

NetScaler MPXTM

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Common hardware components

NOTE:

This section does not apply to the MPX 9200 and MPX 17000 platforms. For information specific to the MPX 9200, see [NetScaler MPX 9200 platform](#). For information specific to the MPX 17000, see [NetScaler MPX 17000 platform](#).

Each platform has front panel and back panel hardware components. The front panel on most appliances has an LCD display and an RS232 serial console port. The number, type, and location of ports vary by hardware platform for the following transceivers: copper Ethernet, copper and fiber 1G SFP, copper 10G Base-T, 10G SFP+, 40G QSFP+, 50G QSFP28, and 100G QSFP28. The back panel provides access to the field replaceable units (power supplies and solid-state drives).

LCD display and LED status indicators

NOTE

This section does not apply to MPX 9100 and MPX 16000.

The LCD display on the front of every appliance displays messages about the current operating status of the appliance. These messages communicate whether your appliance has started and is operating normally. If the appliance is not operating normally, the LCD displays troubleshooting messages.

The LCD displays live statistics, diagnostic information, and active alerts. The dimensions of the LCD limit the display to two lines of 16 characters each. As the result, the displayed information flows through a sequence of screens. Each screen shows information about a specific function.

The LCD has an LED backlight. Normally, the backlight glows steadily. When there is an active alert, it blinks rapidly. If the alert information exceeds the LCD screen size, the backlight blinks at the beginning of each display screen. After the appliance shuts down, the backlight remains on for one minute and then automatically turns off.

System status LEDs

On the MPX 22000 and MPX 24000 appliance back panel, system status LEDs indicate the overall status of the appliance. The following table describes the indicators of the system status LED.

Note: System status LEDs are available on only some NetScaler appliances.

LED COLOR	LED INDICATES
OFF	No power.
Green	Appliance is receiving power.
Red	Appliance has detected an error.

The port LEDs show whether a link is established and traffic is flowing through the port. The following table describes the LED indicators for each port. There are two LED indicators for each port type.

Note: This section applies to all the appliances.

LED port-status indicators

PORT TYPE	LED COLOR	LED INDICATES
50 Gbps	Off	A link has not been established.
	Blinking amber	Indicates a problem with the link
	Solid green	Indicates a valid link with no active traffic.
	Blinking green	Indicates a valid link with active traffic.

PORT TYPE	LED	LED	LED COLOR	LED INDICATES
10 Gbps	Top	Speed	Off	No connection.
			Solid blue or solid green	Traffic rate of 10 gigabits per second.
	Bottom	Link/Activity	Off	No link.
			Solid green	Link is established but no traffic is passing through the port.
			Blinking green	Traffic is passing through the port.
1G SFP (1 Gbps)	Left	Link/Activity	Off	No link.
			Solid green	Link is established but no traffic is passing through the port.
			Blinking green	Traffic is passing through the port.
	Right	Speed	Off	No connection.
			Yellow	Traffic rate of 1 gigabit per second.
Ethernet (RJ45)	Left (Right on MPX 5900 platform)	Speed	Off	No connection, or a traffic rate of 10 megabits

PORT TYPE	LED	LED	LED COLOR	LED INDICATES
				per second (Mbps).
			Green	Traffic rate of 100 Mbps.
			Yellow	Traffic rate of 1 gigabit per second.
	Right (Left on MPX 5900 platform)	Link/Activity	Off	No link.
			Blinking green	Traffic is passing through the port.
Management (RJ45)	Left	Speed	Off	No connection, or a traffic rate of 10 megabits per second (Mbps).
			Green	Traffic rate of 100 Mbps.
			Amber	Traffic rate of 1 gigabit per second.
	Right	Link/Activity	Off	No link.
		Solid yellow	Link is established but no traffic is passing through the port.	

On each power supply, a bicolor LED indicator shows the condition of the power supply.

3Y power supply

The 3Y power supply is used on the following platforms:

- 850 W AC
 - MPX 16000
- 1000 W AC/DC
 - MPX 14000
 - MPX 25000
 - MPX 15000
 - MPX 15000-50G
 - MPX 26000
 - MPX 26000-100G
- 1200 W AC/DC
 - MPX 26000-50S

3Y power supply LED behavior

POWER SUPPLY	850 W AC	1000 W AC	1000 W DC	1200 W AC
LED behavior when	YSEF0850EM	YM-2102NA01R	YM-2102JA01R	YM-2122CA01R
No Power to any power supply	Off	Off	Off	Off
No power to this power supply	AMBER	Flashing RED	Flashing RED	Flashing RED

POWER SUPPLY	850 W AC	1000 W AC	1000 W DC	1200 W AC
Power supply is in standby mode	Flashing GREEN	Flashing GREEN	Flashing GREEN	Flashing GREEN
Power supply is functional	GREEN	GREEN	GREEN	GREEN
Power supply failure	AMBER	RED	RED	RED
Warning (OVP/ UVP/OCP/OTP/ Fan)	Flashing AMBER	-	Flashing RED/ GREEN	-

AcBel power supply

The AcBel power supply is used on the following platforms. The power supply model number is added for each platform.

- 450 W AC
 - MPX 5900/8900 (R1BA2451B)
- 450 W DC
 - MPX 5900/8900 (R1BD2451A)
- 450 W AC
 - MPX 9100 (R1BA2451D)

MPX 9100 AcBel 450 W power supply LED behavior

POWER SUPPLY	450 W AC (100–240 VAC)
LED behavior when	
No Power to any power supply	Off
No power to this power supply	ORANGE
Power supply is in standby mode	Flashing GREEN
Power supply is functional	GREEN
Power supply failure	ORANGE
Power supply failure warning (OVP/UVP/OCP/OTP/Fan)	Flashing ORANGE

MPX 5900/8900 AcBel 450 W power supply LED behavior

POWER SUPPLY	450 W AC (100–240 VAC)	450 W DC (-40 VDC TO -72 VDC)
LED behavior when		
No Power to any power supply	Off	Off
No power to this power supply	RED	AMBER
Power supply is in standby mode	Flashing GREEN	Flashing BLUE

POWER SUPPLY	450 W AC (100–240 VAC)	450 W DC (-40 VDC TO -72 VDC)
Power supply is functional	GREEN	BLUE
Power supply failure	RED	AMBER
Power supply failure warning (OVP/UVP/OC/OTP/Fan)	Flashing RED/GREEN	Flashing AMBER

NOTE

AC power supplies use green LEDs and DC power supplies use blue LEDs.

Flex power supply

The Flex power supply is used on the following platforms:

- 750 W AC/DC
 - MPX 24000
 - MPX 22000

Flex (750 W) power supply LED behavior

POWER SUPPLY	750 W AC	750 W DC
LED behavior when	F750E-XX A00	
No Power to any power supply	Off	Off
No power to this power supply	LED goes off	LED goes off

POWER SUPPLY	750 W AC	750 W DC
Power supply is in standby mode	-	-
Power supply is functional (Power On)	GREEN	GREEN
Power supply failure	-	-
Warning (OVP/UVF/OCP/OTP/Fan)	-	-

NOTE

Power Supply Unit **ON**-Green

Power Supply Unit OFF- No Color

There is no other function other than ON or OFF for the module LEDs. A continuous beep sound occurs if a cable or module is unplugged.

Ports

Ports are used to connect the appliance to external devices. NetScaler appliances support the following ports:

- RS232 serial ports
- 10/100/1000Base-T copper Ethernet ports
- 1 GB copper and fiber SFP ports
- 10 GB fiber SFP+
- 25 GB SFP 28
- 40G QSFP+
- 50 GB QSFP28
- 100 GB QSFP28

All NetScaler appliances have a combination of some or all of these ports. Cards might be vertical or horizontal depending on the platform. The number of ports per card varies across platforms. For better fault tolerance, create link aggregated groups (LAGs) on independent cards. Typically, cards are vertical on 2U appliances and horizontal on 1U appliances as seen in the following sample illustrations.



For more information about LAGs, see [Configuring Link Aggregation](#). For details on the type and number of ports available on your appliance, see the section describing that platform.

NOTE

NetScaler appliances use the Receive Side Scaling (RSS) feature to optimally distribute and process traffic. The RSS implementation is based on `Toeplitz` hashing which distributes the packet among its queues based on the 5-tuple: TCP/IP protocol, source IP address, destination IP address, source port, and destination port.

RS232 serial port

The RS232 serial console port provides a connection between the appliance and a computer, allowing direct access to the appliance for initial configuration and troubleshooting.

All hardware platforms ship with an appropriate serial cable used to connect your computer to the appliance. For instructions on connecting your computer to the appliance, see [Install the Hardware](#).

Copper Ethernet ports

The copper Ethernet ports installed on many models of the appliance are standard RJ45 ports.

There are two types of copper Ethernet ports that can be installed on your appliance:

- 10/100BASE-T port

The 10/100BASE-T port has a maximum transmission speed of 100 megabits per second (Mbps). Most platforms have at least one 10/100BASE-T port.

- 10/100/1000BASE-T port

The 10/100/1000BASE-T port has a maximum transmission speed of 1 gigabit per second, 10 times faster than the other type of copper Ethernet port. Most platforms have at least one 10/100/1000Base-T port.

To connect any of these ports to your network, plug one end of a standard Ethernet cable into the port. Plug the other end into the appropriate network connector.

Management ports

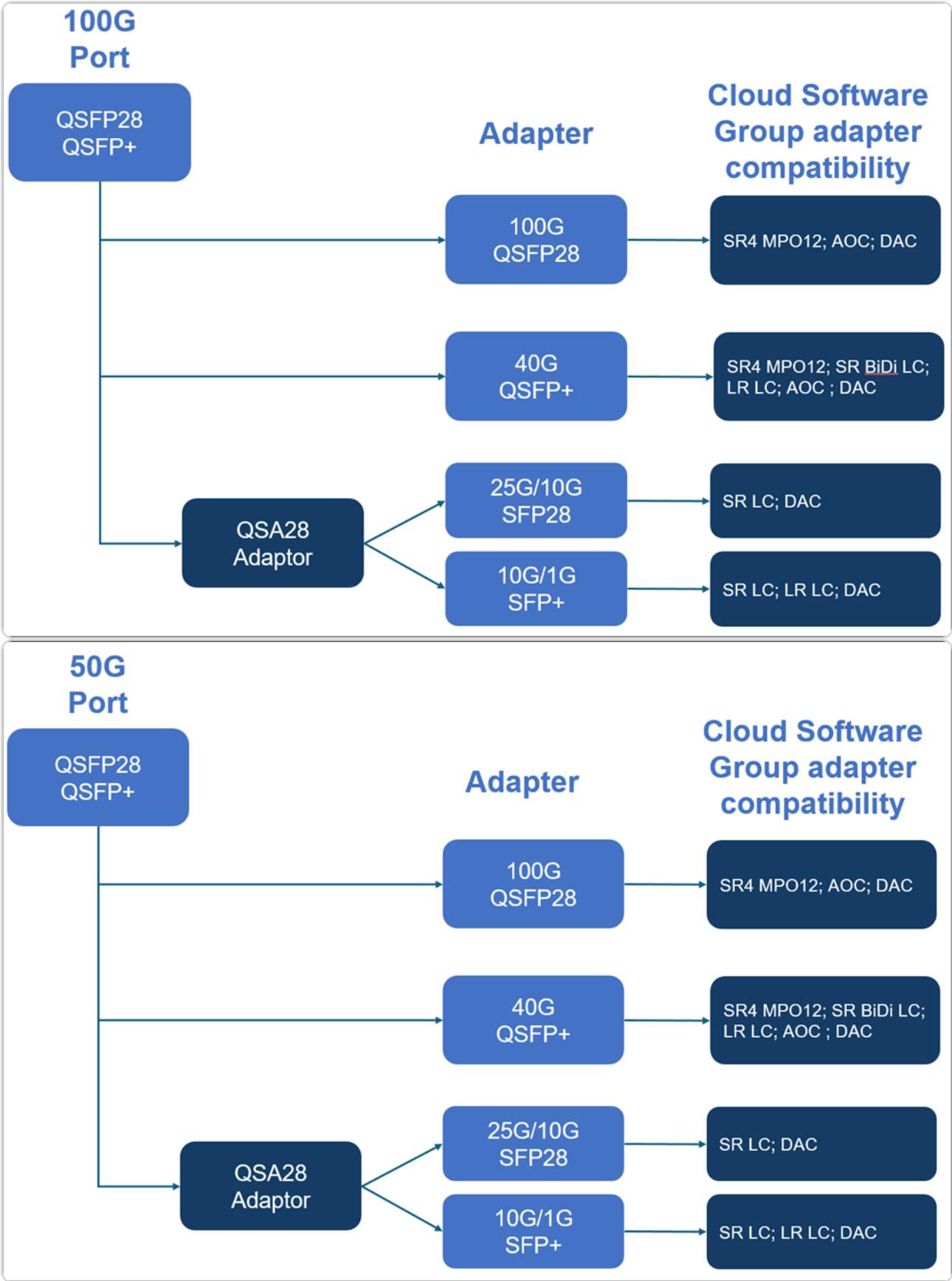
Management ports are standard copper Ethernet ports (RJ45). They are used for direct access to the appliance for system administration functions.

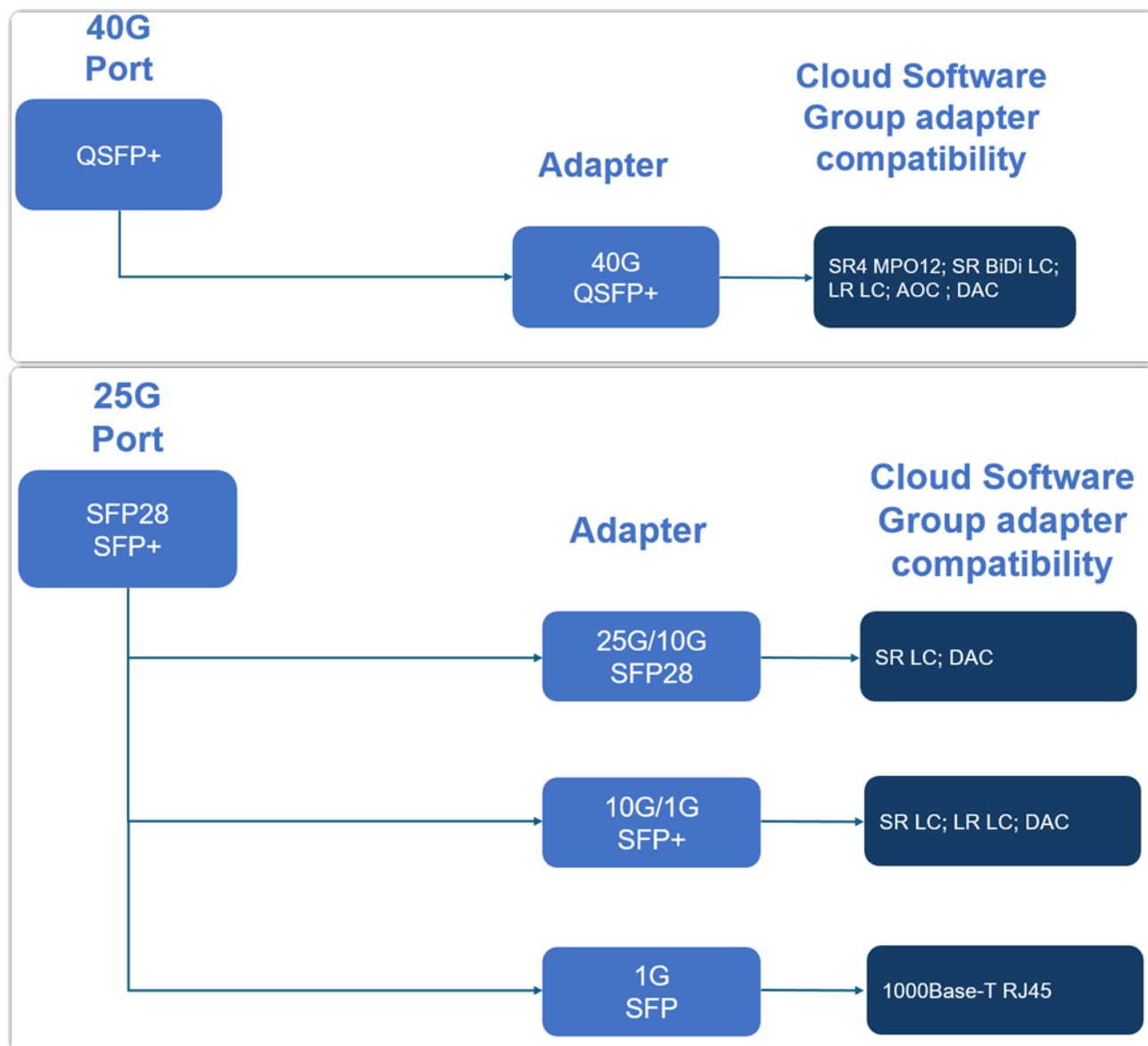
25G, 40G, 50G, and 100G ports

A 100G port can support five speeds: 10G, 25G, 40G, 50G, and 100G. 1G speed is not supported on the 100G port. 50G and 100G ports use the same transceiver. 40G QSFP+ are high-speed ports that can operate at speeds of up to 40 Gbps. The appliance determines the speed, and not the port.

Only 50G/100G (QSFP28) transceivers can be directly used on a QSFP28 interface. Use a QSA28 adapter on a QSFP28 interface to use 10G (SFP+) and 25G (SFP28) transceivers. Use a 40G QSFP+ transceiver in the 50G/100G port if the peer is 40G.

The following diagram shows the transceiver compatibility.



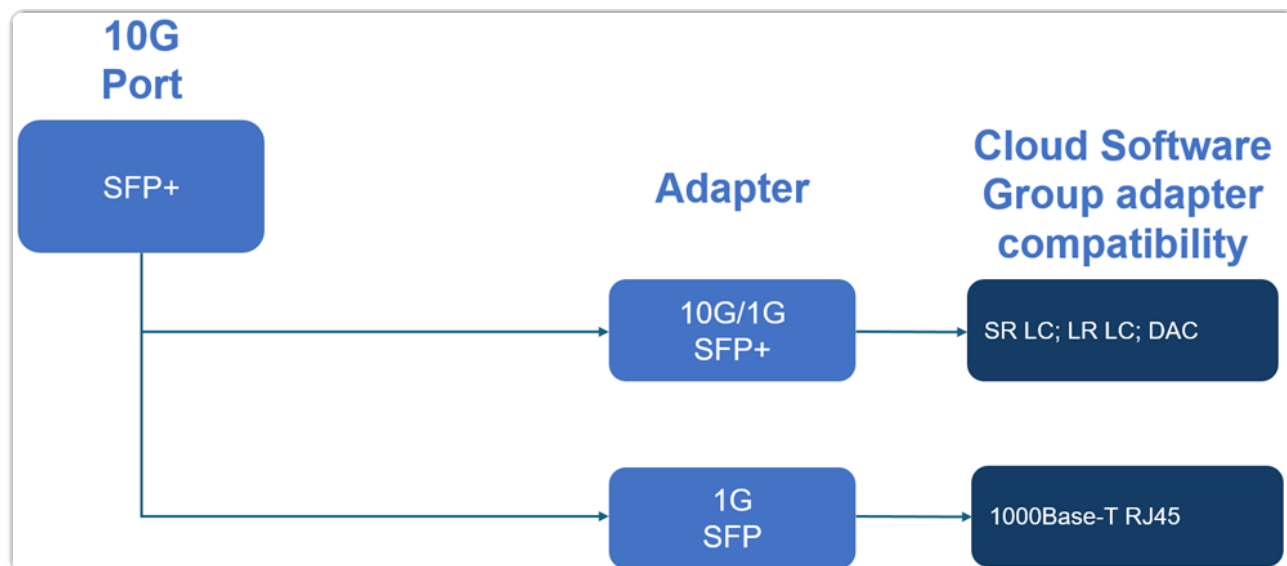
**NOTE:**

FVL firmware 8.70 does not support 1G connectivity. Dual speed 10G/1G SFP+ (both SR LC & LR LC) will not operate at 1G, if FVL firmware 8.70 is used.

1G SFP and 10G SFP+ ports

A 1G SFP port can operate at a speed of 1 Gbps. It accepts either a copper 1G SFP transceiver for operation as a copper Ethernet port, or a fiber 1G SFP transceiver for operation as a fiber optic port.

The 10G SFP+ modules are dual-speed capable and support both 1 Gbps and 10 Gbps, depending on the peer switch that the model connects to. You need a fiber optic cable to connect to a port. If the other end of the fiber optic cable is attached to a 1G SFP port, the 10G SFP+ port automatically negotiates to 1G speed.



Ports compatibility:

On some appliances, the 10G slot supports copper 1G transceivers, which can operate at up to 1 Gbps in a 10 Gbps slot.

Notes:

- Certain platforms have 10G slots that do not support copper transceivers. Check with your account representative for support details.
- You cannot insert a fiber 1G transceiver into a 10G slot.
- You cannot insert a 10G transceiver into a 1G slot.

1G pluggable media

The following information is provided for 1G transceivers:

- Description: The price list description of the part.
- Transmit Wavelength: The nominal transmit wavelength.
- Cable/Fiber Type: Fiber characteristics affect the maximum transmit distance achievable. With 10G on multi-mode fiber (MMF) various dispersion components become dominant. For more information, see <http://www.thefoa.org/tech/ref/basic/fiber.html>.

- Typical Reach: Maximum transmit distance.
- Applicable platforms: Some chassis are available with different media options. Use the appropriate data sheet to confirm that your particular chassis type supports the media.

Copper 1G SFP distance specifications

Description: NetScaler 1G SFP Ethernet copper (100 m) - 4 pack

Transmitter wavelength (nm): Not applicable

Cable type: Category 5 (Cat-5) copper cable

Typical reach (m): 100 m

Applicable platforms:

- MPX 5900/5905/5910
- MPX 14000
- MPX 16000
- MPX 22000
- MPX 24000

Short reach fiber 1G SFP distance specifications

Description: NetScaler 1G SFP Ethernet SX (300 m) - 4 pack

Transmitter wavelength (nm): 850 nm (nominal)

Fiber type: 50/125um MMF, 2000MHz-km (OM3) **Typical Reach (m):** 550 m

Fiber type: 50/125um MMF, 500MHz-km (OM2) **Typical Reach (m):** 550 m

Fiber type: 50/125um MMF, 400MHz-km **Typical Reach (m):** 550 m

Fiber type: 62.5/125um MMF, 200MHz-km (OM1) **Typical Reach (m):** 300 m

Fiber type: 62.5/125um MMF, 160MHz-km **Typical Reach (m):** 300 m

Applicable platforms:

- MPX 5900/5905/5910
- MPX 22000
- MPX 24000

Short reach fiber 1G SFP distance specifications

Description: NetScaler 1G SFP Ethernet short range (300 m) - Single

Transmitter wavelength (nm): 850 nm (nominal)

Fiber type: 50/125um MMF, 2000MHz-km (OM3) **Typical Reach (m):** 550 m

Fiber type: 50/125um MMF, 500MHz-km (OM2) **Typical Reach (m):** 550 m

Fiber type: 50/125um MMF, 400MHz-km **Typical Reach (m):** 550 m

Fiber type: 62.5/125um MMF, 200MHz-km (OM1) **Typical Reach (m):** 275 m

Fiber type: 62.5/125um MMF, 160MHz-km **Typical Reach (m):** 220 m

Applicable platforms:

- MPX 5900/5905/5910
- MPX 22000
- MPX 24000

Long reach fiber 1G SFP distance specifications

Description: NetScaler 1G SFP Ethernet LX - Single

Transmitter wavelength (nm): 1310 nm (nominal)

Fiber type: 9/125um SMF

Typical reach (m): 10 km

Applicable platforms:

- MPX 5900/5905/5910
- MPX 22000
- MPX 24000

Long reach fiber 1G SFP distance specifications

Description: NetScaler 1G SFP Ethernet long range (10 km) - Single

Transmitter wavelength (nm): 1310 nm (nominal)

Fiber type: 9/125um SMF

Typical reach (m): 10 km

Applicable platforms:

- MPX 5900/5905/5910
- MPX 22000
- MPX 24000

10 GE pluggable media

The following information is provided for 10G transceivers:

- **Description:** The price list description of the part.
- **Transmit Wavelength:** The nominal transmit wavelength.
- **Cable/Fiber Type:** Fiber characteristics affect the maximum transmit distance achievable. With 10G on multi-mode fiber (MMF), various dispersion components become dominant. For more information, see [<http://www.thefoa.org/tech/ref/basic/fiber.html>](http://www.thefoa.org/tech/ref/basic/fiber.html).

- Typical Reach: Maximum transmit distance.
- Applicable platforms: Some chassis are available with different media options. Use the appropriate data sheet to confirm that your particular chassis type supports the media.

Short reach fiber 10G SFP+ distance specifications

Applicable platforms:

- MPX 5900/5905/5910
- MPX 9100
- MPX 22000
- MPX 24000
- MPX 25000T
- MPX 25100 40G, MPX 25160 40G
- MPX 14000
- MPX 14000-40G
- MPX 14000-40S
- MPX 14000 FIPS
- MPX 15000
- MPX 15000-50G (adapter required to connect 50G ports to 10G transceiver)
- MPX 16000 (adapter required to connect 100G ports to 10G transceiver)
- MPX 26000 (adapter required to connect 50G ports to 10G transceiver)
- MPX 26000-50S (adapter required to connect 50G ports to 10G transceiver)
- MPX 26000-100G (adapter required to connect 100G ports to 10G transceiver)

DESCRIPTION	TRANSMITTER WAVELENGTH (NM)	FIBER TYPE	TYPICAL REACH (M)
NetScaler 10G SFP+, Ethernet	850 nm (nominal)	50/125um MMF, 2000MHz- km (OM3)	300 m

DESCRIPTION	TRANSMITTER WAVELENGTH (NM)	FIBER TYPE	TYPICAL REACH (M)
Short Range (300 m) - Single			
		50/125um MMF, 500MHz-km (OM2)	82 m
	50/125um MMF, 400MHz-km	66 m	
		62.5/125um MMF, 200MHz-km (OM1)	33 m
		62.5/125um MMF, 160MHz-km	26 m

Long reach fiber 10G SFP+ distance specifications

Description: NetScaler 10G SFP+ Ethernet long range (10 km) - Single

Transmitter wavelength (nm): 1310 nm (nominal)

Fiber type: 9/125um SMF

Typical reach (m): 10 km

Applicable platforms:

- MPX 5900/5905/5910
- MPX 9100
- MPX 22000
- MPX 24000
- MPX 25000T
- MPX 25000-40G
- MPX 14000

- MPX 14000-40G
- MPX 14000-40S
- MPX 14000 FIPS
- MPX 15000
- MPX 15000-50G (adapter required to connect 50G ports to 10G transceiver)
- MPX 16000 (adapter required to connect 100G ports to 10G transceiver)
- MPX 26000 (adapter required to connect 50G ports to 10G transceiver)
- MPX 26000-50S (adapter required to connect 50G ports to 10G transceiver)
- MPX 26000-100G (adapter required to connect 100G ports to 10G transceiver)

Citrix® direct-attached (DAC) copper TwinAx 10G SFP+ passive cables specifications

Description: NetScaler 1 m DAC SFP+ cable for up to 1 m distance

Applicable platforms:

- MPX 5901/5905/5910
- MPX 8905/8910/8920/8930
- MPX 9100
- MPX 16000
- MPX 22000
- MPX 24000
- MPX 14000
- MPX 14000-40G
- MPX 14000-40S
- MPX 14000 FIPS
- MPX 25000TA
- MPX 25000A

- MPX 25000T
- MPX 25000-40G

Description: NetScaler 3 m DAC SFP+ cable for up to 3 m distance

Applicable platforms:

- MPX 5901/5905/5910
- MPX 8905/8910/8920/8930
- MPX 9100
- MPX 16000
- MPX 22000
- MPX 24000
- MPX 14000
- MPX 14000-40G
- MPX 14000-40S
- MPX 14000 FIPS
- MPX 25000TA
- MPX 25000A
- MPX 25000T
- MPX 25000-40G

Description: NetScaler 5 m DAC SFP+ cable for up to 5 m distance

Applicable platforms:

- MPX 9100
- MPX 14000
- MPX 14000-40G
- MPX 14000-40S
- MPX 14000 FIPS
- MPX 16000
- MPX 22000
- MPX 24000

- MPX 25000TA
- MPX 25000A
- MPX 25000T
- MPX 25000-40G

Cisco 40G QSFP+ breakout cable specifications

Cisco part number: L45593-D178-C30

Description: 40GBASE-CR4 QSFP+ to four 10GBASE-CU SFP+ direct attach breakout cable assembly, 3 meters passive

Applicable platforms:

- MPX 14000-40G
- MPX 14000-40C
- MPX 14000-40S
- MPX 14000 FIPS
- MPX 16000
- MPX 22000
- MPX 24000
- MPX 25000T
- MPX 25000-40G
- MPX 25000TA
- MPX 25000A

Notes:

- The peer switch must be 40G. You connect 4x10G ports on the NetScaler appliance. The reverse is not supported. That is, 40G on the NetScaler appliance and 4x10G on the peer switch is not supported.
- To obtain these cables, contact Cisco partner representatives.

50/100 G pluggable media

The following information is provided for 50/100 G pluggable media:

- Up to 100m on OM4 and 70m on OM3 multimode fiber at 100Gb/s
- Up to 100m on OM3 at 40Gb/s (dual speed capable)

Data sheets

The data sheet is available on www.netscaler.com. Navigate to **Platform > Form Factors > Hardware**.

NetScaler MPX hardware-software compatibility matrix

The following table lists the compatibility matrix for all NetScaler hardware platforms and the software releases supported on these platforms. The base platform is listed. For information about the models for each platform, check the data sheet on www.netscaler.com. Navigate to **Platform > Form Factors > Hardware**.

IMPORTANT: The first supported build for each hardware platform and software release are listed in the following table. **All subsequent builds are supported unless the word "only" follows the build number. When it does, only the specified build is supported on that platform.**

HARDWARE PLATFORM S/ SOFTWARE RELEASES	11.1	12.1	13.0	13.1	14.1
MPX 5900	11.1–56.15	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 8900	11.1–56.15	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 8900 FIPS certified Cert #5342	X	12.1–55.X FIPS	X	13.1–37.x FIPS	14.1–72.x FIPS
MPX 9100	X	X	X	13.1–21.x	14.1–4.x
MPX 9100 FIPS Cert #5342	X	X	X	13.1–37.x FIPS	14.1–72.x FIPS
MPX 9200	X	X	X	X	14.1–72.x
MPX 9200 FIPS Cert #5342	X	X	X	X	14.1–72.x FIPS

HARDWARE PLATFORM S/ SOFTWARE RELEASES	11.1	12.1	13.0	13.1	14.1
MPX 14000	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 14000-40C	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 14000-40G	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 14000-40S	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 14000 FIPS	11.1–51.21	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 15000-25G	11.1–60.13	12.1–50.31	13.0–36.27	13.1–4.x	14.1–4.x
MPX 15000-50G	11.1–60.13	12.1–50.31	13.0–36.27	13.1–4.x	14.1–4.x
MPX 15000-50G FIPS certified Cert #4043	X	12.1–55.X FIPS	X	13.1–37.x FIPS	X
MPX 16000	X	X	X	13.1–37.x	14.1–4.x
MPX 17000	X	X	X	X	14.1-72.x
MPX 22000	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 24100	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 25100-40G	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 26100	11.1–60.13	12.1–50.31	13.0–36.27	13.1–4.x	14.1–4.x

HARDWARE PLATFORM S/ SOFTWARE RELEASES	11.1	12.1	13.0	13.1	14.1
MPX 26100-50S	11.1–60.13	12.1–50.31	13.0–36.27	13.1–4.x	14.1–4.x
MPX 26000-100G	11.1–56.15	12.1–50.31	13.0–36.27	13.1–4.x	14.1–4.x

LEGACY HARDWARE PLATFORM S/ SOFTWARE RELEASES	11.1	12.1	13.0	13.1	14.1
MPX 5500	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	X
MPX 5550	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 7500	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	X
MPX 8000	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	14.1–4.x
MPX 9700	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	X
MPX 11500	11.1–47.14	12.1–48.13	13.0–36.27	13.1–4.x	X

Hardware platforms

The various NetScaler hardware platforms offer a wide range of features, communication ports, and processing capacities. All the MPX platforms have multicore processors.

The NetScaler hardware platforms range from the single 10-core processor MPX 9100 to the high-capacity MPX two 16-core processor MPX 16000. The various NetScaler hardware platforms are similar in that they use the same types of components, but different models provide different hardware capabilities. All NetScaler hardware platforms support the NetScaler software. All NetScaler appliances have front to rear airflow.

For information on the software releases supported on the NetScaler hardware platforms, see [Hardware Software Release Matrix](#).

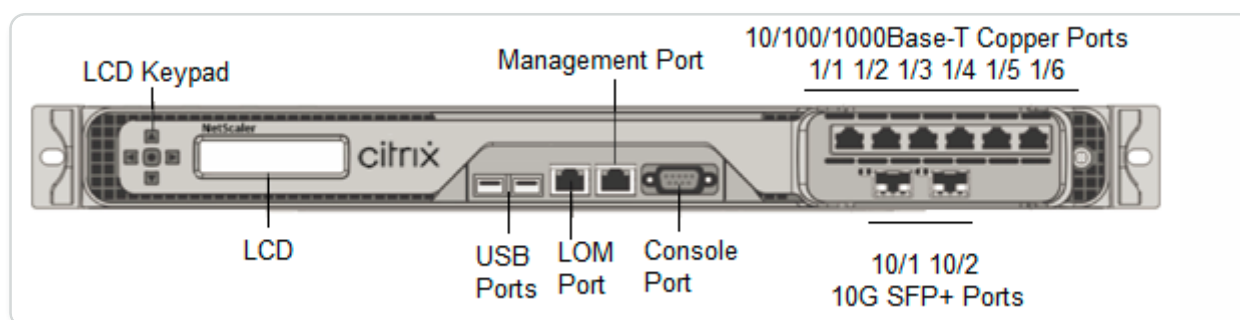
NetScaler MPX 5900

The NetScaler MPX 5900 appliance is a 1U appliance. This platform has a single 8-core processor and 16 GB of memory. The appliance provides a total of eight network ports:

- Six 10/100/1000Base-T RJ45 copper Ethernet Ports.
- Two 10G/1G SFP+ Ethernet Ports.

For information on the software releases supported on the NetScaler hardware platforms, see [Hardware Software Release Matrix](#). The following figure shows the front panel of the MPX 5900 appliance.

