to the Web interface.

# Accessing the Web interface

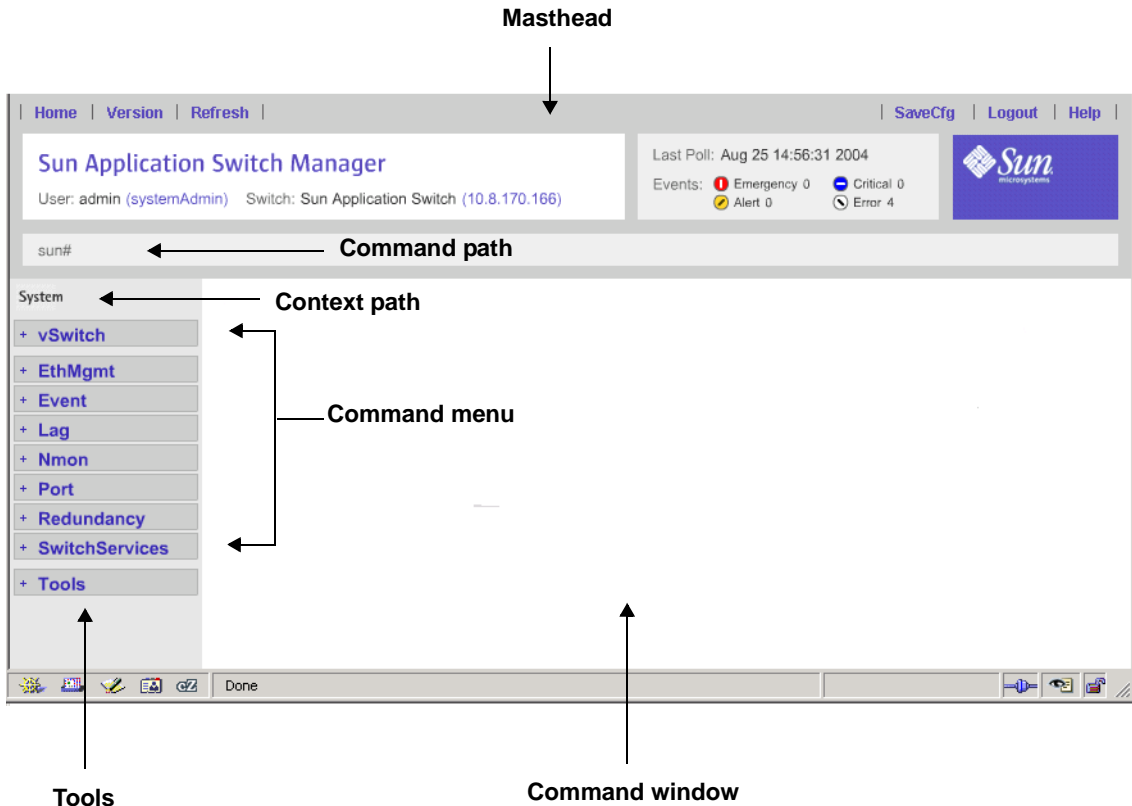
To access the Web interface, enter the switch IP address as the URL in your Web browser, using HTTP or HTTPS depending on system configurations. The system prompts you to enter the user name and password that the system administrator assigned to you.

When you log in successfully, the main window of the Web interface opens. See Figure 2-1.

## Web interface main window

The Web interface main window displays information about the switch and looks similar to the following figure.

FIGURE 2-1 Web interface main window



## Main window components

Components in the Web interface include the following:

- **Masthead** — This section includes a utility bar, the information panel, the status area, and the Sun logo.
- **Command path** — Shows the current command path. It is the equivalent CLI command in most cases.
- **Context path** — Displays the current context level. You can click on any context in a blue color to move up to that context level.
- **Command menu** — Lists all of the available commands. You expand the command menu items to access the commands in lower levels of the command hierarchy.
- **Tools** — Provides access to graphical views of the N2000 Series.
- **Command window** — Displays configuration entries. You can also access the add, modify, delete, copy, and other command functions from this window.

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## Using the Web interface

The following sections detail how to navigate and use the Web interface.

### Navigating in the Web interface



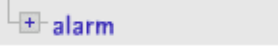
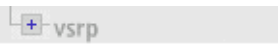

You can use the following components to navigate within the Web interface:

- **Command menu** — Expand choices in the command menu to move to a different part of the command hierarchy.
- **Context path** — Select a context path to move up one or more levels.
- **Web browser Back and Forward buttons** — Use these buttons to move between previously displayed pages.

## Command menu colors

The color of an object in the command menu indicates whether it is a command that you can use to perform a configuration task whether the command provides access to additional commands, or both. The following table lists the colors that the command menu uses.

TABLE 2-1 Command menu colors

If a command menu item is...	It indicates a...
In a gray box with a plus sign. 	Major command category that you can expand to display related commands.
Blue without a plus sign next to it. 	Command that you can use to perform configuration or management functions.
Blue with a plus sign next to it. 	Command that you can use to perform management functions <i>and</i> that you can expand to access additional commands.
Grayed out with a plus sign next to it. 	Command that you can expand to access related commands. There are no configuration entries to display for this command; you must select a lower-level command.
Black with a white background 	Configuration entry that the Web interface is currently displaying in the command window.

## Commands

Just as in the CLI, you use commands to configure and manage the N2000 Series. You access commands from a command menu. The Web interface and the CLI use the same command hierarchy. For example, to show a particular action, select an option from the menu in the Web interface. To perform an action, click a command button.

See “Using Web interface commands” on page 17 for more details about these options.

# Contexts

When using the Web interface, you work in one of the following contexts:

- **System** — The top level command context. The command menu displays all of the commands that you can access at this level and provides access to the vSwitch context.
- **vSwitch** — The context for managing virtual switches. When you select a specific vSwitch configuration, the Web interface command menu displays only the commands associated with configuring a virtual switch. It also provides access to the vRouter context.
- **vRouter** — The context for managing the virtual routers in each vSwitch. You must be in a specific vSwitch context to access the vRouter command. When you select a specific vRouter configuration, the Web interface command menu displays only the commands associated with configuring a vRouter.

---

**Note** – See the *Sun N2000 Series Release 2.0 – System Configuration Guide* for a description of vSwitch and vRouter concepts.

---

## User profiles

The Web interface uses the same predefined user profiles as the CLI. These profiles determine which operations you can perform on the system when you log in. The following table describes the profiles and the privileges associated with them.

TABLE 2-2 Web interface user profiles and privileges

This profile:	Allows...
systemAdmin	Read and write access to all commands for the system, including all vSwitches. You can configure settings that affect the system and any vSwitch.
systemOperator	Read-only access to all commands for the system and all vSwitches. You cannot configure or delete any settings for the system or any vSwitch.
vSwitchAdmin	Read and write access to all commands that affect a specific vSwitch. You can configure settings for only the specified vSwitch.
vSwitchOperator	Read-only access to all commands that affect a specific vSwitch. You cannot configure or delete settings for the specified vSwitch.

---

# Entering data

For most commands, you can select argument values from a drop-down list or you can enter values in a text box. The following illustration shows examples of a drop-down list and a text box.

Modify - Telnetd configuration and current status	
Administrative State	enabled ▾
Maximum Sessions	10 ▾
Telnetd Port	23
Receive Buffer Size	4000

To select a value, click the arrow and select an item.

To specify a value, click the box and enter text.

# Viewing tooltips

When you position the mouse cursor over an option, the Web interface displays brief Help text that describes the option and lists the valid values and the default value for the option. The tooltip closes automatically after a short amount of time.

The following illustration shows an example of a tooltip.

