



CHAPTER 1

Introducing the Cisco NAM 2220 Appliance

This chapter provides an introduction to the Cisco NAM 2220 appliance and describes the appliance hardware, major components, and front- and rear-panel LED indicators, controls, and connectors.

The Cisco NAM 2220 appliance comes preloaded with Cisco Network Analysis Module (NAM), 4.0 software. NAM 4.0 software enables network managers to understand, manage, and improve how applications and services are delivered to end-users.

The NAM offers flow-based traffic analysis of applications, hosts, and conversations, performance-based measurements on application, server, and network latency, quality of experience metrics for network-based services such as voice over IP (VoIP) and video, and problem analysis using deep, insightful packet captures.

The Cisco NAM includes an embedded, web-based Traffic Analyzer GUI that provides quick access to the configuration menus and presents easy-to-read performance reports on web for different types of services and traffic including voice and video, response time, and network flow-based reports.

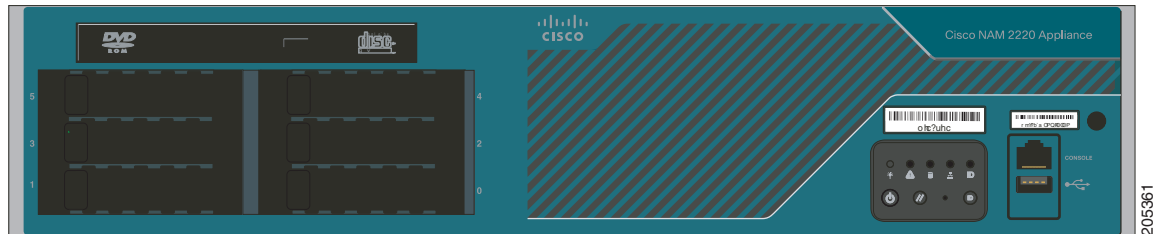
This chapter includes the following sections:

- [Product Overview, page 1-2](#)
- [Hardware Features, page 1-4](#)
- [Environmental Monitoring, page 1-12](#)
- [Regulatory Compliance, page 1-12](#)

Product Overview

The Cisco NAM 2220 appliance (see [Figure 1-1](#)) is contained in a standard shelf-rack enclosure. The appliance weighs 44.7 lb (20.3 kg) and measures 3.5 inches high x 16.93 inches wide x 20 inches deep (8.9 cm x 43.2 cm x 50.8 cm).

Figure 1-1 Cisco NAM 2220 Appliance



Note

The rack-mount brackets are not installed at the factory. You must install them at the site. (See the “[4-Post Rack-Mount Hardware Kit](#)” section on [page 3-5](#) for how to install the rack-mount brackets.) See [Chapter 4, “Installing and Replacing Hardware Options,”](#) for upgrade options and spare part numbers.

The Cisco NAM 2220 appliance is configured for AC-input power, mounted in a standard 19-inch (48.3 cm) 2- or 4-post equipment rack (using the rack-mount brackets provided), and includes the following features:

- Dual Intel Xeon E5440 Quad Core processors with 12 MB L2 cache, 2.83 GHz clock speed, and 1333 MHz Front Side Bus (FSB)
- Eight synchronous dynamic RAM (SDRAM) slots with 2 GB DIMM (16 GB factory installed)
- Six 146-GB SAS hard drives (6 x 146-GB SAS hard drive factory installed)
- Dual 10 GB Ethernet hardware enhanced PCI-E network interface card (NIC) supporting optical XFP interface modules
- Integrated RAID at levels 0 and 1.
- One DVD-ROM drive (located on the front panel)
- Single or redundant (optional) AC power supply
- Front-to-rear airflow blowers using two 40 x 40 x 56-mm exhaust fans and ducting for the CPU and memory, and two 40-mm exhaust fans built in to the power supply
- One RJ-45 10BASE-T/100BASE-TX/1000BASE-T network interface connector (located on the rear panel)
- One RJ-45 serial console port (located on the rear panel)
- One PS/2 (keyboard) port (located on the rear panel)¹
- One PS/2 (mouse) port (located on the rear panel)¹
- One DB-15 video port (located on the rear panel)
- Rear access cabling
- Five front-panel appliance LEDs (for a description, see the “[Cisco NAM 2220 Appliance Front View](#)” section on [page 1-4](#)):

1. Either PS/2 port can support the mouse or keyboard. Neither port supports hot-plugging.

- NIC activity (indicates whether interrupts or packet transfers are running)
- Power (indicates whether the power supply is operational)
- Hard disk drive activity (indicates whether the drive is functioning properly)
- Appliance status
- Appliance identification
- The Cisco NAM 2220 appliance is normally shipped with:
 - Rack-mount kit with rails to enable you to position the Cisco NAM 2220 appliance in a four-post equipment rack. (See [Chapter 3, “Installing the Cisco NAM 2220 Appliance.”](#))

Cisco NAM 2220 Appliance Configurations

[Table 1-1](#) lists the processor, memory, hard disk drive, and expansion slot specifications of the Cisco NAM 2220 appliance.

