



Sun™ N2000 Series Release 2.0— Hardware Installation and Startup Guide

Sun Microsystems, Inc.
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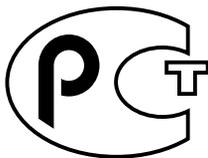
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Preface

About this manual

The *Sun N2000 Series Release 2.0 — Hardware Installation and Startup 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 technicians who are responsible for rackmounting and cabling, and general system maintenance of the Sun N2000 Series system. For those tasks that require you to access internal system hardware, you need to be Sun trained and qualified.

What is in this manual?

This manual includes the following topics.

For information about:	See:
N2000 Series hardware overview	Chapter 1
Installing the chassis	Chapter 2
Installing system and network cables	Chapter 3
Performing system startup	Chapter 4
System maintenance	Chapter 5
Technical specifications	Appendix A

Related documentation

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

Title	Document Number	Location
<i>Sun N2000 Release 2.0 — Introduction Guide</i>	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

Conventions

Typographical conventions

This manual uses the following typographical conventions.

Convention	Function	Example
Ctrl+x	Indicates a control key combination.	Press Ctrl+C
[key name]	Identifies the name of a key to press.	Type xyz , then press [Enter]
brackets []	Indicates an optional argument.	<code>show protocol telnet sessions [ipAddress ipAddress]</code>
braces { }	Indicates a required argument with a choice of values; choose one.	<code>ckm import paste pairHalf {privateKey certificate}</code>
	Encloses an object rule predicate or a list within an object rule created with the CLI.	<code>objectRule rule1 predicate {URI_QUERY matches "information*"}</code>
vertical bar	Separates parameter values. Means "or."	<code>format {pem der iis4 pkcs12 nauticus}</code>
Monospaced regular	Screen output, argument keywords, and defined argument values.	<code>protocol telnet adminState enabled</code>
Monospaced italic	Variable; generic text for which you supply a value.	<code>ntp id <i>number</i></code>
Monospaced bold	User input.	<code>sun> show vSwitch</code>

CLI commands

Command-line interface (CLI) commands are not case sensitive. For example, SWITCHSERVICES is the same as `switchServices`. However, the text strings that you enter for argument values *are* case sensitive. For example, ENGR and `engr` represent two different values.

Data formats

Enter data in these formats unless the instructions say otherwise.

IP addresses

Use 4-byte dotted decimal notation, also called *dot address* or *dotted quad address* notation: 192.168.12.34. You can omit leading 0s in a byte position.

Subnet masks and wildcard masks

Use 4-byte dotted decimal notation: 255.255.255.0 (1s in bit positions to match, 0s in bit positions to ignore). A *wildcard mask* is the reverse of a subnet mask: 0.0.0.255 (0s in bit positions to match, 1s in bit positions to ignore). You can omit leading 0s in a byte position.

In some functions, you might see a complete IP address and subnet mask in CIDR (Classless Interdomain Routing) notation: 192.168.12.34/24. Here, the /24 means that the first 24 bits of the address represent the network part of the address, and therefore the last 8 bits indicate the specific host on the network.

MAC addresses

Use 6-byte hexadecimal notation: 00:B0:D0:C9:99:1F.

Text strings

Use alphanumeric characters, uppercase and lowercase. Most text strings are case sensitive; for example, Evan and evan represent different user names.

Port numbers

Use eth.1.x, where x is an Ethernet port number from 1 through 44 on the N2040, and from 1 to 12 on the N2120.

Hexadecimal numbers

Use a 0x prefix: 0x001732FF.

Notes, cautions, warnings

This manual uses the following formats to highlight notes, cautions, and warnings.



Note: Pay special attention to the described feature or operation.



Caution: Damage to hardware, software, or data is possible.



Warning: Personal injury to yourself or others is possible.

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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
CAT	client address translation
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	N2000 Series model that provides 40 10/100-Mbps ports and 4 SFF pluggable Gigabit Ethernet ports
N2120	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, SFP	small form factor pluggable
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

Chapter 1. N2000 Series hardware overview

Introduction

This chapter provides a high-level overview of the Sun N2000 Series application switch, as well as information that you should know before installing the hardware.

Topics

This chapter covers the following topics:

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N2000 Series hardware overview

The Sun N2000 Series product family is a set of gigabit-scaled application switches that enable 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 Transmission Control Protocol (TCP) and Secure Sockets Layer (SSL) termination in the hardware, keeping the backend Web servers free 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 serial DB-9 console 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.

For detailed information on the Sun N2000 Series features and capabilities, refer to the *Sun N2000 Series Release 2.0— System Configuration Guide*.

N2000 Series chassis views

Figure 1-1 illustrates the N2120 system, and Figure 1-2 illustrates the N2040 system.

Figure 1-1. Sun N2120 chassis

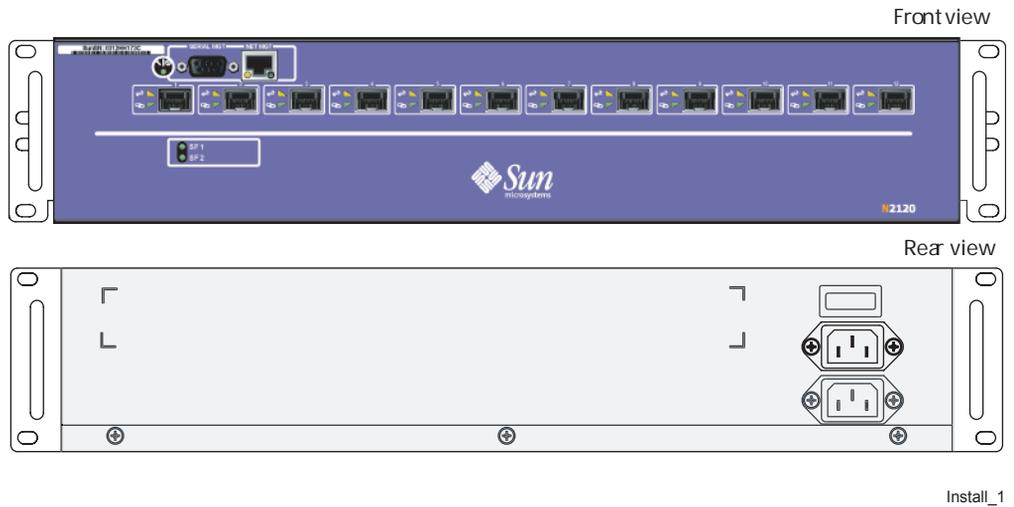
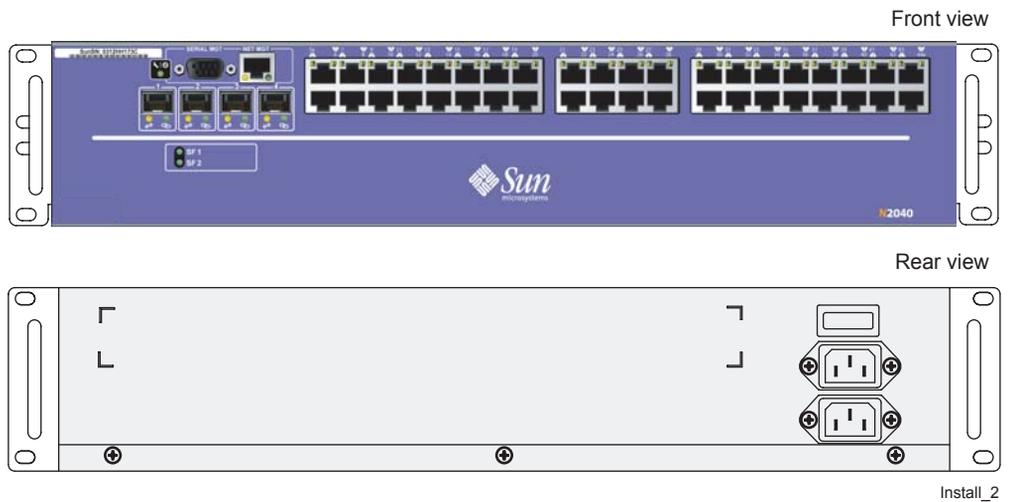


Figure 1-2. Sun N2040 chassis



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 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.