SNMP access configuration table	
Administrative State	disabled
SNMP Port	161
Audit Logging	on

Turn audit logging on or off (on|off) [default: on]

↑ Description      ↑ Valid values      ↑ Default value

## Specifying values for configured or unconfigured items

For some options, the Web interface will display both a drop-down list and a text box for a single option. Typically, this occurs when you specify a value for an item that you have not yet configured. In this case, do one of the following.

Step	Action
1	Select one of the options in the drop-down list (that is not the angle brackets < > option).
	<i>or</i>
1	Select a value in angle brackets (< >) from the list of options. The Web interface displays a text box next to the list.
2	Enter a value in the text box.

---

**Note** – If you select a predefined item from the drop-down list, the text box is no longer displayed.

---

The following illustration shows an example of a drop-down list and text box for a single option.

The screenshot shows a web interface titled "Add - SNMP users". It is divided into two sections: "Required Fields" and "Optional Fields".

**Required Fields:**

- User Name: A text input field.
- Auth Method: A drop-down menu.
- Profile: A drop-down menu.
- Virtualization: A drop-down menu with a text input field next to it. The drop-down menu currently shows "<text>".

**Optional Fields:**

- Address: A text input field with "0.0.0.0" entered.
- Mask: A text input field with "255.255.255.255" entered.
- Authentication Protocol: A drop-down menu with "none" selected.
- Authentication Password: A text input field.
- Privacy Protocol: A drop-down menu with "none" selected.
- Privacy Password: A text input field.

Click the drop-down list and choose one of the options available or select <text> from the drop-down list and enter a value in the text box.

Submit Reset

## Specifying values for configured and unconfigured items

For some command options, you can select configured items and optionally, enter text for items that you have not yet configured. In this situation, the Web interface displays the existing configuration selections using check boxes or a list, depending on the number of configured available items.

To specify values for configured and unconfigured items, do the following.

Step	Action
1	Do <i>one</i> of the following: <ul style="list-style-type: none"><li>• Click all the check boxes for all of the items that you want to select.</li><li>• Select one or more items from the list. To select multiple items from the list, hold down the <b>Ctrl</b> key and click each item that you want to select or hold down the <b>Shift</b> key and click a connected range of items you want to select.</li></ul>
2	Optionally, enter a value in the text box.



The following illustration shows an example of items displayed with check boxes and similar items displayed in a list.

The screenshot shows a web form titled "Add - Service group parameters". It has a "Required Fields" section with "Name" and "Load Balance Type" fields. Below this is the "Configured Real Services" section, which displays a list of two items: "rs1" and "rs2", each with an unchecked checkbox. Below the list is a text box with "-and-" centered above it.

Click one or more check boxes to select configured items.

Optionally, enter a value in the text box if you cannot find the item in the check boxes.

The screenshot shows the same web form as above. In the "Configured Real Services" section, the list of items "rs1", "rs2", "rs3", and "rs4" is displayed in a list box with scroll arrows. Below the list is a text box with "-and-" centered above it.

Highlight one or more items in the list to choose configured items.

Optionally, enter a value in the text box if you want to add additional items.

---

**Note** – Note that if there are four or fewer options, they display as check boxes. If there are more than four options, they display in a list box.

---

## Using Web interface commands

When you use the Web interface to configure the switch, you view, create, copy, modify, and delete entries in the current system configuration.

In addition, you can do the following:

- Refresh the displayed command window data
- Filter data
- Monitor statistics and counters

- Clear statistics and counters
- Graph statistical and operational data
- Export displayed configurations to XML

The Web interface command window displays buttons for only the functions that are available for each command. For example, if a command provides a status display only, the add, modify, and delete buttons are not available.

## Displaying entries

To display entries, select any command in the command menu that is blue in color. The Web interface displays a table that contains a row for each configuration entry for the selected command.

## Creating entries



add

To create a new entry, you click add. This action is available only when you can configure an entry.

To create an entry, do the following.

Step	Action
1	Expand a command (and any required lower-level command) in the command menu and select a command. The Web interface displays the current configurations for the selected command in the command window.
2	Click <b>add</b> . This function is not available in all command windows. The Web interface opens a new command window that displays the settings you can configure.
3	Enter the appropriate values for each setting.
4	Click the <b>Submit</b> button to save the entry. The Web interface returns you to the main command window and displays the new entries that you added.
5	Optionally, click <b>SaveCfg</b> in the masthead to save the configuration entry. You can create more than one entry before you save the settings. If you do not save the settings, the settings are lost when you reboot the system.

# Copying entries



Another method for creating an entry is to copy an existing entry and then modify only the settings that are different for the new entry.

To copy a configuration entry, do the following.

Step	Action
1	Expand a command (and any required lower-level command) in the command menu and select a command. The Web interface displays the current configurations for the selected command in the command window.
2	In the command window, select a row by clicking the check box. To select all displayed rows, click the check box in the table heading row.
3	Click <b>copy</b> . This function is not available in all command windows. The Web interface opens a new command window that displays the settings from the entries you copied.
4	Change the displayed settings, if required.
5	Click the <b>Submit</b> button to save the entry.
6	Optionally, click <b>SaveCfg</b> in the masthead. You can copy and modify more than one entry before you save the settings. If you do not save the settings, the settings are lost when you reboot the system.

# Modifying entries



When you view an entry, the Web interface displays each existing entry in a table row. To modify an entry, you select the row and change the current settings. This action is available only if an entry currently exists and can be modified.

To modify an entry, do the following.

Step	Action
1	Expand a command (and any required lower-level command) in the command menu and select a command. The Web interface displays the current configurations for the selected command in the command window.
2	In the command window, select a row by clicking the check box. To select all displayed rows, click the check box in the table heading row. Note that this is only required if this is a multi-row table.
3	Click <b>modify</b> . This function is not available in all command windows. The Web interface opens a new command window that displays the settings you can modify.
4	Enter the appropriate values for each setting.
5	Click the <b>Submit</b> button to save the configuration entry to the running configuration. The Web Interface returns you to the main command window and displays the settings for the modified entry.
6	Optionally, click <b>SaveCfg</b> in the masthead to save the configuration entry. You can modify more than one entry before you save the settings. If you do not save the settings, the settings are lost when you reboot the system.

## Deleting entries



Deleting an entry removes it from the running configuration. This action is available only if an entry currently exists and can be removed.

To delete entries, do the following.

Step	Action
1	Expand a command item (and any required lower-level command item) in the command menu and select a command. The Web interface displays the current entries for the selected command in the command window.
2	In the command window, select a row by clicking the check box. To select all displayed rows, click the check box in the table heading row. Note that this is only required if this is a multi-row table.

Step	Action
3	Click <b>delete</b> . The Web interface deletes the selected entry from the running configuration. Note that there is no way to undo or cancel a deletion.
4	Optionally, click <b>SaveCfg</b> in the masthead to save the running configuration. You can delete more than one configuration entry before you save the settings. If you do not save the settings, the settings are lost when you reboot the system.

## Saving entries

Configuration changes, such as add, delete, and modify are applied to the running configuration. The running configuration will be lost on reboot, unless you save the configuration by clicking **SaveCfg** in the masthead.

Exiting the Web browser does not affect the running configuration.

---

**Note** – **SaveCfg** updates all the configuration changes for the switch, not just the changes you made in the current Web session.

---

## Refreshing the display



refresh

To display the latest configuration entries for any command, click **refresh** in the command window.

Use this feature to update a window display. This is useful when monitoring statistical information that changes over time or when more than one person is changing configuration settings and you want to see the latest values in the running configuration.

## Filtering command displays



To refine the display for a command so that you see only specific configurations, click **filter** in the command window. The Web interface displays the filter button in all windows that support field filtering.

To filter a command display, do the following.

Step	Action
1	Click <b>filter</b> in the command window. You do not need to select a configuration before clicking <b>filter</b> . The Web interface opens a new window with fields you can use for filtering.
2	Select or enter a value for any or all arguments that you want to use to filter the command display.
3	Click the <b>Submit</b> button. The system displays only the configurations that match all of the filter fields that you specified.