Figure 1. NetScaler MPX 5900, front panel



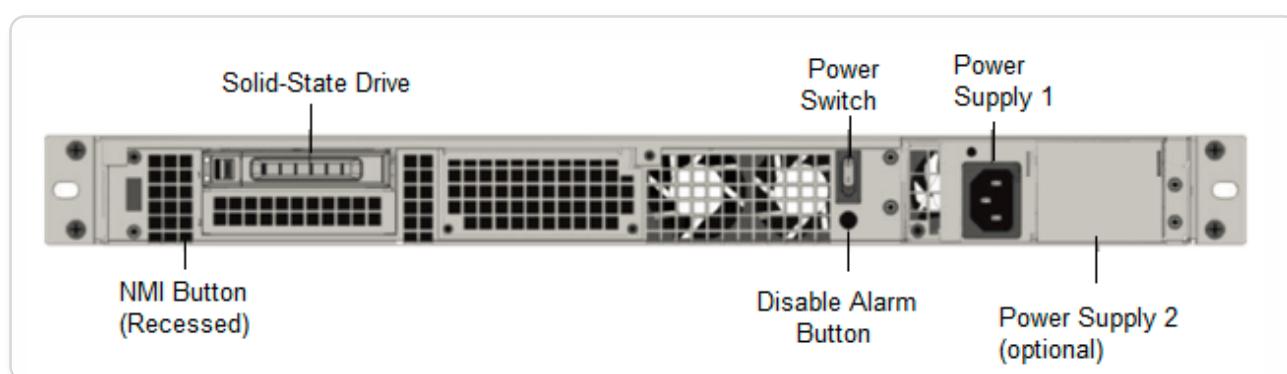
The NetScaler MPX 5900 appliances have the following ports:

- RS232 serial Console Port.

- One 10/100/1000Base-T RJ45 copper Ethernet LOM Port. Use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- One 10/100/1000Base-T RJ45 copper Ethernet Management Port, numbered 0/1. This port is used to connect directly to the appliance for NetScaler administration functions.
- Six 10/100/1000Base-T RJ45 copper Ethernet Ports, numbered 1/1 to 1/6 from left to right.
- Two 10G/1G SFP+ Ethernet Ports, numbered 10/1 to 10/2 from left to right.
- USB port (reserved for a future release).

The following figure shows the back panel of the MPX 5900 appliance.

Figure 2. NetScaler MPX 5900, back panel



The following components are visible on the back panel of the MPX 5900 appliances:

- One 240 GB or larger removable solid-state drive (SSD).
- Note:** Drive densities might increase as components become EOL but its size is never smaller than the original.
- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
 - One power supply, rated at 450 watts, 100–240 VAC (second power supply for redundancy is a customer installable option). Maximum power consumption is under 180-190 watts and typical power consumption is 150-160 watts. Each power supply has an LED indicating its status, as follows:

LED COLOR	LED INDICATES
OFF	No power to any power supply in the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.

- **Disable alarm button**, which is functional only when the appliance has two power supplies. Press this button to silence the power alarm when one of two power supplies loses input power (second power supply optional) or when a power supply is malfunctioning.
- **Non-Maskable Interrupt (NMI) Button**, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

NetScaler MPX 8900

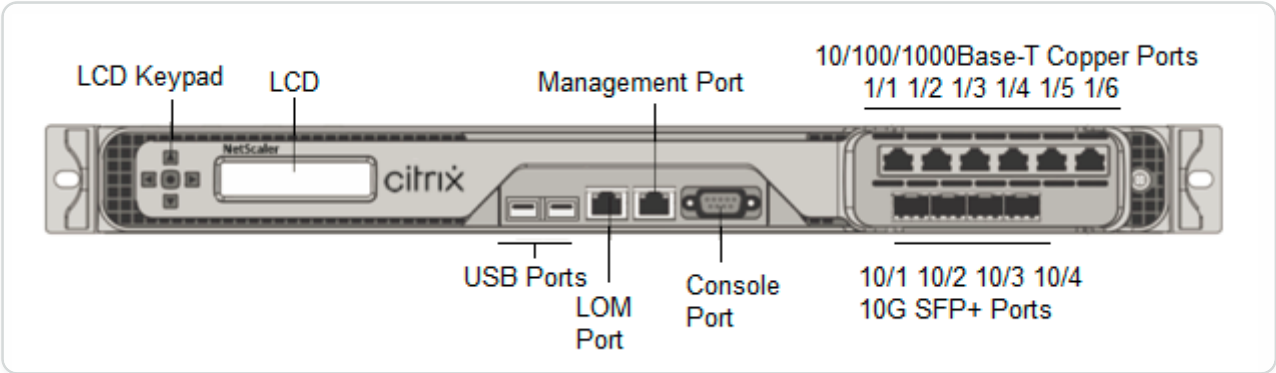
The NetScaler MPX 8900 appliance is a 1U appliance. This platform has a single 8-core processor and 32 GB of memory. The appliance provides a total of 10 network ports:

- Six 10/100/1000Base-T RJ45 copper Ethernet Ports.
- Four 10G/1G SFP+ Ethernet Ports.

For information on the software releases supported on the NetScaler hardware platforms, see [Hardware-Software Release Matrix](#).

The following figure shows the front panel of the MPX 8900 series appliances.

Figure 1. NetScaler MPX 8900, front panel



The NetScaler MPX 8900 series appliances have the following ports:

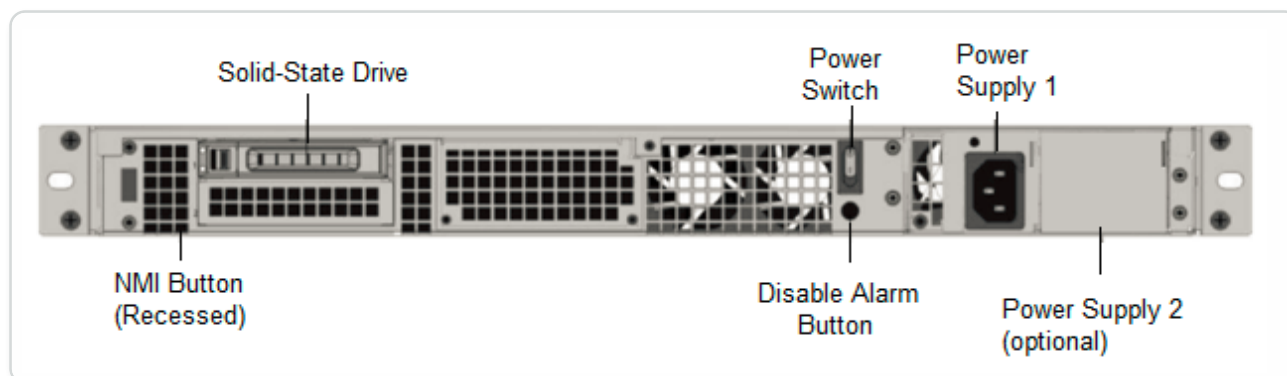
- RS232 serial Console Port.
- One 10/100/1000Base-T RJ45 copper Ethernet LOM Port. Use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- One 10/100/1000Base-T RJ45 copper Ethernet Management Port, numbered 0/1. This port is used to connect directly to the appliance for NetScaler administration functions.
- Six 10/100/1000Base-T RJ45 copper Ethernet Ports, numbered 1/1 to 1/6 from left to right.
- Four 10G/1G SFP+ Ethernet Ports, numbered 10/1 to 10/4 from left to right.
- USB port (reserved for a future release).

The following table indicates the LED status for the Management and LOM ports:

LED COLOR	LED INDICATES
OFF	No connection or 10 Mbps speed
Flashing YELLOW	Active
Flashing GREEN	100 Mbps speed
AMBER	1 Gbps speed

The following figure shows the back panel of the MPX 8900 appliance.

Figure 2. NetScaler MPX 8900, back panel



The following components are visible on the back panel of the MPX 8900 appliance:

- One 240 GB or larger removable solid-state drive (SSD).

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- One power supply, rated at 450 watts, 100–240 VAC (second power supply for redundancy is a customer installable option). Maximum power consumption is 196 watts and typical power consumption is 163 watts. The following table indicates the LED status of each power supply:

LED COLOR	LED INDICATES
OFF	No power to any power supply in the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.

- **Disable alarm button**, which is functional only when the appliance has two power supplies. Press this button to silence the power alarm when one of two power supplies loses input power (second power supply optional) or when a power supply is malfunctioning.

- Non-Maskable Interrupt (NMI) Button, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the **Remote Control** menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

NetScaler MPX 8900 FIPS certified appliance

The NetScaler MPX 8900 FIPS certified appliance is a 1U appliance. This platform has a single 8-core processor and 32 GB of memory.

Note: On all sides of the appliance, you see FIPS tamper seals. Tampering with the seals breaks the FIPS requirement.

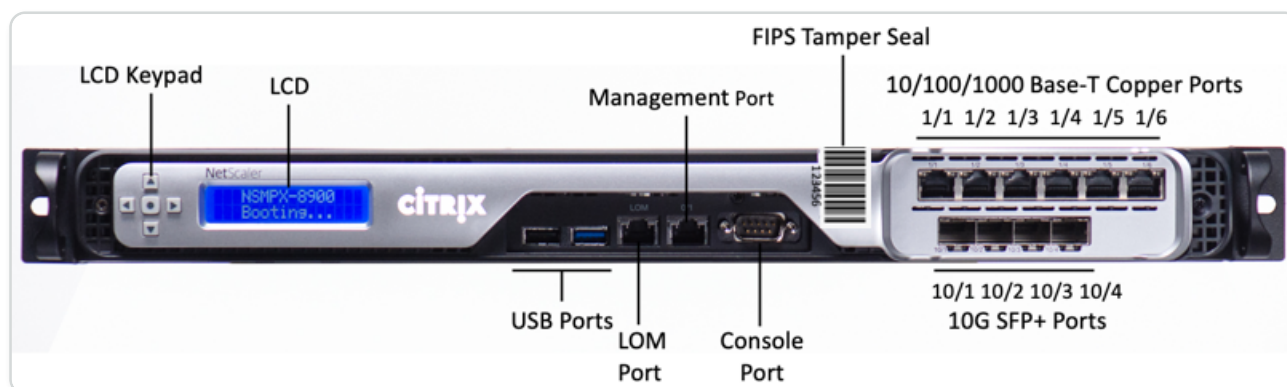
The appliance provides a total of 10 network ports:

- Six 10/100/1000Base-T RJ45 copper Ethernet Ports.
- Four 10G/1G SFP+ Ethernet Ports.

For information on the software releases supported on the NetScaler hardware platforms, see [Hardware-Software Release Matrix](#).

The following figure shows the front panel of the MPX 8900 FIPS certified appliance.

Figure 1. NetScaler MPX 8900 FIPS certified appliance, front panel



The NetScaler MPX 8900 FIPS certified appliance has the following ports:

- RS232 serial Console Port.
- One 10/100/1000Base-T RJ45 copper Ethernet LOM Port. Use this port to remotely monitor and manage the appliance independently of the NetScaler software.

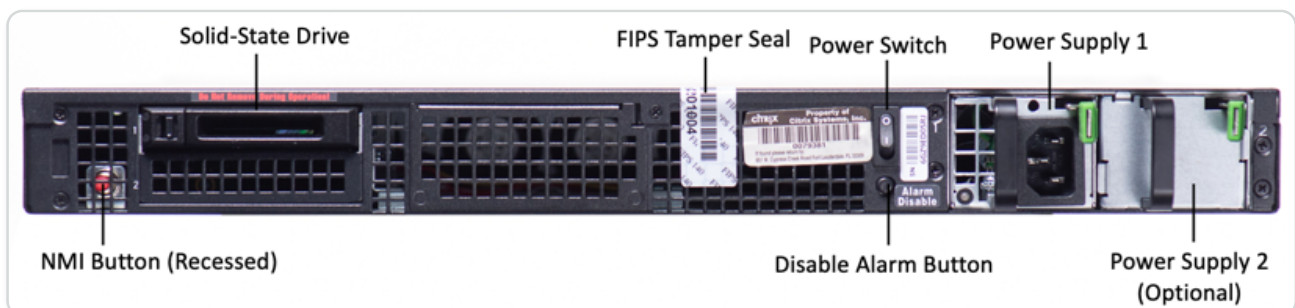
- One 10/100/1000Base-T RJ45 copper Ethernet Management Port, numbered 0/1. This port is used to connect directly to the appliance for NetScaler administration functions.
- Six 10/100/1000Base-T RJ45 copper Ethernet Ports, numbered 1/1 to 1/6 from left to right.
- Four 10G/1G SFP+ Ethernet Ports, numbered 10/1 to 10/4 from left to right.
- USB port (reserved for a future release).

The following table indicates the LED status for the Management and LOM ports:

LED COLOR	LED INDICATES
OFF	No connection or 10 Mbps speed
Flashing YELLOW	Active
Flashing GREEN	100 Mbps speed
AMBER	1 Gbps speed

The following figure shows the back panel of the MPX 8900 FIPS certified appliance.

Figure 2. NetScaler MPX 8900 FIPS certified appliance, back panel



The following components are visible on the back panel of the MPX 8900 FIPS certified appliance:

- One 240 GB or larger removable solid-state drive (SSD).

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.

- One power supply, rated at 450 watts, 100–240 VAC (second power supply for redundancy is a customer installable option). Maximum power consumption is 275 watts and typical power consumption is 225 watts. The following table indicates the LED status of each power supply:

LED COLOR	LED INDICATES
OFF	No power to any power supply in the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.

- **Disable alarm button**, which is functional only when the appliance has two power supplies. Press this button to silence the power alarm when one of two power supplies loses input power (second power supply optional) or when a power supply is malfunctioning.
- Non-Maskable Interrupt (NMI) Button, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the **Remote Control** menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

For information about configuring this appliance see [NetScaler MPX FIPS certified appliances](#).

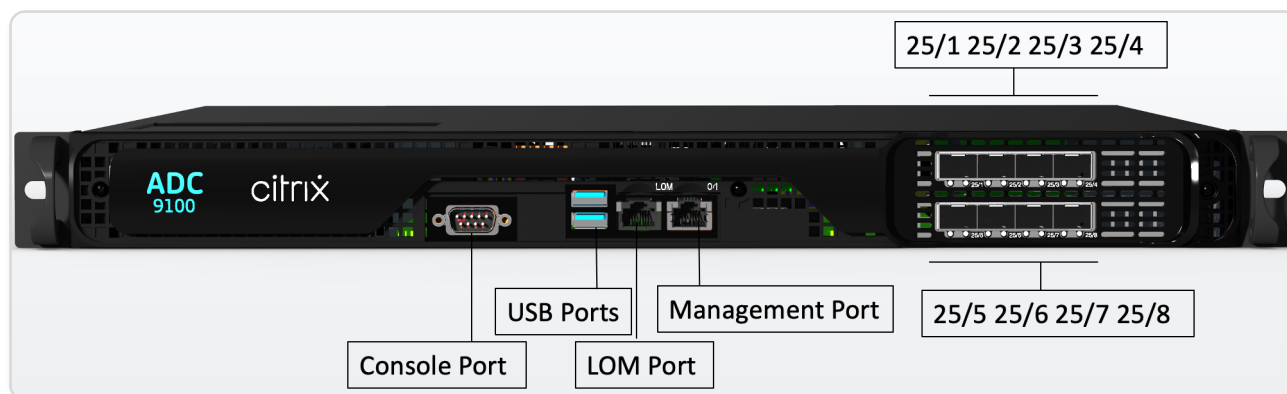
NetScaler MPX 9100

The NetScaler MPX 9100 appliance is a 1U appliance. This platform has a single 10-core processor and 64 GB of memory. The appliance provides a total of eight 25G SFP28 ports.

For information on the software releases supported on the ADC hardware platforms, see [Hardware-Software Release Matrix](#).

The following figure shows the front panel of the MPX 9100 appliance.

Figure 1. NetScaler MPX 9100, front panel

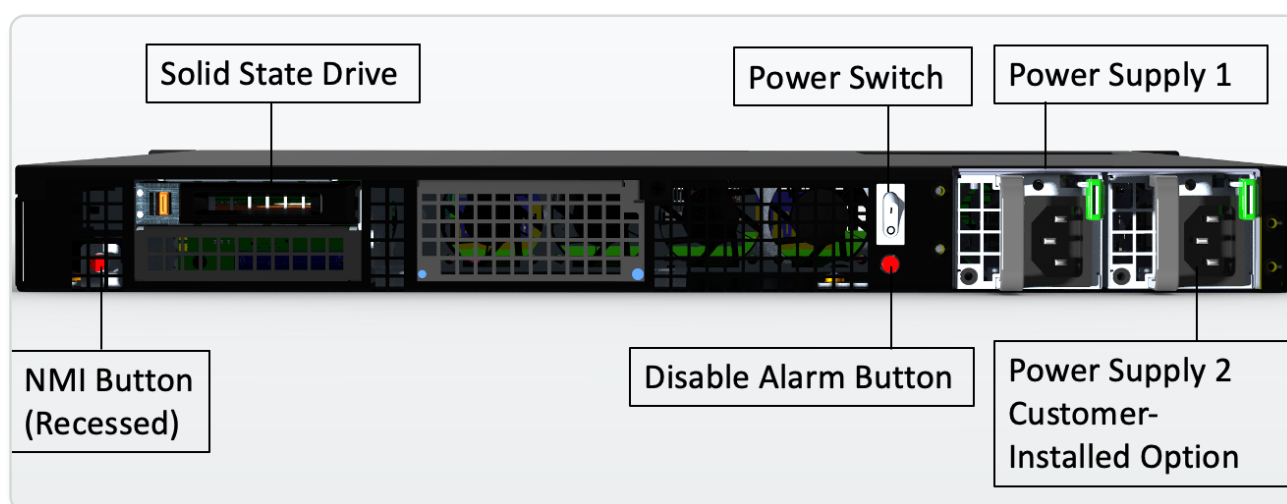


The NetScaler MPX 9100 series appliances have the following ports:

- RS232 serial Console port.
- One 10/100/1000Base-T RJ45 copper Ethernet LOM port. Use this port to remotely monitor and manage the appliance independently of the ADC software.
- One 10/100/1000Base-T RJ45 copper Ethernet management port, numbered 0/1. This port is used to connect directly to the appliance for ADC administration functions.
- Two USB ports (reserved for a future release).
- Eight 25G SFP28 ports, numbered 25/1 to 25/8. For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G ports](#).

The following figure shows the back panel of the MPX 9100 appliance.

Figure 2. NetScaler MPX 9100, back panel



The following components are visible on the back panel of the MPX 9100 appliance:

- One 480 GB removable solid-state drive (SSD).

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- Two power supplies (for hardware shipped after 13th Dec, 2023), rated at 450 watts, 100–240 VAC. Maximum power consumption is 275 watts and typical power consumption is 225 watts. The following table indicates the LED status of each power supply:

LED COLOR	LED INDICATES
OFF	No power to any power supply in the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.

- **Disable alarm button**, which is functional only when the appliance has two power supplies. Press this button to silence the power alarm when one of two power supplies loses input power (second power supply optional) or when a power supply is malfunctioning.
- **Non-Maskable Interrupt (NMI) Button**, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the **Remote Control** menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

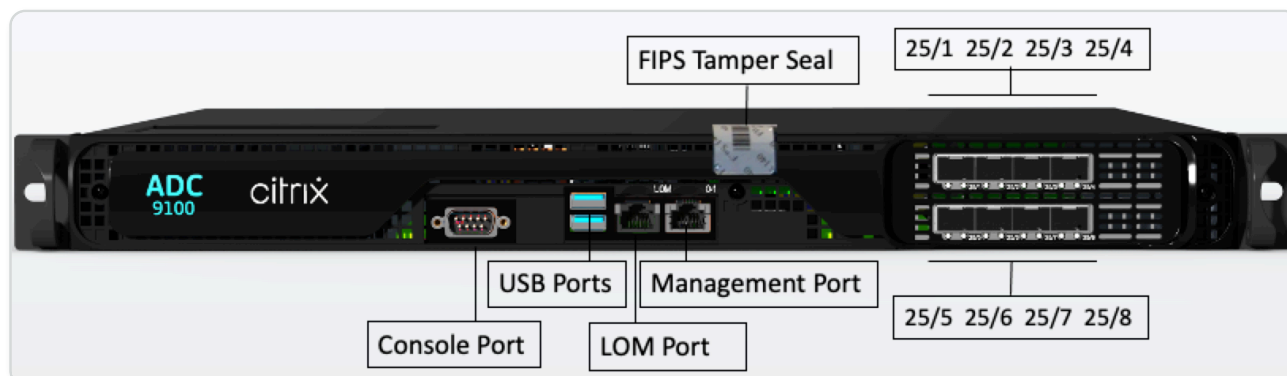
NetScaler MPX 9100 FIPS

The NetScaler MPX 9100 FIPS appliance is a 1U appliance. This platform has a single 10-core processor and 64 GB of memory. The appliance provides a total of eight 25G SFP28 ports.

For information on the software releases supported on the ADC hardware platforms, see [Hardware-Software Release Matrix](#).

The following figure shows the front panel of the MPX 9100 FIPS appliance.

Figure 1. NetScaler MPX 9100 FIPS, front panel

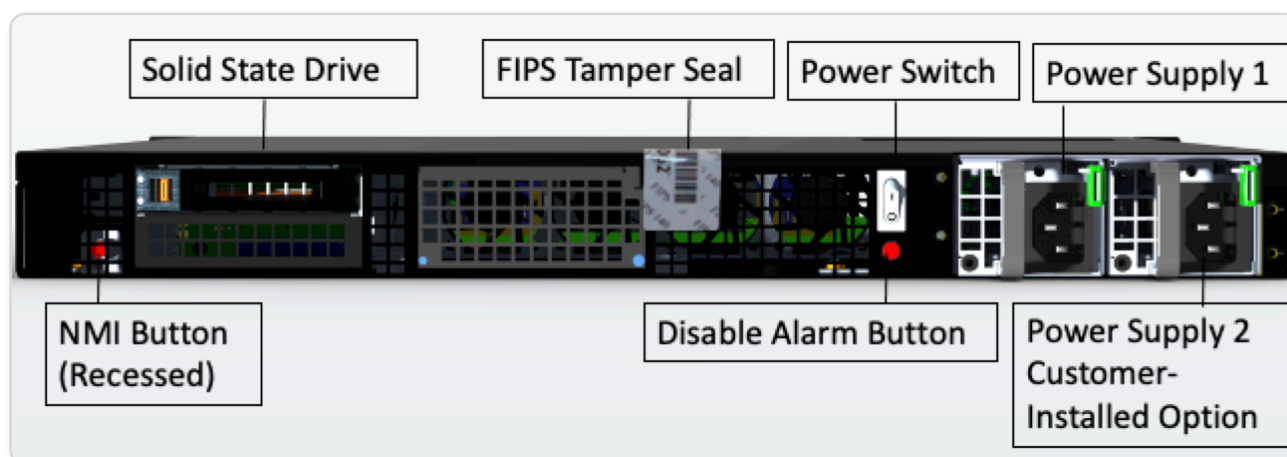


The NetScaler MPX 9100 FIPS series appliances have the following ports:

- RS232 serial Console port.
- One 10/100/1000Base-T RJ45 copper Ethernet LOM port. Use this port to remotely monitor and manage the appliance independently of the ADC software.
- One 10/100/1000Base-T RJ45 copper Ethernet management port, numbered 0/1. This port is used to connect directly to the appliance for ADC administration functions.
- Two USB ports (reserved for a future release).
- Eight 25G SFP28 ports, numbered 25/1 to 25/8. For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G ports](#).

The following figure shows the back panel of the MPX 9100 FIPS appliance.

Figure 2. NetScaler MPX 9100 FIPS, back panel



The following components are visible on the back panel of the MPX 9100 FIPS appliance:

- One 480 GB removable solid-state drive (SSD).

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- One power supply, rated at 450 watts, 100–240 VAC (second power supply for redundancy is a customer-installable option). Maximum power consumption is 275 watts and typical power consumption is 225 watts. The following table indicates the LED status of each power supply:

LED COLOR	LED INDICATES
OFF	No power to any power supply in the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.

- **Disable alarm button**, which is functional only when the appliance has two power supplies. Press this button to silence the power alarm when one of two power supplies loses input power (second power supply optional) or when a power supply is malfunctioning.
- **Non-Maskable Interrupt (NMI) Button**, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the **Remote Control** menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

For information about configuring this appliance see [MPX FIPS appliances](#).

NetScaler MPX 9200

Welcome to the next-generation NetScaler MPX 9200 platform. This section provides comprehensive instructions on how to deploy your appliance efficiently and configure it for optimal performance.

The MPX 9200 1U platform represents the latest advancement in NetScaler technology, featuring enhanced processing power, improved connectivity options, and robust management capabilities.

NOTE:

For certification information and FIPS-specific software information, see [MPX FIPS appliances](#).

Key specifications

- Intel Xeon 5th-generation processor architecture
- 128 GB DDR5 ECC memory for enhanced performance
- Dual 4 x 50G high-speed ports with PCIe 4.0 support
- Redundant CRPS power supplies for high availability
- Dedicated BMC for comprehensive out-of-band management

Prepare for installation

Before installing your new appliance, carefully unpack the unit and verify that all the components are present. The only tools required for installing the appliance are a Phillips screwdriver, a flathead screwdriver, and a cage nut insertion tool (if installing into square-hole racks). Your NetScaler 1U package should include the following items:

Hardware components

- 1x NetScaler MPX 9200 appliance
- 1x standard 4-post rail kit (19-inch rack compatible), which includes:
 - Left rail (x1)
 - Right rail (x1)
 - Mounting screw kit (includes M4x4L, M4x6L, M3x6L, M5x20L screws)

- Rackmount Ear Kit (x1)

The included accessory kit contains essential connectivity hardware, including two power cords to support redundant power supply operation.

NOTES:

- Rail kit compatibility varies by rack manufacturer and configuration. If the provided rail kit does not fit your specific rack infrastructure, contact your NetScaler sales representative immediately to obtain an appropriate alternative mounting solution.
- Before proceeding, examine all components for shipping damage. Report any damaged items to your carrier and NetScaler support before beginning the installation process.

Infrastructure requirements

- Compatible 19-inch rack with adequate depth clearance (minimum 550 mm)
- Proper airflow management with front-to-rear cooling path
- Available rack units (1U height requirement)
- Adequate weight support (system weight: 25.2 lbs)

Network requirements

- Administrative LAN with available switch ports
- Dedicated out-of-band management network
- Appropriate network cables (Cat5e/Cat6 for management, fiber/DAC for data)

Power requirements

- Dual power sources (recommended for redundancy)
- Frequency operating range: 47 Hz – 63 Hz
- Adequate power capacity (full load 110 V: 406 W/240 V: 394.57 W)
- PSU input connector: IEC320-C14 (Male)
- Required power cord: IEC320-C13 to NEMA 5-15P (or regional equivalent)
- Rating: Minimum 10 A / 250 V

Detailed AC input voltage specifications

VOLTAGE RANGE	MINIMUM	RATED OPERATING RANGE	MAXIMUM	BROWN OUT	BROWN IN
115 V Range	90 Vrms	100-127 Vrms	140 Vrms	75 Vac+/-4 V	85 Vac+/-4 V
230 V Range	180 Vrms	200-240 Vrms	264 Vrms	N/A	N/A

Maximum input current requirements

INPUT VOLTAGE RANGE	MAXIMUM CURRENT
100 Vac – 127 Vac	10 A
200 Vac – 240 Vac	5 A

Management station requirements

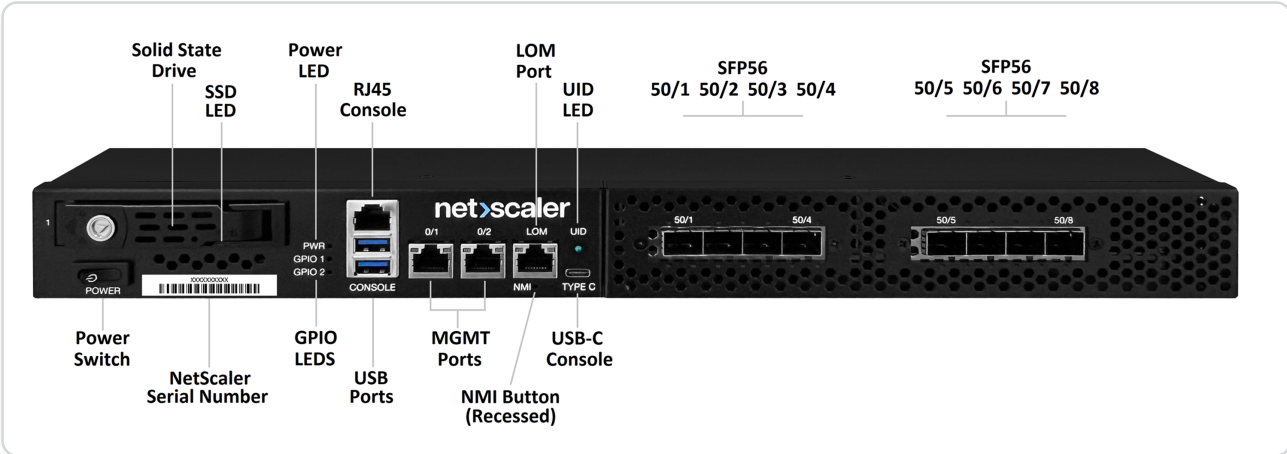
- Workstation or laptop (Windows or macOS) with network connectivity
- Web browser with JavaScript and HTML5 support (Chrome, Firefox, Safari, or Edge)
- Terminal emulator software for CLI access
- Administrative privileges for network configuration

Hardware platform

Front panel components

The 1U front panel integrates comprehensive connectivity and management interfaces designed for enterprise data center environments. Each component serves a specific function in system operation and management.

The following figure shows the front panel of the MPX 9200 appliance.



LABEL	COMPONENT TYPE	TECHNICAL SPECIFICATION	PRIMARY FUNCTION
CONSOLE	RJ-45 Port	RS232 compatible	Primary console interface for direct system access
MGMT 0/1 & 0/2	Dual Ethernet Ports (1000 Base-T)	1 GbE Ethernet	NetScaler management network connectivity
LOM	Dedicated IPMI port	Intelligent Platform Management	Out-of-band monitoring and control system hardware
NMI	Pinhole button	Non-maskable interrupt	Kernel core dump generation
PWR	Soft-Push button 4-second holds for on/off	Power management	System power control with graceful shutdown
TYPE-C	Optional Port	USB Type-C	Alternate console and debug interface
UID	Locator LED	Blue LED indicator	Remote identification capability
GPIO1/GPIO2	User-defined GPIOs	General purpose I/O	Currently disabled in 1U platform design

LABEL	COMPONENT TYPE	TECHNICAL SPECIFICATION	PRIMARY FUNCTION
50/1–50/8	Data Ports	50GbE network interface card NIC	Quad-port SFP56 with PCIe 4.0 x16

Console port configuration: The primary console port eliminates the need for legacy RS232 adapters by providing direct RJ-45 connectivity, which simplifies cable management and improves connection reliability.

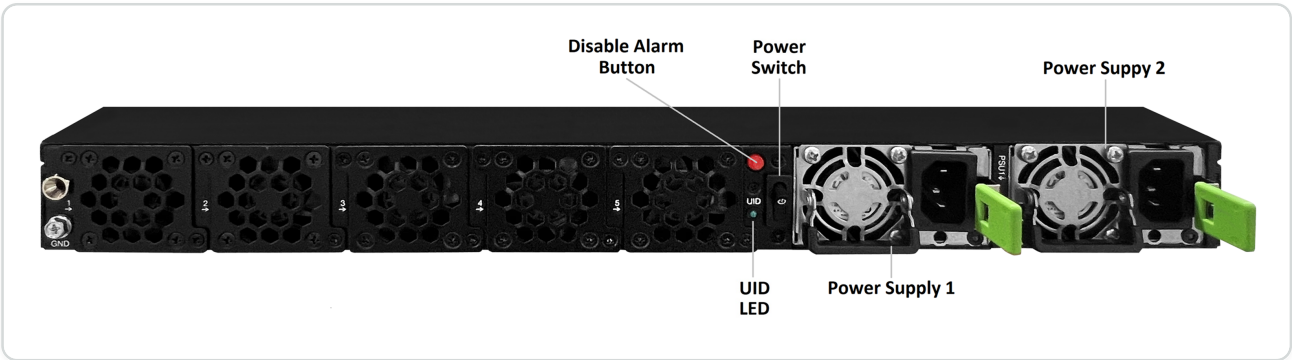
Management port operation: Dual management ports support link aggregation and provide necessary redundancy for secure administrative access.

Data Port Capabilities: High-performance data ports deliver 50GbE per port and support various transceiver types, including SFP56 modules.

Rear panel components

The rear panel houses critical infrastructure components, including dual power supplies, the cooling system, a UID indicator, a PSU alarm, and a secondary power control button.

The following figure shows the back panel of the MPX 9200 appliance.



COMPONENT	TECHNICAL DETAILS	OPERATIONAL CHARACTERISTICS	SERVICE INFORMATION
PSU1 / PSU2	CRPS PSU	Redundant N+1 configuration	Hot-swappable during operation
2nd UID	Locator LED	Blue LED indicator	Remote identification capability
Rear Power Button	Optional control	Mirrors front button function	Dual power control access

COMPONENT	TECHNICAL DETAILS	OPERATIONAL CHARACTERISTICS	SERVICE INFORMATION
Fan Modules	5x system fans	Smart fan control by using the BMC	No field replaceable Fan FRU

Power supply architecture: The Common Redundant Power Supply (CRPS) design ensures continuous operation in the event of a single power supply failure. Each unit is hot-swappable, enabling maintenance without system downtime.

Cooling system design: The intelligent fan control system automatically adjusts cooling based on internal temperatures and current load conditions. Five fan modules provide N+1 redundancy, ensuring simplified serviceability.

Identification system: The Unit Identifier (UID) LED facilitates rapid system identification in dense rack environments. It supports both local activation and remote management through the system interface.

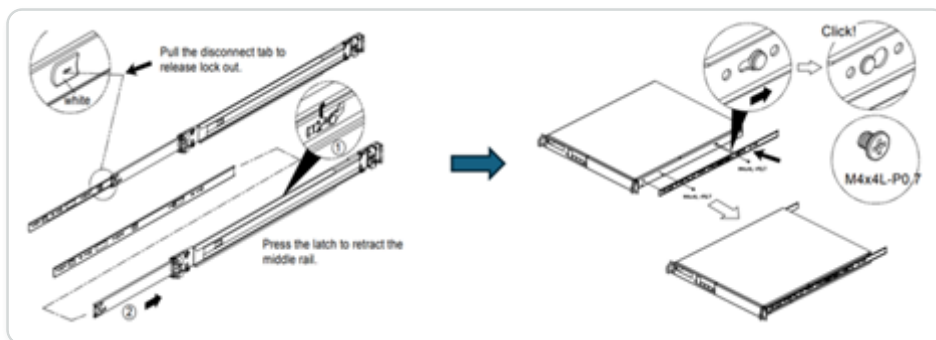
Install the hardware

Rack-mount the appliance

Perform the following procedure to ensure proper appliance mounting and system performance.

Remove the inner rails from the rail assembly

1. Pull the white disconnect tab to release and detach the inner rail member from each slide rail.
2. With the stamped text facing outward, align the inner rail with the chassis mount points, using the black reference markers on both sides of the chassis.
3. Slide the rail toward the rear until it clicks firmly into the locked position.
4. Fasten each inner rail using the provided M4x4L screws, as shown in the diagram.
5. Repeat this process for both the left and right sides of the chassis.