Internal hardware components

Sun N2120 and N2040 systems 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
- 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 N2000 Series systems. 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

The Sun N2000 Series system requires a normal operating environment for computing equipment. The system contains seven fans to ensure adequate airflow. As you look at an 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 (7.6 cm) of unobstructed space on both sides. The chassis requires no air space above or below. If you install the system into an enclosed equipment rack, ensure that there is adequate airflow. Adhere to the following environmental requirements:

- Operating ambient air temperature: 32° to 104° F
- 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 (-60.96 m to 1828 m)

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 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, and a NEMA 5-15 plug (U.S. domestic) on the other end.

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	
System	Green	Normal operation; system OK	
	Yellow	System startup or system fault	
Ethernet ports	Activity (A)	Yellow	Blinking when there is transmit (TX) or receive (RX) activity on the line
		OFF	No packet traffic is present on the line
	Link (L)	Green	Ethernet link active
		OFF	Carrier is not detected; no traffic possible
Function card	Blinking Green	System function card is booting up	
	SF1 Green	System function card is working normally	
	SF2 OFF	System function card not booting up or error	

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.

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 switch by entering keyboard commands. You access the CLI over a direct console connection to the RS-232 port on the front of the switch, 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 popular Web browsers. 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. The Web interface also supports configuration wizards that guide you through a series of configuration steps.

For detailed information on using the Web interface, refer to the *Sun N2000 Series Release 2.0 — Command Reference*.

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*

Chapter 2. Installing the chassis

Introduction

This chapter describes the Sun N2000 Series chassis installation.

Topics

This chapter covers the following topics:

Topic	Page
Required tools	2-2
Unpacking the N2000 Series	2-2
Installation site requirements	2-3
Mounting the N2000 Series into a rack	2-4
Rackmounting requirements and specifications	2-4
Attaching the rackmounting hardware	2-5
Attaching the mounting support brackets (rear	2-8
2-post rack installation steps for flush mount	2-10
2-post rack installation steps for mid-position mount	2-12
4-post rack installation steps	2-14
Installing the N2000 Series on a flat surface	2-15

Required tools

The only tool required for installing an N2000 Series system is a No.2 Phillips screwdriver. The screwdriver is required for installing the rackmounting flanges and for securing the N2000 Series system into a NEMA/EIA-standard computer rack.

Unpacking the N2000 Series

The N2000 Series system shipping container includes the following items:

- Sun N2000 Series chassis
- Null modem serial cable
- Technical documentation (release notes, quick installation guide, installation and startup guide and CD-ROM containing other documentation)
- System accessories (rackmounting flanges and associated hardware for mounting the flanges to the chassis, and rubber cushions for tabletop installations)



Note: Hardware needed to mount the system into a rack or cabinet, such as custom mounting screws, nuts, and miscellaneous hardware items, are not included due to the many variations available.

Refer to the *Sun N2000 Series 2.0 — Release Notes* for the latest information about the contents of the shipping container. If any of the listed components are missing, contact Sun Microsystems or your distributor/reseller.

Installation site requirements

Before installing the chassis, ensure that your installation site meets the physical and environmental requirements for the N2000 Series as listed in Table 2-1. (See Table A-1 and Table A-2 for a complete list of hardware specifications.)

Table 2-1. N2000 Series physical and environmental requirements

Description	Specification
N2000 Series chassis (2RU enclosure)	<ul style="list-style-type: none"> Height: 3.5 in. (8.89 cm) Depth: 26 in. (66.04 cm) Width: 17.40 in. (44.19 cm) Weight: 32 lbs (14.51 kg)
Power supply (2)	115 or 230 VAC
AC current Frequency	10A at 115 VAC; 5A at 230 VAC 47 to 63 Hz
Chassis positioning and mounting	Flat surface, tabletop, or compatible rack For rack installations: 19-in. (48.26-cm) NEMA/EIA-compatible rack; 4-post recommended
Airflow	No obstructions at air intake and exit vents with a minimum side clearance of 3 in. (7.62 cm)
Operating temperature	32° to 104° F
Storage temperature	-22° to 176° F (-30° to 80° C)
Relative humidity (nominal, short-term, and storage)	0 to 95% non-condensing

Mounting the N2000 Series into a rack

The Sun N2000 Series chassis installs into any EIA-standard 19-inch (48.26-cm) computer rack. The rackmounting hardware includes mounting flanges, screws, and brackets for front and rear chassis mounting to accommodate 2-post and 4-post racks.

Rackmounting requirements and specifications

Before installing the N2000 Series chassis into a computer rack, refer to Table 2-2 for the physical requirements associated with a rack installation.

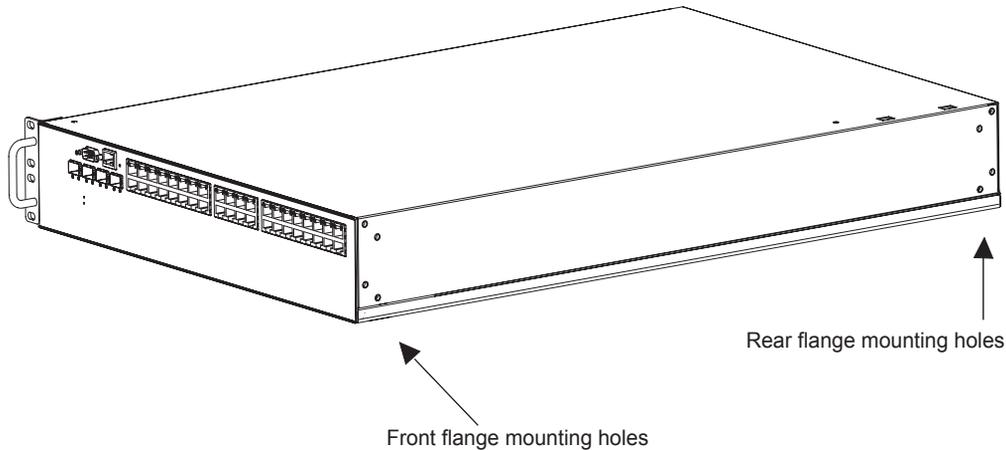
Table 2-2. Rackmounting requirements

Specification	Description
Rack size	Width of 19 in (48.26 cm), depth of 30 to 36 in. (76.2 to 91.44 cm); 2-post or 4-post rack (4-post rack is recommended).
Cooling	Position rack for adequate system cooling at the installation site; system airflow moves right to left.
System power cabling	Ensure adequate space for AC power cabling at the rear of the system. Recommended minimum: 3 in. (7.62 cm)
Network cabling	Ensure adequate space at the front of the rack for attaching and routing network and console cabling. Recommended minimum: 3 in. (7.62 cm)
System access (observation, administration, and maintenance)	Ensure adequate space for technicians and administrators; space should be available for a locally attached terminal or PC.
Ceiling requirements	No special requirements.
Size and weight	No special requirements.

Attaching the rackmounting hardware

Figure 2-1 illustrates the right side of the chassis and the mounting points for rackmounting flanges. To install the mounting flanges, you will need a No. 2 Phillips screwdriver.

Figure 2-1. N2000 Series mounting flange installation points

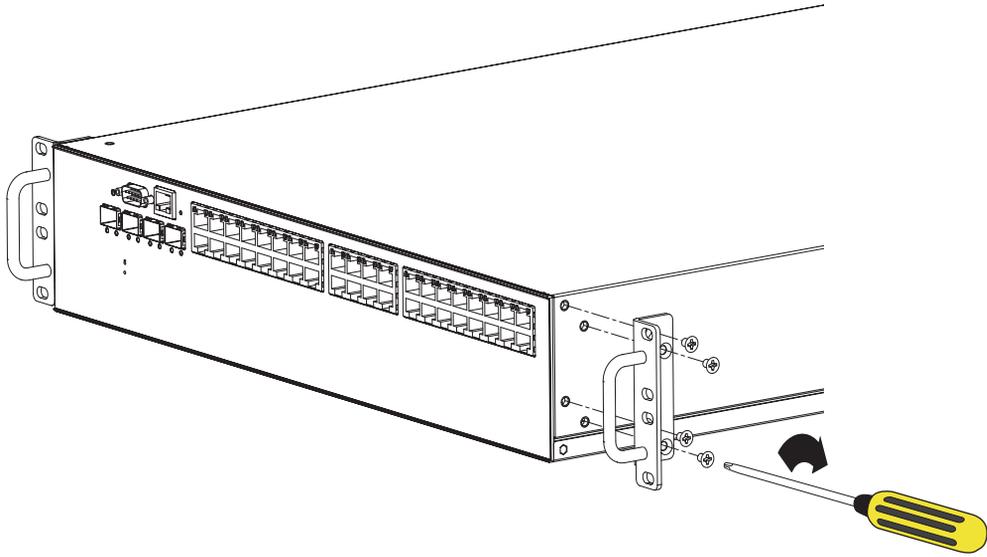


Note: Side air vent not shown for clarity.