---

**Note** – See the *Sun N2000 Series Release 2.0 – Command Reference* for advanced filtering syntax.

---

## Monitoring statistics and counters



**monitor**

The Web interface allows you to monitor N2000 system statistics and counters using configured alarms that generate events when thresholds are crossed.

To monitor statistics and counters, do the following.

Step	Action
1	Expand a command (and any required lower-level command item) in the command menu and select a command.
2	Click <b>monitor</b> to display the alarm configuration window. Note that this function is not available in all windows.
3	Specify the virtualization level (vSwitch/vRouter) if requested, and any filtering criteria. The displayed fields will depend on your current configuration level and the object to be monitored. The definitions for these fields are described from the appropriate Add, Modify, or Show screens for that object.
4	In the Alarm box, use the drop-down list box to select the statistic or counter that you want to monitor.
5	In the Rising Threshold text box, specify the rising threshold to cross that will generate and send an event message to the event log.

Step	Action
6	In the Optional fields, edit the Poll Interval, Alarm Interval, Sampling Type, Falling Threshold, and the type of rising and falling event levels to generate should configured thresholds be crossed.
7	Click the <b>Submit</b> button to apply the required and optional field settings.
8	Click <b>SaveCfg</b> in the masthead to save the monitor configuration entry in flash memory.

---

**Note** – You can see which statistics are being monitored with the `nmon alarm` command. See the *Sun N2000 Series Release 2.0 – Command Reference* for detailed information on monitoring.

---

## Clear counters



clear

Clear counters allow you to temporarily reset values to zero so changes are easily recognized. Resetting the statistics does not alter data, it merely changes the data display for that particular session.

To clear counters, do the following.

Step	Action
1	Expand a command (and any required lower-level command items) in the command menu and select a command. The Web interface displays the current configuration entries for the selected command in the command window.
2	Click <b>clear</b> . The Web interface opens a new command window that displays a list of statistics and counters.
3	In the command window, select a row by clicking the check box. To select all displayed rows, click the check box in the table heading row. Note that this is only required if this is a multi-row table.
4	Click the <b>Submit</b> button. The Web interface returns you to the main command window and displays the cleared field values in purple.

---

**Note** – You can roll over the value in the Web interface to display a tooltip with the actual value.

---

## Creating graphs



graph

The Web interface allows you to create a number of types of graphs to display statistical and operational data. For commands that provide this type of data, the Web interface displays a **graph** button in the command window.

To create a graph, do the following.

Step	Action
1	Expand a command (and any required lower-level command objects) in the command menu and select a command. The Web interface displays the current configuration entries for the selected command in the command window.
2	Click <b>graph</b> in the command window. The Web interface opens the Graphing window.
3	In the “Select rows to graph” box, select the options you want to include in the graph. Do one of the following: <ul style="list-style-type: none"><li>• Click the &lt;<b>Select All</b>&gt; button to include all options in the graph.</li><li>• Click the check box next to each option you want to select.</li><li>• To clear all row selections, click the &lt;<b>Deselect All</b>&gt; button.</li></ul>
4	In the “Select values to graph” box, select the options you want to include in the graph. Do one of the following: <ul style="list-style-type: none"><li>• Click the &lt;<b>Select All</b>&gt; button to include all options in the graph.</li><li>• Click the check box next to each option you want to select.</li><li>• To clear all row selections, click the &lt;<b>Deselect All</b>&gt; button.</li></ul>
5	In the “Graph Options” box, select the type of graph you want to use. <ul style="list-style-type: none"><li>• Click the graph type you want to use. When selected, the graph type icon is highlighted.</li></ul> Also, specify how often you want updates of the data. <ul style="list-style-type: none"><li>• Enter a number to determine the frequency of updates.</li><li>• Choose one of the radio buttons of either seconds, minutes, or hours to determine the frequency of the updates.</li></ul> By default, the Web interface updates graph data every five seconds.
6	Click the < <b>Draw Graph</b> > button. The Web interface displays the Graphing window.
7	Close the Graphing window when you no longer want to display the graph.



## Exporting configurations to XML



You can export the configuration entries stored in the running configuration from a displayed window to an XML file.

To export a displayed configuration entry, do the following.

Step	Action
1	Expand a command (and any required lower-level command items) in the command menu and select a command that is white in color. The Web interface displays the current configuration entries for the selected command in the command window.
2	Click <b>xml</b> . The Web interface opens another browser window that contains the XML code for the command window.
3	Use the Web browser to save the file.

---

**Note** – Not all commands include the XML export feature. If a command performs an administrative function (such as `ping` or `traceroute`), the command window does not include the XML export feature.

---

The XML window includes the XML code for the displayed data as well as the URL for the configuration entry window. You can use the URL with an XML application to extract specific configuration data that you can use in other applications.

---

## Additional options in the Web interface

There are several configuration options available that you can only perform in the Web interface and that are not available in the CLI. These Web only options include the masthead, the Switch View, and object rule editor.

# Masthead

The masthead of the Sun Application Switch Manger includes several sections, that include numerous pieces of information, similar to the following:

FIGURE 2-2 Masthead



There are three primary sections of the masthead, as well as the Sun logo on the far right. The following is a description of each section.

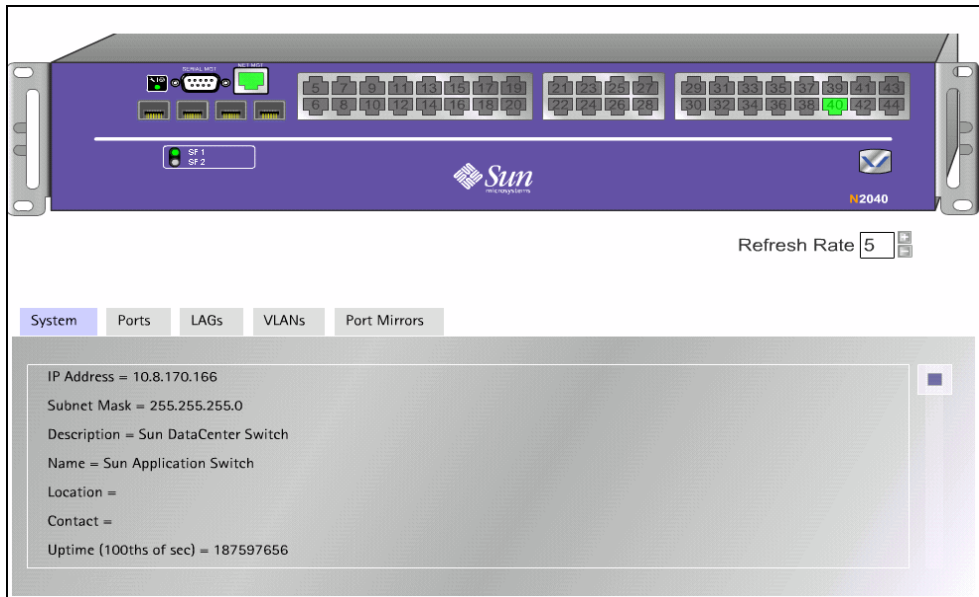
- **Utility bar** - This section of the masthead includes links to the switch Home, information about the switch Version, Refresh ability, **SaveCfg** ability, Logout, and Help. Note that you can only use **SaveCfg** if you are allowed to edit data.
- **Information panel** - This section of the masthead includes the user's name, the user's profile, the name of the switch, and the IP address of the switch.
- **Status area** - This section of the masthead includes the time of the last update of the event counts for the switch. Note that you can click on any count that is non-zero and view the filtered event log for that count.

## Using the Switch View

The Switch View is an interactive and graphical view of the switch. You can view a variety of information about the status of the switch. To open the Switch View, do the following.