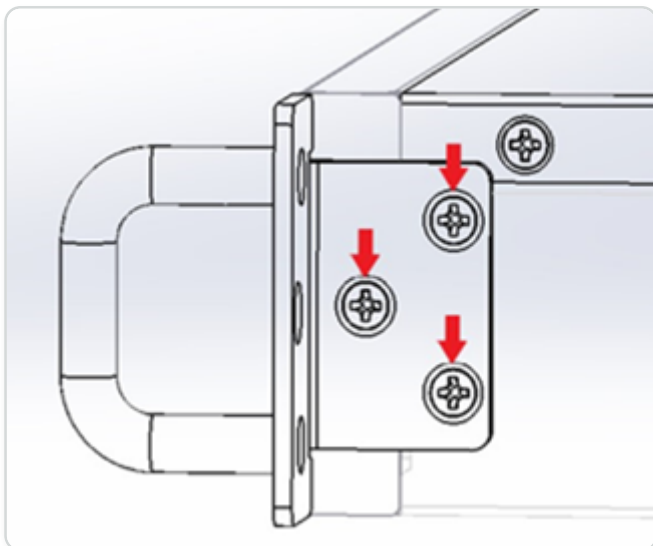


Chassis mounting ear installation

1. Place the rack-mount ears against the left and right sides of the chassis.
2. Align each ear with the designated screw holes on the front of the chassis.
3. Fasten each mounting ear using three M3x6L screws per side.
4. Ensure that the ears are flush against the chassis and properly aligned.
5. Confirm that the mounting ears do not obstruct front-panel ports or LED indicators.

NOTE:

The left and right-side rails are symmetrical. Repeat the installation steps for both sides as illustrated in the diagrams.



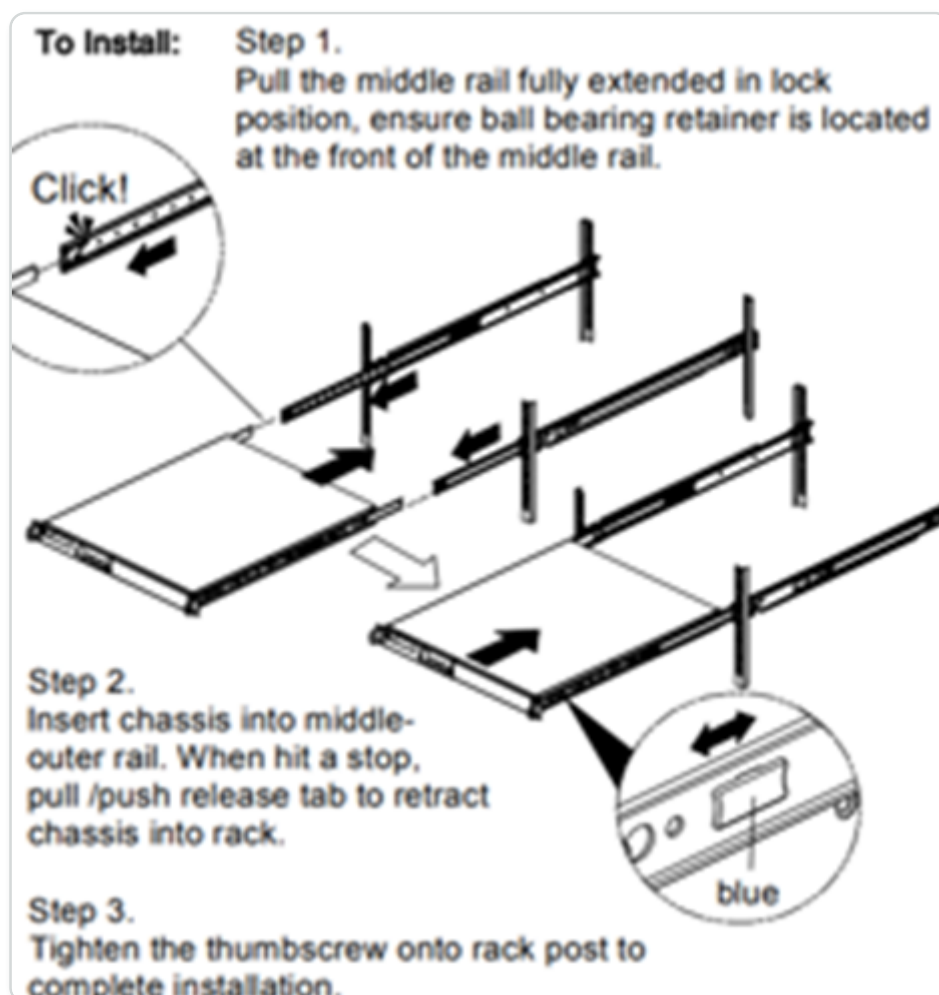
Outer slide rail assembly installation

1. Hold the outer rail assembly against the rack frame.
2. Align the mounting brackets with the rack post holes at the selected U-height.

3. Insert the rail mounting mechanism into the rack posts until it engages.
4. Listen for an audible "click" to confirm that the rail is properly seated and locked.
5. Ensure both the front and rear mounting points are securely attached to the posts.
6. Verify that the rails are level and parallel using the numbered rack post markings.
7. Repeat this process for both the left and right outer rail assemblies.

Mount the chassis into the rack

1. Carefully align the chassis-mounted inner rails with the rack-mounted outer rails.
2. Smoothly slide the system into the rack until the locking mechanism engages.
3. If necessary, apply light, even pressure to ensure the unit locks securely into place.



Safety requirements

For safety and equipment durability, ensure that the following requirements are met:

1. Maintain a minimum of 2 inches of clearance at the front and rear of the chassis to ensure proper ventilation.
2. Verify the rack's weight capacity before installation and ensure that the rack is stable and properly secured to the floor.
3. Use proper lifting techniques. The system weight is approximately 25.2 lbs.
4. Strictly follow electrical safety procedures when connecting the appliance to a power source.

Airflow management

The 1U platform is designed for front-to-rear airflow. Unobstructed passage is required for optimal cooling performance. Restricted airflow results in thermal overheating and the automatic activation of system protection mechanisms (throttling or shutdown).

Network and power connections

Connection sequence

Perform the following sequence to ensure proper system initialization and to prevent configuration conflicts.

1. Management network connectivity

- a. Connect the 0/1 MGMT port to your administrative LAN by using an appropriate Ethernet cable.
- b. Ensure that the network switch port is configured to support auto-negotiation.
- c. Verify network connectivity and ensure that the correct VLAN configuration is applied, if applicable.
- d. Document the assigned IP address and network parameters for future reference.

2. Out-of-Band (OOB) management setup

- a. Connect the LOM port to your dedicated OOB management network.
- b. Use network infrastructure that is physically or logically separate from production traffic.
- c. Configure the port for dedicated mode operation (default).
- d. Ensure management network isolation for security.

3. Data port configuration

- a. Insert the appropriate SFP+, SFP28, or SFP56 transceiver modules into the data ports.
- b. Ensure that transceiver specifications align with your existing network infrastructure requirements.
- c. Connect the fiber optic or direct cables to the data ports.
- d. Confirm that the cable specifications support the required port speed (example: 50GbE).

4. Power system connection

- a. Plug the first power cord into the PSU1 input receptacle.
- b. Plug the second power cord into the PSU2 input receptacle.
- c. Ensure that the power source meets requirements (100–240 VAC, 50–60 Hz).
- d. To ensure power redundancy, connect each PSU to a separate power circuit.

5. System startup

- a. Press the front-panel power button to begin the boot sequence.
- b. Observe the front-panel LED indicators during the startup process.
- c. Verify that both power supply LEDs show a solid green state, indicating normal operation.
- d. Allow the system to complete the full boot cycle before attempting to access the management interface.

Power supply status indicators

The CRPS power supplies provide comprehensive status monitoring through integrated LED indicators located on each unit's faceplate.

PSU LED indicator status:

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
Solid GREEN	AC present, all DC rails active under load	Normal operation	None - normal
1 Hz Blink GREEN	AC present, 5 Vsb active, main rails idle	Redundant standby (N+1)	None - normal

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
Solid AMBER	AC input lost or disconnected	Lost redundancy (if N+1) or system down	Check AC power connection
1 Hz Blink AMBER	OTP/OVP warning threshold reached	Degraded PSU operation/Potential shutdown	Verify PSU cooling and airflow
Solid AMBER	Critical Fault (OCP/OVP/OTP tripped)	PSU shutdown for protection	Replace the PSU immediately

Monitoring recommendations:

- Regularly inspect PSU LED indicators during system operation.
- Document all occurrences of amber LED states to assist in long-term reliability and trending analysis.
- Replace modules with blinking amber status indicators during the next scheduled maintenance cycle.
- Contact customer support for any persistent warning conditions.

System access and configuration

Console connection setup by using the GUI

Use this method for initial deployment and ongoing administration.

Platform-specific access information

- Access the physical appliance directly using the MGMT 0/1 port.
- Default IP address (NSIP): 192.168.100.1
- Default subnet mask: 255.255.0.0/16

NOTE:

Use the single management interface for full system administration.

Perform the following steps to initialize the appliance

1. Network preparation

- a. Connect your management workstation to the MGMT 0/1 port or a port on the same management VLAN.
- b. Configure your workstation network settings (if required).
- c. Verify the network path by performing a ping test to the default NSIP address: 192.168.100.1.
- d. Ensure that any local firewalls allow HTTPS (port 443) traffic to the appliance.

2. Browser initialization

- a. Open a web browser (Chrome, Firefox, Safari, or Edge)
- b. Enter the URL `https://192.168.100.1`.

3. Initial authentication

- a. Enter the default administrative user: `nsroot`.
- b. Enter the system serial number exactly as it appears on the physical chassis label (case-sensitive).
- c. Click **Login** or press **Enter**.

On successful authentication, the system redirects you to the **Initial Configuration Wizard**.

4. Setup wizard configuration

The **Setup Wizard** guides you through the following essential parameters:

- a. NSIP address configuration: Set a NetScaler IP address for management access.
- b. Network parameters: Configure the subnet mask and default gateway.
- c. SNIP configuration: Add subnet IP addresses for client communication.
- d. DNS settings: Configure DNS server addresses for name resolution.
- e. Hostname setup: Assign a unique, descriptive hostname to identify the appliance on the network.
- f. Administrative password: Change the default password to a strong, secure administrative password.

Common default IP address configuration

INTERFACE OR SERVICE	DEFAULT USER LOGIN CREDENTIALS	DEFAULT IP ADDRESS	SUBNET MASK OR GATEWAY	DESCRIPTION
NSIP address (MGMT 0 or 1)	nsroot or product SN	192.168.100.1	255.255.0.0/16	Default NetScaler IP address for initial configuration
LOM or IPMI Port	nsroot or product SN	192.168.1.3	255.255.255.0/24	Out-of-band management IPMI

Navigation best practices

- Use tab-based navigation to move quickly between input fields.
- Hover your cursor over field labels or information icons to view additional help information.
- Ensure that you save your changes before navigating to a different configuration section.
- Avoid using the browser's back button, as it might result in the loss of unsaved configuration data or session timeouts.

Console connection setup by using the CLI

1. Physical connection

- a. Connect an RJ-45 serial cable to the console port on the front panel.
- b. Connect the other end of the cable to your workstation's serial port or to a USB-to-serial adapter.

Ensure that the cable is seated firmly at both ends to prevent data corruption or character "scrambling" during the session.

2. Terminal emulator configuration

Open your terminal emulation software (such as PuTTY, Tera Term, or SecureCRT) and configure the following settings:

SETTING	VALUE
Baud Rate	9600 bps
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None (Disabled)
Terminal Type	ANSI
Putty Keypad Mode	VT 100

3. Session establishment

- Open the terminal emulator application.
- Establish a connection by using the configured settings.
- Press Enter to trigger the login prompt if it does not appear automatically.

Wait for the login prompt to display.

4. Authentication process

- At the login prompt, type `nsroot`.
- At the password prompt, enter the system serial number (found on the chassis label).
- On successful authentication, the system displays the NetScaler command prompt.

NOTE:

All login credentials are case-sensitive.

Sample configuration

Perform the following steps to configure basic network connectivity:

- Configure a NetScaler IP address and subnet mask.

```
set ns config -ipaddress 192.0.2.255 -netmask 255.255.255.0
```

- Add a subnet IP address for client communication.

```
add ns ip 192.0.2.254 255.255.255.0 -type snip
```

- Configure the default route for external connectivity.

```
add route 0.0.0.0 0.0.0.0 10.0.0.1
```

- Configure the system hostname.

```
set ns hostname NS9200-1
```

- Change the administrative password for security.

```
set system user nsroot -password <yourpassword>
```

```
Enter password: *****
```

```
Confirm password: *****
```

- Save configuration to persistent storage.

```
save ns config
```

- Restart the system to apply changes.

```
reboot
```

Basic verification commands

- Check the system software version.

```
show version
```

- Check system hardware information.

```
show hardware
```

- Display the current IP configuration.

```
show ip
```

- Show all network interfaces status.

```
show interface
```

- Display routing table

```
show route
```

- Verify that the configuration saves status.

```
show config
```

System specifications

Hardware configurations

The MPX 9200 platform integrates enterprise-grade hardware built to deliver high-performance applications with consistent reliability.

Core system architecture

Component Category	Specification Details	Performance Characteristics
Regulatory Model	1U 3P3A	FCC and international compliance designation
Processor Architecture	Intel Xeon 5th Generation	20 cores per socket
Platform Chipset	Intel C741 PCH	Advanced platform controller hub
BMC Controller	Baseboard Management Controller with IPMI 2.0	Remote KVM, and hardware monitoring
System Memory	128 GB DDR5 5600 ECC RDIMM	2x 64 GB modules with error correction
Primary Storage	800 GB NVMe U.2/U.3	2.5" form factor, high-performance SSD
Management Connectivity	Two 1GbE RJ45 (1000Base-T)	Dedicated management port access

Component Category	Specification Details	Performance Characteristics
Data Connectivity	Two 4×50G SFP56 network interfaces	PCIe 4.0 x16 interface

Memory architecture

- **DDR5 technology:** Provides enhanced bandwidth and improved power efficiency.
- **ECC (Error Correcting Code):** Maintains data integrity and enhances overall system stability.
- **RDIMM design:** Uses registered DIMMs to support high-density memory configurations.

Storage system

- **NVMe interface:** Enables high-throughput storage with low latency.
- **U.2/U.3 compatibility:** Supports current and next-generation storage standards.
- **Optimized capacity:** Features 800 GB of storage, specifically tuned for system configurations and log retention.

Network interfaces

- **SFP56 connectivity:** Flexible ports that support a wide range of transceiver types and cabling options.
- **PCIe 4.0 integration:** Provides optimized bandwidth for 4x 50GbE high-speed connectivity.
- **Packet offloading:** Hardware-level acceleration for optimized network performance.

Thermal management

- Acoustic optimization for data center environments.
- Redundant cooling with fan modules.
- Temperature monitoring through the BMC interface.

Power and environmental specifications

Power system specifications

PARAMETER	SPECIFICATION	OPERATING RANGE	NOTES
Power Supply Configuration	2x CRPS PSUs	Redundant N+1 operation	Hot-swappable units
Input Voltage Range	100–240 VAC	Universal input compatibility	Auto-sensing
Input Frequency	50–60 Hz	Standard utility frequency	±3 Hz tolerance
Input Current	100–127 V: 10.0 A	Variable by input voltage	Maximum ratings
	200–240 V: 5.0 A		
Typical System Power Consumption	300 W	Normal operational load	Steady-state operation
Maximum System Power Consumption	406 W	Peak system utilization	Full load + redundancy

Environmental specifications

ENVIRONMENTAL FACTOR	OPERATING RANGE	STORAGE RANGE	CRITICAL LIMITS
Ambient Temperature	0°C to 45°C (32°F to 113°F)	-40°C to 70°C	50°C Absolute maximum
Relative Humidity	10% to 90% RH	10% to 95% RH	Non-condensing
Operating Altitude	0 to 5,000 m	0 to 15,200 m	Derated above 8,000 m
Typical System Airflow	80.3 CFM	N/A	100% load at 25°C ambient

ENVIRONMENTAL FACTOR	OPERATING RANGE	STORAGE RANGE	CRITICAL LIMITS
Maximum System Airflow	104 CFM	N/A	100% load at elevated temp

Physical specifications

DIMENSION	MEASUREMENT	STANDARD COMPLIANCE
Width	443 mm (17.4")	EIA 310-D 19-inch rack
Depth	550 mm (21.7")	Standard server depth
Height	44 mm (1.73")	1U Rack unit
System Weight	11.4 kg (25.2 lbs)	Approximate operational weight
Package Weight	18.6 kg (41.0 lbs)	Shipping configuration

System LED status

The system provides real-time status monitoring by using the LED indicators located on the front and rear panels.

Front panel LED status

LED INDICATOR	NORMAL OPERATION	FAULT CONDITION	DESCRIPTION
PWR (Power)	Solid Green	Off	Indicates system power and initialization status
GPIO1	Off	N/A	User-defined function (Disabled by default)

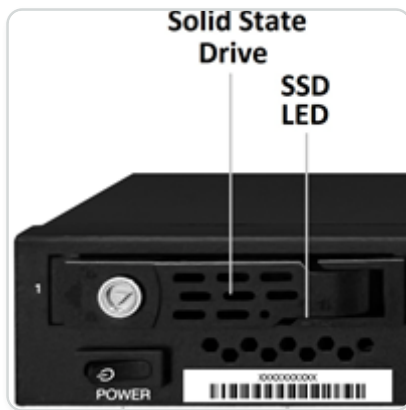
LED INDICATOR	NORMAL OPERATION	FAULT CONDITION	DESCRIPTION
GPIO2	Off	N/A	User-defined function (Disabled by default)

Power supply LED status

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
Solid GREEN	AC present, all DC rails active under load	Normal operation	None - normal
1 Hz Blink GREEN	AC present, 12Vsb active including 5Vsb for BMC power, main rails idle	Redundant standby (N+1)	None - normal
Solid AMBER	AC input lost or disconnected	Lost redundancy (if N+1) or system down	Check AC power connection
1 Hz Blink AMBER	OCP/OVP/OTP warning threshold reached	Degraded PSU operation/Potential shutdown	Verify PSU cooling and airflow
Solid AMBER	Critical Fault (OCP/OVP/OTP tripped)	PSU shutdown for protection	Replace the PSU immediately

NVMe storage LED status

The NVMe SSD activity indicators provide real-time storage operation status.



Left LED (Power/Present) indicator

CONDITION	LED BEHAVIOR
No SSD present	Off
SSD installed and powered	Solid Green

Right LED (Activity) indicator

NVME BRAND	CONDITION	LED BEHAVIOR
Micron	Idle	Very slow blinking
	Active (I/O in flight)	Fast Blinking (4 Hz)
Samsung	Idle	LED Off
	Active (I/O in flight)	Fast Blinking (4 Hz)

Additional information resources

- For information about step-by-step procedures for performing system upgrades and downgrades, see [Upgrade and downgrade a NetScaler appliance](#).
- For information about deploying redundant NetScaler configurations, see [Configuring high availability](#).

Information required for technical support

Before contacting NetScaler Support, gather the following information to ensure an efficient resolution process:

- **Hardware serial number:** Locate this on the physical chassis label.
- **Software version:** Provide the current release version and specific build number (Example: Release 14.1 Build 12.35).
- **Problem description:** Document the specific issue, including exact error codes, timestamps of the occurrence, and any recent changes to the environment.
- **System Configuration:** Provide the network environment and relevant configuration files (Example: ns.conf).
- **Log files:** Collect the system logs and diagnostic information.

NetScaler MPX 9200 FIPS

Welcome to the next-generation NetScaler MPX 9200 FIPS platform. This section provides comprehensive instructions on how to deploy your appliance efficiently and configure it for optimal performance.

The MPX 9200 FIPS is a 1U FIPS 140-3 Level 2 application delivery platform. It represents the latest advancement in NetScaler technology, featuring enhanced processing power, improved connectivity options, and robust management capabilities.

NOTE:

For certification information and FIPS-specific software information, see [MPX FIPS appliances](#).

Key specifications

- **Processor:** Intel Xeon 5th-generation processor architecture
- **Memory:** 128 GB DDR5 ECC RDIMM memory for enhanced performance
- **Data ports:** Dual 4 x 50G high-speed ports with PCIe 4.0 support
- **Power:** Redundant CRPS power supplies for high availability
- **Management:** Dedicated BMC with IPMI 2.0 and Redfish for full out-of-band control
- **Security:** FIPS 140-3 Level 2 compliance with tamper-evident seals on the chassis

Prepare for installation

Carefully inspect your shipment to ensure that all components are present and undamaged. The following items are included with your NetScaler 1U appliance:

Before installing your new appliance, carefully unpack the unit and verify that all the components are present. The only tools required for installing the appliance are a Phillips screwdriver, a flathead screwdriver, and a cage nut insertion tool (if installing into square-hole racks). Your NetScaler 1U package should include the following items:

Hardware components:

- 1x NetScaler MPX 9200 FIPS appliance, with the front ear and handle assemblies pre-installed on the chassis
- 1x standard 4-post rail kit (19-inch rack compatible), which includes:
 - Left rail (x1)
 - Right rail (x1)
 - Mounting screw kit (includes M4x4L, M4x6L, and M5x20L screws)

The included accessory kit contains essential connectivity hardware, including two power cords to support redundant power supply operation.

NOTES:

- Rail kit compatibility varies by rack manufacturer and configuration. If the provided rail kit does not fit your specific rack infrastructure, contact your NetScaler sales representative immediately to obtain an appropriate alternative mounting solution.
- Before proceeding, examine all components for shipping damage. Report any damaged items to your carrier and NetScaler support before beginning the installation process.

Infrastructure requirements

- Compatible 19-inch rack with adequate depth clearance (minimum 550 mm)
- Proper airflow management with front-to-rear cooling path
- Available rack units (1U height requirement)
- Adequate weight support (system weight: 25.2 lbs)

Network infrastructure:

- Administrative LAN with available switch ports
- Dedicated out-of-band management network
- Appropriate network cables (Cat5e/Cat6 for management, fiber/DAC for data)
- A 50 GbE capable switch for the SFP56 data ports

Power requirements:

- Dual power sources (recommended for redundancy)
- Frequency operating range: 47 Hz – 63 Hz
- Adequate power capacity (full load 110 V: 406 W/240 V: 394.57 W)
- PSU input connector: IEC320-C14 (Male)
- Required power cord: IEC320-C13 to NEMA 5-15P (or regional equivalent)
- Rating: Minimum 10 A / 250 V

Detailed AC input voltage specifications:

VOLTAGE RANGE	MINIMUM	RATED OPERATING RANGE	MAXIMUM	BROWN OUT	BROWN IN
115 V Range	90 Vrms	100-127 Vrms	140 Vrms	75 Vac+/-4 V	85 Vac+/-4 V
230 V Range	180 Vrms	200-240 Vrms	264 Vrms	N/A	N/A

Maximum input current requirements:

INPUT VOLTAGE RANGE	MAXIMUM CURRENT
100 Vac – 127 Vac	10 A
200 Vac – 240 Vac	5 A
240 Vdc	5 A

Management station requirements

- Workstation or laptop (Windows or macOS) with network connectivity
- Web browser with JavaScript and HTML5 support (Chrome, Firefox, Safari, or Edge)
- Terminal emulator software for CLI access
- Administrative privileges for network configuration

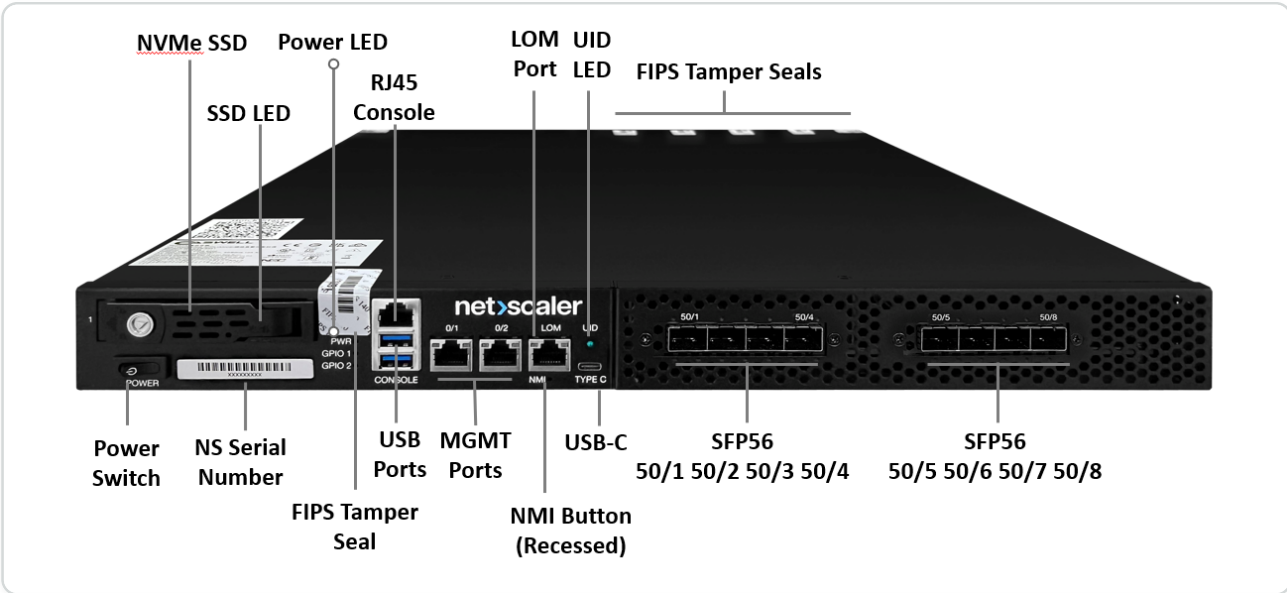
Hardware platform

The MPX 9200 FIPS integrates management, console, and high-speed data interfaces on the front panel, and power, cooling, and identification components on the rear panel. Identify each component before you cable the appliance.

Front panel components

The front panel groups the console and management ports, the storage bay, the data ports, and the FIPS tamper seals.

The following figure shows the front panel of the MPX 9200 FIPS appliance.



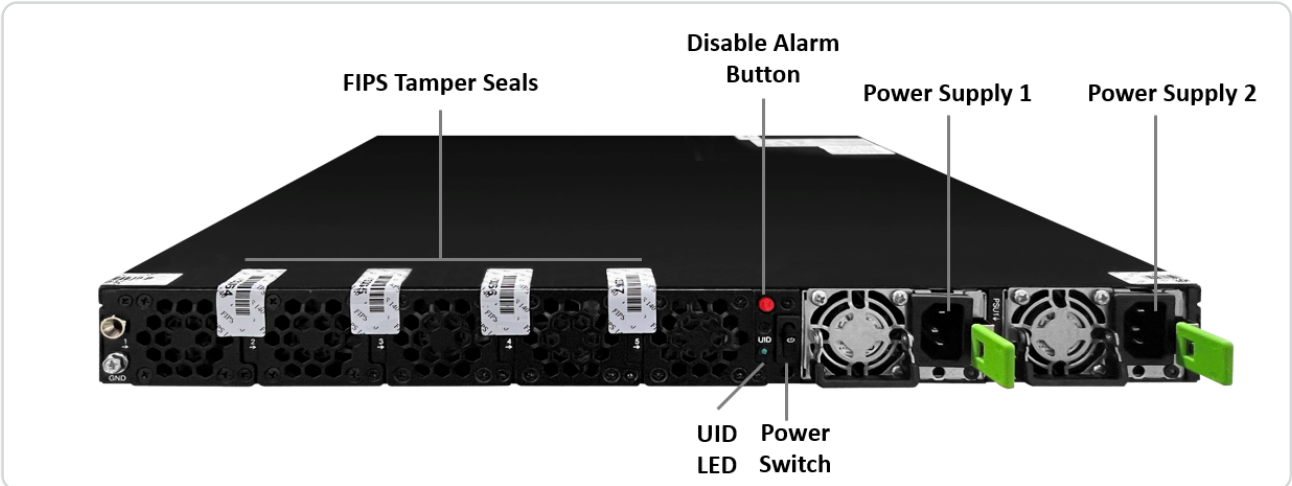
LABEL	COMPONENT TYPE	TECHNICAL SPECIFICATION	PRIMARY FUNCTION
CONSOLE	RJ-45 console port	RS-232 compatible, 9600-8N1	Direct serial console for initial CLI access

LABEL	COMPONENT TYPE	TECHNICAL SPECIFICATION	PRIMARY FUNCTION
MGMT 0/1 & 0/2	Dual Ethernet ports (1000Base-T)	1000Base-T, auto-negotiate	Primary and secondary in-band management
LOM	Dedicated IPMI port	IPMI 2.0/Redfish	Out-of-band hardware monitoring and control
NMI	Recessed pinhole button	Non-maskable interrupt	Force kernel core dump for crash analysis
PWR	Soft-push button (4-second on/off)	Power management	Power on and graceful shutdown control
USB	Two USB Type-A ports (optional)	USB	Service and recovery use
TYPE-C	USB Type-C console port (optional)	Alternate console	Secondary console and debug interface
UID	Locator LED	Blue LED indicator	Visual system identification in the rack
GPIO1/GPIO2	User-defined GPIOs	General-purpose I/O	Not used; disabled by default on the 1U platform
50/1–50/8	SFP56 data ports	Two 4-port SFP56 NICs	50GbE data interfaces; PCIe 4.0 x16
FIPS Seal	Tamper-evident label	FIPS 140-3 Level 2	Tamper evidence across the front of the top cover

Rear panel components

The rear panel houses dual CRPS power supplies, the cooling fans, the rear UID LED, the PSU alarm-mute button, and the rear power button.

The following figure shows the back panel of the MPX 9200 FIPS appliance.



COMPONENT	TECHNICAL DETAILS	OPERATIONAL CHARACTERISTICS	SERVICE INFORMATION
PSU1/PSU2	CRPS PSU, up to 800 W each	Redundant N+1 configuration	Hot-swappable during operation
Rear UID LED	Blue LED locator	Blue LED indicator	Remote chassis identification
PSU Alarm Mute	Red push-button	Silences the audible alarm on PSU fault or loss of AC input	Press once to acknowledge the PSU alarm
Rear Power Button	Soft-push, optional	Mirrors the front-panel power button function	Dual power control access
Fan Modules	5 system fans	Smart fan control managed by the BMC	No field replaceable Fan FRU
FIPS Seals	Tamper-evident labels	FIPS 140-3 Level 2	Across the top cover, spanning fans 1–5

NOTE:

FIPS 140-3 Level 2 tamper evidence. Tamper-evident seals are applied across the top cover at the front and rear of the chassis (spanning fans 1–5). The seals form the physical security boundary. Inspect them on receipt and periodically during operation. If any seal is cut, lifted, or missing, treat the unit as potentially compromised and contact NetScaler Support. Confirm the seal count and placement against the platform Security Policy.

Install the hardware

Rack-mount the appliance

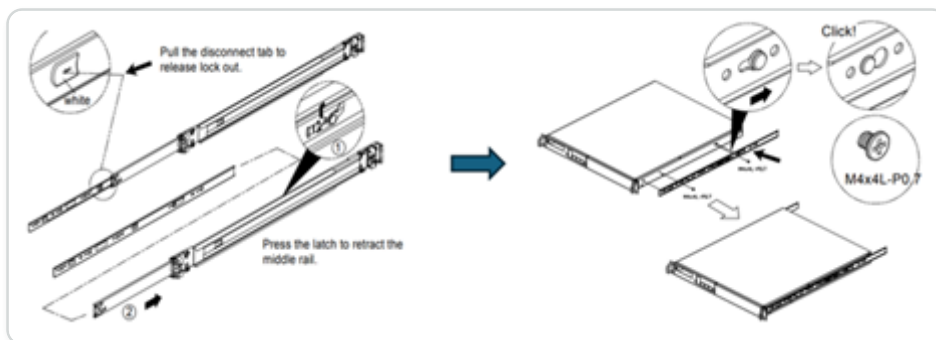
Install the appliance into a 19-inch rack in four stages: attach the inner rails, install the outer rails, mount the appliance, and secure it to the rack. The left and right rails are symmetrical. Repeat each rail step on both sides.

NOTE:

The front ears are pre-installed. The modified handle is set inward from the mounting flange, exposing the M5 rack-mount hole in the ear. The ear and handle assemblies are shipped pre-installed on the chassis, and the packing foam is shaped to hold them in place. You do not attach the ears during installation. Do not remove them.

Attach the inner slide rails

1. Pull the white disconnect tab to release and detach the inner rail member from each slide rail.
2. With the stamped text facing outward, align the inner rail with the chassis mount points, using the black reference markers on both sides of the chassis.
3. Slide the rail toward the rear until it clicks firmly into the locked position.
4. Fasten each inner rail using the provided M4x4L screws, as shown in the diagram.
5. Repeat this process for both the left and right sides of the chassis.

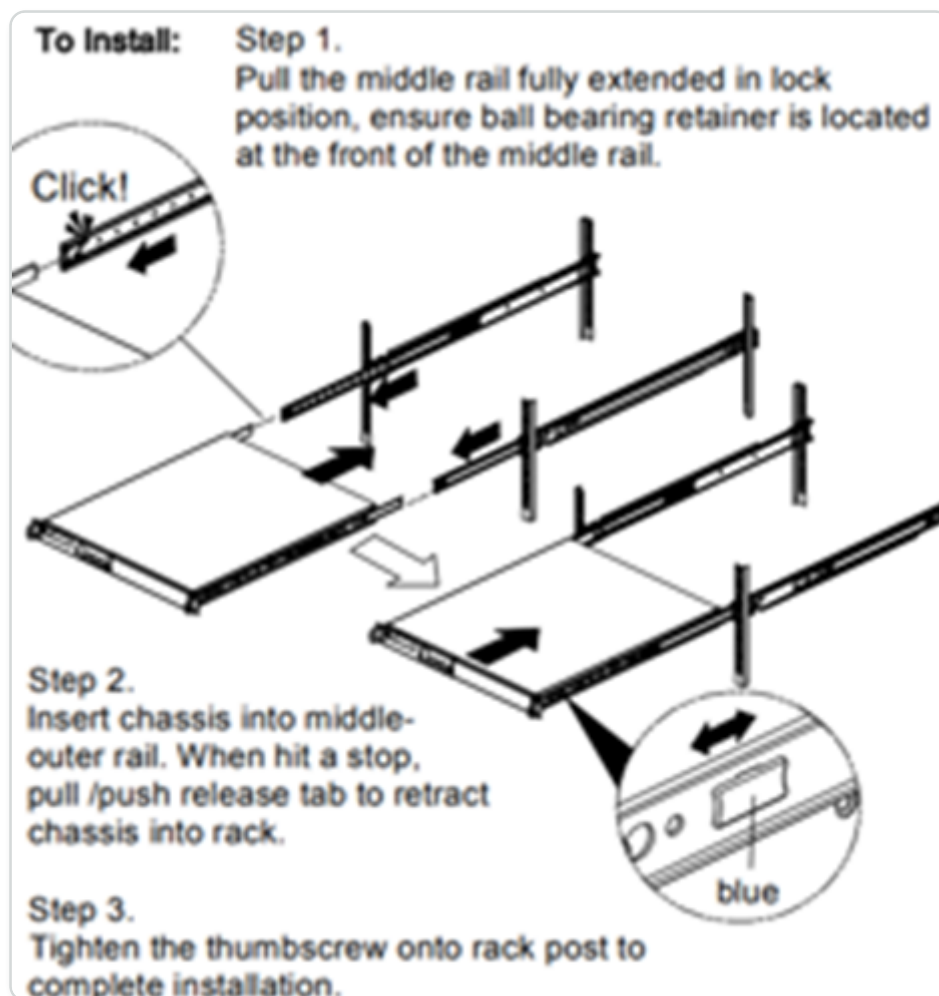


Install the outer slide rails

1. Hold the outer rail assembly against the rack frame.
2. Align the mounting brackets with the rack post holes at the selected U-height.
3. Insert the rail mounting mechanism into the rack posts until it engages.
4. Listen for an audible "click" to confirm that the rail is properly seated and locked.
5. Ensure both the front and rear mounting points are securely attached to the posts.
6. Verify that the rails are level and parallel using the numbered rack post markings.
7. Repeat this process for both the left and right outer rail assemblies.