Table 1-1 Cisco NAM 2220 Series Appliance

Specification	Description	Cisco Spare Part Number ¹
Microprocessor	Dual Intel Xeon E5440 Quad Core processors	n/a
Monitoring interfaces	Dual 10 GB Ethernet hardware enhanced PCI-E network interface card (NIC) supporting optical XFP interface modules	n/a
	Short Range XFP, 10 GB 850 nm	XFP-10GBASE-SR
	Long range XFP, 10 GB 1310 nm	XFP-10GBASE-LR
Memory	Eight (8) 2 GB DIMMs (total 16 GB)	NAM2220-DIMM-16GB
Hard disk drives	Six (6) 146 GB hard disk drives	NAM2220-HDD-6X146
Power supply	AC power supply (one or two)	NAM2220-AC-PS

1. See [Chapter 4, “Installing and Replacing Hardware Options,”](#) for hardware option descriptions and installation and removal procedures.

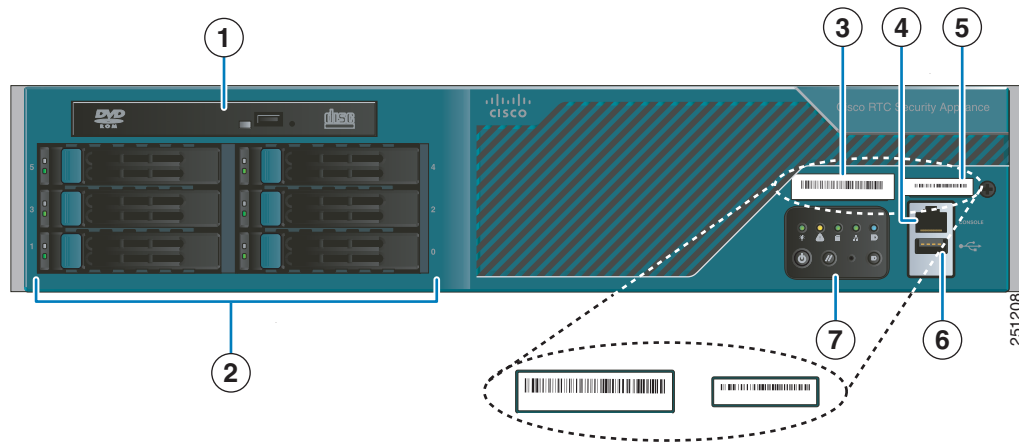
Hardware Features

This section illustrates and describes the front- and rear-panel controls, ports, and LED indicators on the Cisco NAM 2220 appliance.

Cisco NAM 2220 Appliance Front View

Figure 1-2 shows the front view of the Cisco NAM 2220 appliance.

Figure 1-2 Cisco NAM 2220 Appliance Front View



1	DVD drive	5	Product serial number location
2	Hard drive trays (6)	6	USB port
3	Product ID (PID) of the Cisco NAM 2220 appliance	7	Control switches and status LEDs (see Figure 1-3)
4	Unused RJ-45 port		

Product Serial Number Location

On the Cisco NAM 2220 appliance, the serial number label is located on the right side of the appliance. See location #5 in [Figure 1-2](#).



Note

The serial number for the Cisco NAM 2220 appliance is 11 characters long.

Cisco Product Identification Tool

The Cisco Product Identification (CPI) tool helps you retrieve the serial number of the Cisco products.

Before you submit a request for service online or by phone, use the CPI tool to locate the product serial number. You can access this tool from the Cisco Support website by clicking the **Get Tools & Resources** link, clicking the **All Tools (A-Z)** tab, and then choosing **Cisco Product Identification Tool** from the alphabetical list.

This tool offers three search options:

- Search by product ID or model name
- Browse for Cisco model
- Copy and paste the output of the **show** command to identify the product

Search results show an illustration of the product with the serial number label location highlighted. Locate the serial number label on the product and record the information before you place a service call.