Install_3

To install the rackmounting flanges, perform the following steps:

Step	Action
1	Locate the 19-inch (48.26-cm) mounting flanges and the mounting screws supplied with the Sun N2000 Series system. Important: Failure to use the supplied screws could result in damage to the hardware.
2	Attach the right mounting flange to the N2000 Series system by lining up the flange holes with screw holes on the side of the chassis.
3	Using the No. 2 Phillips screwdriver, secure the flange to the chassis using four screws. See Figure 2-2.
4	Repeat Steps 1 to 3 for the left flange.
5	If using a 4-post rack, install the rear flanges. See Figure 2-3.

Figure 2-2. Attaching the rackmounting flanges (front)

Install_4

Figure 2-3. Attaching the rackmounting flanges (rear)

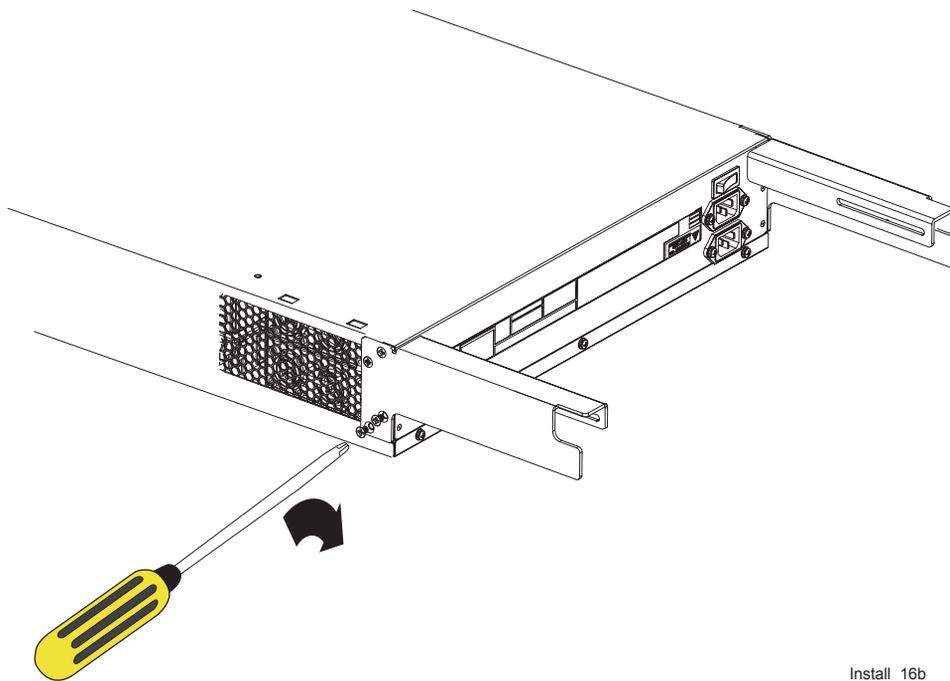
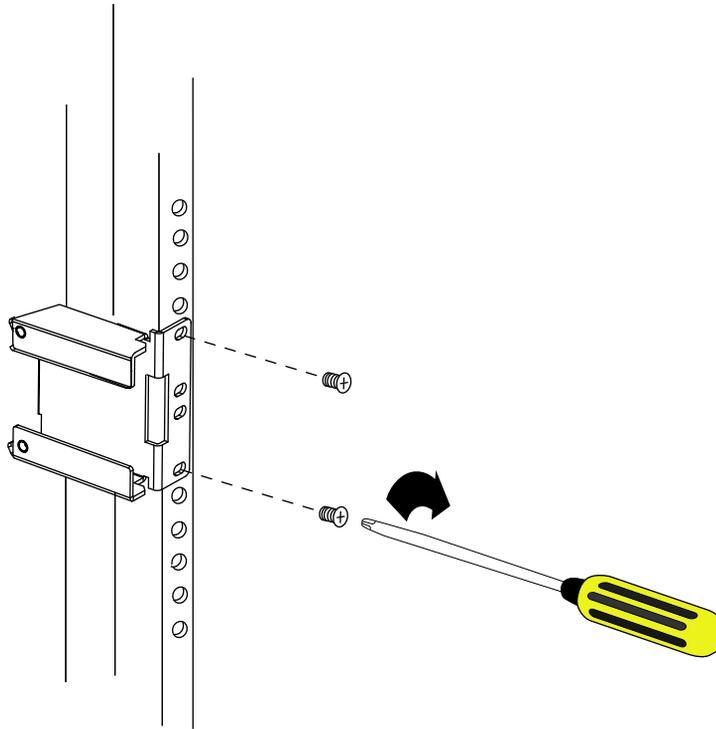


Figure 2-4 illustrates how to attach the mounting support brackets to the rear posts.



Note: Rack-specific mounting screws, nuts, and miscellaneous hardware items are not included with the N2000 Series system due to the many variations available.

Figure 2-4. Attaching the mounting support brackets (rear

Install_23

Positioning and securing the chassis

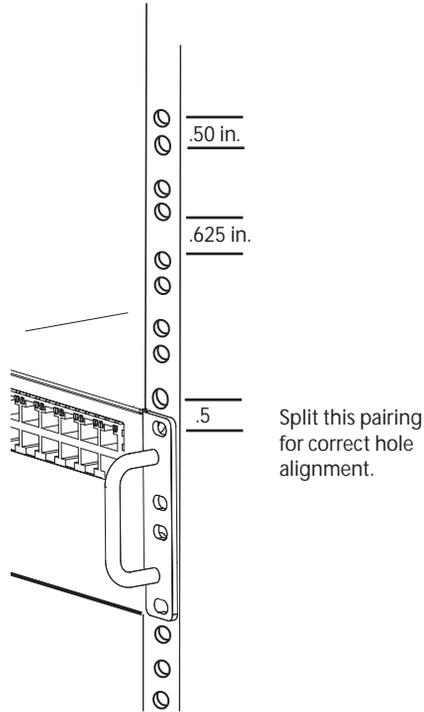
To complete the chassis installation in a rack, locate the following:

- 10-32 mounting screws
- No. 2 Phillips screwdriver

Note on rack hole spacing

EIA-standard racks use 0.50-inch (1.2-cm) spacing between hole positions, and 0.625-inch (1.6-cm) spacing between the mounting hole pairs. When mounting, align the top hole on the mounting flange to the lower hole that is part of the 0.50-inch (1.2-cm) pair, splitting the pair, as illustrated in Figure 2-5.