Step	Action
1	Click <b>Tools</b> in the command window.
2	Click <b>Switch View</b> in the command window. The interactive graphical representation of the switch opens in a new browser window.

FIGURE 2-3 Switch View



The Switch View shows both a representation of the switch and a tab structure that includes detailed information about the switch.

The switch displays port status (green is an active link, gray is a non-active link, and red is a link error), function status (LEDs for SF1 and SF2), and the virtualization configuration information.

You can mouse over the port icons to display the port name. The tab structure includes details about the System, Ports, LAGs, VLANs, and Port Mirrors tabs. When you are in any of the tabs except the System tab, whenever you roll over any of the information, it shows particular information about the highlighted configured ports.

# Using the object rule editor

The object rule editor is an interactive tool within the Web interface that simplifies creating, editing, and validating L5 to L7 object rule predicates. Using fields and pull-down menus, you interactively select fields, operators, and values that comprise and combine one or more object rules. A *validate* function checks the rule(s) for completeness and syntax, an *update* function applies and saves the rule in the current editing session.

The object rule editor allows you to perform the following tasks:

- Add new object rule predicates and edit existing ones.
- Build compound object rules using the AND, OR, NOT, and () operators.
- Remove or replace existing object rule predicates.
- Validate each object rule to ensure accuracy and operability.

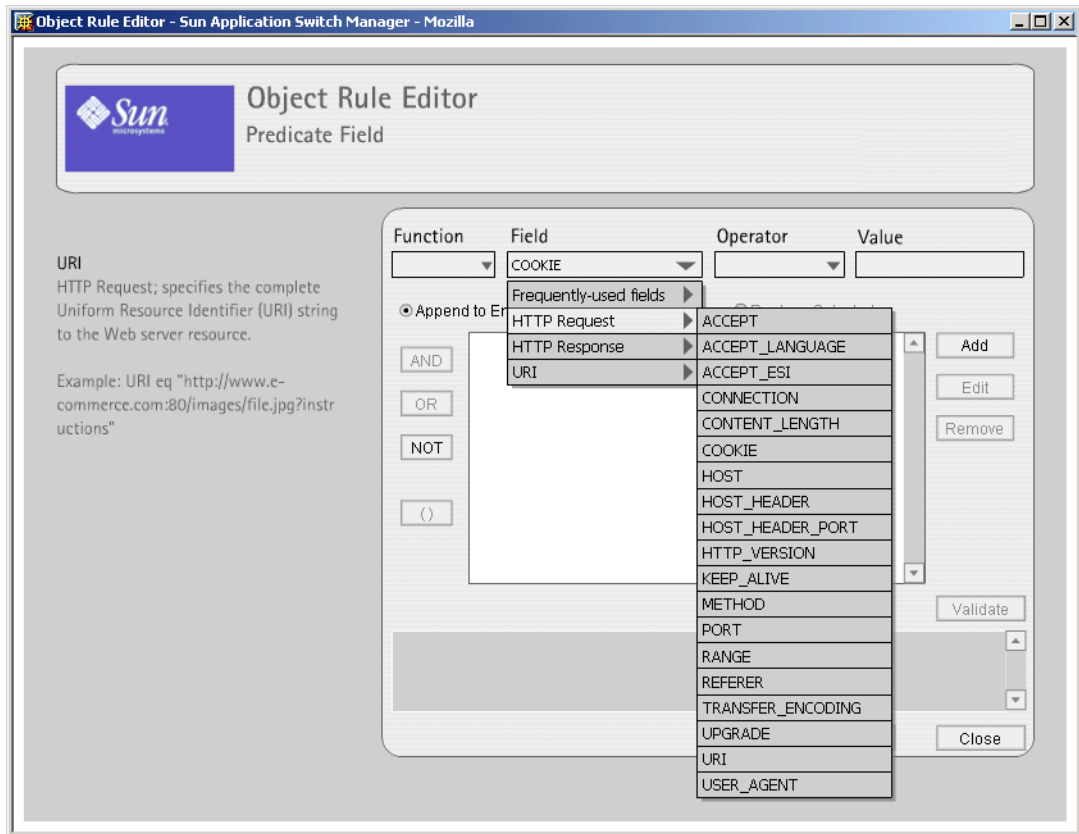
Additionally, the editor automatically displays Help information on the left side of the screen that describes the object rule predicate that you are currently creating.

To access the object rule editor, do the following.

Step	Action
1	Click <b>vSwitch</b> in the command window. The vSwitch options expand and are viewable.
2	Select a vSwitch. Choose any vSwitch except the System vSwitch. If you log in as a vSwitchAdmin or vSwitchOperator user, you are automatically in the correct vSwitch context.
3	Click <b>LoadBalance</b> in the command window.
4	Click <b>objectRule</b> in the command window.
5	Click <b>add</b> to display the Add - Expressions window.
6	Click the <b>Editor</b> button to display the Object Rule Editor window. The Object Rule Editor window opens. Follow the instructions on the left side of the editor to create, edit, and validate L5 to L7 object rules.
7	Click <b>Update</b> to apply the validated rule and to return to the Add Expressions window. Click <b>Close</b> to close the window.

The following figure shows the Object Rule Editor window and a sample drop-down menu.

FIGURE 2-4 Object Rule Editor window



For more information on creating object rule predicates, refer to the *Sun N2000 Series Release 2.0 – System Configuration Guide*.

## Using Help





You can access Help for each command window by clicking the help button on a command window. The Help explains how to use the currently displayed window as well as the arguments or output fields associated with the configuration entry.

# Navigating Help

By default, clicking the Help button displays the help for the currently displayed window. The following table describes how to move between topics.

**TABLE 2-3** Moving between Help topics

To do this:	Click:
Move to the previous topic in the Help system.	
Move to the next topic in the Help system.	
Move back to a topic you displayed previously.	The Web browser Back button.
Move forward to a topic that you displayed previously.	The Web browser Forward button.

## Navigation tabs

You also can open the navigation tab and view all of the topics in the Help file. To open the navigation tab, click the Navigation button in the Help toolbar:



The following table describes the tabs you can select when you open the navigation tab.

**TABLE 2-4** Help navigation tabs

Tab	Description
Contents	Provides a list of all topics in the Help system.
Index	Provides an alphabetic list of all topics and terms in the Help system.
Search	Allows you to search the Help system for a specific word or set of words. Type the words to use in the search and click Go.

---




**Note** – Once you open the navigation tab, you cannot close it unless you exit the Help system. You can, however, drag the bar between the main Help window and the navigation tab to hide the navigation tab.

---

## Additional Help features

The following table describes additional features you can access from the Help system.

**TABLE 2-5** Additional Help features

Feature	Description	Button
Show in contents	Adjusts the Contents tab in the navigation pane so that the displayed topic entry appears at the top of the tab.	
Print	Prints the displayed topic to your system's printer. This option is not available on the Macintosh platform. You can use the Web browser print function to print the displayed frame, instead.	
Bookmark	Adds a bookmark for the currently displayed topic to your Web browser's bookmark file.	





# N2000 Series system specifications

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This appendix includes a listing of all the system specifications for the Sun N2000 Series.

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## System specifications

This section includes specific information and details about the Sun N2000 Series Sun Application Switch Manager.