The CPI tool is accessed via Cisco.com at the following URL:

<http://tools.cisco.com/Support/CPI/index.do>

Access to the CPI tool on the Cisco Support website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at:

<http://tools.cisco.com/RPF/register/register.do>

Front Control Panel LEDs and Switches

Figure 1-3 shows the location of the Cisco NAM 2220 appliance LEDs and switches on the front panel. Table 1-2 describes the LEDs and switches located on the front panel.

Figure 1-3 Cisco NAM 2220 Appliance Front Control Panel

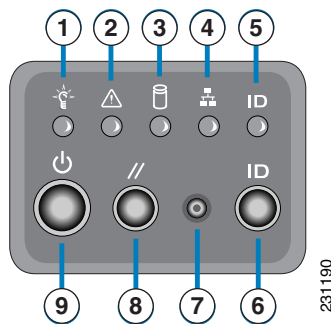


Table 1-2 Front Control Panel LEDs and Switches

Loc.	LED	Color	State	Description
1	Appliance Power	Green	On	Power on
			Off	Power off

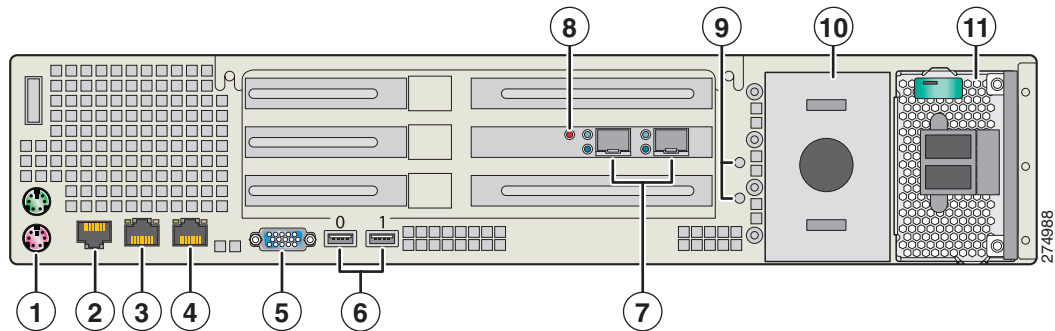
Table 1-2 Front Control Panel LEDs and Switches (continued)

Loc.	LED	Color	State	Description
2	Appliance Status	Green	On	Standby or ready for operation
		Green	Blinking	Degraded operation (for example, power supply nonredundancy, part of system memory mapped out of BIOS)
		Amber	On	One or more critical fault conditions
		Amber	Blinking	One or more noncritical fault conditions
3	Hard Disk Drive	Green	On	HDD activity
		Amber	On	HDD fault Note This is an aggregated indication for all hard disk drives. Each hard disk drive contains its own activity and fault LEDs.
4	NIC	Green	On	NIC activity
5	System ID	Blue		System identity
6	ID			Toggles appliance ID LED
7	NMI			Unused non-maskable interrupt
8	Reset			Resets the appliance
9	Power			Turns the appliance power on and off

Cisco NAM 2220 Appliance Rear View

Figure 1-4 shows the rear view of the Cisco NAM 2220 appliance.

Figure 1-4 Cisco NAM 2220 Appliance Rear View



1	PS/2 connectors for keyboard and mouse (used only for maintenance)	7	XFP transceiver slots <ul style="list-style-type: none"> Slot on right provides input to logical DataPort 1 Slot on left provides input to logical DataPort 2.
2	RJ-45 serial (console) port	8	GPS time sync signal connector
3	NAM Management port; NIC 1 (10/100/1000 Mb/s)	9	Ground studs
4	Non-functional NIC port Note A plastic plug covers this unused NIC port.	10	Power supply 2 location (optional redundant power supply) If a second power supply is not used, a baffle covers this space (as shown).
5	Video (VGA) connector (used only for maintenance)	11	Power supply 1
6	Unused USB ports (0 and 1)		

NIC LEDs

The rear of the Cisco NAM 2220 appliance includes LEDs (a green LED to the left of the connector and a bi-color [green/amber] LED to the right of the connector) that indicate the connection activity and speed of the NIC ports. (See [Figure 1-5](#).)

[Table 1-3](#) describes the activity and connection speed associated with the NIC LEDs.