Figure 2-5. Rack hole spacing (in inches) and hole selection



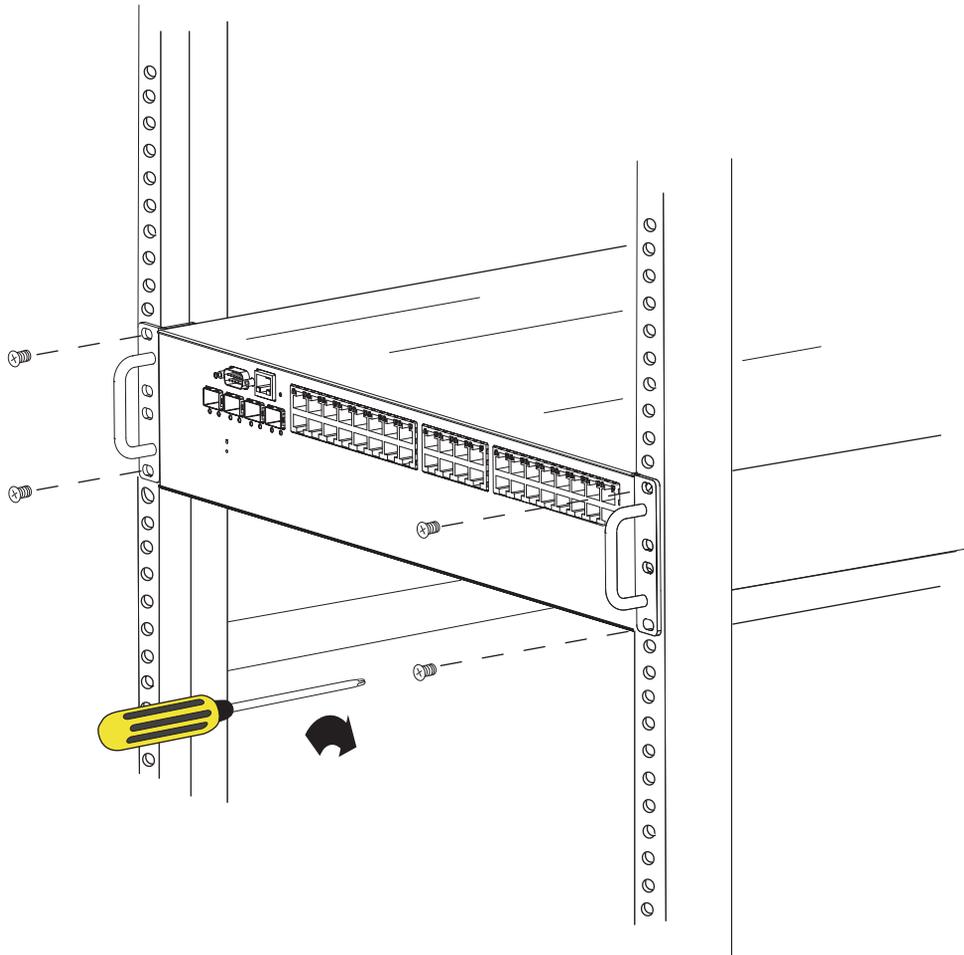
Install_22

2-post rack installation steps for flush mount

Perform the following steps to install the chassis into a 2-post rack (Figure 2-6):

Step	Action
1	Using two persons, move the chassis up or down in the rack to align the hole positions on the mounting flanges with the corresponding mounting holes on the vertical supports.
2	With one person supporting the chassis, insert and tighten the lower screws first, then insert and tighten the upper screws to the front-installed flanges. Installing the lower screws first helps bear the weight of the chassis during installation. When removing the chassis from a rack, remove the upper screws first.
3	Tighten each screw using the Phillips screwdriver.

Figure 2-6. Securing the N2000 Series chassis to a 2-post rack (flush mount)



Install_6

2-post rack installation steps for mid-position mount

Perform the following steps to install the chassis into a 2-post rack using the optional mid-position mounting hardware (Figure 2-7):

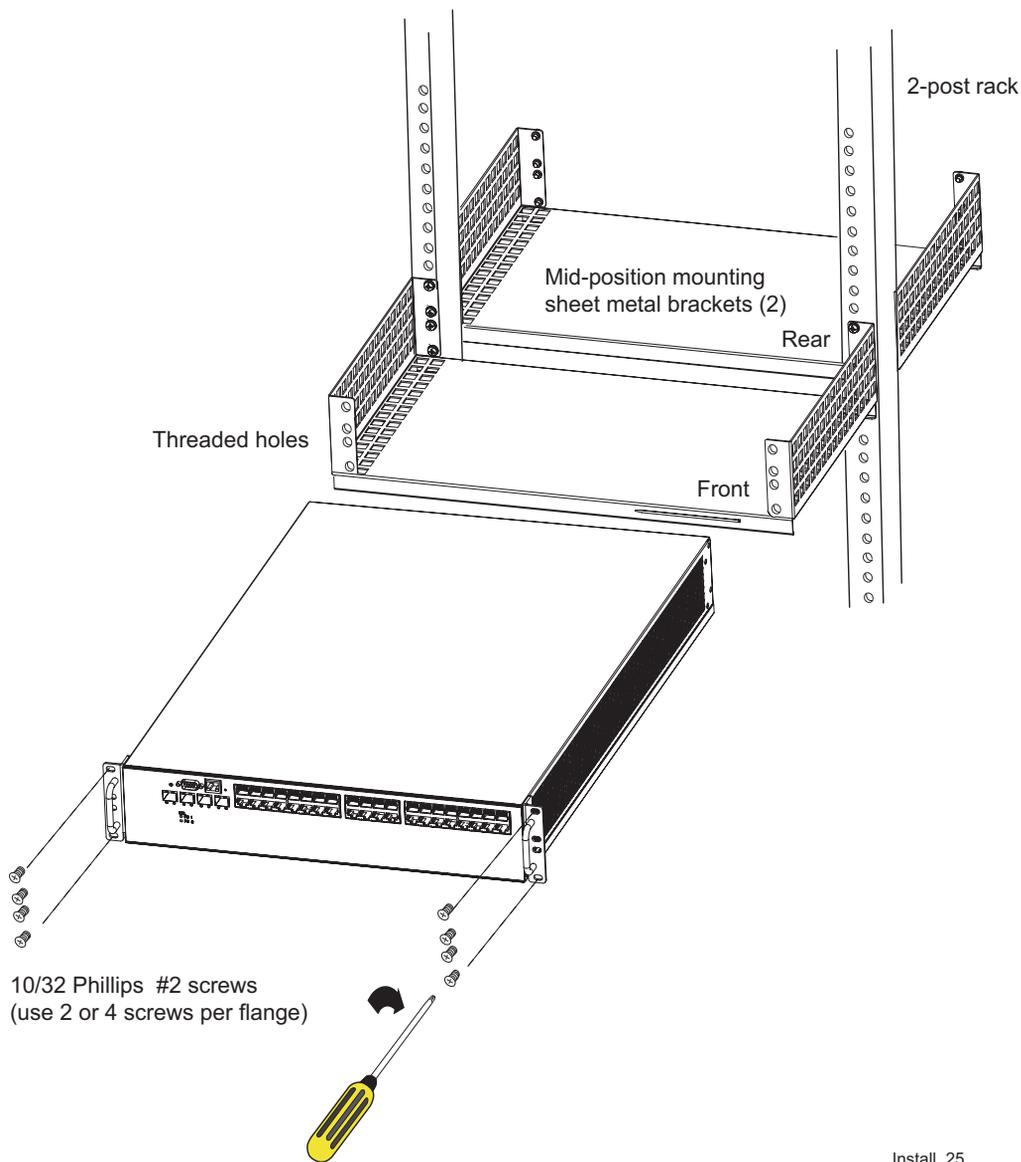
Step	Action
1	Using the screws supplied with the rack, install the two mid-position mounting brackets. Use corresponding holes on the front and back to ensure that the brackets are level with each other when secured to the rack.
2	Using a No. 2 Phillips screwdriver, remove the 10-32 screws supplied with the bracket that you mounted to the front of the rack.
3	Lift and position the chassis on the mounting brackets; align the chassis mounting flanges with the corresponding holes in the bracket.
4	Using the screws that you removed in Step 2, secure the chassis to the rack using the No. 2 Phillips screwdriver. Use at least two screws for each chassis mounting flange.



Notes: It is not necessary to secure the chassis at the rear. The rear bracket only supports the weight of the chassis.

Do not install the rubber cushions that you received with your Sun N2000 Series system if you use the mid-position mounting hardware.

Figure 2-7. Securing the N2000 Series chassis to a 2-post rack (mid-position)



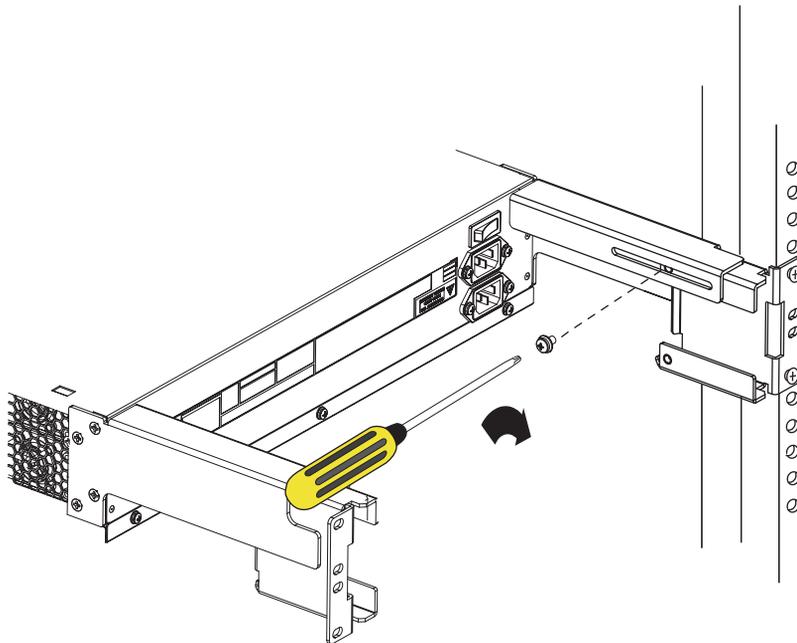
Install_25

4-post rack installation steps

Perform the following steps to install the chassis into a 4-post rack:

Step	Action
1	Using one or two persons, insert the chassis into the rack and rest the chassis rear mounting flanges on the mounting brackets you already attached to the rack (Figure 2-4).
2	Leveling the system, move the front of the chassis up or down to align the hole positions on the mounting flanges with the corresponding mounting holes on the vertical supports (Figure 2-5).
3	Supporting the chassis, install one screw to support the chassis, then install and tighten the remaining screws to the front-installed flanges.
4	Install and tighten the screw that secures the rear rail to the installed mount on the rack (Figure 2-8). Repeat this step for the opposite rail.