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### Performance

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64-Gbps non-blocking switch fabric

Up to 6-Gbps application switching throughput

Up to 4-Gbps cryptographic throughput

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### Function Cards

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Up to two per system

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### Virtual Switches

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Multiple virtual switches per system

Allocate services per fully secure, partitioned switch domains

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**Access Control Lists**

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L3-L4: filter by protocol, IP address, port

L5-L7: filter by URI, headers, content

Separate rule sets for each virtual switch

---

**System Interfaces**

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N2040: 40 10/100BASE-T ports, 4 SFF pluggable Gigabit Ethernet ports

N2120: 12 SFF pluggable Gigabit Ethernet ports

Management Interfaces: DB-9 serial port, RJ-45 10/100 Ethernet

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**Bandwidth Management**

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Bandwidth parameters: CIR, CBS, EBS

Shaping parameters: WFQ, strict priority, strict priority with excess, WRED

DiffServ

802.1p

---

**Common Attack Protection**

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URL filtering to stop HTTP worms

Rate and connection limiting to reduce flooding

Frame filtering for poison data: filter frames for any “poison” or unexpected data

SYN Flood attack mitigation

“SMURF” attack nullification

“FRAGGLE” attack nullification

Land attack

IP packets with multicast or broadcast source IP address

TCP server resource release

Filter TCP traffic with SYN and FIN bits set

Source/Destination IP is a loop-back address

Ping of Death attack

Fragmentation reassembly errors

Source spoofed frames

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**Protocols and Standards**

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RFC 1812 Router Requirements

RFC 1519 CIDR

RFC 1256 IRDP Router Discovery

RFC 783 TFTP

RFC 1122 Host Requirements

RFC 768 UDP

RFC 791 IP

RFC 792 ICMP

RFC 793 TCP

RFC 826 ARP

RFC 1058 RIPv1

RFC 2453 RIPv2

RFC 2328 OSPFV2

VSRP (Virtual Service Redundancy Protocol)

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**Application Switching/Load Balancing**

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Up to 300,000 new L4 - L7 connections/sec

Up to 2 million concurrent L4 - L7 connections/sec

Application switch bi-directionality on HTTP headers, URI, cookie, payload, content

Client stickiness with client source address and port and switch managed cookies

Load Balancing Algorithms: round-robin, weighted round-robin, least connections, source address hashing

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**SSL Acceleration**

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Up to 24,000 new L4 - L7 connections/sec

Up to 480,000 concurrent connections/sec

Up to 4-Gbps symmetric key SSL crypto throughput

SSL 3.0, TLS 1.0

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**SSL Acceleration**

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Client and server-side support  
Reencryption for end-to-end security  
X.509 certificates

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**Quality of Service**

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IEEE 802.1D - 1998 (802.1p) packet priority  
IEEE 802.1Q - VLAN tagging  
IEEE 802.3ad draft-static-configuration  
Port-based  
MAC-based  
Protocol-sensitive

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**Security**

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Secure Shell V2.0  
Secure Shell File Transfer Protocol  
RFC 1851 3DES-CBC cipher  
RFC 2792 DSA key exchange  
TACACS+  
RADIUS

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**System Dimensions (HXWXD)**

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3.5 in x 17.4 in x 26.0 in (8.89 cm x 44.2 cm x 66.0 cm)  
2 RU enclosure, 2 or 4 post rack-mounted STD EIA/NEMA rack

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**Environmental**

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Operating temperatures: -32 to 104 degrees Fahrenheit (0 to 40 degrees Celsius)  
Storing temperatures: -22 to 176 degrees Fahrenheit (-30 to 80 degrees Celsius)  
Operating humidity: 0 to 95% relative humidity, non-condensing  
Maximum heat dissipation, fully populated: 2050 BTU/hr

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**Power**

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Input current: 10A at 115 VAC, 5A at 230 VAC

90 to 135/180 to 265 VAC automatic select

47-63 Hz

Redundant power supply option and power cord

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**Weight**

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Fully configured: 40 lbs

Function card: 3.5 lbs

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**Management**

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RFC 1157 SNMPv1/v2c

RFC 1907 SNMPv2

RFC 1493 Bridge MIB

RFC 1213 MIB-II

RFC 2233 Interface MIB

RFC 2096 IP Forwarding MIB

RFC 1724 RIPv2 MIB

RFC 2576 SNMP-Community-MIB

RFC 2573 SNMP-Notification-MIB

RFC 2571 SNMP- Framework-MIB

RFC 2573 SNMP-Target-MIB

RFC 2572 SNMP-MPD-MIB

RFC 2574 SNMP-User-based-SM-MIB

RFC 2068 HTTP

RFC 854 Telnet

Sun N2000 Series private MIBs

HTML and Telnet management

Configuration logging

Multiple images

Multiple syslog servers

NTP

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**Certifications**

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FCC Part 15, Subpart B, Class A limits

Industry Canada ICES-003, Class A limits

AS/NZ3548 Class A

VCCI Class A

BSMI CNS 13438 Class A

EN 60950

EN 55022 Class A

EN55022:1998/CISPR-22 Class A

CE

UL60950 UL/CUL

IEC60950

CSA-C22.2

EN55024:1998

FIPS 140-2 certified cryptographic algorithms: SHA-1, DSA, DES, 3DES

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# Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

## Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

## Symbols

The following symbols may appear in this book:



---

**Caution** – There is a risk of personal injury and equipment damage. Follow the instructions.

---



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**Caution** – Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.

---



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**Caution** – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

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Depending on the type of power switch your device has, one of the following symbols may be used:



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**On** – Applies AC power to the system.

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**Off** – Removes AC power from the system.

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**Standby** – The On/Standby switch is in the standby position.

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## Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for regulatory compliance of a modified Sun product.

## Placement of a Sun Product



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**Caution** – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

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## Noise Level

In compliance with the requirements defined in DIN 45635 Part 1000, the workplace-dependent noise level of this product is less than 70 db(A).

## SELV Compliance

Safety status of I/O connections comply to SELV requirements.

### Power Cord Connection



---

**Caution** – Sun products are designed to work with power systems having a grounded neutral (grounded return for DC-powered products). To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

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**Caution** – Not all power cords have the same current ratings. Do not use the power cord provided with your equipment for any other products or use. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.

---



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注意 – 添付の電源コードを他の装置や用途に使用しない  
添付の電源コードは本装置に接続し、使用することを目的として設計され、その安全性が確認されているものです。決して他の装置や用途に使用しないでください。火災や感電の原因となる恐れがあります。

---

The following caution applies only to devices with a Standby power switch:



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**Caution** – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

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The following caution applies only to devices with multiple power cords:



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**Caution** – For products with multiple power cords, all power cords must be disconnected to completely remove power from the system.

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### Battery Warning



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**Caution** – There is danger of explosion if batteries are mishandled or incorrectly replaced. On systems with replaceable batteries, replace only with the same manufacturer and type or equivalent type recommended by the manufacturer per the instructions provided in the product service manual. Do not disassemble batteries or attempt to recharge them outside the system. Do not dispose of batteries in fire. Dispose of batteries properly in accordance with the manufacturer's instructions and local regulations. Note that on Sun CPU boards, there is a lithium battery molded into the real-time clock. These batteries are not customer replaceable parts.

---

### System Unit Cover

You must remove the cover of your Sun computer system unit to add cards, memory, or internal storage devices. Be sure to replace the cover before powering on your computer system.



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**Caution** – Do not operate Sun products without the cover in place. Failure to take this precaution may result in personal injury and system damage.

---



## Rack System Warning

The following warnings apply to Racks and Rack Mounted systems.



**Caution** – For safety, equipment should always be loaded from the bottom up. That is, install the equipment that will be mounted in the lowest part of the rack first, then the next higher systems, etc.



**Caution** – To prevent the rack from tipping during equipment installation, the anti-tilt bar on the rack must be deployed.



**Caution** – To prevent extreme operating temperature within the rack insure that the maximum temperature does not exceed the product's ambient rated temperatures.



**Caution** – To prevent extreme operating temperatures due to reduced airflow consideration should be made to the amount of air flow that is required for a safe operation of the equipment.

## Laser Compliance Notice

Sun products that use laser technology comply with Class 1 laser requirements.