Figure 1-5 NIC 1 LEDs

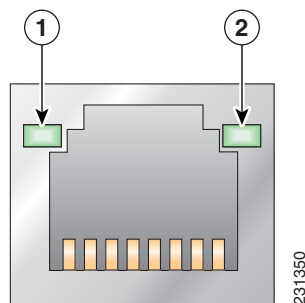


Table 1-3 NIC LEDs

Loc.	LED	Color	State	Description
1	Left		Off	No network connection
		Green	Solid	Network connection
		Green	Blinking	Transmit/receive activity
2	Right		Off	10-Mb/s connection (if left LED is on or blinking)
		Green	Solid	100-Mb/s connection
		Amber	Solid	1000-Mb/s (or 1-Gb/s) connection

AC Power Supply LED

The rear of Cisco NAM 2220 appliance includes LEDs that indicate the power status of the AC power supply (or supplies for optional redundant power supplies). (See locations 10 and 11 in [Figure 1-4](#).) [Table 1-4](#) describes the power status associated with the AC power supply LED.

Table 1-4 AC Power Supply LED

LED	Color	State	Description
Below AC power supply input connector		Off	No AC input power to power supply
	Green	Blinking	AC power applied to power supply and standby voltages are available
	Green	Solid	All power available
	Amber	Blinking	AC power supply warning due to overcurrent or overtemperature condition or slow fan
	Amber	Solid	AC power supply failed or shut down due to blown fuse, high overcurrent or overtemperature condition, or fan failure

Input/Output Ports and Connectors

The Cisco NAM 2220 appliance supports the following I/O connectors on the rear of the appliance:

- Management port (NIC 1 Ethernet connection)
- Serial connector

The following connectors are not required for normal day-to-day operation of the NAM appliance. These connectors are only used in the case of a RAID0 hard disk replacement:

- Video connector
- Mouse connector
- Keyboard connector



Warning

To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables. Statement 1021

Management Port (NIC 1)

The Cisco NAM 2220 appliance uses the NIC 1 port, an integrated Ethernet controller (10/100/1000 Mb/s), as the management port. When you connect this port to a gateway, you enable management and NAM 4.0 application access to the Cisco NAM 2220 appliance.



Note

We recommend that you use no less than a Category 5e or 6 unshielded twisted-pair (UTP) cable for the management port connection.

To access the Ethernet port, connect a Category 5e or 6 unshielded twisted-pair (UTP) cable to the RJ-45 connector on the back of the appliance. (See [Table 1-5](#). The appliance comes with an Ethernet RJ-45-to-RJ-45 yellow cable.)

Table 1-5 Ethernet Cabling Guidelines

Type	Description
10BASE-T	EIA Categories 3, 4, or 5 UTP (2 or 4 pairs) up to 328 ft (100 m)
100BASE-TX	EIA Category 5e UTP (2 pairs) up to 328 ft (100 m)
1000BASE-T	EIA Category 6 (recommended), Category 5E or 5 UTP (2 pairs) up to 328 ft (100 m)

Ethernet Port Connector

Figure 1-6 shows the Ethernet RJ-45 port and plug.

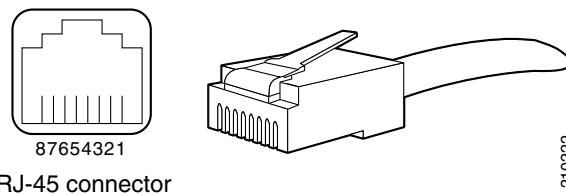
Figure 1-6 RJ-45 Port and Plug

Table 1-6 lists the RJ-45 pin signals used on the connector.

Table 1-6 Ethernet Port Pinout

Ethernet Port Pin	Signal	Description
1	BI_DA+	Bidirectional pair A, +
2	BI_DA-	Bidirectional pair A, -
3	BI_DB+	Bidirectional pair B, +
4	BI_DC+	Bidirectional pair C, +
5	BI_DC-	Bidirectional pair C, -
6	BI_DB-	Bidirectional pair B, -
7	BI_DD+	Bidirectional pair D, +
8	BI_DD-	Bidirectional pair D, -

Serial (Console) Port

The Cisco NAM 2220 appliance has a standard serial (console) port. The appliance comes with a console port cable kit, which contains the cable and adapter to connect a console terminal (an ASCII terminal or PC running terminal-emulation software). The console cable kit includes the following items:

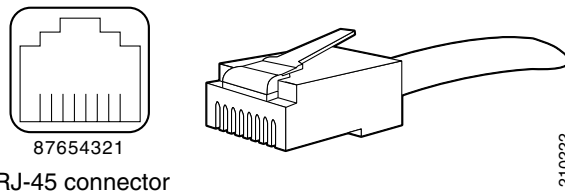
- RJ-45-to-RJ-45 rollover cable (light blue)
- RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL)

Serial (Console) Port Connector

The Cisco NAM 2220 appliance uses the RJ-45 serial port connector located on the back of the appliance. The RJ-45 port connector located on the front panel is not functional and should not be used.