Figure 2-8. Securing the N2000 Series chassis to a 4-post rack



Install_24

Installing the N2000 Series on a flat surface

If you are installing the N2000 Series system on a smooth tabletop or flat surface, attach the four sticky-back rubber cushions to the bottom of the chassis. The cushions prevent the system from sliding and falling to the floor. The cushions are included in the system accessory kit.



Note: Installing the rubber cushions will increase the chassis height and will violate the 2 rack unit (RU) height specification (if equipment height is an installation consideration in your data center).

Chapter 3. Installing system and network cables

Introduction

This chapter covers the Sun N2000 Series system and network cable installation procedures.

Topics

This chapter includes the following topics:

Topic	Page
Required tools	3-2
Connecting AC power to the chassis	3-2
AC power requirements	3-3
Connecting the AC power cords	3-3
Applying power	3-3
Connecting to the console port	3-5
Connecting to the management port	3-7
Connecting a local modem	3-10
Connecting the network cables	3-11
Connecting to the Ethernet ports	3-12

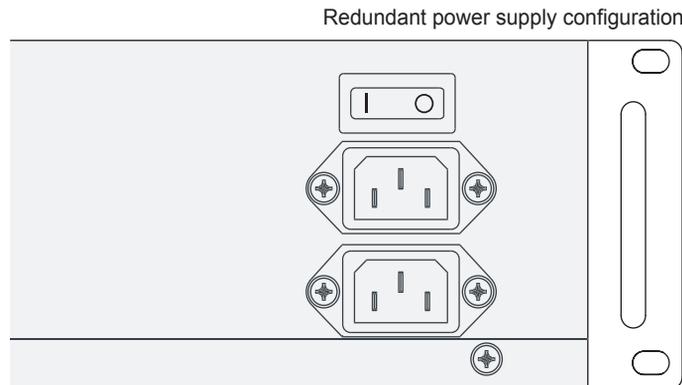
Required tools

The only tool required for installing network and console cabling is a 1/4-inch (0.64-cm) flat blade screwdriver (for securing cable interface connectors).

Connecting AC power to the chassis

This section shows you how to connect the system power cable to the N2000 Series system. The system uses two power supplies. Figure 3-1 illustrates the N2000 Series redundant power supply configuration.

Figure 3-1. N2000 Series redundant power supply configuration



Install_11

AC power requirements

Before installing the power cords, ensure that your site is compatible with the N2000 Series AC power requirements:

- Voltage: 115 or 230 VAC (90 to 135 or 180 to 265 VAC), 60 Hz (47 to 63 Hz); automatic selection
- Current draw: 10A @ 115 VAC, 5A @ 230 VAC
- Power supply connector: Standard 3-prong keyed IEC receptacle on power supply; cord supplied with IEC connector on one end, NEMA 5-15 plug (U.S. domestic) on the other end

Connecting the AC power cords

To connect the AC power cords to the system, perform the following steps (Figure 3-2):

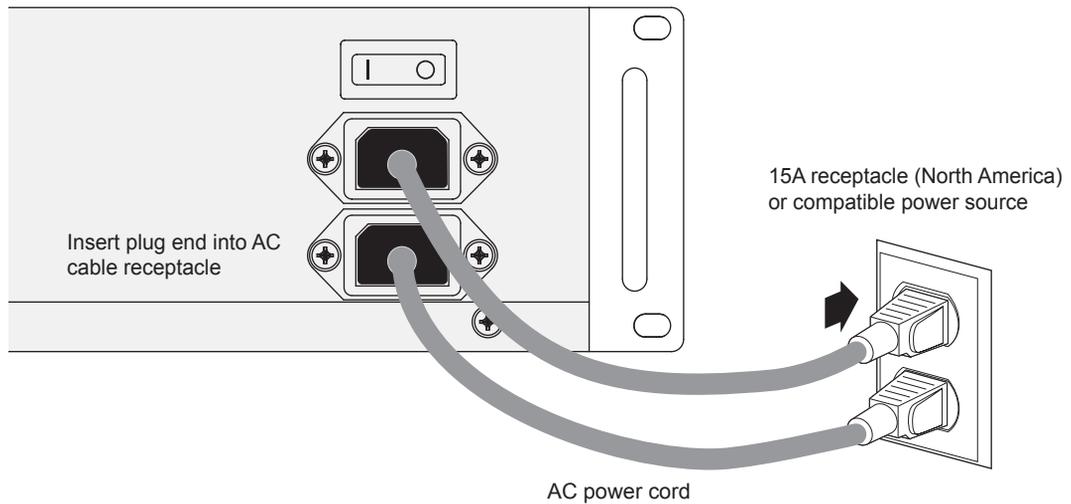
Step	Action
1.	Locate the system power cord.
2.	Insert the plug end into the AC cable receptacle at the back of the system. See Figure 3-2.
3.	Make sure that the Power ON/OFF switch is in the OFF position (O). Plug the other end of the cord into a compatible power source.
4.	Repeat Steps 1 to 3 for the redundant power supply.

Applying power

You can power on the system before installing a system console and attaching network cabling. To apply power and to initiate system startup, press the Power ON/OFF switch to the ON position (I).

➔ **Note:** If you want to view the system startup sequence, attach a system console prior to applying power. See “Connecting to the console port” on page 3-5.

Figure 3-2. Attaching the power cords



Install_12

Connecting to the console port

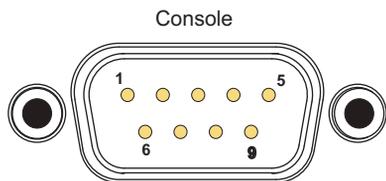
This section shows you how to connect a video display terminal or PC to the N2000 Series console port. The console port provides a serial RS-232 connection with a DTE interface using a male DB-9 connector. Attaching a terminal or PC allows you to connect to the system CLI for initial setup at the installation site.

To connect a terminal or PC to the console port, you need one of the following:

- A standard DB-9 to DB-9 serial crossover cable (also called a null modem cable)
- A DB-9 to DB-25 adapter cable (if connecting to a VT-100 compatible terminal)

Figure 3-3 illustrates the console port and associated pin information.