Mount the unit onto the rails

1. Carefully align the chassis-mounted inner rails with the rack-mounted outer rails.
2. Smoothly slide the system into the rack until the locking mechanism engages.
3. If necessary, apply light, even pressure to ensure the unit locks securely into place.



Step 4: Secure the appliance to the rack

1. Slide the appliance fully into the rack until the front ears are flush against the rack posts.
2. Align the mounting holes in the front ears with the corresponding holes in the rack posts.
3. Insert a standard M5 rack screw through each ear and into the rack post.
4. Tighten the screws evenly to secure the appliance to the rack. Do not overtighten.

NOTE:

Front ears secured to the rack posts. The red arrows mark the M5 rack-mount holes on the left and right ears.

1. Verify that the appliance is level and securely fastened to the rack.

Safety considerations

For safety and equipment durability, ensure that the following requirements are met:

1. Maintain a minimum of 2 inches of clearance at the front and rear of the chassis to ensure proper ventilation.
2. Verify the rack's weight capacity before installation and ensure that the rack is stable and properly secured to the floor.
3. Use proper lifting techniques. The system weight is approximately 25.2 lbs.
4. Strictly follow electrical safety procedures when connecting the appliance to a power source.

NOTE:

The MPX-9200-FIPS 1U platform requires unobstructed front-to-rear airflow for optimal cooling. Restricted airflow results in overheating and trigger system protection mechanisms.

Network and power connections

Connection sequence

Follow this specific connection order to ensure proper system initialization and to avoid configuration conflicts.

1. Management network connectivity

- a. Connect the MGMT 0/1 port to your administrative LAN, using Cat5e/Cat6.
- b. Verify that the network switch port configuration supports auto-negotiation.
- c. Confirm network connectivity and VLAN configuration, if applicable.
- d. Document the assigned IP address and network parameters.

2. Out-of-band management setup

- a. Connect the LOM port to a dedicated OOB management network.
- b. Use network infrastructure that is separate from production traffic.
- c. Leave the LOM port in dedicated mode operation (factory default).

3. Data port configuration

- a. Install SFP56 (or compatible SFP28/SFP+) transceiver modules in data ports 50/1–50/8.
- b. Match each transceiver type to the switch port capability. Use NetScaler-qualified transceiver MPNs for guaranteed interoperability.
- c. Connect the fiber or DAC cables to the data ports as required.

- d. Confirm that the cable rating matches the 50GbE port speed.

4. Power system connection

- a. Connect the first power cord to the PSU1 input receptacle.
- b. Connect the second power cord to the PSU2 input receptacle.
- c. Use independent AC feeds where possible for N+1 redundancy.
- d. Verify that the input voltage is 100–240 VAC, 50–60 Hz, before applying power.

5. System startup

- a. Press the front-panel PWR button to initiate the boot sequence.
- b. Observe the front-panel LEDs. The PWR LED must illuminate solid green.
- c. Verify that both PSU LEDs are solid green within 10 seconds of power-on.
- d. Allow the full boot cycle to complete (about 4–5 minutes) before accessing the system.

NOTE:

Use NetScaler-qualified transceiver and cable part numbers for guaranteed interoperability and support coverage.

Power supply status indicators

The CRPS power supplies provide comprehensive status information through integrated LED indicators located on each power supply faceplate.

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
Solid GREEN	AC present, all DC rails active under load	Normal operation	None - normal
1 Hz Blink GREEN	AC present, 12 Vsb active including 5 Vsb for BMC power, main rails idle	Redundant standby (N+1)	None - normal

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
Solid AMBER	AC input lost or disconnected	Lost redundancy (if N+1) or system down	Check the AC power connection
1 Hz Blink AMBER	OCP/OVP/OTP warning threshold reached	Degraded PSU operation/potential shutdown	Verify PSU cooling and airflow
Solid AMBER	Critical fault (OCP/OVP/OTP tripped)	PSU shutdown for protection	Replace the PSU immediately

System access and configuration

Configure the appliance through the NetScaler GUI or the CLI. Both methods provide full access to the initial setup. Use the default addresses and credentials below for first access, and then change them during setup.

INTERFACE OR SERVICE	DEFAULT USER LOGIN CREDENTIALS	DEFAULT IP ADDRESS	SUBNET MASK OR GATEWAY	DESCRIPTION OR NOTE
NSIP (MGMT 0/1)	nsroot or product SN	192.168.100.1	255.255.0.0/16	Default NetScaler IP for initial configuration
LOM/IPMI Port	nsroot or product SN	192.168.1.3	255.255.255.0/24	Out-of-band management IPMI, Redfish, remote iKVM, power control

NOTE:

The default password is the device serial number. Enter it exactly as printed on the chassis label. All credentials are case-sensitive. Change the default password during the initial setup.

Console connection setup by using the GUI

The web management interface provides complete configuration through a browser. The appliance is managed through the MGMT 0/1 port at the default NSIP.

1. Network preparation

- a. Connect the management workstation to the MGMT 0/1 port or to the same VLAN.
- b. Set a static IP on the workstation in the 192.168.100.X/16 range (for example, 192.168.100.50).
- c. Verify network connectivity by performing a ping test to the default NSIP address: 192.168.100.1.
- d. Ensure that firewall settings allow HTTPS traffic (TCP 443).

2. Browser configuration

- a. Open a Web browser (Chrome, Firefox, Safari, or Edge).
- b. Enter `https://192.168.100.1`.
- c. Accept the self-signed certificate warning to continue.

3. Initial authentication

- a. In the **Username** field, enter `nsroot`.
- b. In the **Password** field, enter the device serial number exactly as printed on the chassis label.
- c. Click **Login**. The system redirects to the initial setup wizard.

4. Complete the setup wizard

The setup wizard guides you through the following essential configuration parameters:

- a. Management Service IP (NSIP): Assign a static IP for management access.
- b. Subnet mask and default gateway: Configure these for your network segment.
- c. DNS server: Enter the primary DNS IP address.
- d. Hostname: Assign a meaningful system identifier.
- e. Administrative password: Set a strong password to replace the serial number default.

Console connection setup by using the CLI

The command-line interface provides direct system access for advanced configuration and troubleshooting through the front-panel console port.

1. Physical connection

- a. Connect an RJ-45 serial cable to the CONSOLE port on the front panel.
- b. Connect the other end to the workstation serial port or to a USB-to-serial adapter.

2. Terminal emulator configuration

Open your terminal emulation software (such as PuTTY, Tera Term, or SecureCRT) and configure the following settings:

SETTING	VALUE
Baud Rate	9600 bps
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None (disabled)
Terminal Type	ANSI
PuTTY Keypad Mode	VT100

3. Session establishment

- a. Open the terminal emulator application.
- b. Establish a connection, using the configured settings.
- c. Press **Enter** if no prompt appears.

Wait for the login prompt to display.

1. Authentication process

- a. At the login prompt, enter `nsroot`.
- b. At the password prompt, enter the device serial number.

On successful authentication, the system displays the NetScaler command prompt. All credentials are case-sensitive.

2. Verify the software and platform identity

After you log in, run `show version` and `show hardware` to confirm the firmware build and the platform identity before you configure the appliance. The following example shows the expected output for the first GA release of the MPX 9200 FIPS.

```
> show version

NetScaler NS14.1: Build 43.142.fips.nc, Date: May 22 2026, 20:07:37
(64-bit) (NS14.1-FIPS)

Done

> show hardware

Platform: NSMPX-9200-FIPS-Z 20*CPU+128GB+8*MLX(50)+2*E1K+2*RAPIDS 36010

Manufactured on: 12/19/2025

CPU: 2200MHZ

Host Id: 161644678

Serial no: 749FWDTM6K

Encoded serial no: 749FWDTM6K

Netscaler UUID: 14e3330a-e709-11f0-a8ec-08357136584d

BMC Revision: 4.01

Done
```

Confirm the following two items in this output:

- The build string ends in `.fips` and the release tag reads `(NS14.1-FIPS)`. Both confirm that the FIPS firmware is running.
- The **Platform** line reports the model descriptor and the platform system ID: `36010`, which uniquely identifies the MPX 9200 FIPS.

MPX configuration examples

Run the following commands from the NetScaler CLI to establish basic connectivity.

Basic network configuration:

```
# Configure the NetScaler IP address and subnet mask

set ns config -ipaddress 10.0.0.10 -netmask 255.255.255.0


# Add a subnet IP address for client communication

add ns ip 10.0.0.11 255.255.255.0 -type snip


# Configure the default route for external connectivity

add route 0.0.0.0 0.0.0.0 10.0.0.1


# Configure the system hostname

set ns hostname NS9200-1


# Change the administrative password for security

set system user nsroot -password <yourpassword>

Enter password: *****

Confirm password: *****


# Save the configuration to persistent storage

save ns config
```

```
# Restart the system to apply changes
```

```
reboot
```

NOTE:

Changing the NSIP and rebooting interrupts management connectivity. Reconnect at the new NSIP after the appliance restarts. Always run `save ns config` before you reboot.

Basic verification commands:

```
# Check the system software version
```

```
show version
```

```
# Check the system hardware information
```

```
show hardware
```

```
# Display the current IP configuration
```

```
show ip
```

```
# Show the status of all network interfaces
```

```
show interface
```

```
# Display the routing table
```

```
show route
```

```
# Verify the configuration save status  
  
show config
```

LOM port management

Initial LOM configuration

The Lights Out Management (LOM) port provides critical out-of-band access for system monitoring and remote management, independent of the main software operation. Configure the LOM through the web GUI (Method 1) or the CLI with `ipmitool` (Method 2).

Method 1: LOM web GUI

1. Initial network connection

- a. Set a static IP on the management workstation: 192.168.1.10/255.255.255.0.
- b. Connect directly to the LOM port using a crossover cable, or connect both to the same switch.
- c. Open a browser and navigate to `https://192.168.1.3`. The LOM login page appears.

2. Default authentication

- a. In the **Username** field, enter `nsroot`.
- b. In the **Password** field, enter the device serial number (case-sensitive).
- c. On the first login, the system forces a LOM password change before granting access.

3. Change the default password

- a. Enter the current password (device serial number).
- b. Enter a new password that meets the complexity requirements shown on the LOM login page.
- c. Confirm the new password and click **Submit**. The system logs out automatically. Log in again with the new password.

4. Configure the LOM network

- a. Navigate to **Settings > Network IP Settings**.
- b. Select the LAN interface (Default: `eth0`).
- c. IPv4 address configuration: Enter the desired LOM IPv4 address.
- d. Subnet mask definition: Set the appropriate subnet mask.
- e. Gateway configuration: Enter the default gateway IP address for routing.
- f. Click **Save** to apply.

5. Validate connectivity

- a. Verify that the new configuration takes effect.
- b. Test connectivity by performing a ping test from the management workstation.
- c. Attempt to log in using the new IP address to confirm accessibility.
- d. Document the final LOM configuration for operational procedures.

NOTE:

Insufficient privilege due to system lockdown. If the LOM GUI shows "Insufficient Privilege (code 8000)" or "You do not have permission to view this content", System Lockdown is enabled. While lockdown is active, all out-of-band interfaces (LOM web UI, IPMI, and Redfish) are read-only. You cannot change Network Settings, User Management, or other LOM settings until lockdown is disabled. See [System lockdown mode](#).

Method 2: LOM CLI initial configuration (ipmitool)

Access the NetScaler shell through the console, and then use `ipmitool` to configure the LOM. If System Lockdown is enabled, disable it first.

System lockdown mode

When system lockdown is enabled in-band from the host OS, the BMC enforces out-of-band configuration protection. All platform configuration interfaces, including LOM firmware update, network settings, user management, FRU data, and general LOM configuration, are restricted to read-only access through the LOM web UI and IPMI/Redfish interfaces. No persistent configuration or firmware changes can be performed while lockdown is active.

```
# Check the system lockdown mode status (return 00 = disabled, 01 =
enabled)

ipmitool raw 0x34 0x81

# Unlock or disable system lockdown mode (allow OOB write access based on
user privilege)

ipmitool raw 0x34 0x81 0x0

# Lock or enable system lockdown mode (restrict OOB to read-only mode)

ipmitool raw 0x34 0x81 0x1
```

Configure a static LOM IP address:

```
# Set LOM to use static IP addressing

ipmitool lan set 1 ipsrc static

# Configure the static IP address

ipmitool lan set 1 ipaddr <new_LOM_IP_address>

# Set the subnet mask

ipmitool lan set 1 netmask <new_netmask_IP_address>

# Configure the default gateway

ipmitool lan set 1 defgw ipaddr <new_gateway_IP_address>
```

```
# Cold reboot the BMC (Baseboard Management Controller)

ipmitool mc reset cold
```

Restore the BMC to factory defaults:

```
# Restore the BMC to factory default configuration

ipmitool raw 0x32 0x66
```

NOTE:

If the IPMI or Network Preserve Configuration option is not enabled in the **Maintenance** section of the LOM GUI, this operation resets all settings, including LOM network configuration, user accounts, and IPMI web settings, to LOM factory defaults.

Allow approximately 120 seconds for the BMC reboot and network initialization. Test connectivity by performing a ping test after the 120-second initialization period, and verify LOM accessibility using the new IP address before proceeding.

Verify the LOM configuration:

```
# Display the current LOM network configuration

ipmitool lan print 1


# Test LOM connectivity from an external system

ping <new_LOM_IP_address>
```

Manage the LOM password from the host. For enhanced security, change the LOM password from the NetScaler shell.


```
# List the current LOM users to identify the user ID

ipmitool user list 1


# Change the password for a specific user ID (typically user ID 2 for the
nsroot admin)

ipmitool user set password <user_ID> <new_LOM_password>
```

LOM security considerations:

- Change the default password immediately after initial access.
- Implement network-level access controls for the LOM segment.
- Place the LOM on an isolated management VLAN for enhanced security.
- Enable audit logging for administrative actions.
- Re-enable System Lockdown after configuration to protect the OOB interfaces.

Remote power control operations

The LOM interface provides comprehensive remote power management capabilities, enabling administrators to control system power states without physical access to the appliance.

System startup procedure:

1. Pre-startup verification

- a. Confirm that both PSU LEDs show solid or blinking green.
- b. Verify that the network infrastructure is available.
- c. Check for existing hardware alerts in the LOM event log.

2. Remote power-on execution

- a. Navigate to the **Power Control** menu in the LOM web UI.
- b. Select **Power On** and click **Perform Action**.
- c. Monitor the front-panel PWR LED for solid green confirmation.

3. Startup monitoring

- a. Watch for POST completion in the LOM remote console.
- b. Confirm that the network interfaces initialize (the MGMT 0/1 interface is accessible at 192.168.100.1).

System shutdown procedure:

1. Initiate shutdown

- a. Verify that no critical operations are in progress before shutting down.
- b. Navigate to **Power Control**, select **ACPI Shutdown**, and click **Perform Action**.

2. Confirm verification

- a. Monitor the front-panel PWR LED. It extinguishes when the power-off is complete.
- b. Wait for full power-off before initiating a subsequent power-on sequence.

NOTE:

Always use **ACPI Shutdown** for a graceful OS-level shutdown. Use Power Off (immediate) only when the system is unresponsive. Document all remote power events for audit and troubleshooting purposes.

System specifications

Hardware configuration

The MPX 9200 FIPS platform incorporates enterprise-grade components designed for high-performance application delivery and reliability.

Core system architecture

COMPONENT CATEGORY	SPECIFICATION DETAILS	PERFORMANCE CHARACTERISTICS
Regulatory Model	1U3P3A	FCC and international compliance designation
Processor Architecture	Intel Xeon 5th-generation processor	1 socket, 20 active cores at 2.2 GHz

Component Category	Specification Details	Performance Characteristics
Platform Chipset	Intel C741 PCH	Advanced platform controller hub
BMC Controller	Baseboard Management Controller with IPMI 2.0	Remote KVM, hardware monitoring, power control
System Memory	128 GB DDR5 ECC RDIMM	2x 64 GB modules, error correction enabled
Primary Storage	800 GB NVMe U.2/U.3	2.5-inch high-performance SSD
Management Connectivity	Two 1GbE RJ45 (1000Base-T)	MGMT 0/1 (primary), MGMT 0/2 (secondary)
Data Connectivity	Two 4-port SFP56 NICs	Ports 50/1–50/8, PCIe 4.0 x16 interface, 8 total 50GbE ports

Power and environmental specifications

Parameter	Specification	Operating Range	Notes
Power Supply Configuration	2x CRPS PSUs, up to 800 W each	Redundant N+1 operation	N+1 redundant, hot-swappable
Input Voltage Range	100–240 VAC	Universal input compatibility	Auto-sensing
Input Frequency	50–60 Hz	Standard utility frequency	±3 Hz tolerance
Input Current	100-127 V: 10.0 A; 200-240 V: 5.0 A	Variable by input voltage	Maximum ratings
Typical System Power Consumption	300 W	Normal operational load	Steady-state operation

PARAMETER	SPECIFICATION	OPERATING RANGE	NOTES
Maximum System Power Consumption	406 W	Peak system utilization	Peak load with both PSUs active

Environmental specifications

ENVIRONMENT FACTOR	OPERATING RANGE	STORAGE RANGE	CRITICAL LIMITS
Ambient Temperature	0-45°C (32-113°F)	-40-70°C	50°C absolute maximum
Relative Humidity	10-90% RH	10-95% RH	Non-condensing
Operating Altitude	0-5,000 m	0-15,200 m	Derated above 8,000 m
Typical System Airflow (front-to-back)	~80.3 CFM	N/A	Full load at nominal 25°C ambient
Maximum System Airflow (front-to-back)	~104 CFM	N/A	Full load at elevated temperature

Physical specifications

DIMENSION	MEASUREMENT	STANDARD COMPLIANCE
Width	443 mm (17.4")	EIA 310-D 19-inch rack
Depth	550 mm (21.7")	Standard server depth
Height	44 mm (1.73")	1U rack unit
System Weight	25.6 lbs (11.6 kg)	Approximate operational weight
Package Weight	41 lbs (18.6 kg)	Shipping configuration

System LED status

The system provides comprehensive status indication through various LED indicators located on the front and rear panels.

Front panel LED status

LED INDICATOR	NORMAL OPERATION	FAULT CONDITION	DESCRIPTION
PWR (Power)	Solid Green	Off	System power and initialization status
UID	Off/blue when set	N/A	Unit locator. Lit on demand through the LOM web GUI
GPIO1	Off (default)	N/A	User-defined function (disabled)
GPIO2	Off (default)	N/A	User-defined function (disabled)

Power supply LED status

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
Solid GREEN	AC present, all DC rails active under load	Normal operation	None - normal
1 Hz Blink GREEN	AC present, 12 Vsb active including 5 Vsb for BMC power, main rails idle	Redundant standby (N+1)	None - normal
Solid AMBER	AC input lost or disconnected	Lost redundancy (if N+1) or system down	Check the AC power connection

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
1 Hz Blink AMBER	OCP/OVP/OTP warning threshold reached	Degraded PSU operation/potential shutdown	Verify PSU cooling and airflow
Solid AMBER	Critical fault (OCP/OVP/OTP tripped)	PSU shutdown for protection	Replace the PSU immediately

NVMe storage LED status

Each NVMe drive carrier has an activity LED indicator.

CONDITION	LED BEHAVIOR
Idle	LED Off
Active (I/O in flight)	Fast blink at 4 Hz

Additional resources

Primary documentation resources:

- **NetScaler hardware platforms documentation:** Complete hardware documentation, including detailed specifications, configuration guides, and troubleshooting procedures.
- **System upgrade and downgrade guide:** Step-by-step procedures for upgrading or downgrading software while maintaining system availability and configuration integrity.
- **High availability configuration guide:** Detailed instructions for implementing high availability configurations using multiple NetScaler appliances for enhanced system resilience.

Support information

When contacting NetScaler Support, prepare the following information:

- **Hardware serial number:** Located on the chassis label (required for all support cases).
- **Software version:** Current software builds and version information.
- **Problem description:** Detailed description of the issue, including error messages.
- **System configuration:** Network topology and relevant configuration details.

- **Log files:** System logs and diagnostic information, if available.

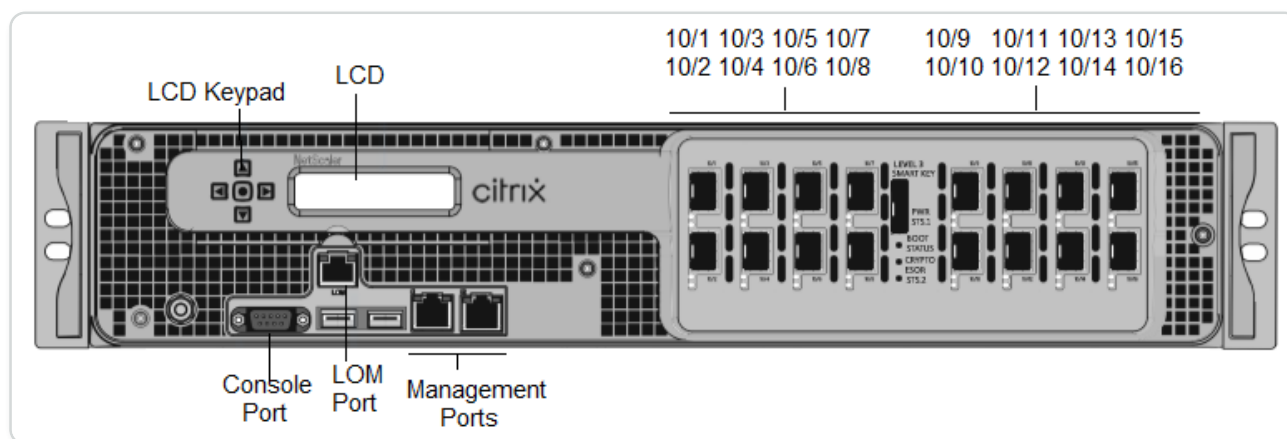
NetScaler MPX 14000

The NetScaler MPX 14020/14030/14040/14060/14080/14100 are 2U appliances. Each model has two 6-core processors and 64 GB of memory and sixteen 10G SFP+ ports (16x10G SFP+).

For information about the software releases supported on the NetScaler hardware platforms, see [NetScaler hardware software support matrix](#).

The following figure shows the front panel of the MPX 14020/14030/14040/14060/14080 (16x10G SFP+) appliance.

Figure 1. NetScaler MPX 14020/14030/14040/14060/14080/14100 (16x10G SFP+), front panel



The NetScaler MPX 14020/14030/14040/14060/14080/14100 appliances have the following ports:

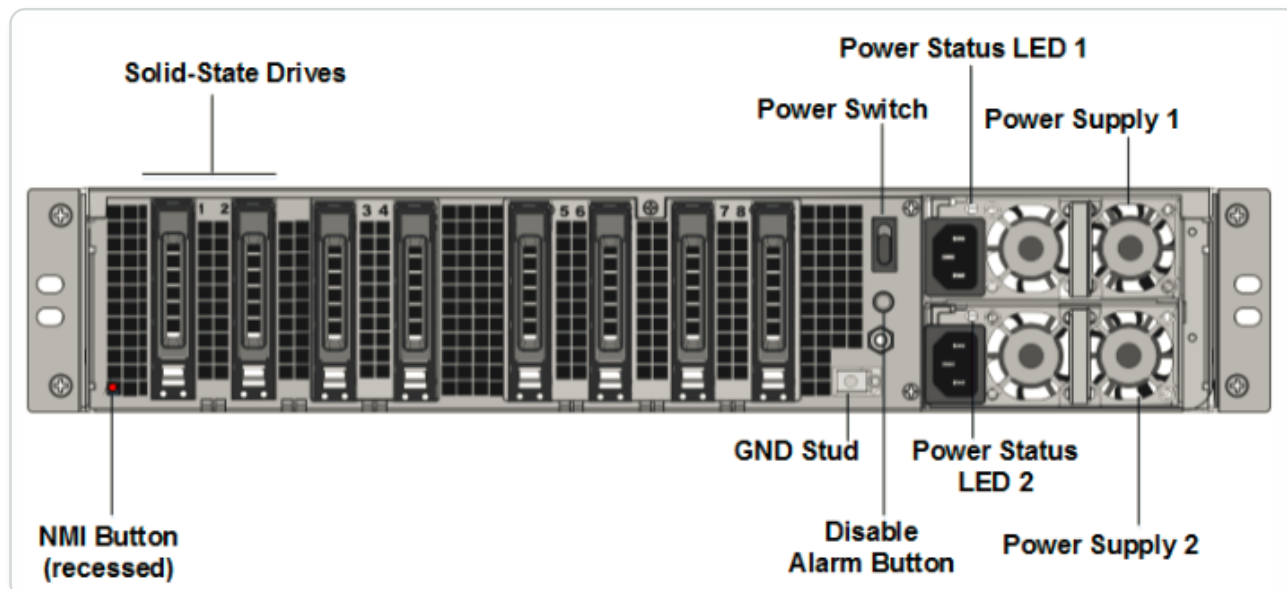
- RS232 serial Console Port.
- 10/100Base-T copper Ethernet Port (RJ45), also called the LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Two 10/100/1000Base-T copper Ethernet Management Ports (RJ45), numbered 0/1 and 0/2 from left to right. These ports are used to connect directly to the appliance for system administration functions.
- Network Ports, sixteen 10G SFP+ ports (16x10G SFP+).
- USB port (reserved for a future release).

NOTE:

The 10G SFP+ ports on these appliances support copper 1G SFP transceivers.

The following figure shows the back panel of the MPX 14020/14030/14040/14060/14080/ 14100 appliance.

Figure 2. NetScaler MPX 14020/14030/14040/14060/14080/14100, back panel



The following components are visible on the back panel of the MPX 14020/14030/14040/14060/14080/14100 appliance:

- Two 240 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) configuration. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off. Press the switch for less than two seconds to shut off the power.
- Two power supplies, each rated at 1000 watts, 100–240 volts. Each power supply has an LED that indicates the status of the power supply, as described in [Common hardware components](#).
- **Disable alarm button**, which is functional only when the appliance has two power supplies. Press this button to stop the power alarm from sounding when:
 - You have plugged the appliance into only one power outlet
 - One power supply is malfunctioning and you want to continue operating the appliance until it is repaired.
- Non-maskable interrupt (NMI) Button, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a

pen, pencil, or other pointed object. The NMI button is also available remotely over the network in the LOM GUI, in the Remote Control menu.

For information about installing the rails, rack mounting the hardware, and connecting the cables, see [Installing the Hardware](#).

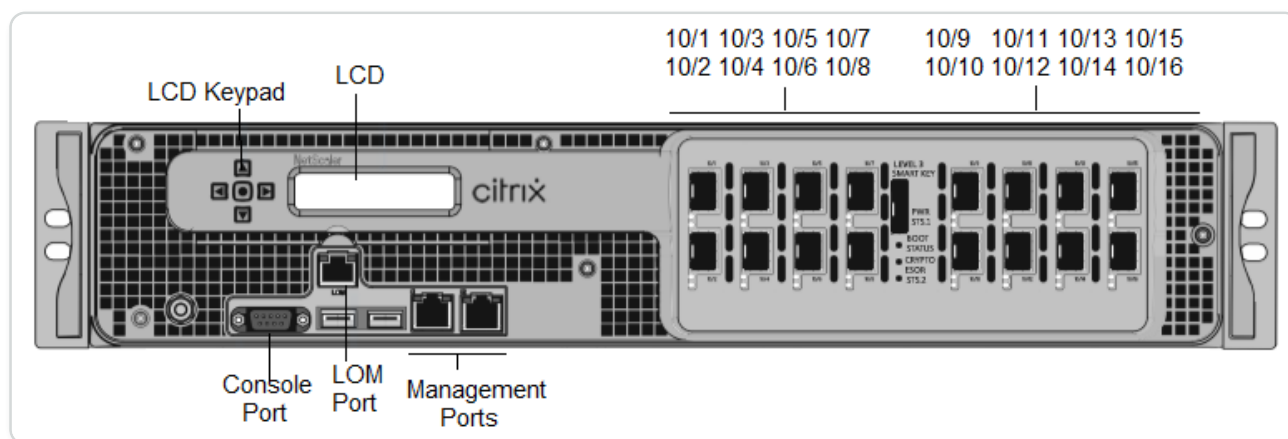
For information about performing initial configuration of your appliance, see [Initial Configuration](#).

NetScaler MPX 14000-40C

The NetScaler MPX 14000-40C are 2U appliances. Each model has 2 six-core processors, 64 GB of memory, and sixteen 10G SFP+ ports.

The following figure shows the front panel of the 14000-40C appliance.

Figure 1. NetScaler MPX 14020/14040/14060/14080/14100-40C (16x10G SFP+ ports), front panel

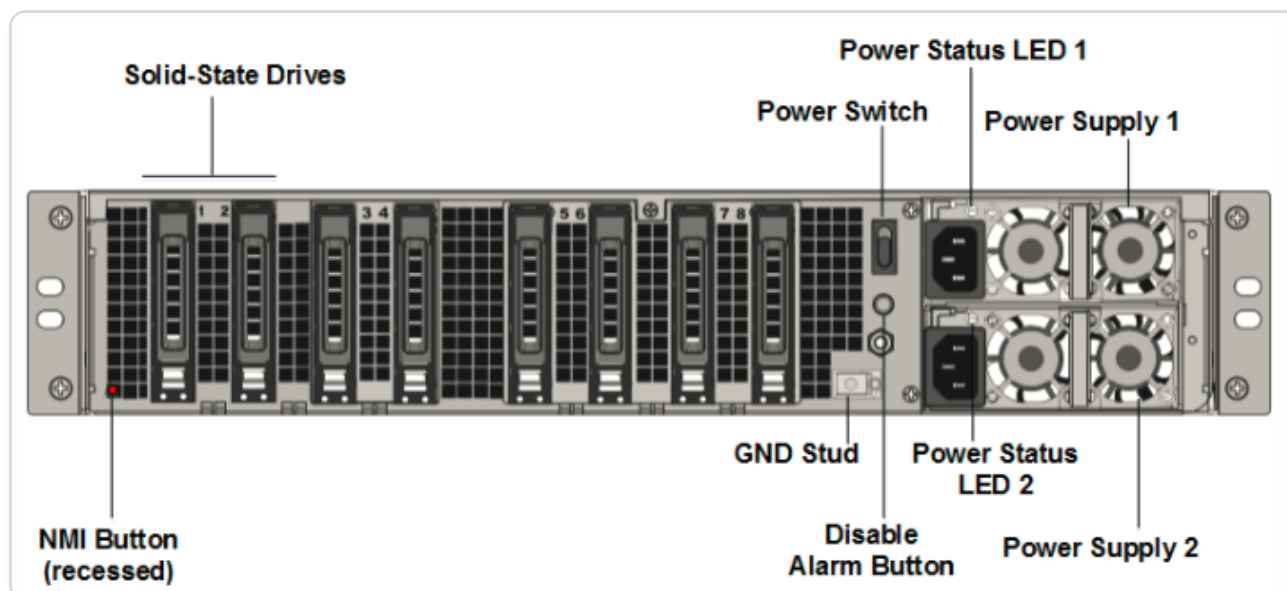


The NetScaler MPX14000-40C appliances have the following ports:

- RS232 serial Console Port.
- 10/100Base-T copper Ethernet Port (RJ45), also called the LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Two 10/100/1000Base-T copper Ethernet management ports (RJ45), also called Management ports, numbered 0/1 and 0/2 from left to right. These ports are used to connect directly to the appliance for system administration functions.
- Network Ports: Sixteen 10G SFP+ ports.
- USB port (reserved for a future release).

The following figure shows the back panel of the MPX14000-40C appliances.

Figure 2. NetScaler MPX 14020/14040/14060/14080/14100-40C (16x10G SFP+), back panel



The following components are visible on the back panel of the MPX 14000-40C appliances:

- Two 300 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) devices. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off. Press the switch for less than two seconds to shut off the power. For more information, see [Common Hardware Components](#)
- Two power supplies, each power supply is rated at 1000 watts, 100–240 volts. Each power supply has an LED that indicates the status of the power supply, as described [Common hardware components](#).
- **Disable alarm button.** This button is functional when the appliance has two power supplies. Press this button to stop the power alarm from sounding when one of the following conditions is true:
 - You have plugged the appliance into only one power outlet.
 - One power supply is malfunctioning and you want to continue operating the appliance until it is repaired.
- Non-maskable interrupt (NMI) Button that is used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about lights out

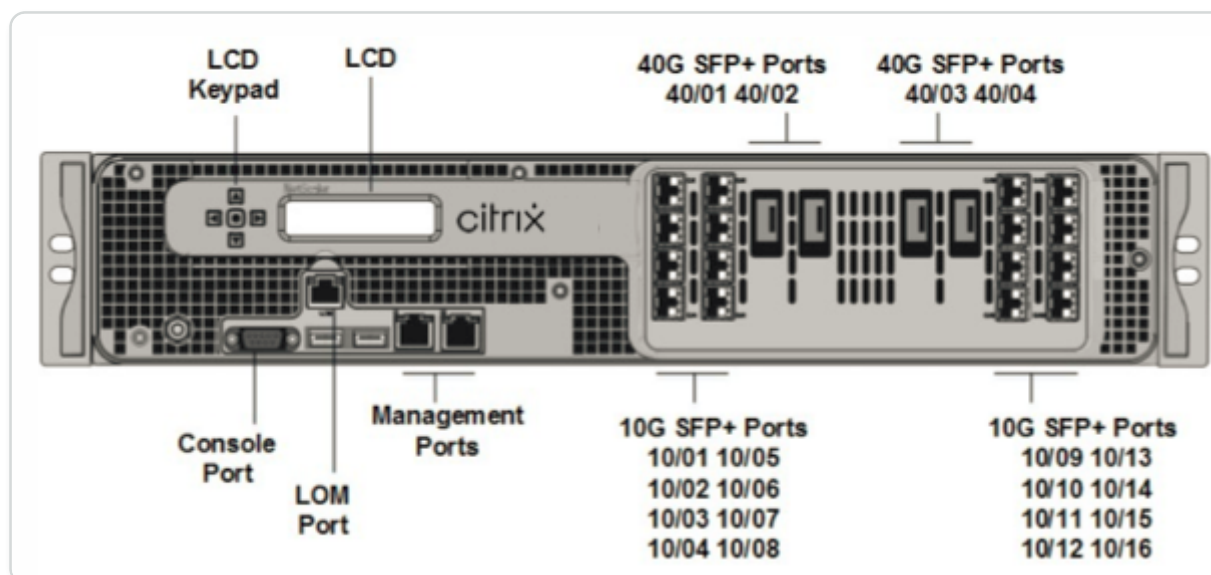
management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

NetScaler MPX 14000-40G

The NetScaler MPX 14020-40G, MPX 14040-40G, MPX 14060-40G, MPX 14080-40G, MPX 14100-40G are 2U appliances. Each model has two 6-core processors, 64 GB of memory, four 40G QSFP+ ports, and sixteen 10G SFP+ ports (4x40G QSFP+ + 16x10G SFP+).