Figure 1-7 shows the pin number assignments for the RJ-45 serial (console) port connector on the back or front of the appliance. These pin number assignments conform to industry standards.

Figure 1-7 Serial Port Connector



Note

The serial (console) RJ-45 port pinout differs slightly between the front- and rear-panel ports, specifically in relation to Pin 6 and Pin 7.



Note

Port settings are preset at the factory before shipping and should not be modified.

On the rear-panel serial (console) port, Pin 7 can be configured with a jumper located on the appliance motherboard. This jumper allows you to set Pin 7 to either Data Set Ready (DSR) or Data Carrier Detect (DCD) as might be required when using a serial port concentrator. The default jumper configuration selects the DSR signal, which conforms to the Cisco serial port standard.

Table 1-7 shows the rear-panel serial (console) port pinout description.

Table 1-7 Rear-Panel RJ-45 Serial (Console) Port Pinout

Serial Port Pin	Signal	Description
1	RTS	Request to send
2	DTR	Data terminal ready
3	TXD	Transmit data
4	GND	Earth ground
5	GND	Earth ground
6	RXD	Receive data
7	DSR or DCD ¹	Data set ready or Data carrier detect
8	CTS	Clear to send

1. A jumper block on the appliance motherboard determines whether DSR or DCD is routed to Pin 7. The appliance motherboard has the jumper block preconfigured with DSR enabled.

Serial (Console) Port Cables

Use the thin, flat, RJ-45-to-RJ-45 rollover cable and the RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL) to connect the console port to an ASCII terminal or a PC running terminal-emulation software. Table 1-8 lists the pinouts for the asynchronous serial console port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-9 female DTE adapter.

Table 1-8 Serial Console Port Signaling and Cabling Using a DB-9 Adapter

Console Port (DTE)	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-9 Terminal Adapter (Connected to Rollover Cable)	Console Device
	RJ-45 Pin	RJ-45 Pin	DB-9 Pin	
Signal				Signal
RTS	1 ¹	8	8	CTS
DTR	2	7	6	DSR
TXD	3	6	2	RXD
GND	4	5	5	GND
GND	5	4	5	GND
RXD	6	3	3	TXD
DSR	7	2	4	DTR
CTS	8 ¹	1	7	RTS

1. Pin 1 is connected internally to pin 8.

AC Power Supplies

The Cisco NAM 2220 appliance is equipped with either a 110-V or 220-V AC power supply (see locations 10 and 11 in Figure 1-4). If an appliance has an optional redundant power supply, both power supplies must both be the same type. A baffle panel covers the empty power supply slot in an appliance without a redundant power supply as shown in location 10 of Figure 1-4.

The power supply is rated for 600-W output capacity in full AC input voltage.

The power supply incorporates a single 40-mm fan for cooling, which also contributes to overall appliance cooling. The cooling air enters the power supply from the power distribution side. If airflow through the power supply is insufficient, the overtemperature protection circuits activate a shutdown before the temperature passes the maximum rated temperature.



Caution

To ensure proper cooling if only one power supply is installed, the power supply must be in the right-hand slot and the power supply blank filler panel must be in the left-hand slot. (See Figure 4-22 on page 4-20.)



Warning

Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.

Statement 1029

To maintain hot-swap capability, ensure that an active power supply is in both power supply slots before replacing (hot-swapping) a power supply. Check the power supply LED to determine if a power supply module has failed.

AC Power Supply Input

A single receptacle is provided at the rear of the AC power supply for AC input.

Environmental Monitoring

The Cisco NAM 2220 appliance has protection circuits that monitor and detect overcurrent, overvoltage, and overtemperature conditions inside the appliance. If the power supply shuts down or latches off, a cycle of off for 15 seconds and on for 1 second will reset the power supply.

Overcurrent Protection (OCP)

The power supply shuts down and latches off after an overcurrent condition occurs. This latch is cleared by a power interruption.



Note

The power supply will not be damaged from power cycling.

Overvoltage Protection (OVP)

The power supply shuts down and latches off after an overvoltage condition occurs. This latch is cleared by a power interruption.

Overtemperature Protection (OTP)

The power supply is protected against overtemperature conditions caused by the loss of fan cooling or excessive ambient temperature. In an OTP condition, the power supply will shut down. When the power supply temperature drops to the rated safety limit, the power supply restores power automatically.

Regulatory Compliance

For regulatory compliance and safety information, see the *Cisco Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliance* document. This document is provided with the Cisco NAM 2220 appliance and is also available online at Cisco.com:

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/regulatory/compliance/nam2200rcsi.html