Class 1 Laser Product  
Luokan 1 Laserlaite  
Klasse 1 Laser Apparat  
Laser Klasse 1

## CD and DVD Devices

The following caution applies to CD, DVD, and other optical devices.



**Caution** – Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

## Conformité aux normes de sécurité

Veillez lire attentivement cette section avant de commencer. Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

## Mesures de sécurité

Pour votre sécurité, nous vous recommandons de suivre scrupuleusement les mesures de sécurité ci-dessous lorsque vous installez votre matériel:

- Suivez tous les avertissements et toutes les instructions inscrites sur le matériel.
- Assurez-vous que la tension et la fréquence de votre source d'alimentation correspondent à la tension et à la fréquence indiquées sur l'étiquette de la tension électrique nominale du matériel
- N'introduisez jamais d'objets quels qu'ils soient dans les ouvertures de l'équipement. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet étranger conducteur risque de produire un court-circuit pouvant présenter un risque d'incendie ou de décharge électrique, ou susceptible d'endommager le matériel.

## Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés:



**Attention** – Vous risquez d'endommager le matériel ou de vous blesser. Veuillez suivre les instructions.



**Attention** – Surfaces brûlantes. Évitez tout contact. Les surfaces sont brûlantes. Vous risquez de vous blesser si vous les touchez.



---

**Attention** – Tensions dangereuses. Pour réduire les risques de décharge électrique et de danger physique, observez les consignes indiquées.

---

Selon le type d'interrupteur marche/arrêt dont votre appareil est équipé, l'un des symboles suivants sera utilisé:



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**Marche** – Met le système sous tension alternative.

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**Arrêt** – Met le système hors tension alternative.

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**Veilleuse** – L'interrupteur Marche/Veille est sur la position de veille.

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## Modification du matériel

N'apportez aucune modification mécanique ou électrique au matériel. Sun Microsystems décline toute responsabilité quant à la non-conformité éventuelle d'un produit Sun modifié.

## Positionnement d'un produit Sun



---

**Attention** – Évitez d'obstruer ou de recouvrir les orifices de votre produit Sun. N'installez jamais un produit Sun près d'un radiateur ou d'une source de chaleur. Si vous ne respectez pas ces consignes, votre produit Sun risque de surchauffer et son fonctionnement en sera altéré.

---

## Niveau de pression acoustique

Le niveau de pression acoustique du lieu de travail définie par la norme DIN 45 635 Part 1000 doit être au maximum de 70 db(A).

## Conformité SELV

Le niveau de sécurité des connexions E/S est conforme aux normes SELV.

## Connexion du cordon d'alimentation



---

**Attention** – Les produits Sun sont conçus pour fonctionner avec des systèmes d'alimentation équipés d'un conducteur neutre relié à la terre (conducteur neutre pour produits alimentés en CC). Pour réduire les risques de décharge électrique, ne branchez jamais les produits Sun sur une source d'alimentation d'un autre type. Contactez le gérant de votre bâtiment ou un électricien agréé si vous avez le moindre doute quant au type d'alimentation fourni dans votre bâtiment.

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**Attention** – Tous les cordons d'alimentation ne présentent pas les mêmes caractéristiques électriques. Les cordons d'alimentation à usage domestique ne sont pas protégés contre les surtensions et ne sont pas conçus pour être utilisés avec des ordinateurs. N'utilisez jamais de cordon d'alimentation à usage domestique avec les produits Sun.

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L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur Veille:



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**Attention** – L'interrupteur d'alimentation de ce produit fonctionne uniquement comme un dispositif de mise en veille. Le cordon d'alimentation constitue le moyen principal de déconnexion de l'alimentation pour le système. Assurez-vous de le brancher dans une prise d'alimentation mise à la terre près du système et facile d'accès. Ne le branchez pas lorsque l'alimentation électrique ne se trouve pas dans le châssis du système.

---

L'avertissement suivant s'applique uniquement aux systèmes équipés de plusieurs cordons d'alimentation:



---

**Attention** – Pour mettre un système équipé de plusieurs cordons d'alimentation hors tension, il est nécessaire de débrancher tous les cordons d'alimentation.

---

## Mise en garde relative aux batteries



**Attention** – Les batteries risquent d'exploser en cas de manipulation maladroite ou de remplacement incorrect. Pour les systèmes dont les batteries sont remplaçables, effectuez les remplacements uniquement selon le modèle du fabricant ou un modèle équivalent recommandé par le fabricant, conformément aux instructions fournies dans le manuel de service du système. N'essayez en aucun cas de démonter les batteries, ni de les recharger hors du système. Ne les jetez pas au feu. Mettez-les au rebut selon les instructions du fabricant et conformément à la législation locale en vigueur. Notez que sur les cartes processeur de Sun, une batterie au lithium a été moulée dans l'horloge temps réel. Les batteries ne sont pas des pièces remplaçables par le client.



**Attention** – Afin d'éviter que le rack ne penche pendant l'installation du matériel, tirez la barre anti-basculement du rack.



**Attention** – Pour éviter des températures de fonctionnement extrêmes dans le rack, assurez-vous que la température maximale ne dépasse pas la fourchette de températures ambiantes du produit déterminée par le fabricant.



**Attention** – Afin d'empêcher des températures de fonctionnement extrêmes provoquées par une aération insuffisante, assurez-vous de fournir une aération appropriée pour un fonctionnement du matériel en toute sécurité

## Couvercle de l'unité

Pour ajouter des cartes, de la mémoire ou des périphériques de stockage internes, vous devez retirer le couvercle de votre système Sun. Remettez le couvercle supérieur en place avant de mettre votre système sous tension.



**Attention** – Ne mettez jamais des produits Sun sous tension si leur couvercle supérieur n'est pas mis en place. Si vous ne prenez pas ces précautions, vous risquez de vous blesser ou d'endommager le système.

## Avis de conformité des appareils laser

Les produits Sun qui font appel aux technologies lasers sont conformes aux normes de la classe 1 en la matière.

Class 1 Laser Product  
Luokan 1 Laserlaitte  
Klasse 1 Laser Apparat  
Laser Klasse 1

## Mise en garde relative au système en rack

La mise en garde suivante s'applique aux racks et aux systèmes montés en rack.



**Attention** – Pour des raisons de sécurité, le matériel doit toujours être chargé du bas vers le haut. En d'autres termes, vous devez installer, en premier, le matériel qui doit se trouver dans la partie la plus inférieure du rack, puis installer le matériel sur le niveau suivant, etc.



## Périphériques CD et DVD

L'avertissement suivant s'applique aux périphériques CD, DVD et autres périphériques optiques:

**Attention** – L'utilisation de contrôles et de réglages ou l'application de procédures autres que ceux spécifiés dans le présent document peuvent entraîner une exposition à des radiations dangereuses.

## Einhaltung sicherheitsbehördlicher Vorschriften

Lesen Sie vor dem Ausführen von Arbeiten diesen Abschnitt. Im folgenden Text werden Sicherheitsvorkehrungen beschrieben, die Sie bei der Installation eines Sun Microsystems-Produkts beachten müssen.

### Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz bei der Installation des Geräts die folgenden Sicherheitsvorkehrungen:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Stellen Sie sicher, dass Spannung und Frequenz der Stromversorgung den Nennleistungen auf dem am Gerät angebrachten Etikett entsprechen.
- Führen Sie niemals Fremdoobjekte in die Öffnungen am Gerät ein. Es können gefährliche Spannungen anliegen. Leitfähige Fremdoobjekte können einen Kurzschluss verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

### Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:



---

**Achtung** – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.

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---

**Achtung** – Heiße Oberfläche. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.

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---

**Achtung** – Gefährliche Spannungen. Befolgen Sie die Anweisungen, um Stromschläge und Verletzungen zu vermeiden.

---

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole verwendet werden:



---

**Ein** – Versorgt das System mit Wechselstrom.

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**Aus** – Unterbricht die Wechselstromzufuhr zum Gerät.