The following figure shows the front panel of the 14000-40G appliance.

Figure 1. NetScaler MPX 14020/14040/14060/14080/14100-40G (4x40G QSFP+, 16x10G SFP+), front panel



- RS232 serial Console Port.
- 10/100Base-T copper Ethernet Port (RJ45), also called the LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Two 10/100/1000Base-T copper Ethernet Management Ports (RJ45), numbered 0/1 and 0/2 from left to right. These ports are used to connect directly to the appliance for system administration functions.
- Network Ports, sixteen 10G SFP+ ports (16x10G SFP+), four 40G QSFP+ ports (4x40G QSFP+). For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G ports](#).
- USB port (reserved for a future release).

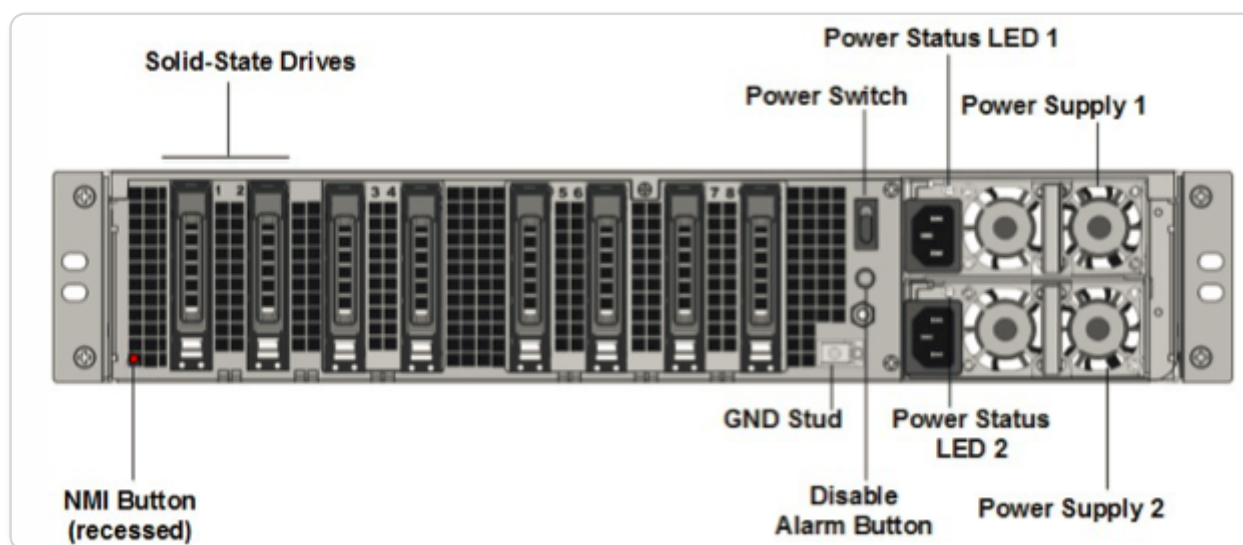
NOTE:

the following points regarding the network ports on 14000 FIPS appliances:

- 10G ports do not support 1G copper or 1G fiber transceivers.
- 40G ports do not support 10G and 1G transceivers.

The following figure shows the back panel of the 14000-40G appliance.

Figure 2. NetScaler MPX 14020/14040/14060/14080/14100-40G (4x40G QSFP+, 16x10G SFP+), back panel



The following components are visible on the back panel of the MPX 14000-40G appliance:

- Two 300 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) devices. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch. This switch turns the power to the appliance on or off. Press the switch for less than two seconds to shut off the power.
- Two power supplies. Each power supply is rated at 1000 watts, 100–240 volts. Each power supply has an LED that indicates the status of the power supply, as described in [Common hardware components](#).

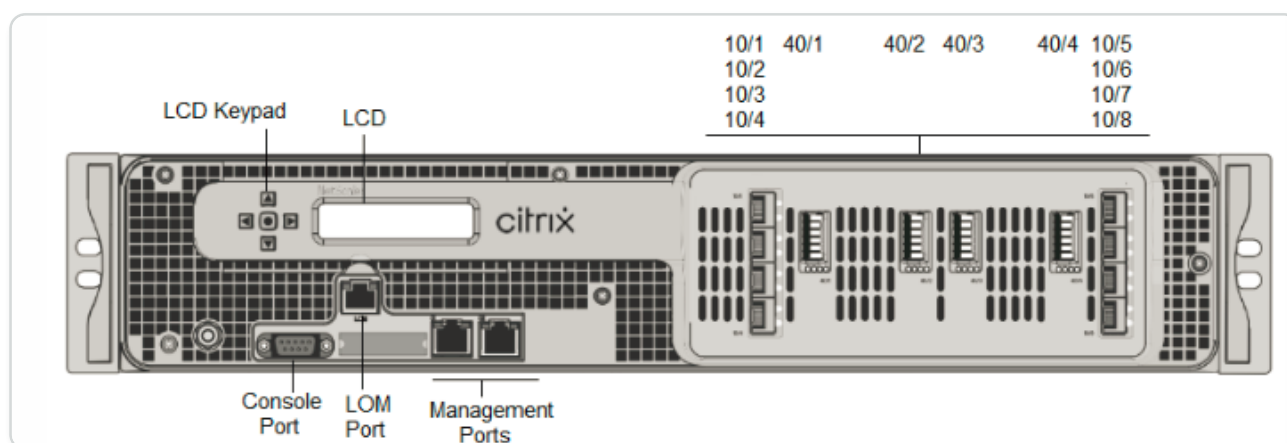
- **Disable alarm button.** This button is functional only when the appliance has two power supplies. Press this button to stop the power alarm from sounding when one of the following conditions is true:
 - You have plugged the appliance into only one power outlet.
 - One power supply is malfunctioning and you want to continue operating the appliance until it is repaired.
- **Non-maskable interrupt (NMI) button.** This button is used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#) topic.

NetScaler MPX 14000-40S

The NetScaler MPX 14040-40S, MPX 14060-40S, MPX 14080-40S, MPX 14100-40S are 2U appliances. Each model has two 6-core processors, 64 GB of memory, four 40G QSFP+ ports, and eight 10G SFP+ ports.

The following figure shows the front panel of the 14000-40S appliance.

Figure 1. NetScaler MPX 14040/14060/14080/14100-40S (4x40G QSFP+, 8x10G SFP+), front panel



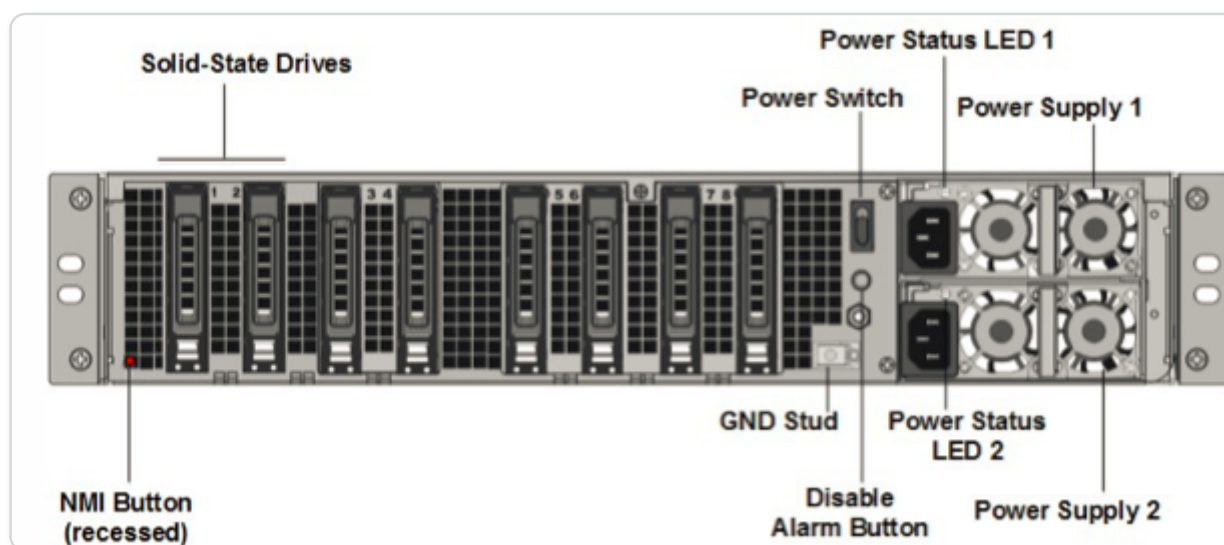
The NetScaler MPX 14000-40S appliances have the following ports:

- RS232 serial Console Port.
- 10/100Base-T copper Ethernet Port (RJ45), also called the LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.

- Two 10/100/1000Base-T copper Ethernet management ports (RJ45), also called Management ports, numbered 0/1 and 0/2 from left to right. These ports are used to connect directly to the appliance for system administration functions.
- Network Ports, four 40G QSFP+, eight 10G SFP+ ports. For information about supported transceivers per port, see [25G, 40G, 50G, and 100G ports](#).

The following figure shows the back panel of the 14000-40S appliance.

Figure 2. NetScaler MPX 14020/14040/14060/14080/14100-40S (4x40G QSFP+, 8x10G SFP+), back panel



The following components are visible on the back panel of the MPX 14000-40S appliance:

- Two 300 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) devices. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns the power to the appliance on or off. Press the switch for less than two seconds to shut off the power.
- Two power supplies, each power supply is rated at 1000 watts, 100–240 volts. Each power supply has an LED that indicates the status of the power supply, as described in [Common Hardware Components](#).

- **Disable alarm button.** This button is functional only when the appliance has two power supplies. Press this button to stop the power alarm from sounding when one of the following conditions is true:
 - You have plugged the appliance into only one power outlet.
 - One power supply is malfunctioning and you want to continue operating the appliance until it is repaired.
- **Non-maskable interrupt (NMI) button** that is used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

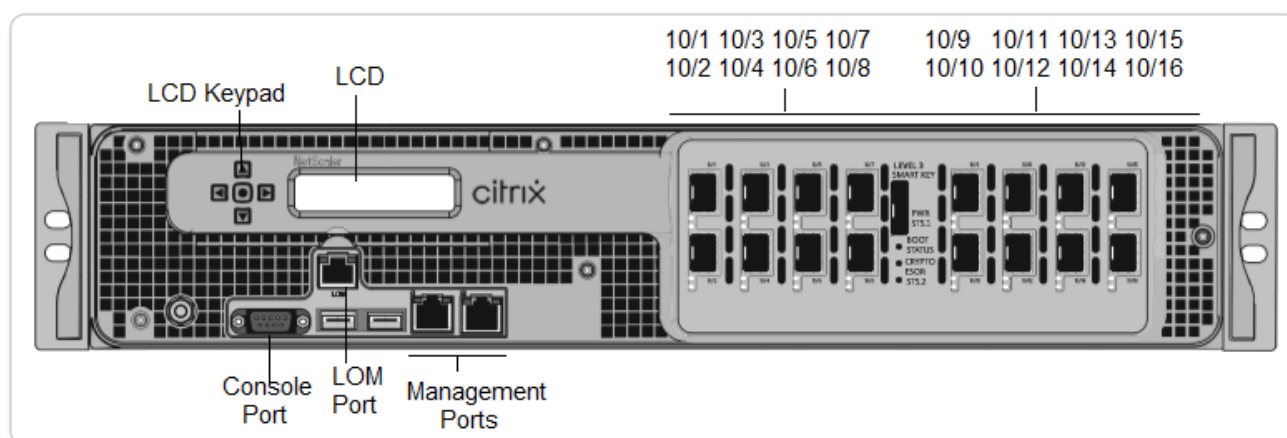
NetScaler MPX 14000 FIPS

Note For information about configuring a NetScaler MPX 14030/14060/14080 FIPS appliance, see [MPX 14000 FIPS appliance](#).

The NetScaler models MPX 14030 FIPS, MPX 14060 FIPS, and MPX 14080 FIPS are 2U appliances. Each model has two 6-core processors, 64 GB of memory, sixteen 10G SFP+ ports (16x10G SFP+).

The following figure shows the front panel of the MPX 14030/14060/14080 FIPS appliances.

Figure 1. NetScaler MPX 14030/14060/14080 FIPS, front panel



The NetScaler MPX 14030/14060/14080 FIPS appliances have the following ports:

- RS232 serial Console Port.

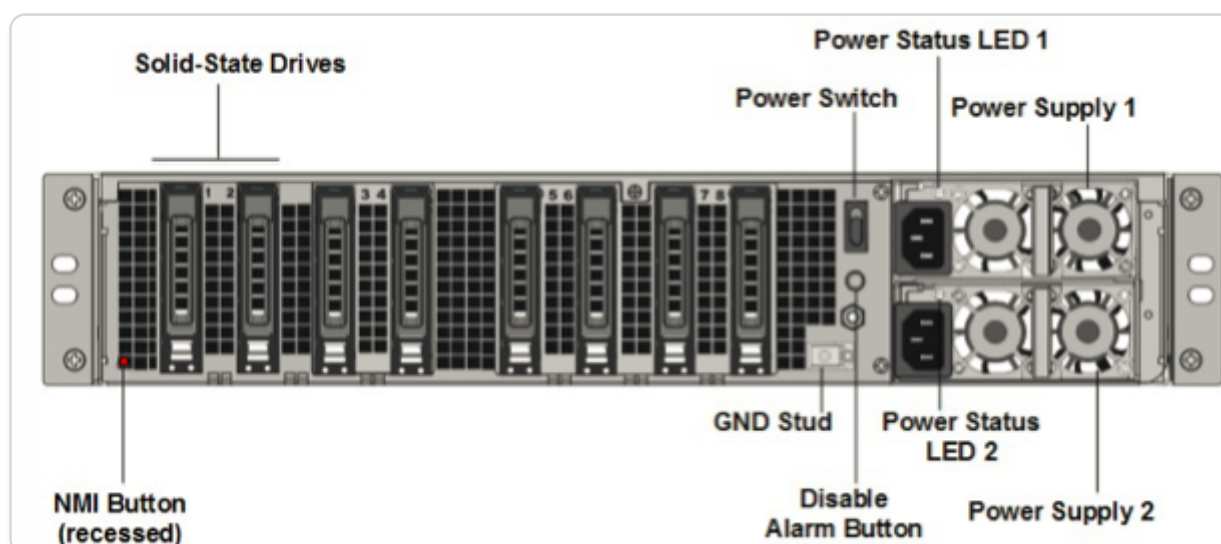
- 10/100Base-T copper Ethernet Port (RJ45), also called the LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Two 10/100/1000Base-T copper Ethernet Management Ports (RJ45), numbered 0/1 and 0/2 from left to right. These ports are used to connect directly to the appliance for system administration functions.
- Sixteen 10G SFP+ ports.
- USB port (reserved for a future release).

Notes:

- 10G ports do not support 1G copper or 1G fiber transceivers.
- 40G ports do not support 10G and 1G transceivers.

The following figure shows the back panel of the MPX 14030/14060/14080 FIPS appliances.

Figure 2. NetScaler MPX 14030/14060/14080 FIPS appliance, back panel



The following components are visible on the back panel of the MPX 14000 FIPS appliance:

- Two 300 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) devices. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch. This switch turns the power to the appliance on or off. Press the switch for less than two seconds to shut off the power.

- Two power supplies. Each power supply is rated at 1000 watts, 100–240 volts. Each power supply has an LED that indicates the status of the power supply, as described in [Common hardware components](#).
- **Disable alarm button.** This button is functional only when the appliance has two power supplies. Press this button to stop the power alarm from sounding when:
 - You have plugged the appliance into only one power outlet
 - One power supply is malfunctioning and you want to continue operating the appliance until it is repaired.
- Non-maskable interrupt (NMI) button. This button is used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

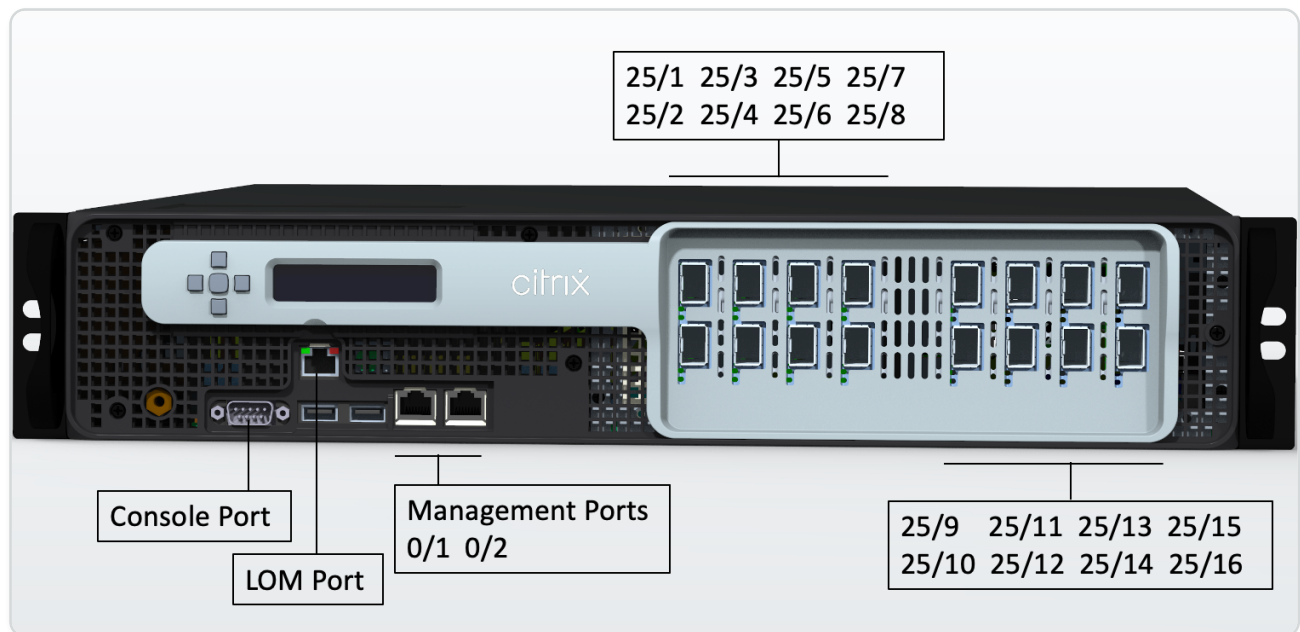
NetScaler MPX 15000

The NetScaler MPX 15000 appliance is a 2U appliance. This platform has two 8-core processors and 128 GB of memory. The appliance provides a total of 16 Ethernet 25G ports.

For information on the software releases supported on the NetScaler hardware platforms, see [Hardware-Software Release Matrix](#).

The following figure shows the front panel of the MPX 15000 series appliances.

Figure 1. NetScaler MPX 15000, front panel

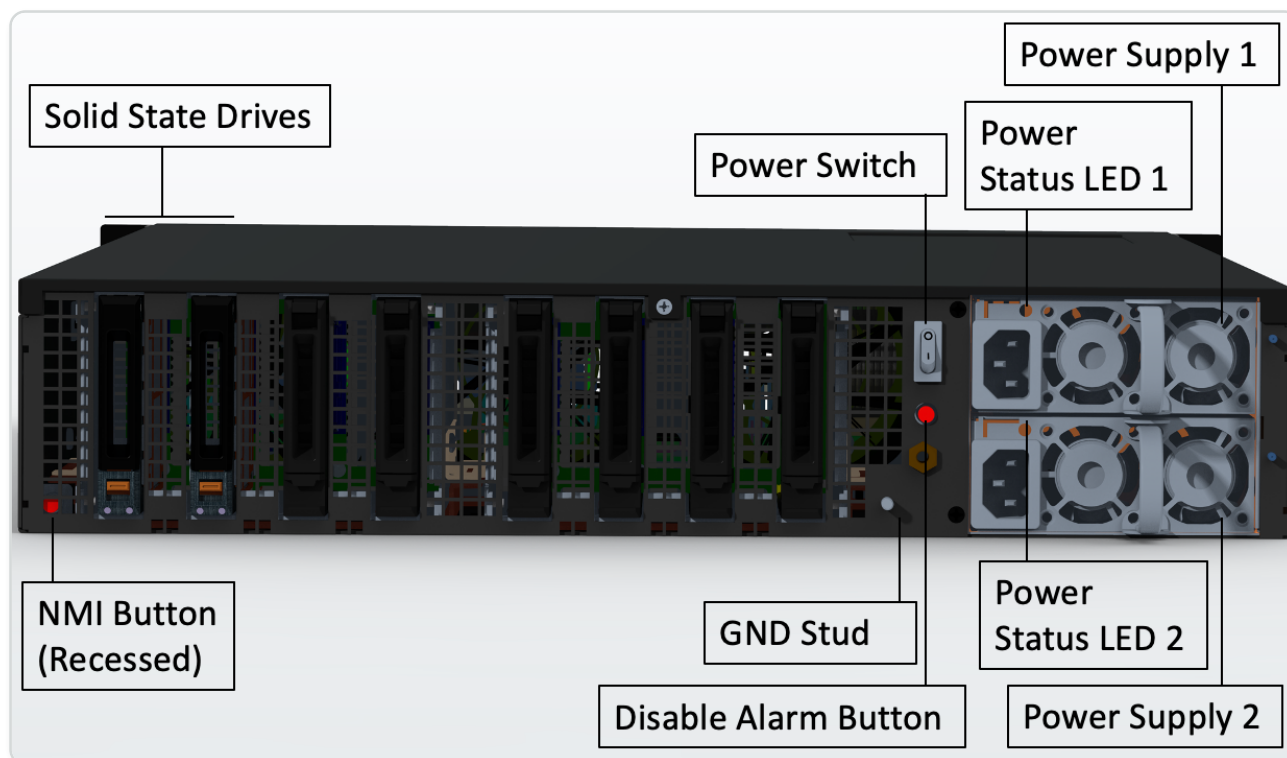


The NetScaler MPX 15000 series appliances have the following ports:

- RS232 serial console port.
- Two 10/100/1000Base-T RJ45 copper Ethernet Management ports, numbered 0/1 and 0/2. This port is used to connect directly to the appliance for NetScaler administration functions.
- One 10/100/1000Base-T RJ45 copper Ethernet Management Port, numbered 0/1. This port is used to connect directly to the appliance for NetScaler administration functions.
- Sixteen 25G Ethernet ports numbered 25/1 to 25/16. For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G ports](#).

The following figure shows the back panel of the MPX 15000 appliance.

Figure 2. NetScaler MPX 15000, back panel



The following components are visible on the back panel of the MPX 15000 appliance:

- Two 480 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) configuration. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- Two hot-swappable, 100–240 VAC input power supply modules, rated at 1000 watts each. Maximum power consumption is 520 watts and typical power consumption is 395 watts. Each power supply has an LED indicating its status:

LED COLOR	LED INDICATES
OFF	No power to any power supply in the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.
Flashing RED and GREEN	Warning (OVP/UVP/OCP/OTP/Fan); OVP = Over Voltage Protection; UVP = Under Voltage Protection; OCP = Over Current Protection; OTP = Over Temperature Protection

- **Disable alarm button**, which is functional only when the appliance has two power supplies. Press this button to silence the power alarm when one of two power supplies loses input power (second power supply optional) or when a power supply is malfunctioning.
- **Non-Maskable Interrupt (NMI) Button**, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#) topic.

NetScaler MPX 15000-50G

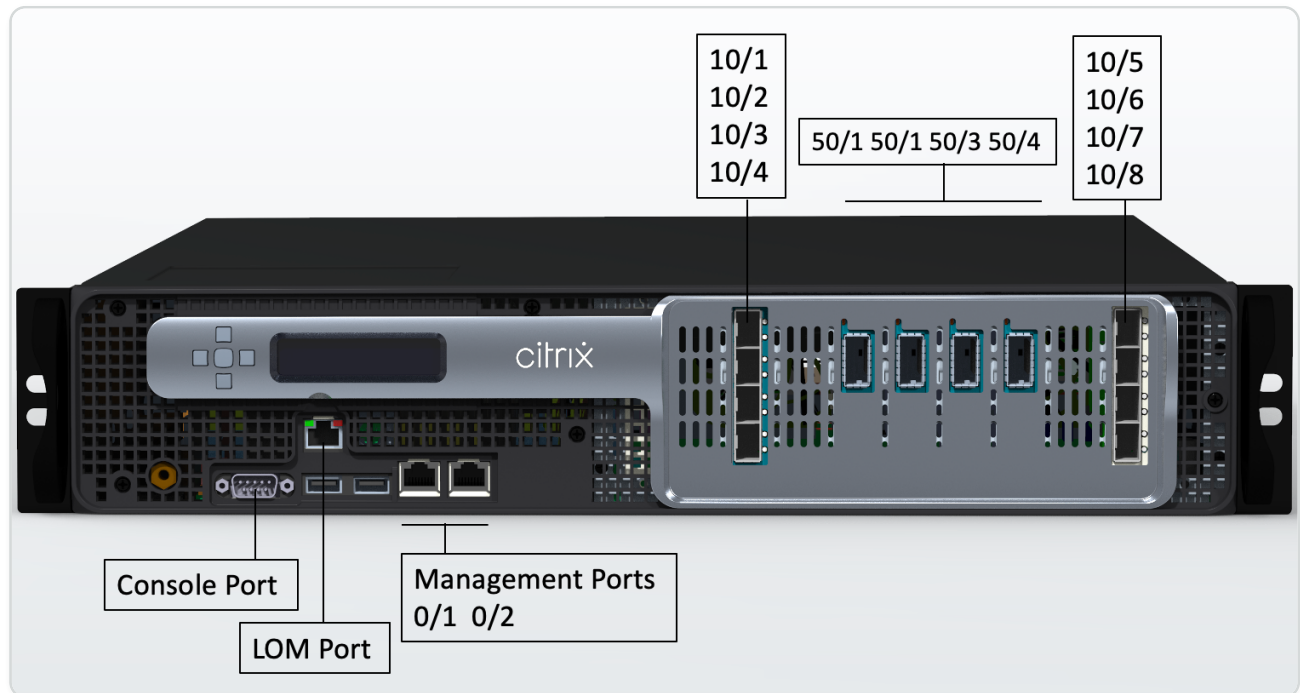
The NetScaler MPX 15000-50G appliance is a 2U appliance. This platform has two 8-core processors and 128 GB of memory. The MPX 15000-50G appliance provides a total of 12 network ports:

- Eight 10G SFP+ Ethernet Ports
- Four 50G Ethernet Ports

For information about the software releases supported on the NetScaler hardware platforms, see [NetScaler MPX hardware software compatibility matrix](#).

The following figure shows the front panel of the NetScaler MPX 15000-50G appliance.

Figure 1. NetScaler MPX 15000-50G, front panel

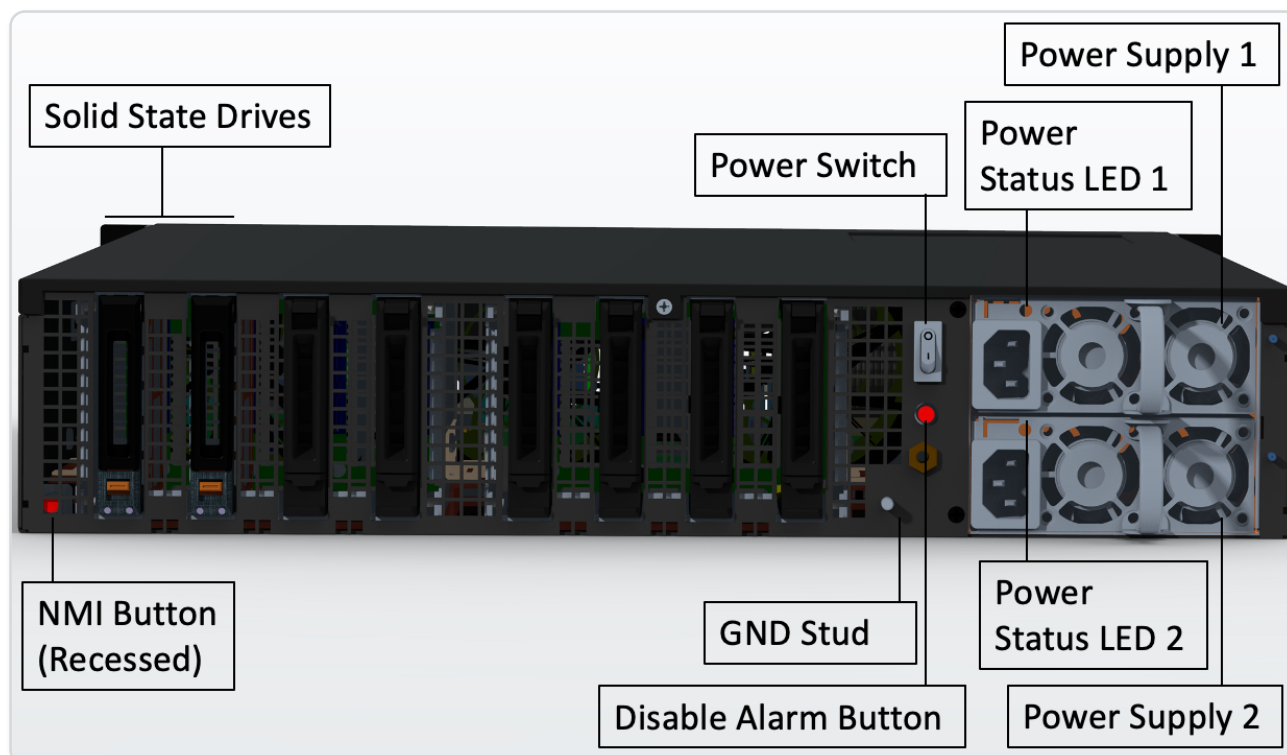


The NetScaler MPX 15000-50G appliances have the following ports:

- RS232 serial console port.
- One 10/100/1000Base-T RJ45 copper Ethernet LOM port. Use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Two 10/100/1000Base-T RJ45 copper Ethernet Management ports, numbered 0/1 and 0/2. This port is used to connect directly to the appliance for NetScaler administration functions.
- Eight 10G SFP+ Ethernet ports, numbered 10/1 to 10/8.
- Four 50G ports, numbered 50/1 to 50/4. For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G ports](#).

The following figure shows the back panel of the NetScaler MPX 15000-50G appliance.

Figure 2. NetScaler MPX 15000-50G, back panel



The following components are visible on the back panel of the MPX 15000-50G appliances:

- Two 480 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) configuration. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- Two hot-swappable 100–240 VAC input power supply modules, rated at 1000 watts each. Maximum power consumption is 522 watts and typical power consumption is 300 watts. The following table indicates the LED status of each power supply:

LED COLOR	LED INDICATES
OFF	No power to any power supply on the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.
Flashing RED and GREEN	Warning (OVP/UVP/OCP/OTP/Fan); OVP = Over Voltage Protection; UVP = Under Voltage Protection; OCP = Over Current Protection; OTP = Over Temperature Protection

- **Disable alarm button.** Press this button to silence the power alarm when one of two power supplies loses input power or when a power supply is malfunctioning.
- **Non-Maskable Interrupt (NMI) Button,** used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [NetScaler MPX hardware-software compatibility matrix](#).

NetScaler MPX 15000-50G FIPS certified appliance

The NetScaler MPX 15000-50G FIPS certified appliance is a 2U appliance. This platform has two 8-core processors and 128 GB of memory.

Note: There are FIPS tamper seals on all sides of the appliance. Tampering with the seals breaks the FIPS requirement.

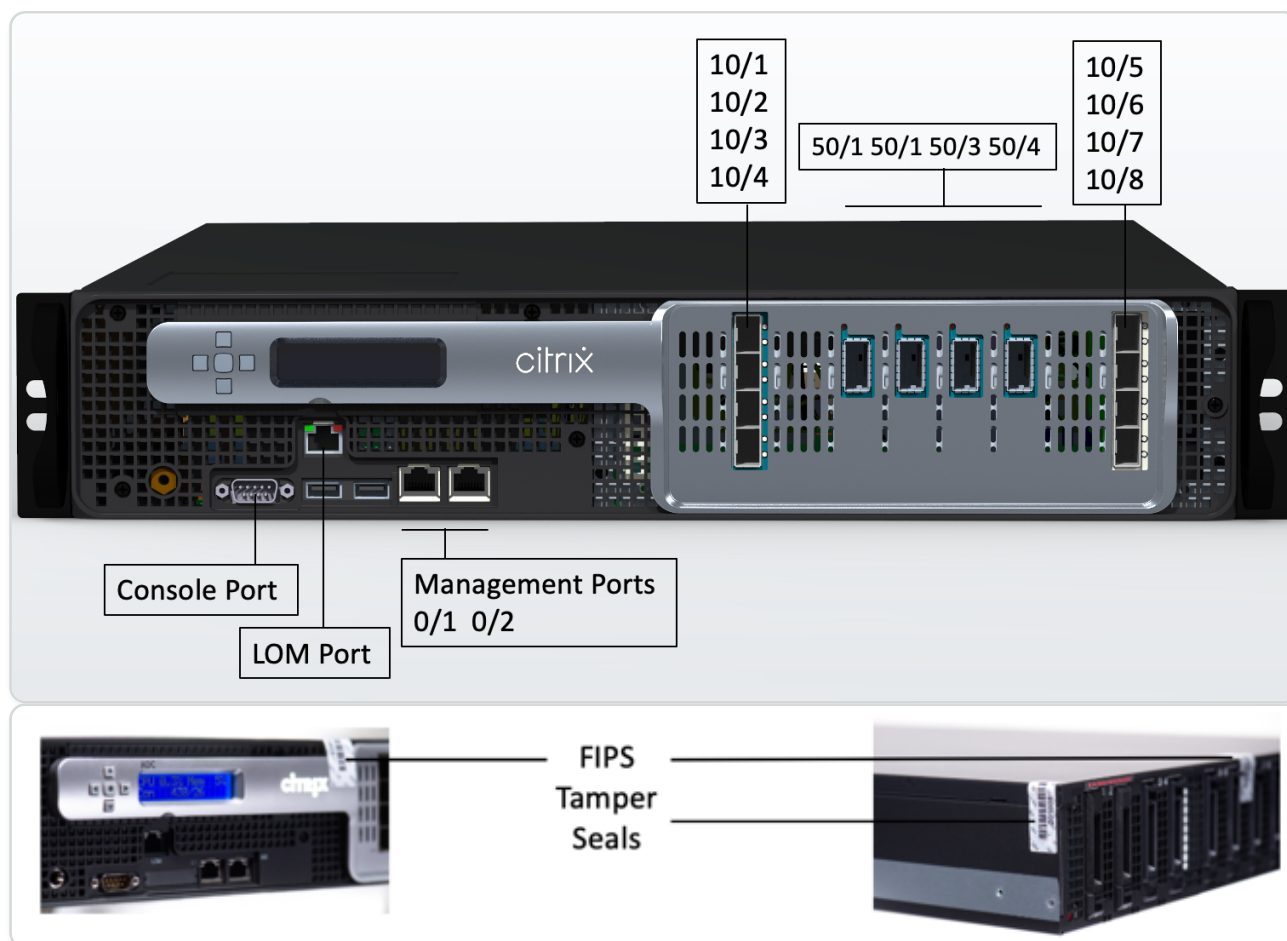
The MPX 15000-50G FIPS certified appliance provides a total of 12 network ports:

- Eight 10G SFP+ Ethernet Ports
- Four 50G Ethernet Ports

For information about the software releases supported on the NetScaler hardware platforms, see [NetScaler MPX hardware software compatibility matrix](#).