Figure 3-3. DB-9 console port pin information



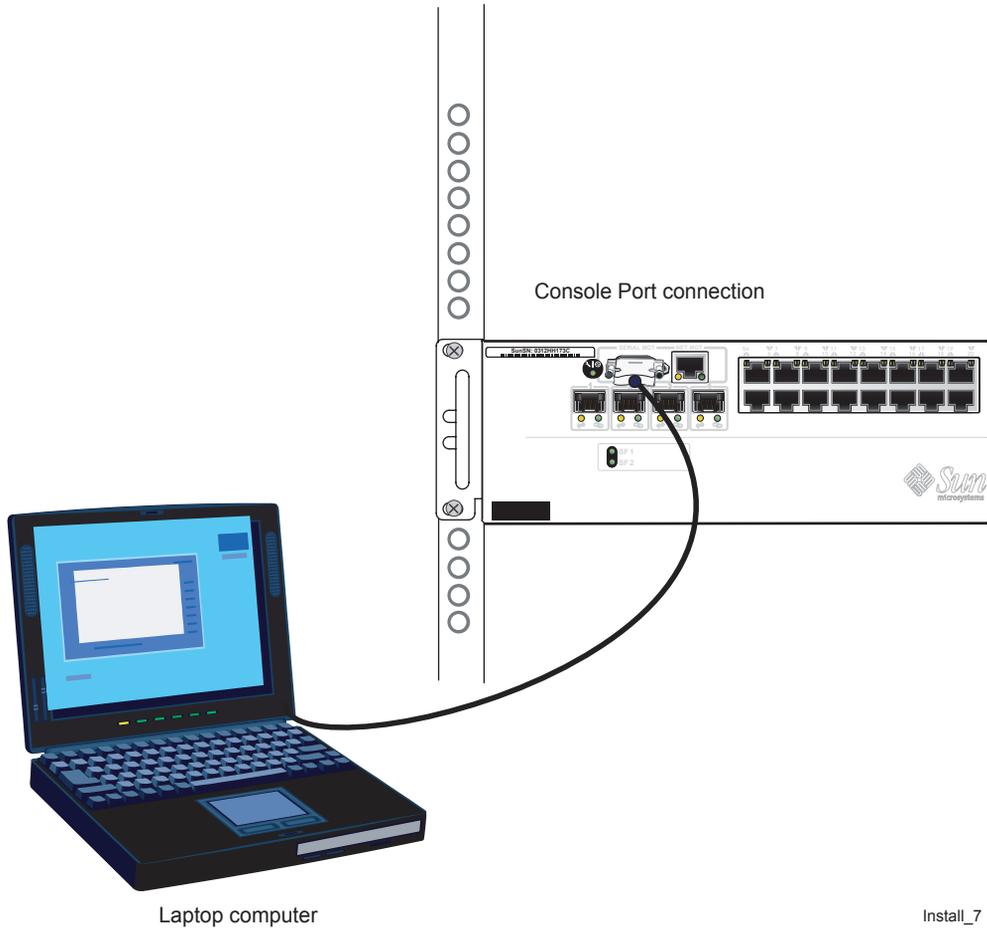
Pin	Signal Name
1	DCD (data carrier detect)
2	RXD (receive data)
3	TXD (transmist data)
4	DTR (data terminal ready)
5	GND (signal ground)
6	DSR (data set ready)
7	RTS (request to send)
8	CTS (clear to send)
9	RI (ring indicator)

Install_5

Perform the following steps to connect a video terminal or PC to the console port (Figure 3-4):

Step	Action
1.	Check the video terminal or PC for the type of serial connector that it uses (either DB-9 or DB-25) and select the appropriate cable: <ul style="list-style-type: none">• DB-9 to DB-9• DB-9 to DB-25
2.	Connect the receptacle end of the DB-9 cable to the console port and tighten the thumbscrews.
3.	Connect the other end of the cable to the video terminal or PC.
4.	Turn on the video terminal or PC.
5.	Configure the video terminal or PC (using a terminal emulation program such as HyperTerminal) with the following settings: <ul style="list-style-type: none">• Baud rate: 9600• Terminal type: VT-100 (if prompted)• Connect to: COM1• Stop bits: 1• Data bits: 8• Parity: none• Flow control: none
6.	If the N2000 Series is powered on, press the [Enter] key at the keyboard to display the user name prompt that allows you to access the system CLI. Refer to Chapter 4, “Performing system startup” for information on starting a CLI session and configuring a management IP address.

Figure 3-4. Connecting to the console port



Connecting to the management port

The N2000 Series management port allows you to access the CLI over a Telnet connection, or to access the Sun Application Switch Manager from your Web browser.

To connect to the management port, you need the following:

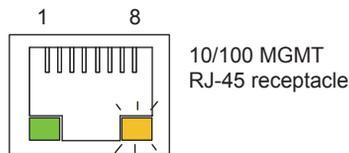
- For connection to an Ethernet hub or switch, an RJ-45 to RJ-45 straight-through cable (100 ohm, Category 5 or 5E, maximum length/328 feet/100 meters)
- For a direct connection to a PC or laptop computer, an Ethernet crossover cable



Caution: Do not insert an RJ-11 telephone connector into the Ethernet management port or any Ethernet port on the system. Damage to the port may occur.

Figure 3-5 illustrates the management port and associated pin information.

Figure 3-5. MGMT 10/100 Ethernet port pin assignments



Pin	Signal Name	Associated Wire
1	TX+	White with orange
2	TX-	Orange
3	RX+	White with green
4		Blue
5		White with blue
6	RX-	Green
7		White with brown
8		Brown

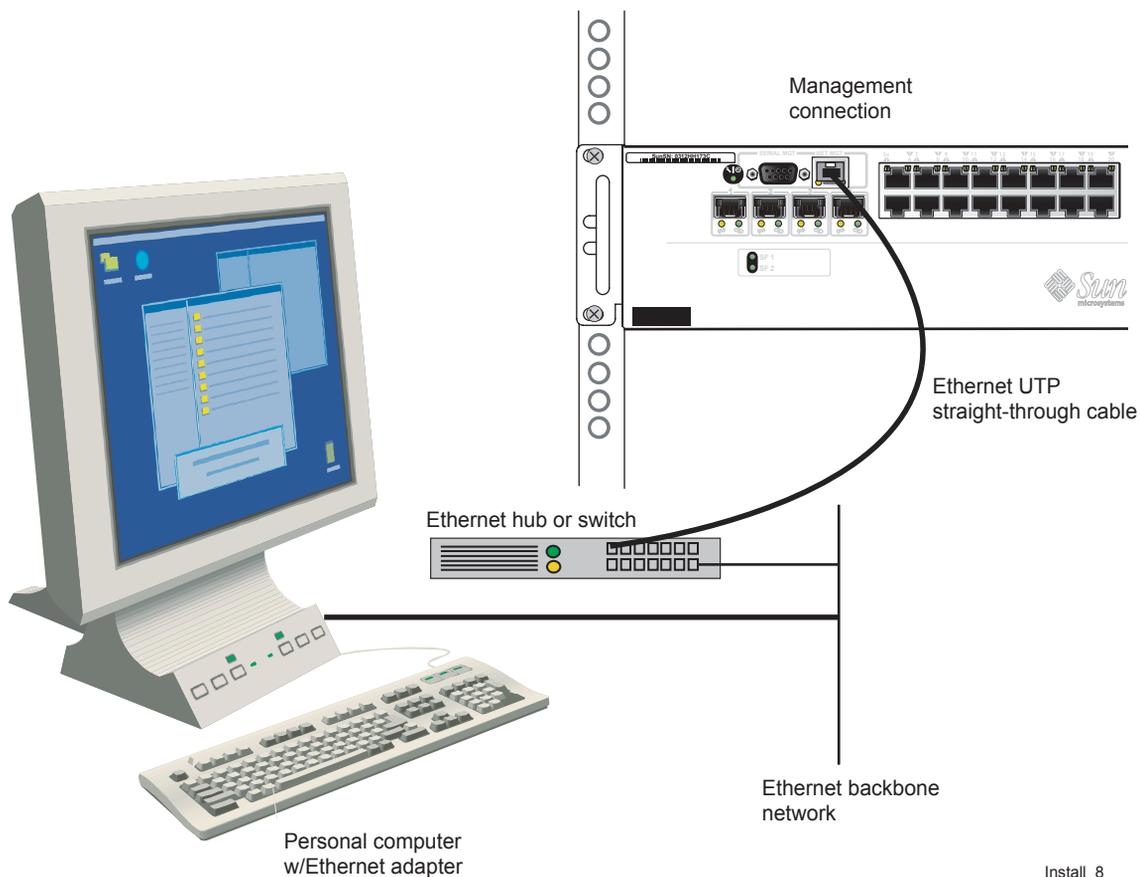
Install_15

Perform the following steps to connect to the management port (Figure 3-6):

Step	Action
1.	Connect one end of the RJ-45 Ethernet straight-through cable to the port labeled MGMT 10/100.

Step	Action
2.	Connect the other end of the cable to an available port on the Ethernet hub or switch. The LEDs should display green (Link) and yellow (Activity).
3.	If connecting a PC or laptop computer directly to the MGMT 10/100 port, use an Ethernet crossover cable or crossover adapter to ensure a proper connection to the port.