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**Wartezustand** – Der Ein-/Standby-Netzschalter befindet sich in der Standby-Position.

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### Modifikationen des Geräts

Nehmen Sie keine elektrischen oder mechanischen Gerätemodifikationen vor. Sun Microsystems ist für die Einhaltung der Sicherheitsvorschriften von modifizierten Sun-Produkten nicht haftbar.

### Aufstellung von Sun-Geräten



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**Achtung** – Geräteöffnungen Ihres Sun-Produkts dürfen nicht blockiert oder abgedeckt werden. Sun-Geräte sollten niemals in der Nähe von Heizkörpern oder Heißluftklappen aufgestellt werden. Die Nichtbeachtung dieser Richtlinien kann Überhitzung verursachen und die Zuverlässigkeit Ihres Sun-Geräts beeinträchtigen.

---

### Lautstärke

Gemäß den in DIN 45 635 Teil 1000 definierten Vorschriften beträgt die arbeitsplatzbedingte Lautstärke dieses Produkts weniger als 70 dB(A).

### SELV-Konformität

Der Sicherheitsstatus der E/A-Verbindungen entspricht den SELV-Anforderungen.

## Anschluss des Netzkabels

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**Achtung** – Sun-Geräte sind für Stromversorgungssysteme mit einem geerdeten neutralen Leiter (geerdeter Rückleiter bei gleichstrombetriebenen Geräten) ausgelegt. Um die Gefahr von Stromschlägen zu vermeiden, schließen Sie das Gerät niemals an andere Stromversorgungssysteme an. Wenden Sie sich an den zuständigen Gebäudeverwalter oder an einen qualifizierten Elektriker, wenn Sie nicht sicher wissen, an welche Art von Stromversorgungssystem Ihr Gebäude angeschlossen ist.

---



**Achtung** – Nicht alle Netzkabel verfügen über die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastschutz und sind daher für Computersysteme nicht geeignet. Verwenden Sie bei Ihrem Sun-Produkt keine Haushalts-Verlängerungskabel.

---

Die folgende Warnung gilt nur für Geräte mit Standby-Netzschalter:



**Achtung** – Beim Netzschalter dieses Geräts handelt es sich nur um einen Ein-/Standby-Schalter. Zum völligen Abtrennen des Systems von der Stromversorgung dient hauptsächlich das Netzkabel. Stellen Sie sicher, dass das Netzkabel an eine frei zugängliche geerdete Steckdose in der Nähe des Systems angeschlossen ist. Schließen Sie das Stromkabel nicht an, wenn die Stromversorgung vom Systemchassis entfernt wurde.

---

Die folgende Warnung gilt nur für Geräte mit mehreren Netzkabeln:



**Achtung** – Bei Produkten mit mehreren Netzkabeln müssen alle Netzkabel abgetrennt werden, um das System völlig von der Stromversorgung zu trennen.

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## Warnung bezüglich Batterien

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**Achtung** – Bei unsachgemäßer Handhabung oder nicht fachgerechtem Austausch der Batterien besteht Explosionsgefahr. Verwenden Sie bei Systemen mit austauschbaren Batterien ausschließlich Ersatzbatterien desselben Typs und Herstellers bzw. einen entsprechenden, vom Hersteller gemäß den Anweisungen im Service-Handbuch des Produkts empfohlenen Batterietyp. Versuchen Sie nicht, die Batterien auszubauen oder außerhalb des Systems wiederaufzuladen. Werfen Sie die Batterien nicht ins Feuer. Entsorgen Sie die Batterien entsprechend den Anweisungen des Herstellers und den vor Ort geltenden Vorschriften. CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie. Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgetauscht werden.

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## Gehäuseabdeckung

Sie müssen die Abdeckung Ihres Sun-Computersystems entfernen, um Karten, Speicher oder interne Speichergeräte hinzuzufügen. Bringen Sie vor dem Einschalten des Systems die Gehäuseabdeckung wieder an.



**Achtung** – Nehmen Sie Sun-Geräte nicht ohne Abdeckung in Betrieb. Die Nichtbeachtung dieses Warnhinweises kann Verletzungen oder Geräteschaden zur Folge haben.

---

## Warnungen bezüglich in Racks eingebauter Systeme

Die folgenden Warnungen gelten für Racks und in Racks eingebaute Systeme:



**Achtung** – Aus Sicherheitsgründen sollten sämtliche Geräte von unten nach oben in Racks eingebaut werden. Installieren Sie also zuerst die Geräte, die an der untersten Position im Rack eingebaut werden, gefolgt von den Systemen, die an nächsthöherer Stelle eingebaut werden, usw.

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**Achtung** – Verwenden Sie beim Einbau den Kippschutz am Rack, um ein Umkippen zu vermeiden.

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**Achtung** – Um extreme Betriebstemperaturen im Rack zu vermeiden, stellen Sie sicher, dass die Maximaltemperatur die Nennleistung der Umgebungstemperatur für das Produkt nicht überschreitet

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---

**Achtung** – Um extreme Betriebstemperaturen durch verringerte Luftzirkulation zu vermeiden, sollte die für den sicheren Betrieb des Geräts erforderliche Luftzirkulation eingesetzt werden.

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## Hinweis zur Laser-Konformität

Sun-Produkte, die die Laser-Technologie verwenden, entsprechen den Laser-Anforderungen der Klasse 1.

Class 1 Laser Product  
Luokan 1 Laserlaite  
Klasse 1 Laser Apparat  
Laser Klasse 1

## CD- und DVD-Geräte

Die folgende Warnung gilt für CD-, DVD- und andere optische Geräte:



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**Achtung** – Die hier nicht aufgeführte Verwendung von Steuerelementen, Anpassungen oder Ausführung von Vorgängen kann eine gefährliche Strahlenbelastung verursachen.

---

## Normativas de seguridad

Lea esta sección antes de realizar cualquier operación. En ella se explican las medidas de seguridad que debe tomar al instalar un producto de Sun Microsystems.

## Medidas de seguridad

Para su protección, tome las medidas de seguridad siguientes durante la instalación del equipo:

- Siga todos los avisos e instrucciones indicados en el equipo.
- Asegúrese de que el voltaje y frecuencia de la fuente de alimentación coincidan con el voltaje y frecuencia indicados en la etiqueta de clasificación eléctrica del equipo.
- No introduzca objetos de ningún tipo por las rejillas del equipo, ya que puede quedar expuesto a voltajes peligrosos. Los objetos conductores extraños pueden producir cortocircuitos y, en consecuencia, incendios, descargas eléctricas o daños en el equipo.

## Símbolos

En este documento aparecen los siguientes símbolos:



---

**Precaución** – Existe el riesgo de que se produzcan lesiones personales y daños en el equipo. Siga las instrucciones.

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**Precaución** – Superficie caliente. Evite todo contacto. Las superficies están calientes y pueden causar lesiones personales si se tocan.

---



---

**Precaución** – Voltaje peligroso. Para reducir el riesgo de descargas eléctricas y lesiones personales, siga las instrucciones.

---

En función del tipo de interruptor de alimentación del que disponga el dispositivo, se utilizará uno de los símbolos siguientes:



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**Encendido** – Suministra alimentación de CA al sistema.

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**Apagado** – Corta la alimentación de CA del sistema.

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**Espera** – El interruptor de encendido/espera está en la posición de espera.

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## Modificaciones en el equipo

No realice modificaciones de tipo mecánico ni eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de normativas en caso de que un producto Sun se haya modificado.

## Colocación de un producto Sun



---

**Precaución** – No obstruya ni tape las rejillas del producto Sun. Nunca coloque un producto Sun cerca de radiadores ni fuentes de calor. Si no sigue estas indicaciones, el producto Sun podría sobrecalentarse y la fiabilidad de su funcionamiento se vería afectada.