The following figure shows the front panel of the NetScaler MPX 15000-50G FIPS certified appliance.

Figure 1. NetScaler MPX 15000-50G FIPS certified appliance, front panel

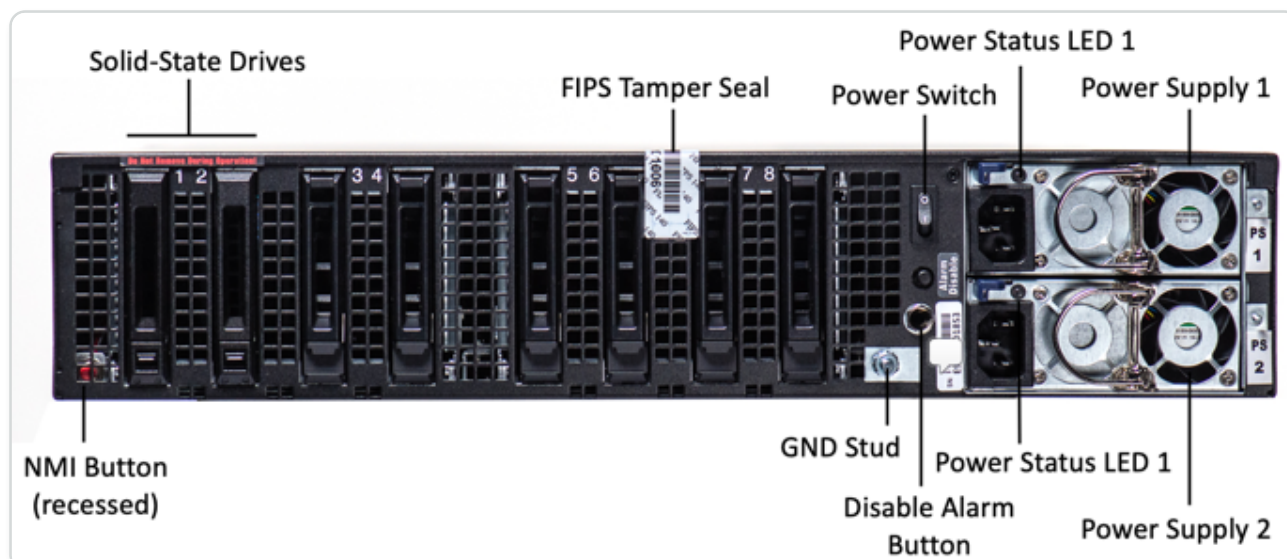


The NetScaler MPX 15000-50G FIPS certified appliance has the following ports:

- RS232 serial console port.
- One 10/100/1000Base-T RJ45 copper Ethernet LOM port. Use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Two 10/100/1000Base-T RJ45 copper Ethernet Management ports, numbered 0/1 and 0/2. This port is used to connect directly to the appliance for NetScaler administration functions.
- Eight 10G SFP+ Ethernet ports, numbered 10/1 to 10/8.
- Four 50G ports, numbered 50/1 to 50/4. For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G](#) ports.

The following figure shows the back panel of the NetScaler MPX 15000-50G FIPS certified appliance.

Figure 2. NetScaler MPX 15000-50G FIPS certified appliance, back panel



The following components are visible on the back panel of the MPX 15000-50G FIPS certified appliance:

- Two 480 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) configuration. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- Two hot-swappable 100–240 VAC input power supply modules, rated at 1000 watts each. Maximum power consumption is 522 watts and typical power consumption is 300 watts. The following table indicates the LED status of each power supply:

LED COLOR	LED INDICATES
OFF	No power to any power supply on the appliance.
Flashing RED	No power to this power supply.

LED COLOR	LED INDICATES
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.
Flashing RED and GREEN	Warning (OVP/UVP/OCP/OTP/Fan); OVP = Over Voltage Protection; UVP = Under Voltage Protection; OCP = Over Current Protection; OTP = Over Temperature Protection

- **Disable alarm button.** Press this button to silence the power alarm when one of two power supplies loses input power or when a power supply is malfunctioning.
- Non-Maskable Interrupt (NMI) Button, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [NetScaler MPX hardware-software compatibility matrix](#).

For information about configuring this appliance see [NetScaler MPX FIPS certified appliances](#).

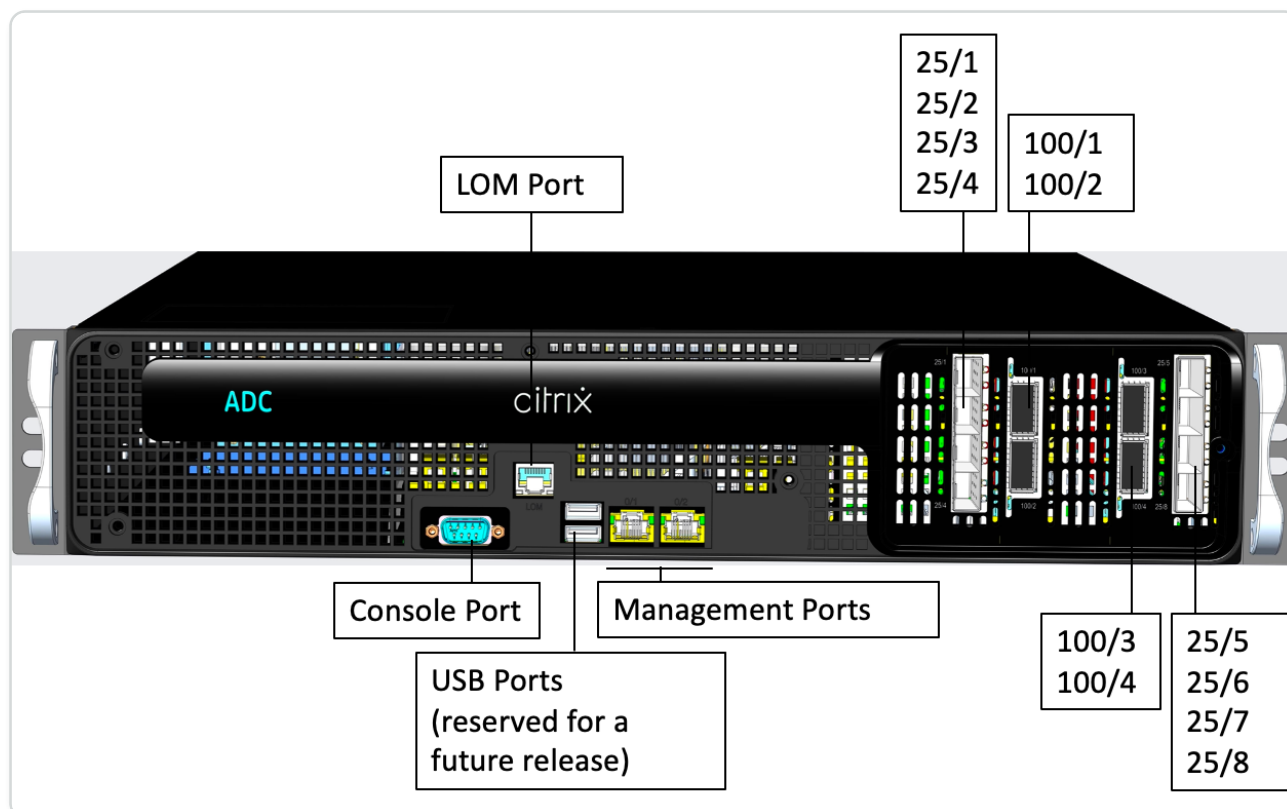
NetScaler MPX 16000

The NetScaler MPX 16000 appliance is a 2U appliance. This platform has two 16-core processors and 128 GB (16 x 8 GB DIMM) of memory. The appliance provides a total of eight 25G SFP28 ports and four 100G QSFP28 Ethernet ports.

For information on the software releases supported on the ADC hardware platforms, see [Hardware-Software Release Matrix](#).

The following figure shows the front panel of the MPX 16000 appliance.

Figure 1. NetScaler MPX 16000, front panel

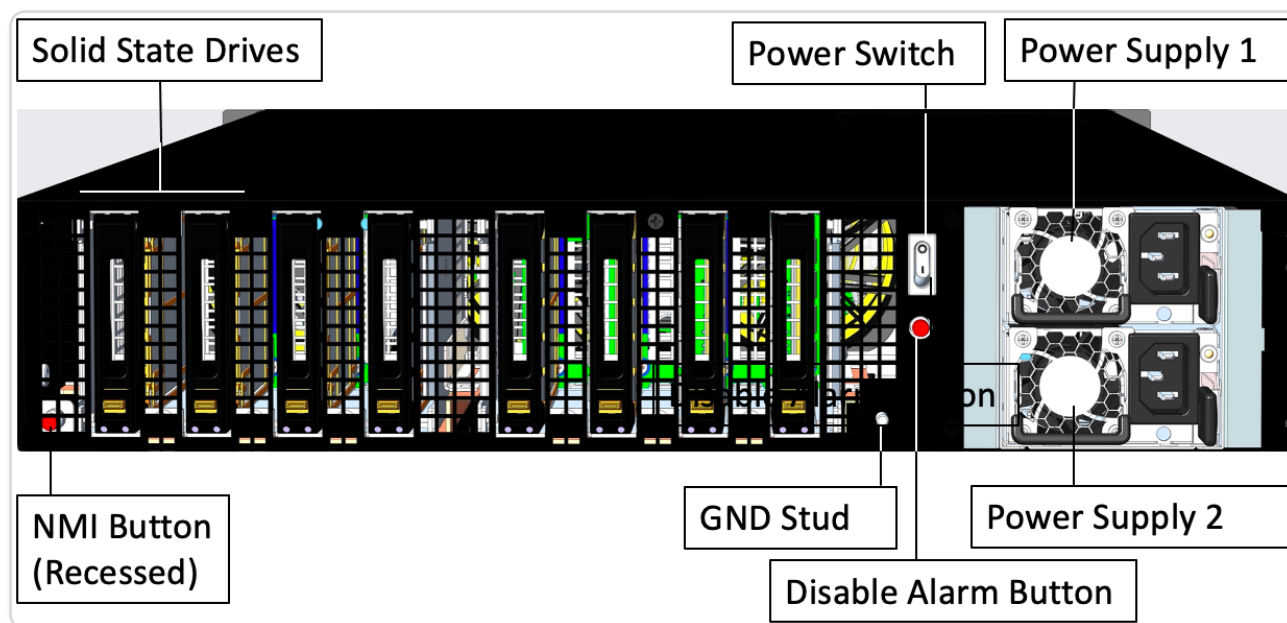


The NetScaler MPX 16000 series appliances have the following ports:

- RS232 serial Console port.
- One 100/1000Base-T RJ45 copper Ethernet LOM port. Use this port to remotely monitor and manage the appliance independent of the {{citrix-adc-generic}} firmware.
- Two 100/1000Base-T RJ45 copper Ethernet management ports, numbered 0/1 and 0/2. These ports are used to connect directly to the appliance for {{citrix-adc-generic}} administration functions.
- Two USB ports (reserved for a future release).
- Eight 25G SFP28 ports, numbered 25/1 to 25/8. Four 100G QSFP28 ports, numbered 100/1 to 100/4. For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G ports](#).

The following figure shows the back panel of the MPX 16000 appliance.

Figure 2. NetScaler MPX 16000, back panel



The following components are visible on the back panel of the MPX 16000 appliance:

- Two 960 GB removable solid-state drives (SSD).

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- Two power supplies, rated at 850 watts, 100–240 VAC. Maximum power consumption is 584 watts and typical power consumption is 465 watts. The following table indicates the LED status of each power supply:

LED COLOR	LED INDICATES
OFF	No power to any power supply in the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.

LED COLOR	LED INDICATES
RED	Power supply failure.

- **Disable alarm button**, which is functional only when the appliance has two power supplies. Press this button to silence the power alarm when one of two power supplies loses input power (second power supply optional) or when a power supply is malfunctioning.
- **Non-Maskable Interrupt (NMI) Button**, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the **Remote Control** menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

NetScaler MPX 17000

Welcome to the next-generation NetScaler MPX 17000 platform. This section provides comprehensive instructions on how to deploy your appliance efficiently and configure it for optimal performance.

The NetScaler MPX 17000 2U platform represents the latest advancement in NetScaler® technology, featuring enhanced processing power, improved connectivity options, and robust management capabilities.

Key specifications

COMPONENT	SPECIFICATION
Processor	Intel Xeon 5th generation processor, 2x sockets
Total Logical CPUs	40 active cores (2 sockets x 20 active cores per socket)
System Memory	256GB DDR5 ECC RDIMM
Boot Storage (RAID-1)	2x 960 GB NVMe SSD (slots 1 and 2)

COMPONENT	SPECIFICATION
Data Connectivity	2x Quad-port 50G SFP56 NIC (PCIe 4.0 x16) and 2x Dual-port 200G QSFP56 NIC (PCIe 5.0 x16)
Management Ports	2x 1 GbE RJ45 (MGMT 0/1 and 0/2) and 1x dedicated LOM port
Power Supplies	2x CRPS PSUs, redundant N+1, hot-swappable, up to 1600 W each
BMC/IPMI	Dedicated BMC for out-of-band management
Form Factor	2U, EIA 310-D 19-inch rack compatible, 88 mm height

Prepare for installation

Before installing your new appliance, carefully unpack the unit and verify that all the components are present. The only tools required for installing the appliance are a Phillips screwdriver, a flathead screwdriver, and a cage nut insertion tool (if installing into square-hole racks). Your NetScaler 2U package should include the following items:

- 1x NetScaler MPX 17000 appliance
- 1x standard 4-post rail kit (19-inch rack compatible), which includes:
 - Left rail (x1)
 - Right rail (x1)
 - Mounting screw kit (includes M4x4L, M4x6L, M5x20L screws)
 - Rackmount ear kit (x1)

The included accessory kit contains essential connectivity hardware, including two power cords to support redundant power supply operation.

NOTES:

- Rail kit compatibility varies by rack manufacturer and configuration. If the provided rail kit does not fit your specific rack infrastructure, contact your NetScaler sales representative immediately to obtain an appropriate alternative mounting solution.
- Before proceeding, examine all components for shipping damage. Report any damaged items to your carrier and NetScaler support before beginning the installation process.

Infrastructure requirements

- Ensure that the 19-inch rack has a minimum of 550 mm depth clearance and 2U available height (88 mm).
- Proper airflow management with front-to-rear cooling path.
- Adequate weight support (system weight: 35 lbs).

Network requirements

- Administrative LAN switch port available for MGMT 0/1 (1 GbE RJ-45).
- Dedicated out-of-band management network or LOM/IPMI access.
- Appropriate network cables (Cat5e or Cat6 for management, fiber, or DAC for data).
- 50 GbE capable switch for SFP56 data ports; 200 GbE capable switch for QSFP56 data ports.

Power requirements

- Dual power sources (recommended for N+1 redundancy).
- Frequency operating range: 47 Hz – 63 Hz.
- Adequate power capacity (full load 100 V: 734 W / 240 V: 716 W).
- PSU input connector: IEC320-C14 (Male).
- Required power cord: IEC320-C13 to NEMA 5-15P (or regional equivalent).
- Rating: Minimum 10 A / 250 V.

Detailed AC input voltage specifications

VOLTAGE RANGE	MINIMUM	RATED OPERATING RANGE	MAXIMUM	BROWN OUT	BROWN IN
115 V Range	90 Vrms	100-127 Vrms	140 Vrms	75 Vac+/-4 V	85 Vac+/-4 V
230 V Range	180 Vrms	200-240 Vrms	264 Vrms	N/A	N/A

Maximum input current requirements

INPUT VOLTAGE RANGE	MAXIMUM CURRENT
100 Vac – 127 Vac	12 A
200 Vac – 240 Vac	10 A

Management station requirements

- Workstation or laptop (Windows or macOS) with network connectivity.
- Web browser with JavaScript and HTML5 support (Chrome, Firefox, Safari, or Edge).
- Terminal emulator software for CLI access.
- Administrative privileges for network configuration.

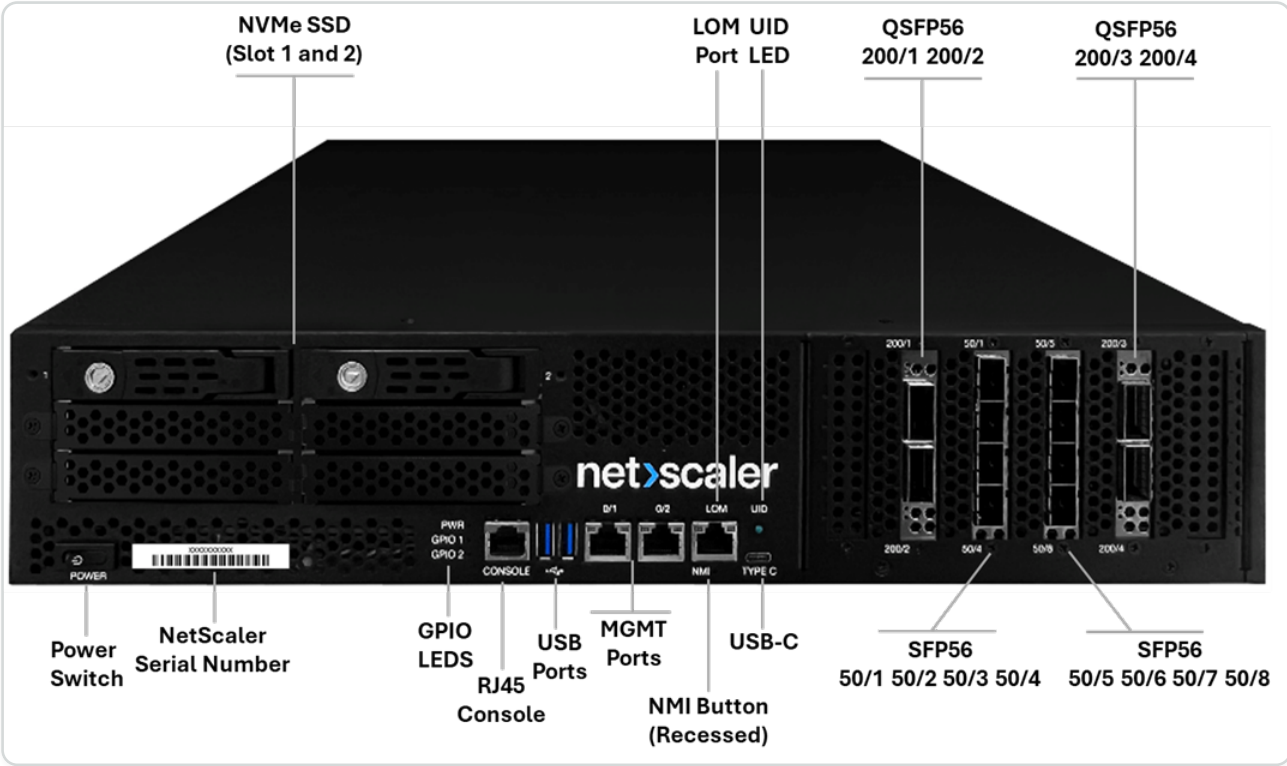
Hardware platform

Front panel components

The MPX 17000 front panel provides management interfaces, NVMe drive bays, data ports, and power controls. Two hot-swappable NVMe bays are located at the front left of the panel.

NVMe drive bay assignments:

- Slots 1–2: Two 960 GB NVMe SSDs configured as RAID-1 for the MPX OS/system volume.



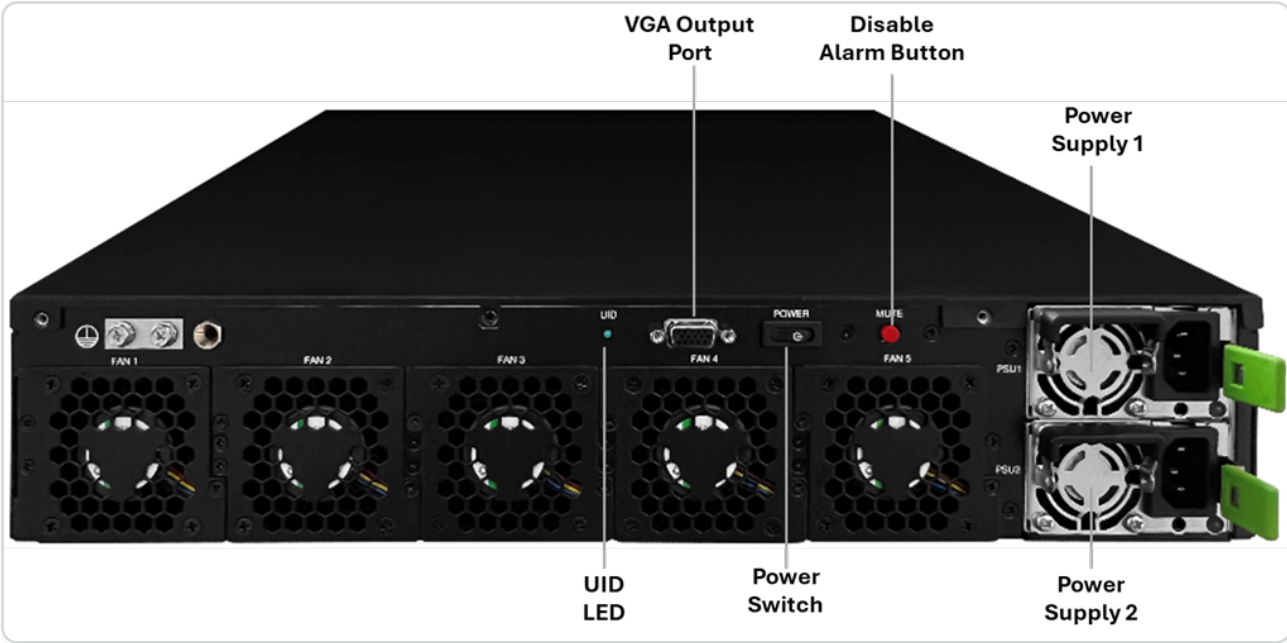
Front panel component description

LABEL	COMPONENT TYPE	TECHNICAL SPECIFICATION	PRIMARY FUNCTION
CONSOLE	RJ-45 Console Port	RS-232 compatible, 9600-8N1	Primary serial console for direct system access
MGMT 0/1 & 0/2	Dual Ethernet Ports (1000Base-T)	1000Base-T, autonegotiate	Primary/secondary in-band management
LOM	Dedicated IPMI Port	Intelligent Platform Management Interface, IPMI 2.0, Redfish 1.15.1	Out-of-band hardware monitoring and control
NMI	Pinhole Button	Non-maskable interrupt	Force kernel core dump for crash analysis
PWR	Soft-push Button (4 sec on/off)	Power management	Power on / graceful shutdown control

LABEL	COMPONENT TYPE	TECHNICAL SPECIFICATION	PRIMARY FUNCTION
TYPE-C	USB Type-C Port (optional)	Alternate console (not used in standard deployment)	Secondary console and debug interface
UID	Locator LED	Blue LED indicator	Visual system identification in rack
GPIO1/GPIO2	User-defined GPIOs	General-purpose I/O	Not utilized; disabled by default on 2U platform
NVMe Slots 1-2	U.2/U.3 NVMe SSDs	960 GB per drive (2x)	RAID-1 MPX OS boot volume
50/1-50/8	SFP56 Data Ports	50 GbE network interface card (NIC)	Two 4-port SFP56 with PCIe 4.0 x16
200/1-200/4	QSFP56 Data Ports	200 GbE network interface card (NIC)	Two 2-port QSFP56 with PCIe 5.0 x16

Rear panel components

The rear panel houses the dual Common Redundant Power Supply (CRPS), cooling fans, a secondary Unit Identification (UID) LED, a PSU alarm mute button, a VGA output port, and a rear power button.



Panel component description

COMPONENT	TECHNICAL DETAILS	OPERATIONAL CHARACTERISTICS	SERVICE INFORMATION
PSU1/PSU2	CRPS PSU, up to 1600 W each	Redundant N+1 configuration	Hot-swappable during operation
Rear UID LED	Blue LED locator	Blue LED indicator	Remote chassis identification
PSU Alarm Mute	Red push-button	Silences audible alarm on PSU fault or loss of AC input	Press once to acknowledge PSU alarm
VGA Output	DB-15 (female D-sub)	System video output	Local KVM connection; also accessible by using LOM
Rear Power Button	Soft-push, optional	Mirrors front panel power button function	Dual power control access
Fan Modules	5 system fans	Smart fan intelligent control by BMC	Note: No field-replaceable Fan FRU

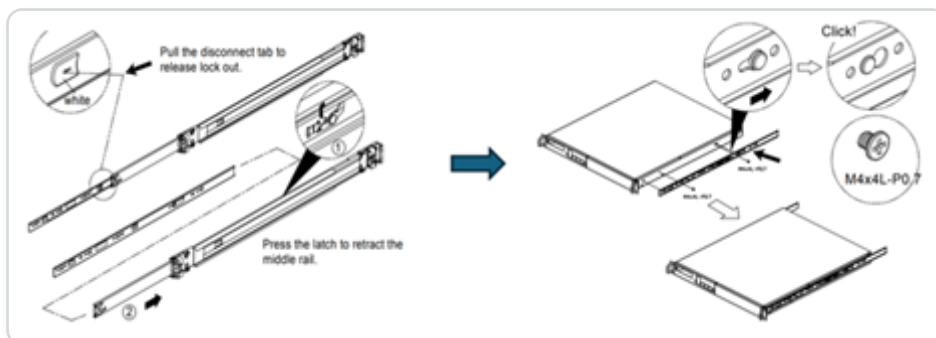
Install the hardware

Rack-mount the appliance

Perform the following procedure to ensure proper appliance mounting and system performance.

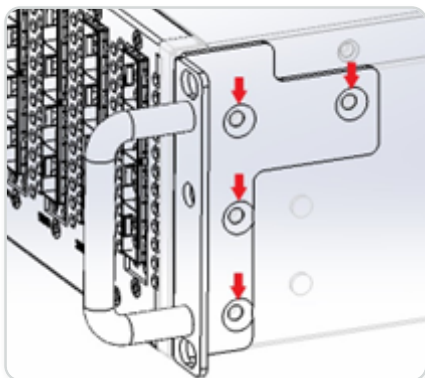
Remove the inner rails from the rail assembly

1. Pull the white disconnect tab to release and detach the inner rail member from each slide rail.
2. With the stamped text facing outward, align the inner rail with the chassis mount points, using the black reference markers on both sides of the chassis.
3. Slide the rail toward the rear until it clicks firmly into the locked position.
4. Fasten each inner rail using the provided M4x4L screws. Use five screws per side for a total of ten.
5. Repeat this process for both the left and right sides of the chassis.



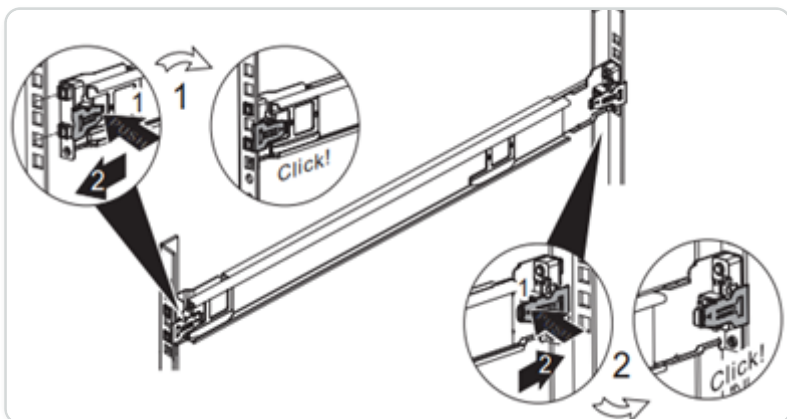
Chassis mounting ear installation

1. Attach rack mount ears to both the left and right sides of the chassis front.
2. Align the ears with the designated screw holes on the chassis.
3. Secure each ear with M4x6L screws using four screws per side.
4. Verify that the ears are flush and do not obstruct front panel access.



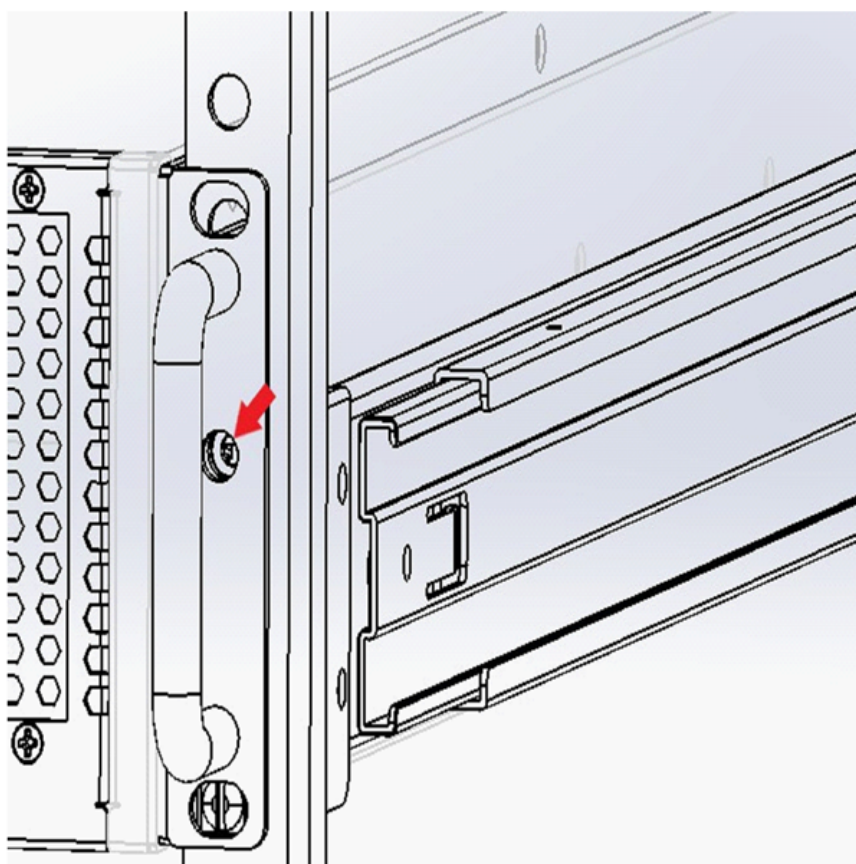
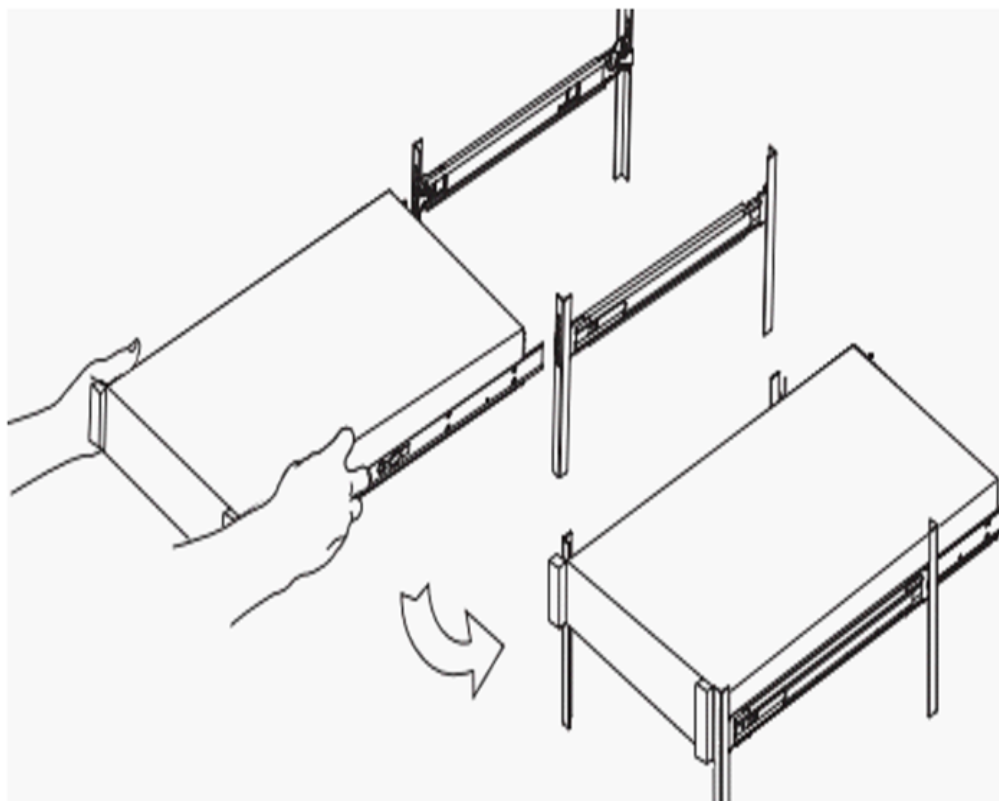
Outer slide rail assembly installation

1. Align the mounting brackets with the rack post holes at the selected 2 U-height.
2. Insert the rail mounting mechanism into the rack posts until it engages.
3. Listen for an audible "click" to confirm that the rail is properly seated and locked.
4. Ensure both the front and rear mounting points are securely attached to the posts.
5. Verify that the rails are level and parallel using the numbered rack post markings.
6. Repeat this process for both the left and right outer rail assemblies.



Mount the chassis into the rack

1. Carefully align the chassis-mounted inner rails with the rack-mounted outer rails.
2. Smoothly slide the system into the rack until the locking mechanism engages.
3. If necessary, apply even pressure to ensure the unit locks securely into place.
4. Secure each front ear to the rack post using one M5x20 screw per side.



Safety requirements

For safety and equipment durability, ensure that the following requirements are met:

1. Maintain a minimum of 2 inches of clearance at the front and rear of the chassis to ensure proper ventilation.
2. Verify the rack's weight capacity before installation and ensure that the rack is stable and properly secured to the floor.
3. Use proper lifting techniques. The system weight is approximately 35 lbs.
4. Strictly follow electrical safety procedures when connecting the appliance to a power source.

Airflow management

The 2U platform is designed for front-to-rear airflow. Unobstructed passage is required for optimal cooling performance. Restricted airflow results in thermal overheating and the automatic activation of system protection mechanisms (throttling or shutdown).

Network and power connections

Connection sequence

Perform the following procedure to ensure proper system initialization and to prevent configuration conflicts.

1. Management network connectivity

- a. Connect the MGMT 0/1 port to your administrative LAN by using a Cat5e/Cat6 Ethernet cable.
- b. Ensure that the network switch port is configured to support auto-negotiation.
- c. Verify network connectivity and ensure that the correct VLAN configuration is applied, if applicable.
- d. Document the assigned IP address and network parameters for future reference.

2. Out-of-Band (OOB) management setup

- a. Connect the Lights-Out Management (LOM) port to a dedicated out-of-band (OOB) management network.
- b. Use separate network infrastructure from production traffic.

- c. Leave the LOM port in dedicated mode operation (factory default).

3. Data port configuration

- a. Install appropriate SFP56 transceivers (50 GbE ports: 50/1-50/8) or QSFP56 transceivers (200 GbE ports: 200/1-200/4).
- b. Match the transceiver type to switch port capabilities. Use Citrix-qualified transceiver MPNs for guaranteed interoperability.
- c. Connect fiber or DAC cables to data ports as required.
- d. Verify that the cable specifications match the port capabilities (50 GbE and 200 GbE).