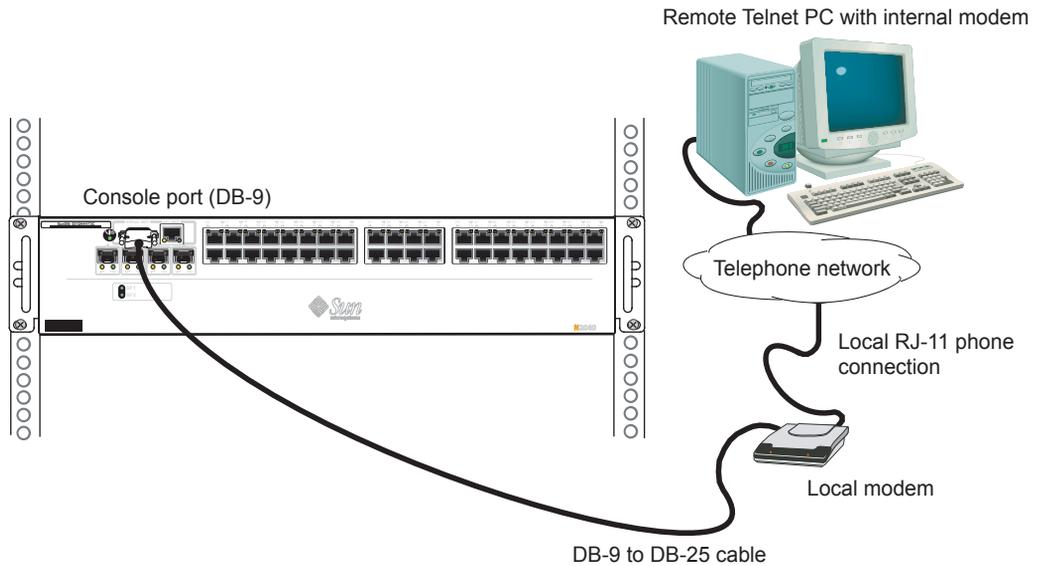
Figure 3-6. Connecting to the management port (MGMT 10/100)



Connecting a local modem

The N2000 Series supports asynchronous transmission over modems for remote access to the system console port and CLI. With most external modems (such as AT or Hayes-compatible), use a customer-supplied DB-9 to DB-25 modem cable. Figure 3-7 illustrates a sample modem connection to the console port.

Figure 3-7. Connecting a local modem



Install_9



Caution: Do not insert an RJ-11 telephone connector into the Ethernet management port or any Ethernet port on the system. Damage to the port may occur.

To connect a modem to the N2000 Series, perform the following steps(Figure 3-7):

Step	Action
1.	Turn on the modem, then refer to the documentation supplied with the modem to configure the modem with the following settings: <ul style="list-style-type: none">• Baud rate: 9600• Data Set Ready (DSR): On• Local echo: Off• Clear to Send (CTS): On• Auto answer: Set to greater than 0 for the number of rings with DTR active• Data Terminal Ready (DTR): DTR signal fail-connect enabled; return to command mode; auto answer enabled• Data Carrier Detect (DCD): Signal on while carrier present• Supervisory functions: Off
2.	Turn off the modem.
3.	Connect the DB-9 end of the cable to the console port.
4.	Connect the DB-25 end of the cable to the modem.
5.	Connect the modem to the telephone network.
6.	Turn on the modem.

Connecting the network cables

The N2000 Series supports the following networks:

- 10/100-Mbps Ethernet (copper)
 - The N2040 system supports 40 10/100-Mbps Ethernet ports.
- Gigabit Ethernet (optical)
 - The N2040 system supports 4 Gigabit Ethernet ports.
 - The N2020 system supports 12 Gigabit Ethernet ports.

Connecting to the Ethernet ports

To connect the 10/100-Mbps Ethernet ports to the external data network, you need the following components:

- An RJ-45 to RJ-45 straight-through cable (100 ohm, Category 5 or 5E, with a maximum length of 328 feet/100 meters)
- Links to the external network, either:
 - Connection to upstream and downstream Layer 2 switches
 - Direct connection to a Web server
 - Connection to network firewalls

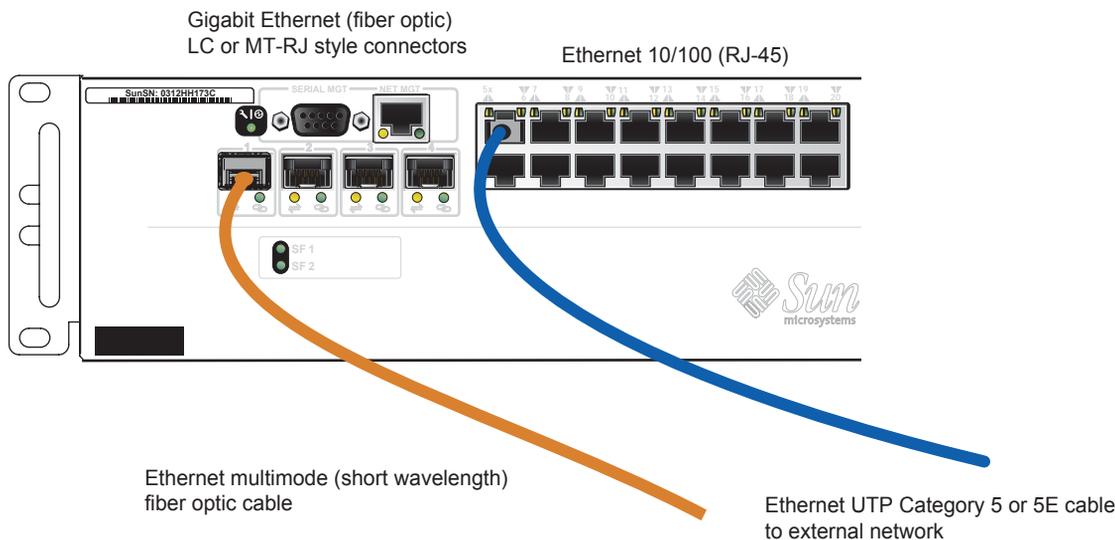
To connect the Gigabit Ethernet fiber-optic I/O ports to the external data network, you need the following components:

- A fiber-optic transceiver. See Chapter 5, “System maintenance” for information on installing the transceiver.
- Multimode (short wavelength) fiber-optic cable using LC or MT-RJ style SFF pluggable connectors.
- Links to the external network, either:
 - Connection to upstream and downstream Layer 2 switches
 - Direct connection to a Web server
 - Connection to network firewalls

To connect to the Ethernet ports, perform the following steps (Figure 3-8):

Step	Action
1.	For the Gigabit Ethernet ports, install an appropriate fiber-optic transceiver into one or more of the GbE ports. Refer to Chapter 5, "System maintenance" for information on installing and removing the fiber-optic transceivers.
2.	Connect one end of the Ethernet cable to any one of the available ports.
3.	Connect the other end to an Ethernet link to the external data network.
4.	Check the LEDs. They should display green (Link) and yellow (Activity).

Figure 3-8. N2000 Series Ethernet connections



Install_10



Danger: When handling Class 1 laser devices and cables, DO NOT look directly into the connector or laser light source, as this could cause serious eye injury or blindness.

Chapter 4. Performing system startup

Introduction

This chapter describes how to power up the N2000 Series system, as well as initially configure the system to be a host-only device that you can ping on a network.

Topics

This chapter contains the following topics:

Topic	Page
Applying power	4-1
Checking the system LEDs	4-2
Logging on and starting the CLI	4-3
Assigning the management IP address	4-3

Applying power

You can power on the system before or after installing a system console and attaching network cabling. If you have not already done so, turn on the system to initiate system startup by pressing the power ON/OFF switch to the ON position (|).

Checking the system LEDs

After powering on the system, check the system LEDs to ensure proper cabling and connections.

Table 4-1 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.



Note: On the N2040 system, a removable label on the front of the system identifies the LEDs for the RJ-45 “harmonica” style connectors. You can remove the label or leave it as positioned.

Table 4-1. System LED descriptions

LED	Status	Description	
System	Green	Normal operation; system OK	
	Yellow	System startup or system fault	
Ethernet ports	Activity (A)	Yellow	Blinking when there is transmit (TX) or receive (RX) activity on the line
		OFF	No packet traffic is present on the line
	Link (L)	Green	Ethernet link active
		OFF	Carrier is not detected; no traffic possible
Function card	Blinking green	System function card is booting up	
	SF1 SF2	Green	System function card is working normally
		OFF	System function card not booting up or error

Logging on and starting the CLI

Using a locally attached console with a terminal emulation program (as described in Chapter 3, “Installing system and network cables”), log on to the N2000 Series system for the first time by first pressing the [Enter] key a few times to display the `username:` prompt. Respond to the `username:` and `password:` prompts by entering `admin`. This displays the `sun>` prompt on your screen.

```
username: admin
password: admin

sun>
```

Assigning the management IP address

This section describes how to configure the N2000 Series system on the network as a host-only node that can be “pinged” by other devices on the network. As a host, the N2000 Series will respond to network `ping` commands by returning host response messages.