---

## Nivel de ruido

De conformidad con los requisitos establecidos en el apartado 1000 de la norma DIN 45635, el nivel de ruido en el lugar de trabajo producido por este producto es menor de 70 db(A).

## Cumplimiento de la normativa para instalaciones SELV

Las condiciones de seguridad de las conexiones de entrada y salida cumplen los requisitos para instalaciones SELV (del inglés *Safe Extra Low Voltage*, voltaje bajo y seguro).

## Conexión del cable de alimentación



---

**Precaución** – Los productos Sun se han diseñado para funcionar con sistemas de alimentación que cuenten con un conductor neutro a tierra (con conexión a tierra de regreso para los productos con alimentación de CC). Para reducir el riesgo de descargas eléctricas, no conecte ningún producto Sun a otro tipo de sistema de alimentación. Póngase en contacto con el encargado de las instalaciones de su empresa o con un electricista cualificado en caso de que no esté seguro del tipo de alimentación del que se dispone en el edificio.

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---

**Precaución** – No todos los cables de alimentación tienen la misma clasificación eléctrica. Los alargadores de uso doméstico no cuentan con protección frente a sobrecargas y no están diseñados para su utilización con sistemas informáticos. No utilice alargadores de uso doméstico con el producto Sun.

---

La siguiente medida solamente se aplica a aquellos dispositivos que dispongan de un interruptor de alimentación de espera:



---

**Precaución** – El interruptor de alimentación de este producto funciona solamente como un dispositivo de espera. El cable de alimentación hace las veces de dispositivo de desconexión principal del sistema. Asegúrese de que conecta el cable de alimentación a una toma de tierra situada cerca del sistema y de fácil acceso. No conecte el cable de alimentación si la unidad de alimentación no se encuentra en el bastidor del sistema.

---

La siguiente medida solamente se aplica a aquellos dispositivos que dispongan de varios cables de alimentación:



---

**Precaución** – En los productos que cuentan con varios cables de alimentación, debe desconectar todos los cables de alimentación para cortar por completo la alimentación eléctrica del sistema.

---

## Advertencia sobre las baterías



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**Precaución** – Si las baterías no se manipulan o reemplazan correctamente, se corre el riesgo de que estallen. En los sistemas que cuentan con baterías reemplazables, reemplácelas sólo con baterías del mismo fabricante y el mismo tipo, o un tipo equivalente recomendado por el fabricante, de acuerdo con las instrucciones descritas en el manual de servicio del producto. No desmonte las baterías ni intente recargarlas fuera del sistema. No intente deshacerse de las baterías echándolas al fuego. Deshágase de las baterías correctamente de acuerdo con las instrucciones del fabricante y las normas locales. Tenga en cuenta que en las placas CPU de Sun, hay una batería de litio incorporada en el reloj en tiempo real. Los usuarios no deben reemplazar este tipo de baterías.

---

## Cubierta de la unidad del sistema

Debe extraer la cubierta de la unidad del sistema informático Sun para instalar tarjetas, memoria o dispositivos de almacenamiento internos. Vuelva a colocar la cubierta antes de encender el sistema informático.



---

**Precaución** – No ponga en funcionamiento los productos Sun que no tengan colocada la cubierta. De lo contrario, puede sufrir lesiones personales y ocasionar daños en el sistema.

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## Advertencia sobre el sistema en bastidor

Las advertencias siguientes se aplican a los sistemas montados en bastidor y a los propios bastidores.



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**Precaución** – Por seguridad, siempre deben montarse los equipos de abajo arriba. A saber, primero debe instalarse el equipo que se situará en el bastidor inferior; a continuación, el que se situará en el siguiente nivel, etc.

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**Precaución** – Para evitar que el bastidor se vuelque durante la instalación del equipo, debe extenderse la barra antivolcado del bastidor.

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**Precaución** – Para evitar que se alcance una temperatura de funcionamiento extrema en el bastidor, asegúrese de que la temperatura máxima no sea superior a la temperatura ambiente establecida como adecuada para el producto.

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**Precaución** – Para evitar que se alcance una temperatura de funcionamiento extrema debido a una circulación de aire reducida, debe considerarse la magnitud de la circulación de aire requerida para que el equipo funcione de forma segura.

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## Aviso de cumplimiento de la normativa para la utilización de láser

Los productos Sun que utilizan tecnología láser cumplen los requisitos establecidos para los productos láser de clase 1.

Class 1 Laser Product  
Luokan 1 Laserlaite  
Klasse 1 Laser Apparat  
Laser Klasse 1



## Dispositivos de CD y DVD

La siguiente medida se aplica a los dispositivos de CD y DVD, así como a otros dispositivos ópticos:



**Precaución** – La utilización de controles, ajustes o procedimientos distintos a los aquí especificados puede dar lugar a niveles de radiación peligrosos.

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## Nordic Lithium Battery Cautions

### Norge



**Advarsel** – Litiumbatteri — Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

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### Sverige



**Varning** – Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

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### Danmark



**Advarsel!** – Litiumbatteri — Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

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### Suomi



**Varoitus** – Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

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# Index

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## A

- abbreviations, xiii
- about this manual, xi
- access control lists (ACL), 34
- acronyms, xiii
- air flow and cooling, 4
- altitude, N2000 Series operating, 4
- ambient air temperature
  - operating and non-operating, 4

## C

- certifications, 38
- clear counters, 23
- command line interface, 7
  - Telnet and SSH access to, 7
- command menu colors, 12
- configuration commands, 17
- configuration entries, 17
  - copying, 19
  - creating, 18
  - deleting, 20
  - displaying, 18
  - modifying, 19
  - saving, 21
- copying configuration entries, 19
- creating configuration entries, 18
- creating graphs, 24

## D

- deleting configuration entries, 20
- displaying configuration entries, 18
- documentation, xii

## E

- environmental requirements, 36
- Ethernet ports, 3
  - supported cables, 3
- exporting configurations to xml, 25

## F

- fan module, 4
- filtering command displays, 21
- function card, 4
  - LEDs, 4

## G

- graphs
  - creating, 24
- GUI overview, 9

## H

- heat dissipation, 4

## L

LEDs status and conditions (Table), 6

## M

main window components, 11  
management interface, 1, 3  
management specifications, 37  
masthead, 26  
modifying configuration entries, 19  
monitoring counters, 22  
monitoring statistics, 22

## N

### N2000 Series

- chassis views, 2
- cooling requirements, 4
- documentation, xii
- environmental requirements, 4
- function cards, 3
- GUI, 9
- LEDs, 6
- product overview, 1
- software, 7
- system board, 3, 4
- system fan module, 3
- system power supply, 3, 5
- user interface, 9
- Web interface, 9
- Web interface overview, 9

### N2040

- chassis overview, 2

### N2120

- chassis overview, 2

network management, 7

## O

object rule editor, 28  
operating system software, 7

## P

power requirements, 5  
power supply, 5

## R

refresh, 21  
refreshing the display, 21  
related documentation, xii  
relative humidity, 4  
RS-232 serial port, 3  
*See* console port

## S

saving configuration entries, 21  
SNMP support, 8  
switch view, 26  
system and network management, 7  
system board, 4

- supported features, 4

system dimensions, 36  
system fan module, 4  
system LEDs, 6  
system software, 7  
system specifications, 33

## T

technical support, xiii  
tooltips, 14

## U

uninterruptible power supply (UPS), 5  
user interface overview, 9  
user profiles, 13  
using the interface, 11  
using the Web interface, 11

## **V**

voltage requirements, 5

## **W**

Web interface, 10  
  components, 11  
  configurations, 17  
  main window, 10  
  masthead, 26  
  user profiles, 13  
  using, 11

## **X**

xml, 25