4. Power system connection

- a. Plug the first power cord into the PSU1 input receptacle.
- b. Plug the second power cord into the PSU2 input receptacle.
- c. Connect the unit to independent power feeds where possible to ensure N+1 redundancy.
- d. Ensure that the power source meets requirements (100–240 VAC, 50–60 Hz).

5. System startup

- a. Press the front panel power button to initiate the boot sequence.
- b. Observe the front panel LEDs; the power LED should illuminate solid green.
- c. Verify both PSU LEDs are solid green within ten seconds of power-on.
- d. Allow the full boot cycle to complete (approximately 4–5 minutes) before accessing the system.

Power supply status indicators

The CRPS power supplies provide comprehensive status monitoring through integrated LED indicators located on each unit's faceplate.

PSU LED indicator status:

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
Solid GREEN	AC present, all DC rails active under load	Normal operation	None - normal

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
1 Hz Blink GREEN	AC present, 12Vsb active including 5Vsb for BMC power, main rails idle	Redundant standby (N+1)	None - normal
Solid AMBER	AC input lost or disconnected	Lost redundancy (if N+1) or system down	Check AC power connection
1 Hz Blink AMBER	OCP/OVP/OTP warning threshold reached	Degraded PSU operation/Potential shutdown	Verify PSU cooling and airflow
Solid AMBER	Critical Fault (OCP/OVP/OTP tripped)	PSU shutdown for protection	Replace the PSU immediately

System access and configuration

MPX GUI access method

The NetScaler MPX GUI is a web-based interface for the efficient configuration, monitoring, and troubleshooting of the appliance. Administrators access the GUI over HTTPS using the Management IP (NSIP), providing comprehensive control over system health, networking, load balancing, and security.

Platform-specific access information

- Access the physical appliance directly using the MGMT 0/1 port.
- Default IP address (NSIP): 192.168.100.1
- Default subnet mask: 255.255.0.0/16

NOTE:

Use the single management interface for full system administration.

Perform the following steps to initialize the appliance

1. Network preparation

- a. Connect your management workstation to the MGMT 0/1 port or a port on the same management VLAN.
- b. Set a static IP address on the workstation in the 192.168.100.X/16 range (for example, 192.168.100.50).
- c. Verify the network path by performing a ping test to the default IP address: 192.168.100.1.
- d. Ensure that any local firewalls allow HTTPS (port 443) traffic to the appliance.

2. Browser initialization

- a. Open a Web browser (Chrome, Firefox, Safari, or Edge).
- b. Enter the URL `https://192.168.100.1`.

NOTE:

Accept a security certificate warning (self-signed certificate) to proceed to the login page.

3. Initial authentication

- a. Username: `nsroot`.
- b. Password: Enter the system serial number exactly as it appears on the physical chassis label (case-sensitive).
- c. Click **Login** or press **Enter**.

On successful authentication, the system redirects you to the **Initial Configuration Wizard**.

4. Setup wizard configuration

The **Setup Wizard** guides you through the following essential parameters:

- a. Management service IP address (NSIP): Assign a static IP address for management access.
- b. Subnet mask and default gateway: Configure these for your network segment.
- c. DNS server: Enter the primary DNS IP address.
- d. Hostname: Assign a unique, descriptive hostname to identify the appliance on the network.

- e. Administrative password: Change the default password to a strong, secure administrative password.

Common default IP address configuration

INTERFACE OR SERVICE	DEFAULT USER LOGIN CREDENTIALS	DEFAULT IP ADDRESS	SUBNET MASK OR GATEWAY	DESCRIPTION
NSIP address (MGMT 0/1)	nsroot or product SN	192.168.100.1	255.255.0.0/16	Default NetScaler IP address for initial configuration
LOM or IPMI Port	nsroot or product SN	192.168.1.3	255.255.255.0/24	Out-of-band management IPMI, Redfish, remote iKVM, power control

Console connection setup by using the CLI

1. Physical connection

- a. Connect an RJ-45 serial cable to the console port on the front panel.
- b. Connect the other end of the cable to your workstation's serial port or to a USB-to-serial adapter.

Ensure that the cable is seated firmly at both ends to prevent data corruption or character "scrambling" during the session.

2. Terminal emulator configuration

Open your terminal emulation software (such as PuTTY, Tera Term, or SecureCRT) and configure the following settings:

SETTING	VALUE
Baud Rate	9600 bps
Data Bits	8

SETTING	VALUE
Parity	None
Stop Bits	1
Flow Control	None (Disabled)
Terminal Type	ANSI
Putty Keypad Mode	VT 100

3. Session establishment

- Open the terminal emulator application.
- Establish a connection by using the configured settings.
- Press Enter to trigger the login prompt if it does not appear automatically.

Wait for the login prompt to display.

4. Authentication process

- At the login prompt, type `nsroot`.
- At the password prompt, type the system serial number (found on the chassis label).
- On successful authentication, the system displays the NetScaler command prompt.

NOTE:

All login credentials are case-sensitive.

Sample configuration

Perform the following steps to configure basic network connectivity:

- Configure a NetScaler IP address and subnet mask.

```
set ns config -ipaddress 192.0.2.255 -netmask 255.255.255.0
```

- Add a subnet IP address for client communication.

```
add ns ip 192.0.2.254 255.255.255.0 -type snip
```

- Configure the default route for external connectivity.

```
add route 0.0.0.0 0.0.0.0 10.0.0.1
```

- Configure the system hostname.

```
set ns hostname NS17000-1
```

- Change the administrative password for security.

```
set system user nsroot -password <yourpassword>
```

```
Enter password: *****
```

```
Confirm password: *****
```

- Save configuration to persistent storage.

```
save ns config
```

- Restart the system to apply changes.

```
reboot
```

Basic verification commands

- Check the system software version.

```
show version
```

- Check system hardware information.

```
show hardware
```

- Display the current IP configuration.

```
show ip
```

- Show all network interfaces status.

```
show interface
```

- Display routing table

```
show route
```

- Verify that the configuration saves status.

```
show config
```

System specifications

Hardware configurations

The MPX 17000 platform integrates enterprise-grade hardware built to deliver high-performance applications with consistent reliability.

Core system architecture

COMPONENT CATEGORY	SPECIFICATION DETAILS	PERFORMANCE CHARACTERISTICS
Regulatory Model	2U3P3A	FCC and international compliance designation
Processor Architecture	Intel Xeon 5th generation processor	2 sockets, 20 active cores per socket at 2.2 GHz
Platform Chipset	Intel C741 PCH	Advanced platform controller hub
BMC Controller	Baseboard Management Controller with IPMI 2.0	Remote KVM, hardware monitoring, power control
System Memory	256 GB DDR5 5600 ECC RDIMM	8x 32 GB modules, error correction enabled
Primary Storage	2x 960 GB NVMe U.2/U.3 (slot 1 and 2)	Configured as RAID-1 for MPX OS and system volume
Management Connectivity	Two 1 GbE RJ45 (1000Base-T)	MGMT 0/1 (primary), MGMT 0/2 (secondary)
50G Data Connectivity	Two 4-port SFP56 NICs	PCIe 4.0 x16 - ports 50/1-50/8, 8 total 50G ports

COMPONENT CATEGORY	SPECIFICATION DETAILS	PERFORMANCE CHARACTERISTICS
200G Data Connectivity	Two 2-port QSFP56 NICs	PCIe 5.0 x16 - ports 200/1-200/4, 4 total 200G ports
NUMA Topology	2 NUMA nodes	Each NUMA node corresponds to one CPU socket

Power and environmental specifications

Power system specifications

PARAMETER	SPECIFICATION	OPERATING RANGE	NOTES
Power Supply Configuration	2x CRPS PSUs	Redundant N+1 operation	Hot-swappable, up to 1600 W each
Input Voltage Range	100-240VAC	Universal input compatibility	Auto-sensing
Input Frequency	50-60 Hz	Standard utility frequency	+/-3Hz tolerance
Input Current	100-127Vac: 12A max 200-240Vac: 10A max	Variable by input voltage	Maximum ratings
Typical System Power Consumption	465 W	Normal operational load	Steady-state operation
Maximum System Power Consumption	734W at 100V or 716W at 240V	Peak system utilization	Full load with both PSUs active

Environmental specifications

ENVIRONMENT FACTOR	OPERATING RANGE	STORAGE RANGE	CRITICAL LIMITS
Ambient Temperature	0-45 deg C (32-113 deg F)	-40 to 70 deg C	50 deg C absolute maximum
Relative Humidity	10-90% RH	10-95% RH	Non-condensing
Operating Altitude	0-5,000 m	0-15,200 m	Derated above 8,000 m
Typical System Airflow (front-to-back)	~126.54 CFM	N/A	Full load at nominal 25 deg C ambient
Maximum System Airflow (front-to-back)	~214.83 CFM	N/A	Full load at elevated temperature

Physical specifications

DIMENSION	MEASUREMENT	STANDARD COMPLIANCE
Width	443 mm (17.4 in)	EIA 310-D 19-inch rack
Depth	550 mm (21.7 in)	Standard server depth
Height	88 mm (3.5 in)	2U rack unit
System Weight	35 lbs	Approximate operational weight
Package Weight	52 lbs	Shipping configuration

System LED status

The system provides real-time status monitoring by using the LED indicators located on the front and rear panels.

Front panel LED status

LED INDICATOR	NORMAL OPERATION	FAULT CONDITION	DESCRIPTION
PWR (Power)	Solid Green	Off	System power and initialization status
GPIO1	Off (default)	N/A	User-defined function (disabled)
GPIO2	Off (default)	N/A	User-defined function (disabled)

Power supply LED status

LED INDICATOR	PSU STATE	SYSTEM IMPACT	ACTION REQUIRED
Solid GREEN	AC present, all DC rails active under load	Normal operation	None - normal
1 Hz Blink GREEN	AC present, 12Vsb active including 5Vsb for BMC power, main rails idle	Redundant standby (N+1)	None - normal
Solid AMBER	AC input lost or disconnected	Lost redundancy (if N+1) or system down	Check AC power connection
1 Hz Blink AMBER	OCP/OVP/OTP warning threshold reached	Degraded PSU operation/Potential shutdown	Verify PSU cooling and airflow
Solid AMBER	Critical Fault (OCP/OVP/OTP tripped)	PSU shutdown for protection	Replace the PSU immediately

NVMe SSD tray LED status

Each NVMe tray includes two LEDs. The right LED indicates drive presence and activity. The left LED indicates drive status and is controlled by the NVMe backplane controller through the BMC.



Left LED status indicators:

LEFT LED (LOCATION / STATUS)	LED STATE
Locate/Identify Drive	Yellow Blink at 4 Hz

NOTE:

Use the LOM Web UI (Storage section) to toggle the Location LED for a specific NVMe slot (1–2) to identify a drive in a populated rack. Select the target drive and change the Location LED state from OFF (default) to ON (Locate Active).

Right LED status indicators:

RIGHT LED (ACTIVE / PRESENT)	LED STATE
SSD present and idle	Solid Green
Storage data transfer/active	Green, Blinking at 4 Hz
No SSD Present or Removed	LED Off

Additional information resources

- For information about detailed specifications, configuration guides, and troubleshooting procedures, see the [NetScaler Hardware Platforms Documentation](#).
- For information about step-by-step procedures for performing system upgrades and downgrades, see [Upgrade and downgrade a NetScaler appliance](#).
- For information about deploying redundant NetScaler configurations, see [Configuring high availability](#).

Technical support access

- Primary support portal: Customer portal at <https://www.netscaler.com/>

- Online documentation: Complete technical library at www.docs.netScaler.com

Information required for technical support

Before contacting NetScaler Support, gather the following information to ensure an efficient resolution process:

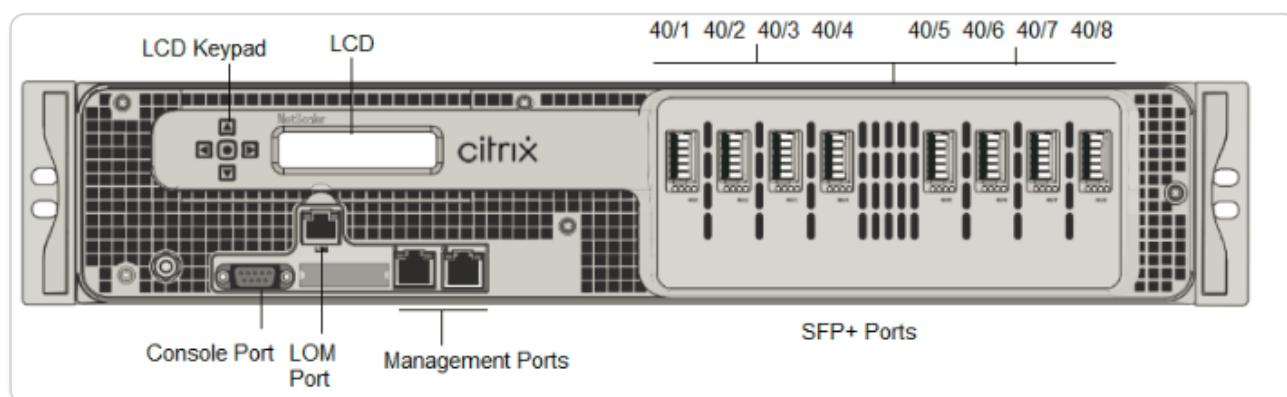
- **Hardware serial number:** Locate this on the physical chassis label.
- **Software version:** Provide the current release version and specific build number (Example: Release 14.1 Build 12.35).
- **Problem description:** Document the specific issue, including exact error codes, timestamps of the occurrence, and any recent changes to the environment.
- **System configuration:** Provide the network environment and relevant configuration files (Example: ns.conf).
- **Log files:** Collect the system logs and diagnostic information.

NetScaler MPX 25000A

The NetScaler MPX 25100A, MPX 25160A, and MPX 25200A are 2U appliances. Each model has two eight-core processors, 256 GB of memory, eight 40G QSFP+ ports (8x40G QSFP+).

The front panel of the MPX 25100A, MPX 25160A, and MPX 25200A appliances has a (8x40G QSFP+) port configuration.

Figure 1. NetScaler MPX 25100A, MPX 25160A, and MPX 25200A, front panel



The NetScaler MPX 25100A, MPX 25160A, and MPX 25200A appliances have the following ports:

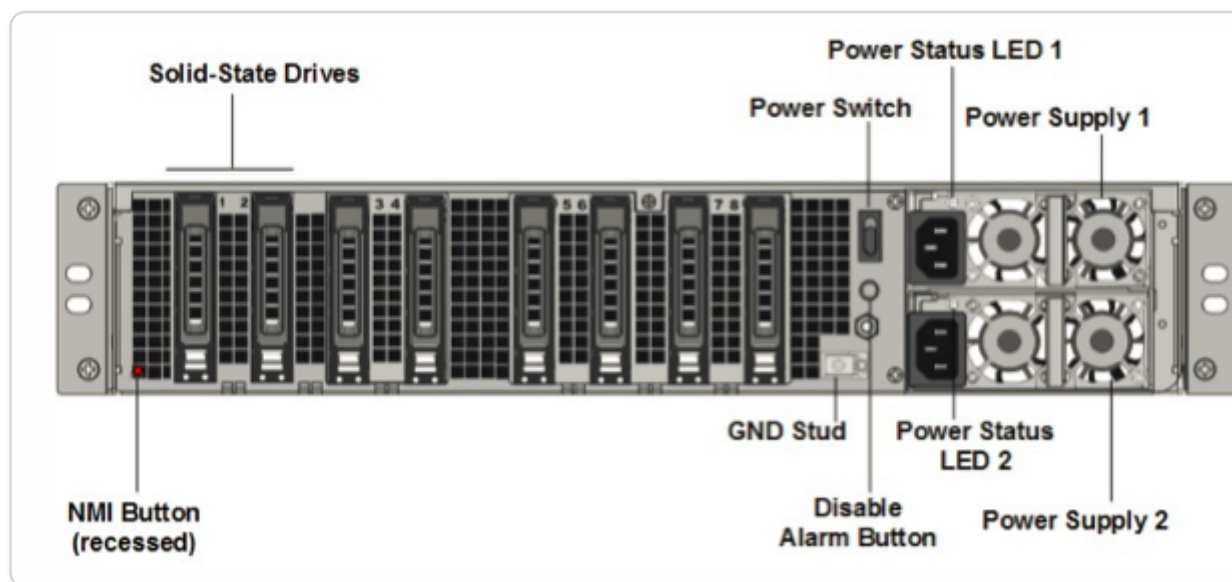
- RS232 serial Console Port.
- 10/100Base-T copper Ethernet Port (RJ45), also called the LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.

- Network Ports, eight 40G QSFP+ ports. For information about supported transceivers per port, see [25G, 40G, 50G, and 100G ports](#).

NOTE

40G ports do not support 10G and 1G transceivers.

The following figure shows the back panel of the MPX 25100A, MPX 25160A, and MPX 25200A appliances.



The following components are visible on the back panel of the MPX 25100A, MPX 25160A, and MPX 25200A:

- Two 300 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) devices. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch. This switch turns the power to the appliance on or off. Press the switch for less than two seconds to shut off the power.
- Two power supplies. Each power supply is rated at 1000 watts, 100–240 volts. Each power supply has an LED that indicates the status of the power supply, as described in [Common hardware components](#).
- **Disable alarm button.** This button is functional only when the appliance has two power supplies. Press this button to stop the power alarm from sounding when you have plugged the

appliance into only one power outlet, or when one power supply is malfunctioning and you want to continue operating the appliance until it is repaired.

- Non-maskable interrupt (NMI) button. This button is used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

NetScaler MPX 25100T

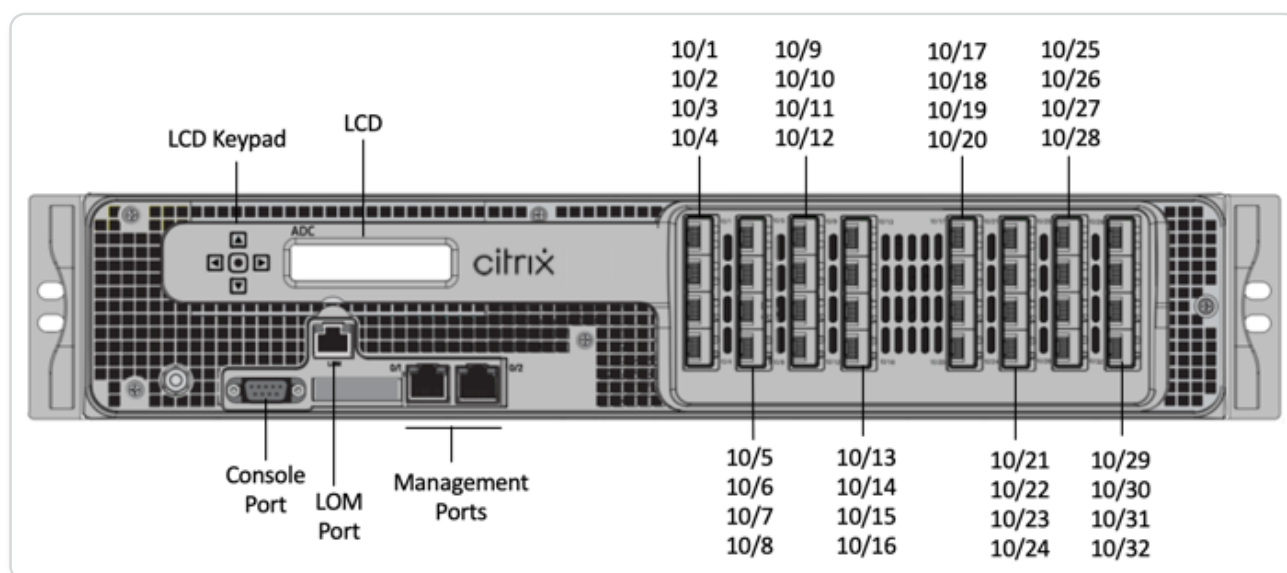
The NetScaler MPX 25100T and 25160T are 2U appliances. Each model has two 10-core processors and 128 GB of memory. The MPX 25100T/25160T appliances are available in the thirty-two 10G SFP+ ports (32x10G SFP+) configuration.

NOTE:

The MPX 25000T appliances are not RAID (redundant array of independent disks) devices.

The following figure shows the front panel of the MPX 25100T/25160T (32x10G SFP+) appliance.

Figure 1. NetScaler MPX 25100T/25160T (32x10G SFP+), front panel



Depending on the model, the appliance has the following ports:

- RS232 serial Console Port.
- 10/100Base-T copper Ethernet Port (RJ45), also called the LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.

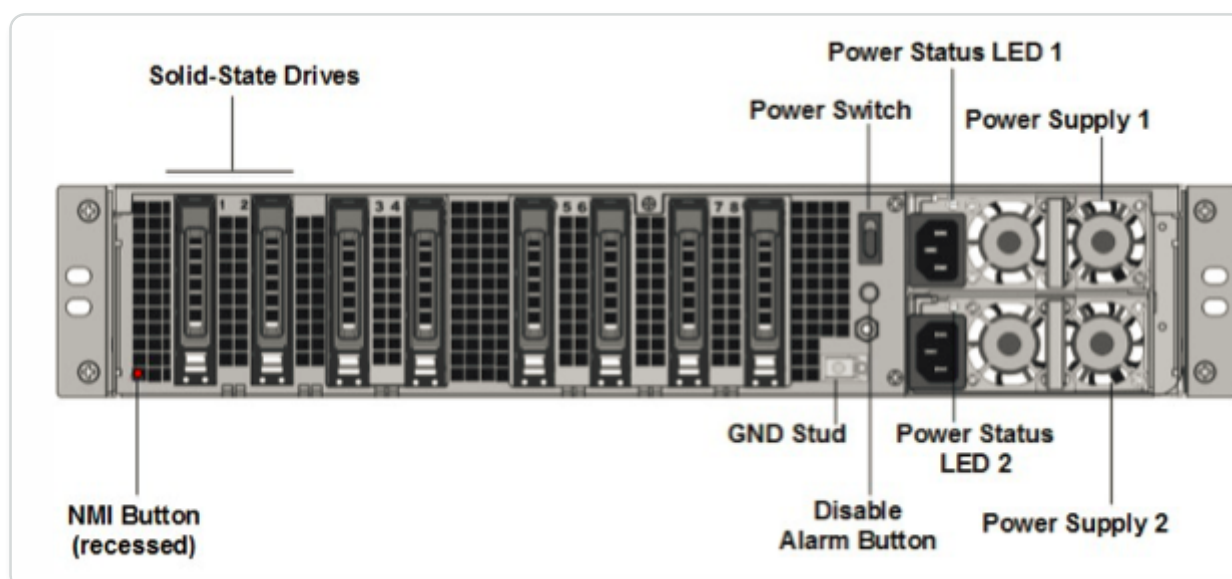
- Two 10/100/1000Base-T copper Ethernet Management Ports (RJ45), numbered 0/1 and 0/2 from left to right. These ports are used to connect directly to the appliance for system administration functions.
- Network Ports, thirty-two 10G SFP+ ports (32x10G SFP+).

NOTE:

The 10G SFP+ ports on these appliances support copper 1G SFP transceivers.

The following figure shows the back panel of the MPX 25100T/25160T appliance.

Figure 2. NetScaler MPX 25100T/25160T, back panel



The following components are visible on the back panel of the MPX 25100T/25160T appliance:

- One 300 GB or larger removable solid-state drive.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off. Press the switch for less than two seconds to shut off the power.
- Two power supplies, each rated at 1000 watts, 100–240 volts. Max power consumption is 717 W. Typical power consumption is 594 W. Each power supply has an LED that indicates the status of the power supply, as described in [Common hardware components](#).
- **Disable alarm button**, which is functional only when the appliance has two power supplies.

Press this button to stop the power alarm from sounding when either of the following conditions is true:

- You have plugged the appliance into only one power outlet.
- One power supply is malfunctioning, and you want to continue operating the appliance until it is repaired.
- Non-maskable interrupt (NMI) Button, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

For information about installing the rails, rack mounting the hardware, and connecting the cables, see [Installing the Hardware](#).

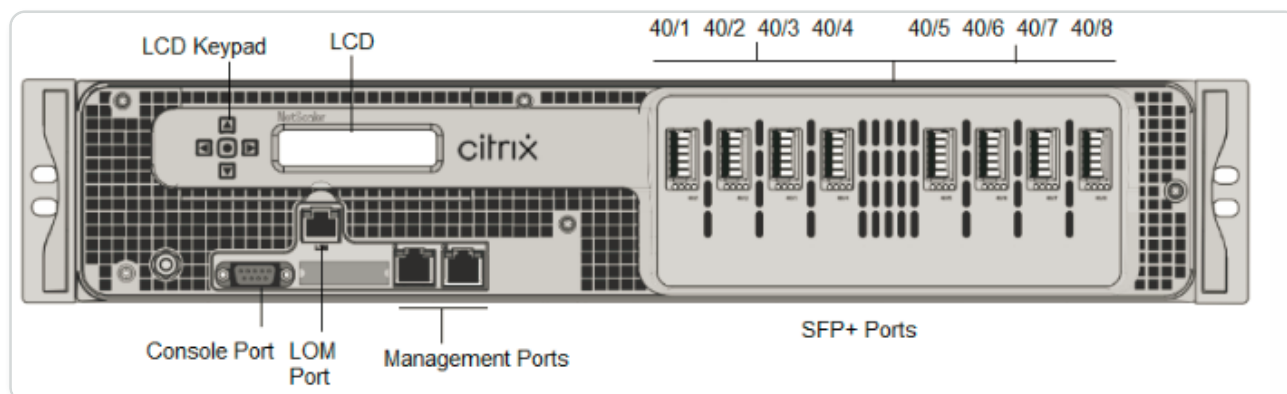
For information about performing initial configuration of your appliance, see [Initial Configuration](#).

NetScaler MPX 25000TA

The NetScaler MPX 25100TA, MPX 25160TA, and MPX 25200TA are 2U appliances. Each model has two 8-core processors, 128 GB of memory, 8X40GE (QSFP+) ports.

The front panel of the MPX 25100TA, MPX 25160TA, and MPX 25200TA have (8X40GE QSFP+) ports.

Figure 1. NetScaler MPX 25100TA, MPX 25160TA, and MPX 25200TA, front panel



The NetScaler MPX 25100TA, MPX 25160TA, and MPX 25200TA appliances have the following ports:

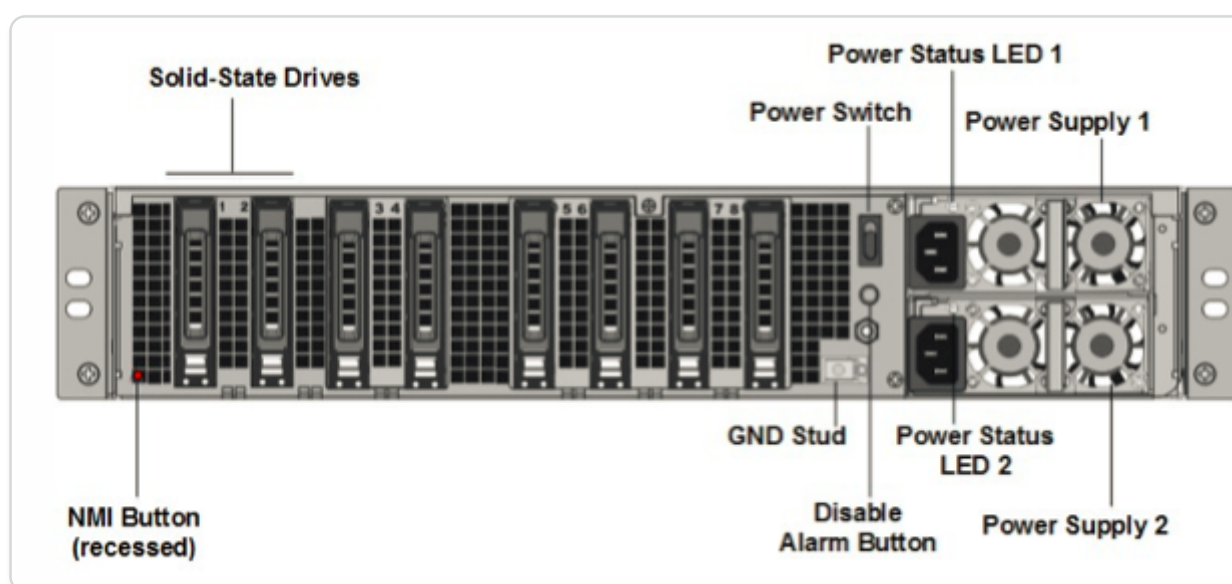
- RS232 serial Console Port.
- 10/100Base-T copper Ethernet Port (RJ45), also called the LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.

- Two 10/100/1000Base-T copper Ethernet Management Ports (RJ45), numbered 0/1 and 0/2 from left to right. These ports are used to connect directly to the appliance for system administration functions.
- Network Ports, 8 X 40GE QSFP+ ports. For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G](#) ports.

Note the following points regarding the network ports on MPX 25100TA appliances:

- 10G ports do not support 1G copper or 1G fiber transceivers.
- 40G ports do not support 10G and 1G transceivers.

Figure 2. NetScaler MPX 25100TA, MPX 25160TA, back panel.



The following components are visible on the back panel of the MPX 25100TA, MPX 25160TA, and MPX 25200TA appliance:

- One 300 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) devices. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off. Press the switch for less than two seconds to shut off the power.

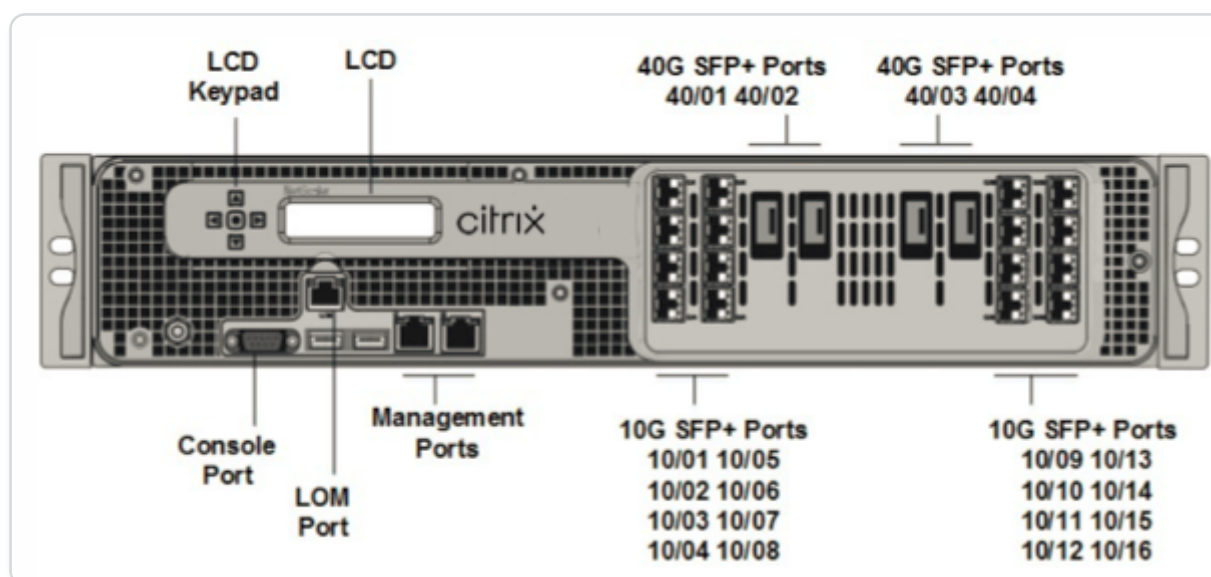
- Two power supplies, each rated at 1000 watts, 100–240 volts. Max power consumption is 717 W. Typical power consumption is 594 W. Each power supply has an LED that indicates the status of the power supply, as described in [Common hardware components](#).
- **Disable alarm button**, which is functional only when the appliance has two power supplies. Press this button to stop the power alarm from sounding when one of the following conditions is true:
 - You have plugged the appliance into only one power outlet
 - One power supply is malfunctioning and you want to continue operating the appliance until it is repaired.
- Non-maskable interrupt (NMI) Button, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

NetScaler MPX 25000-40G

The NetScaler MPX 25000-40G are 2U appliances. Each model has two 10-core processors, 256 GB of memory, four 40G QSFP+ ports, and sixteen 10G SFP+ ports (4x40G QSFP+ 16x10G SFP+).

The following figure shows the front panel of the MPX 25100/MPX 25160/25200 40G appliances.

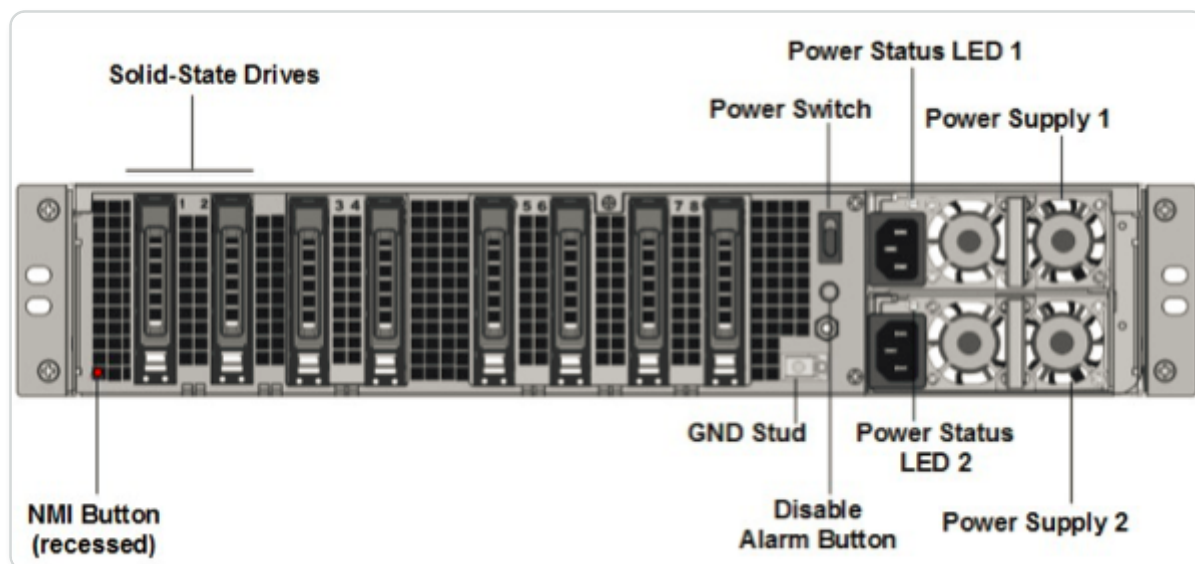
Figure 1. NetScaler MPX 25100 40G, MPX 25160 40G, MPX 25200 40G, front panel



- RS232 serial Console Port.
- 10/100Base-T copper Ethernet Port (RJ45), also called the LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Network Ports. Four 40G QSFP+ ports and sixteen 10G SFP+ ports (4x40G QSFP+, 4x10G SFP+, 4x10G Base-T). For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G ports](#).
- USB ports (reserved for a future release).

Note the following points regarding the network ports on MPX 25100 40G and MPX 25160 40G appliances:

- 10G ports do not support 1G copper or 1G fiber transceivers.
- 40G ports do not support 10G and 1G transceivers.