You need to set the management IP address to the system vSwitch’s management vRouter. This IP address allows users to establish a Telnet session with the N2000 Series, as well as access the CLI and the Sun Application Switch Manager Web interface for system configuration, management, and monitoring. After assigning the address, use the `ping` command from your console to test the N2000 Series as a responding host on the network.

To log on, start the CLI, and display the `sun>` prompt, enter the following commands to assign the management IP address.

```
username: admin
password: admin
sun> enable
sun# config
sun<config># vSwitch system
sun<config-vSwitch-system># vRouter management
sun<config-vSwitch-system-vRouter-management># ip address ethMgmt.1
<ip-address> <networkMask>
```

Where:

- `system` is the name of the system vSwitch.
- `management` is the name of the management vRouter.
- `ethMgmt.1` is the default name of the 10/100-Mbps Ethernet management port.
- `ip-address` and `networkMask` are customer-supplied IP network settings.

For detailed information on configuring the N2000 Series, refer to the following manuals:

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

Chapter 5. System maintenance

Introduction

This chapter covers N2000 Series maintenance.



Caution: Only qualified Sun-trained personnel are authorized to perform maintenance tasks associated with the N2000 Series internal hardware. These tasks require that the system be removed from the equipment rack and placed top-side down on a bench or tabletop for proper removal of the system sheet metal cover and access to system modules and components. If your system requires service, contact Sun Technical Support.

Topics

This chapter contains the following topics:

Topic	Page
Maintenance tasks for the N2000 Series	5-2
Installing and replacing fiber-optic transceivers	5-2
Performing general maintenance	5-4

Maintenance tasks for the N2000 Series

The following N2000 Series maintenance tasks are to be performed by qualified Sun personnel:

- Removing the chassis sheet metal cover
- Installing a Service Load Balancing with SSL Function Card

Installing and replacing fiber-optic transceivers

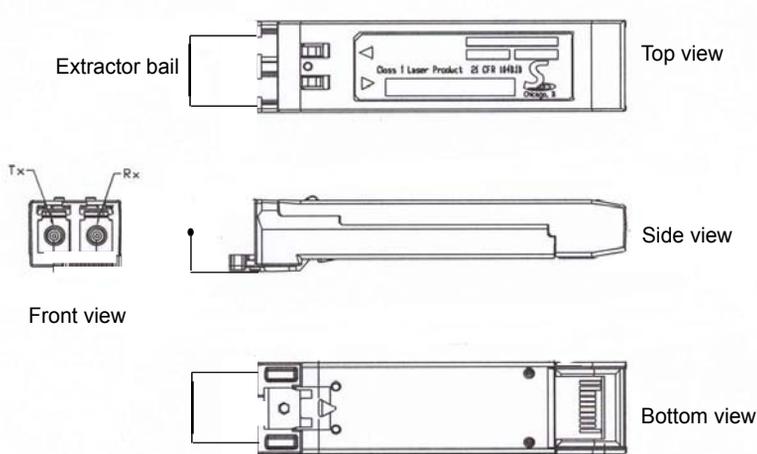
This section covers the installation and replacement of the front panel fiber-optic transceivers that install into N2120 and N2040 Gigabit Ethernet ports. These transceivers are available from Sun Microsystems, or they can be ordered directly from an approved list of vendors. Refer to the product release notes for the current list of approved vendors.



Danger: When handling Class 1 laser devices and cables, DO NOT look directly into the connector or laser light source, as this could cause serious eye injury or blindness.

Figure 5-1 illustrates a sample fiber-optic transceiver. The transceiver uses a wire extractor bail that allows you to remove the transceiver from the Gigabit Ethernet connector.

Figure 5-1. Sample fiber-optic transceiver views



Perform the following steps to install and remove the transceiver:

Step	Action
1.	<p>To install:</p> <p>With the tapered end of the transceiver pointed toward the interface, slide the transceiver into the connector until it snaps into place.</p>
2.	Move the extractor bail to the closed position and snap it into place.
3.	Connect the fiber-optic Ethernet cable to the transceiver.
4.	<p>To remove:</p> <p>Disconnect the fiber-optic cable from the transceiver.</p>
5.	Unclip the wire extractor bail from the transceiver, then grab the bail and remove the transceiver from the connector.

Performing general maintenance

Vacuum the chassis air intake vents, as well as areas around the chassis as necessary to keep dust and particles from entering the chassis. While dust is not an immediate danger to the system hardware, dust can retain moisture that could eventually damage electronic components.

Appendix A. Technical specifications

N2000 Series hardware

Table A-1. N2000 Series hardware technical specifications

Description	Specification
N2000 Series chassis (2RU enclosure)	<ul style="list-style-type: none"> • Height: 3.5 in. (8.89 cm) • Depth: 26 in. (66.04 cm) • Width: 17.4 in. (44.19 cm) • Weight: 32 lbs (14.51 kg)
Power supply (2)	115 or 230 VAC (redundant supply is load sharing)
Input current	10A at 115 VAC; 5A at 230 VAC 47 to 63 Hz
Chassis positioning and mounting	Flat surface, tabletop, or compatible rack For rack installations: 19-in. (48.26-cm) NEMA/EIA-compatible rack; 4-post recommended; see Table A-2
Airflow	Position rack for adequate system cooling at the installation site. System airflow moves right to left. No obstruction at air intake and exit vents with a minimum side clearance of 3 in. (7.62 cm).
Operating temperature	32° to 104° F
Storage temperature	-22° to 176° F (-30° to 80° C)
Operating relative humidity	0 to 95%, non-condensing

Table A-1. N2000 Series hardware technical specifications (continued)

Description	Specification
Maximum heat dissipation, fully populated	2050 BTU/hr
Management port	Single 10/100-Mbps Ethernet port with RJ-45 receptacle; requires a standard UTP/STP network cable, Category 5 or 5E, with an RJ-45 8-pin modular connector.
10/100 Ethernet ports See Cautions and dangers.	N2040: 40 on front panel N2120: None Ethernet 10/100BASE-T ports require standard UTP/STP network cable, Category 5 or 5E, with RJ-45 8-pin modular connectors.
Gigabit Ethernet See Cautions and dangers	N2040: 4 ports on front panel N2120: 12 ports on front panel GbE ports require small form factor pluggable (SFP) LC or MT-RJ fiber-optic connectors on multimode (short wavelength) fiber-optic cable.
Console port	Male DB-9 receptacle, DTE interface; requires EIA-232 (RS-232) straight-through serial cable with a DB-9 connector.
Status LEDs Indicators	System OK or System Fault Ethernet Activity (A) and Link (L)
Function card	Service Load Balancing with SSL Function Card (Fx-SSL)
Fan module	Seven fans enclosed in a single module

Cautions and dangers



Caution: Do not insert an RJ-11 telephone connector into the Ethernet management port or any Ethernet port on the system. Damage to the port may occur.



Danger: When handling Class 1 laser devices and cables, DO NOT look directly into the connector or laser light source, as this could cause serious eye injury or blindness.

N2000 Series rack mounting

Table A-2. N2000 Series rack mounting specifications

Description	Specification
Rack size	Width of 19 in. (48.26 cm), depth of 30 to 36 in. (76.2 to 91.44 cm); 2-post or 4-post (4-post is recommended)
System power cabling	Ensure adequate space for AC power cabling at the rear of the system.
Rack mounting hole spacing	NEMA/EIA-standard hole spacing
Network cabling	Ensure adequate space at the front of the rack for attaching and routing network and console cabling. Recommended minimum: 3 in. (7.62 cm) Cable management tray or cable routing devices as required by customer.
System access (observation, administration, and maintenance)	Ensure adequate space for technicians and administrators. Space should be available for a locally attached terminal or PC.

N2000 Series certifications and compliance

Emissions

FCC Part 15, Subpart B, Class A limits
Industry Canada ICES-003, Class A limits
AS/NZ3548 Class A (Australia/New Zealand)
EN 55022:1998/CISPR-22 Class A
CE Mark
VCCI Class A
BSMI CNS 13438 Class A (Taiwan)

Immunity

EN55024:1998

Shock and Vibration

ISTA Specification 1A (product packaging for shipment)

Safety

UL 1950
IEC60950
CSA-C22.2
EN 60950
TUV GS

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