The following components are visible on the back panel of the MPX 25100/25160/25200 40G appliances:

- Two 300 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) devices. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch This switch turns the power to the appliance on or off. Press the switch for less than two seconds to shut off the power.

- Two power supplies. Each power supply is rated at 1000 watts, 100–240 volts. Each power supply has an LED that indicates the status of the power supply, as described in [Common hardware components](#).
- **Disable alarm button.** This button is functional only when the appliance has two power supplies. Press this button to stop the power alarm from sounding when one of the following conditions is true:
 - You have plugged the appliance into only one power outlet.
 - One power supply is malfunctioning and you want to continue operating the appliance until it is repaired. For more information, see [Lights out management port of the NetScaler MPX appliance](#) topic.
- **Non-maskable interrupt (NMI) button** This button is used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#) topic.

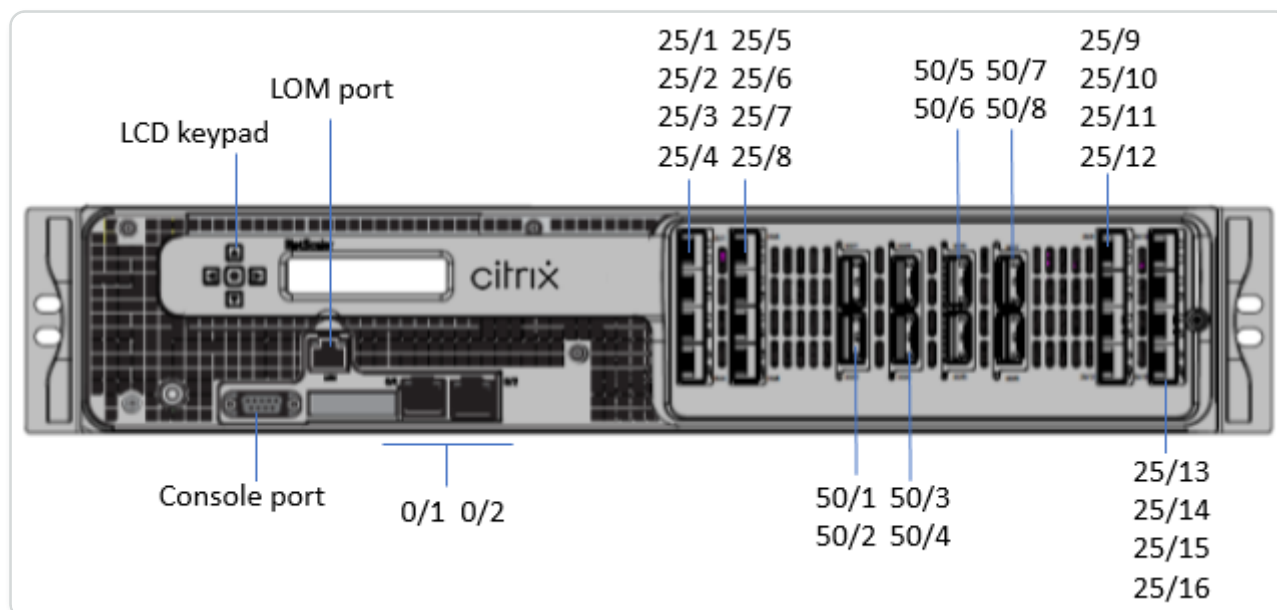
NetScaler MPX 26000

The NetScaler MPX 26100/26160/26200 appliances are 2U appliances. These appliances have two 14-core processors and 256 GB of memory. The appliance has eight 50G and sixteen 25G network ports.

For information about the software releases supported on the NetScaler hardware platforms, see [NetScaler MPX hardware software compatibility matrix](#).

The following figure shows the front panel of the NetScaler MPX 26000 appliances.

Figure 1. NetScaler MPX 26000, front panel

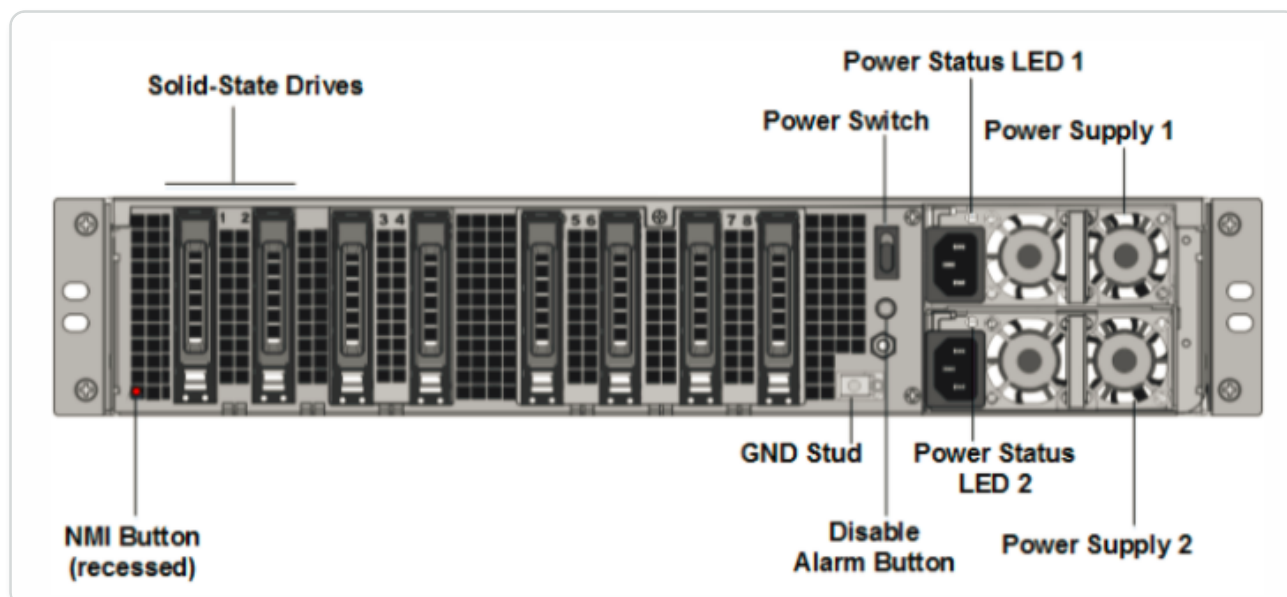


The NetScaler MPX 26000 appliances have the following ports:

- RS232 serial console port.
- One 10/100/1000Base-T RJ45 copper Ethernet LOM Port. Use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Two 10/100/1000Base-T RJ45 copper Ethernet Management Ports, numbered 0/1 and 0/2. These ports are used to connect directly to the appliance for NetScaler administration functions.
- Eight 50G ports, numbered 50/1 to 50/8.
- Sixteen 25G ports, numbered 25/1 through 25/16. For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G ports](#).

The following figure shows the back panel of the MPX 26000 appliances.

Figure 2. NetScaler MPX 26000, back panel



The following components are visible on the back panel of the NetScaler MPX 26000 appliances:

- Two 480 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) configuration. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- Two hot-swappable 100–240 VAC, 1000 W power supply modules. Max power consumption is 672 W. Typical power consumption is 540 W. Each power supply has an LED indicating its status as follows:

LED COLOR	LED INDICATES
OFF	No power to any power supply on the appliance.
Flashing RED	No power to this power supply.

LED COLOR	LED INDICATES
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.
Flashing RED and GREEN	Warning (OVP/UVP/OCP/OTP/Fan); OVP = Over Voltage Protection; UVP = Under Voltage Protection; OCP = Over Current Protection; OTP = Over Temperature Protection

- **Disable alarm button.** Press this button to silence the power alarm when one of two power supplies loses input power or when a power supply is malfunctioning.
- Non-Maskable Interrupt (NMI) Button, used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

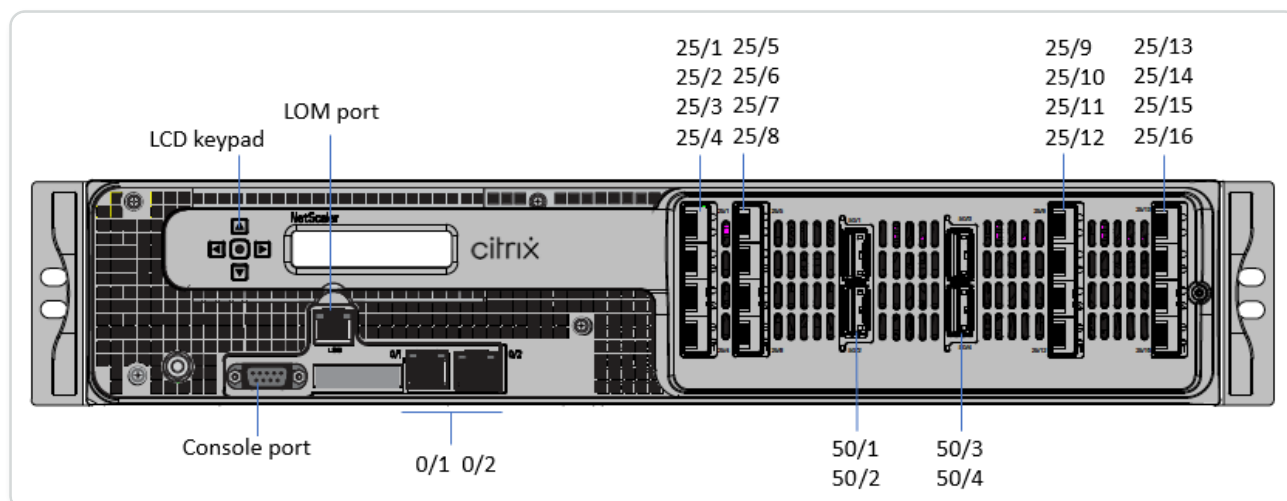
NetScaler MPX 26000-50S

The NetScaler MPX 26000-50S appliances are 2U appliances. These appliances have two 14-core processors and 256 GB of memory. The appliances have four 50G and 16 25G network ports.

For information about the software releases supported on the NetScaler hardware platforms, see [NetScaler MPX hardware software compatibility matrix](#).

The following figure shows the front panel of the NetScaler MPX 26000-50S appliances.

Figure 1. NetScaler MPX 26000-50S, front panel

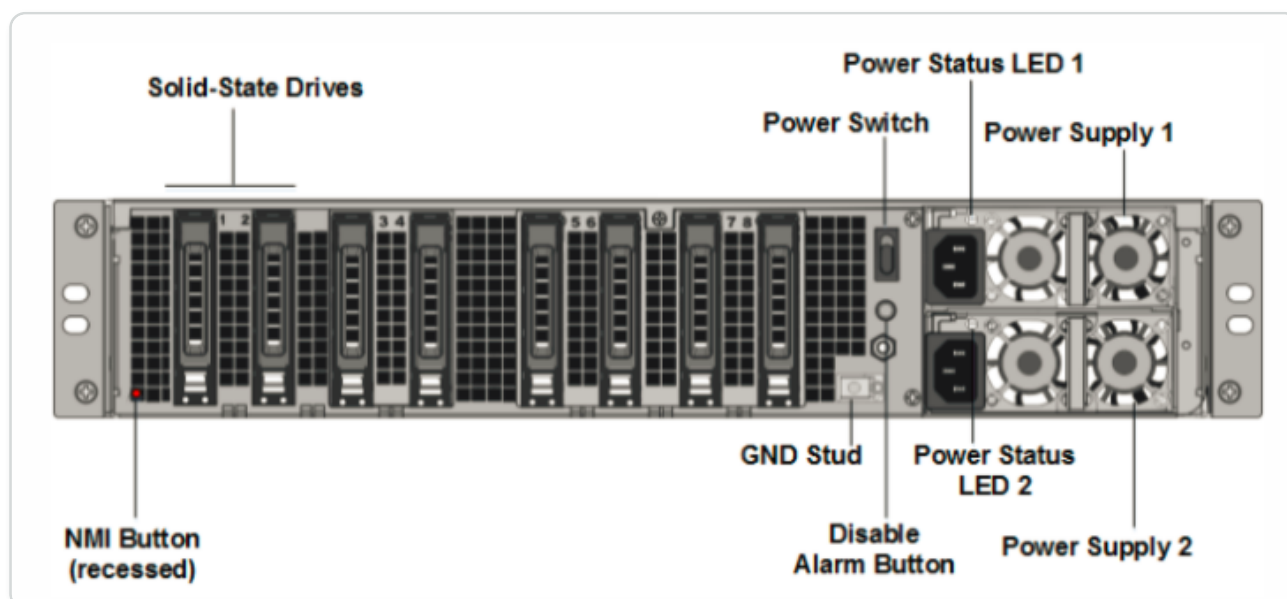


The NetScaler MPX 26000-50S appliances have the following ports:

- RS232 serial console port.
- One 10/100/1000Base-T RJ45 copper Ethernet LOM Port. Use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Two 10/100/1000Base-T RJ45 copper Ethernet Management Ports, numbered 0/1 and 0/2. These ports are used to connect directly to the appliance for NetScaler administration functions.
- Four 50G ports, numbered 50/1 to 50/4.
- Sixteen 25G ports, numbered 25/1 through 25/16. For information about supported transceivers per port, see [25G, 40G, 50G, and 100G ports](#).

The following figure shows the back panel of the MPX 26000-50S appliances.

Figure 2. NetScaler MPX 26000-50S, back panel



The following components are visible on the back panel of the NetScaler MPX 26000-50S appliances:

- Two 480 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) configuration. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- Two hot-swappable 100–240 VAC, 1200 W power supply modules. Max power consumption is 764 W. Typical power consumption is 628 W. Each power supply has an LED indicating its status:

LED COLOR	LED INDICATES
OFF	No power to any power supply on the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.
Flashing RED and GREEN	Warning; (OVP/UVP/OCP/OTP/Fan); OVP = Over Voltage Protection; UVP = Under Voltage Protection; OCP = Over Current Protection; OTP = Over Temperature Protection; OTP = Over Temperature Protection

- **Disable alarm button.** Press this button to silence the power alarm when one of two power supplies loses input power or when a power supply is malfunctioning.
- **Non-Maskable Interrupt (NMI) Button,** used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

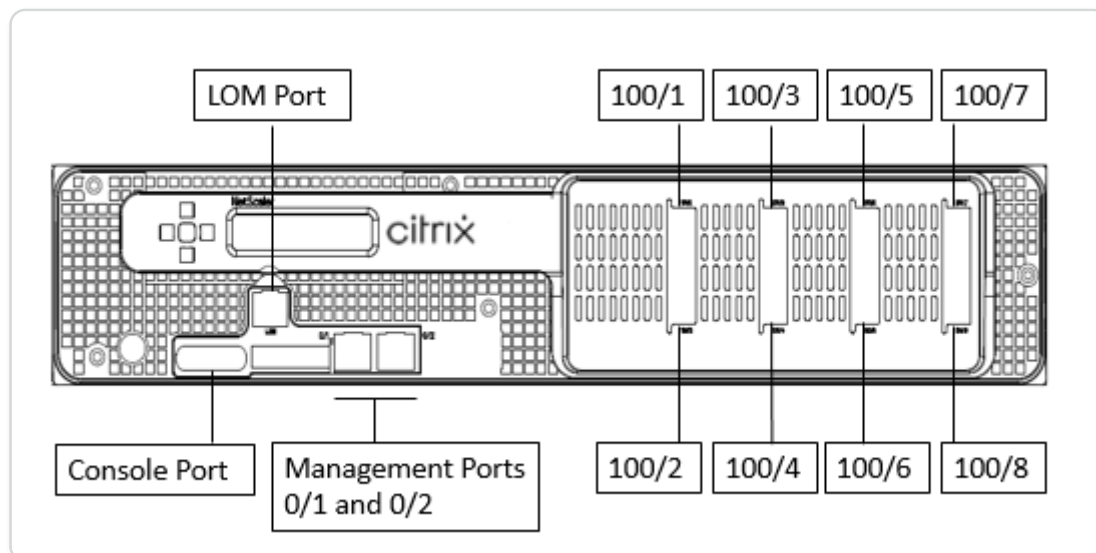
NetScaler MPX 26000-100G

The NetScaler MPX 26000-100G and MPX 26000T-100G appliances are 2U appliance. These appliances have two 14-core processors and 256 GB of memory. The appliances provide a total of 8 network ports: Four cards with dual 100G SFP+ Ethernet Ports.

For information about the software releases supported on the NetScaler hardware platforms, see [NetScaler MPX hardware software compatibility matrix](#).

The following figure shows the front panel of the NetScaler MPX 26000-100G and NetScaler MPX 26000T-100G appliances.

Figure 1. NetScaler MPX 26000-100G and NetScaler MPX 26000T-100G, front panel



The NetScaler MPX 26000-100G and NetScaler MPX 26000T-100G appliances have the following ports:

- RS232 serial Console Port.

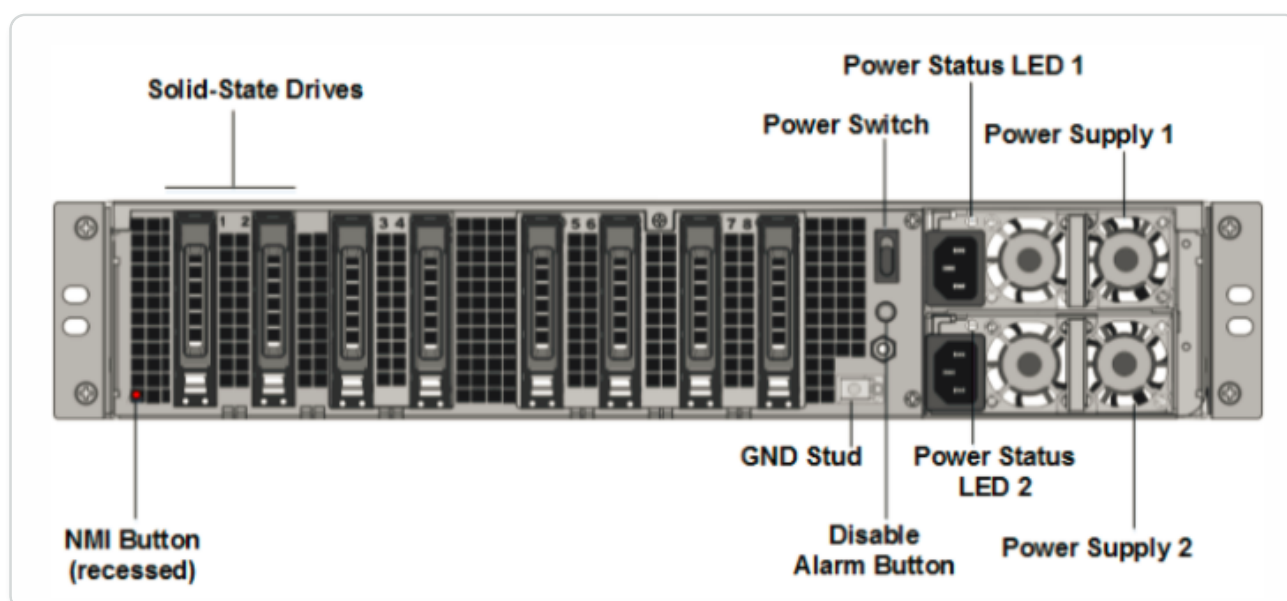
- One 10/100/1000Base-T RJ45 copper Ethernet LOM Port. Use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- Two 10/100/1000Base-T RJ45 copper Ethernet Management Ports, numbered 0/1 and 0/2. These ports are used to connect directly to the appliance for NetScaler administration functions.
- Eight 100G Ethernet Ports, numbered 100/1 to 100/8. For information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G ports](#).

NOTE

There are no native 10G ports on 26000-100G. The 100G ports support native 40G/50G/100G transceivers, DAC and AoCs. To support native 10G and 25G transceivers, DAC and AoCs, use an SFP+ to QSFP+ adapter.

The following figure shows the back panel of the NetScaler MPX 26000-100G and NetScaler MPX 26000T-100G appliances.

Figure 2. NetScaler MPX 26000-100G and NetScaler MPX 26000T-100G, back panel



The following components are visible on the back panel of the NetScaler MPX 26000-100G and NetScaler MPX 26000T-100G appliances:

- Two 480 GB or larger removable solid-state drives in a redundant array of independent disks (RAID) configuration. In a RAID configuration, the same data is stored on multiple drives to improve performance, increase storage capacity, lower the risk of data loss, and provide fault

tolerance. The two SSDs store the same data. If one fails and you replace it, the new SSD mirrors the other one.

Note: Drive densities might increase as components become EOL but its size is never smaller than the original.

- Power switch, which turns power to the appliance on or off.
 - If the OS is functional, press the switch for less than two seconds to power down the system with a graceful shutdown.
 - If the OS is not responsive, press the power switch for more than 4 seconds to force the power off.
- Two hot-swappable 100–240 VAC input power supply modules. Each power supply has an LED indicating its status:

LED COLOR	LED INDICATES
OFF	No power to any power supply on the appliance.
Flashing RED	No power to this power supply.
Flashing GREEN	Power supply is in standby mode.
GREEN	Power supply is functional.
RED	Power supply failure.
Flashing RED and GREEN	Warning; (OVP/UVP/OCP/OTP/Fan); OVP = Over Voltage Protection; UVP = Under Voltage Protection; OCP = Over Current Protection; OTP = Over Temperature Protection

- **Disable alarm button.** Press this button to silence the power alarm when one of two power supplies loses input power or when a power supply is malfunctioning.
- **Non-Maskable Interrupt (NMI) Button,** used at the request of Technical Support to initiate a core dump. To press this red button, which is recessed to prevent unintentional activation, use a pen, pencil, or other pointed object. The NMI Button is also available remotely over the network in the LOM GUI, in the Remote Control menu. For more information about the lights out management port of the appliance, see [Lights out management port of the NetScaler MPX appliance](#).

Field replaceable units

NetScaler field replaceable units (FRU) are ADC components that a user or a technician can replace at the user's site. The FRUs for a NetScaler appliance include DC or AC power supplies, solid-state (SSD) or hard-disk drives (HDD), direct attach cable (DAC), the bezel of the appliance, transceivers, and rail kits.

NOTES

- The SSD or HDD stores your configuration information, and it must be restored from a backup after the unit is replaced.
- All NetScaler FRUs must be purchased from Citrix. Components not provided by NetScaler are not supported on NetScaler appliances. Contact your NetScaler sales representative to buy FRUs for your appliance.

Power supply

For appliances containing two power supplies, the second power supply is optional but recommended. Some appliances can accommodate four power supplies, and require two power supplies as a bare minimum for proper operation. As a best practice, plug in all the power supplies for redundancy.

The appliance ships with a standard power cord that plugs into the appliance's power supply. It has a NEMA 5–15 plug on the other end for connecting to the power outlet on the rack or in the wall.

For power-supply specifications, see [Common Components](#).

NOTE:

If you suspect that a power-supply fan is not working, see the description of your platform. On some platforms, what appears to be the fan does not turn, and the actual fan turns only when necessary.

On each power supply, a bicolor LED indicator shows the condition of the power supply.

Electrical safety precautions for power supply replacement

- Make sure that the appliance has a direct physical connection to earth ground during normal use. When installing or repairing an appliance, always connect the ground circuit first and disconnect it last.
- Never touch a power supply when the power cord is plugged in. As long as the power cord is plugged in, line voltages are present in the power supply even if the power switch is turned off.

For the complete list of safety precautions, see [Safety, Cautions, Warnings, and Other Information](#).

Replace an AC power supply

Most NetScaler MPX platforms accommodate two power supplies. Some platforms accommodate four power supplies. All NetScaler appliances function properly with a single power supply, except the appliances that accommodate four power supplies. These appliances need two power supplies for proper operation. The other power supply serves as a backup. All power supplies must be of the same type (AC or DC).

NOTE

If the appliance has only one power supply, you have to shut down the appliance before replacing the power supply. With two power supplies, you can replace one power supply without shutting down the appliance, provided the other power supply is working. With four power supplies, you can replace one or two power supplies without shutting down the appliance, provided the other two power supplies are working.

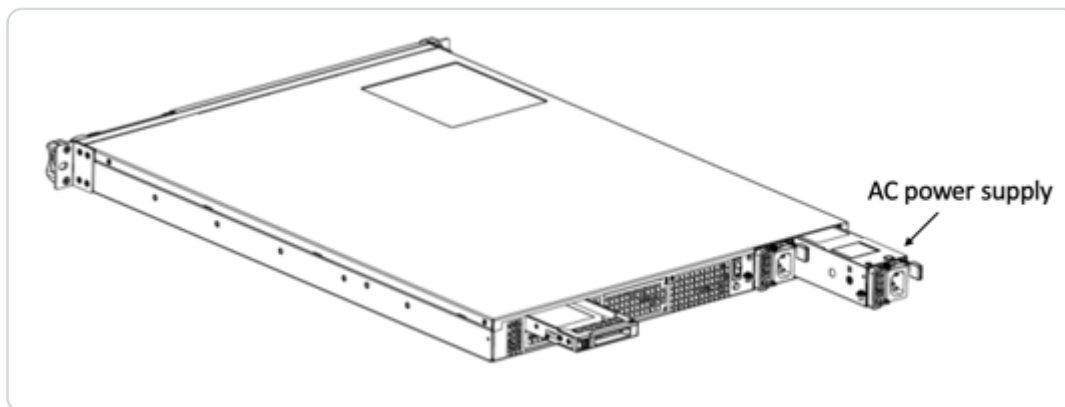
To install or replace an AC power supply on a NetScaler appliance:

1. Align the handle perpendicular to the power supply. Loosen the thumbscrew (if it is screwed) and press the lever toward the handle and pull out the existing power supply.

NOTE

The illustration in the following figures might not represent the actual NetScaler appliance.

Figure 1. Remove the existing AC power supply



2. Carefully remove the new power supply from its box.
3. On the back of the appliance, align the power supply with the power supply slot.
4. Insert the power supply into the slot and press against the semicircular handle until you hear the power supply snap into place.
5. Connect the power supply to a power source. If connecting all power supplies, plug separate power cords into the power supplies and connect them to separate wall sockets.

NOTE:

NetScaler appliances emit a high-pitched alert in the following scenarios:

- One power supply fails
- You connect only one power cable to an appliance in which two power supplies are installed.

To silence the alarm, press the small red button on the back panel of the appliance. The **Disable alarm button** is functional only when the appliance has two power supplies.

Replace a DC power supply

Most NetScaler MPX platforms can accommodate two power supplies. Some platforms can accommodate four power supplies. All NetScaler appliances function properly with a single power supply, except the appliances that can accommodate four power supplies. These appliances need two power supplies for proper operation. The other power supply serves as a backup. All power supplies must be of the same type (AC or DC).

NOTE

If the appliance has only one power supply, you have to shut down the appliance before replacing the power supply. With two power supplies, you can replace one power supply without shutting down the appliance, provided the other power supply is working. With four power supplies, you can replace one or two power supplies without shutting down the appliance, provided the other two power supplies are working.

To install or replace a DC power supply on a NetScaler appliance:

1. Loosen the thumbscrew and press the lever towards the handle and pull out the existing power supply, as shown in the following figure.

NOTE

The illustration in the following figures might not represent the actual NetScaler appliance.

Figure 2. Remove the existing DC power supply



2. Carefully remove the new power supply from its box.
3. On the back of the appliance, align the power supply with the power supply slot.
4. Insert the power supply into the slot while pressing the lever towards the handle. Apply firm pressure to insert the power supply firmly into the slot.

Figure 3. Inserting the Replacement DC Power Supply



5. When the power supply is inserted into its slot, release the lever.
6. Connect the power supply to a power source. If connecting all power supplies, plug separate power cords into the power supplies and connect them to separate wall sockets.

NOTE

NetScaler appliances emit a high-pitched alert in the following scenarios:

- One power supply fails
- You connect only one power cable to an appliance in which two power supplies are installed.

To silence the alarm, press the small red button on the back panel of the appliance. The **Disable alarm button** is functional only when the appliance has two power supplies.

Solid-state drive

An SSD is a high-performance device that stores data in solid-state flash memory. The MPX SSDs contain the boot loader configuration file, configuration file (ns.conf), licenses, and for some models, the NetScaler software and the user data.

All MPX platforms store the NetScaler software on the SSD. The SSD is mounted as /flash.

Replace a RAID-supported SSD by using the CLI

NOTE:

The following models support RAID if they have more than one SSD:

- MPX 14000
- MPX 15000
- MPX 16000
- MPX 25000
- MPX 26000

In the NetScaler GUI, navigate to **Configuration > System > Diagnostic > Utility > Command line interface**. You can also access the CLI from the serial console port or the management port (0/1 or 0/2).

NOTE:

The RAID status can take READY or DEGRADED values. The drive status can take ONLINE or MISSING values.

To check the status of your SSDs in RAID, at the CLI type:

Command:

```
sh raid
```

Output:

```
RAID1 status: READY

Drive:

    1  ONLINE

    2  ONLINE

Done
```

If both the SSDs' show ONLINE and the RAID status shows READY, no action is required.

In the following table, the values in the first column show the drive number on the back panel of the appliance. The drive number in the other columns refers to the number that must be used in the command or as it appears in the output of the CLI and shell.

CHASSIS	CLI COMMAND	SHELL COMMAND	SHELL COMMAND	SHELL COMMAND
Slot in chassis	sh raid	atacontrol status ar0	atacontrol detach / atacontrol attach	atacontrol addspare ar0
SSD 1	drive 1	drive 0	ata2	ad4
SSD 2	drive 2	drive 1	ata3	ad6

The following output indicates SSD 2 has failed and must be replaced.

Command:

```
sh raid
```

Output:

```
RAID1 status: DEGRADED
```

```
Drive:
```

```
1    ONLINE
```

```
2    MISSING
```

```
Done
```

Sometimes, the failed drive/SSD might not be reported.

Command:

```
sh raid
```

Output:

```
RAID1 status: DEGRADED
```

```
Drive:
```

```
1    ONLINE
```

```
Done
```

From the shell, confirm that drive 1/SSD 2 has failed, RAID status reports DEGRADED and drive 1/SSD 2 reports MISSING, or not present in the output.

1. At the NetScaler command prompt, switch to the shell prompt. Type: `shell`
2. Check the status of the RAID array. SSD2 shows missing or is not present in the output.

Command:

```
root@ns# atacontrol status ar0
```

Output:

```
ar0: ATA RAID1 status: DEGRADED
```

```
subdisks:
```

```
    0 ad4  ONLINE
```

```
    1 ---- MISSING
```

OR

```
ar0: ATA RAID1 status: DEGRADED
```

```
subdisks:
```

```
    0 ad4  ONLINE
```

NOTE:

Drive numbering changes in the shell: SSD 1 reports as drive 0 and SSD 2 as drive 1.

Perform the following steps to restore the RAID array to health by using the `atacontrol` utility.

1. Detach a failed drive. The failed drive is replaced with a new FRU drive.
2. Attach the FRU drive.
3. Add the FRU drive to the RAID array.
4. Verify that the replacement drive is recognized.
5. Start the rebuild process.
6. Monitor the rebuild process.
7. Verify that the rebuild is successful.
8. Exit the bash shell and verify from the NetScaler CLI.

Example when SSD 2 fails

In the following example, SSD 2/disk 1/ata3 has failed.

1. Detach a failed drive.

```
root@ns# atacontrol detach ata3
```

2. Physically, remove SSD 2/drive 1 and replace it with a new FRU drive in slot 2.
3. Attach the FRU drive.

```
root@ns# atacontrol attach ata3
```

4. Add the FRU drive to the RAID array.

```
root@ns# atacontrol addspare ar0 ad6
```

5. Verify that the replacement drive is recognized.

```
root@ns# atacontrol status ar0
```

Output:

```
ar0: ATA RAID1 status: DEGRADED

subdisks:

    0 ad4  ONLINE

    1 ad6  SPARE
```

6. Start the rebuild process.

```
root@ns# atacontrol rebuild ar0
```

7. Monitor the rebuild process.

```
root@ns# atacontrol status ar0
```

Output:

```
ar0: ATA RAID1 status: REBUILDING 10% completed
```

```
subdisks:
```

```
0 ad4 ONLINE
```

```
1 ad6 SPARE
```

NOTE:

Rebuilding the RAID array takes some time.

8. Verify that the REBUILD is successful.

```
root@ns# atacontrol status ar0
```

Output:

```
ar0: ATA RAID1 status: READY
```

```
subdisks:
```

```
0 ad4 ONLINE
```

```
1 ad6 ONLINE
```

NOTE:

After the rebuild operation completes, the subdisks status shows ONLINE, and the RAID status shows READY.

9. Exit the shell and verify the status of the RAID array from the NetScaler CLI.

```
root@ns# exit
```

```
>sh raid
```

Output:

```
RAID1 status: READY
```

```
Drive:
```

```
1    ONLINE
```

```
2    ONLINE
```

```
Done
```

Example when SSD 1 fails

In the following example, SSD 1/drive 0/ata2 has failed.

1. Detach a failed drive.

```
root@ns# atactrol detach ata2
```

2. Physically, remove SSD 1/drive 0 and replace it with a new FRU drive in slot 1.
3. Attach the FRU drive.

```
root@ns# atactrol attach ata2
```

4. Add the FRU drive to the RAID array.

```
root@ns# atactrol addspare ar0 ad4
```

5. Verify that the replacement drive is recognized.

```
root@ns# atactrol status ar0
```

Output:

```
ar0: ATA RAID1 status: DEGRADED
```

```
subdisks:
```

```
0 ad4 SPARE
```

```
1 ad6 ONLINE
```

6. Start the rebuild process.

```
root@ns# atacontrol rebuild ar0
```

7. Monitor the rebuild process.

```
root@ns# atacontrol status ar0
```

Output:

```
ar0: ATA RAID1 status: REBUILDING 10% completed
```

```
subdisks:
```

```
0 ad4 SPARE
```

```
1 ad6 ONLINE
```

NOTE:

Rebuilding the RAID array takes some time.

8. Verify that the REBUILD is successful.

```
root@ns# atacontrol status ar0
```

Output:

```
ar0: ATA RAID1 status: READY
```

```
subdisks:
```

```
0 ad4 ONLINE
```



```
1 ad6 ONLINE
```

NOTE:

After the rebuild operation completes, the subdisks status shows ONLINE, and the RAID status shows READY.

9. Exit the shell and verify the status of the RAID array from the NetScaler CLI.

```
root@ns# exit

>sh raid
```

Output:

```
RAID1 status: READY

Drive:

1    ONLINE

2    ONLINE

Done
```

Replace a solid-state drive

Replacement SSDs contain a pre-installed version of the NetScaler software and a generic configuration file (ns.conf). However, it does not contain SSL-related certificates and keys, or custom boot settings. Configuration files and customized settings must be restored to a replacement drive from a backup storage location at the customer site, if available. The files to be restored might include:

- /flash/nsconfig/ns.conf: The current configuration file.
- /flash/nsconfig/ZebOS.conf: The ZebOS configuration file.

- /flash/nsconfig/license: The licenses for the NetScaler features.
- /flash/nsconfig/ssl: The SSL certificates and keys required for encrypting data to clients or to back-end servers.
- /nsconfig/rc.netscaler: Customer-specific boot operations (optional).

To replace a solid-state drive:

1. At the NetScaler command prompt, exit to the shell prompt. Type:

```
shell
```

2. Shut down the NetScaler appliance by typing the following command at the shell prompt:

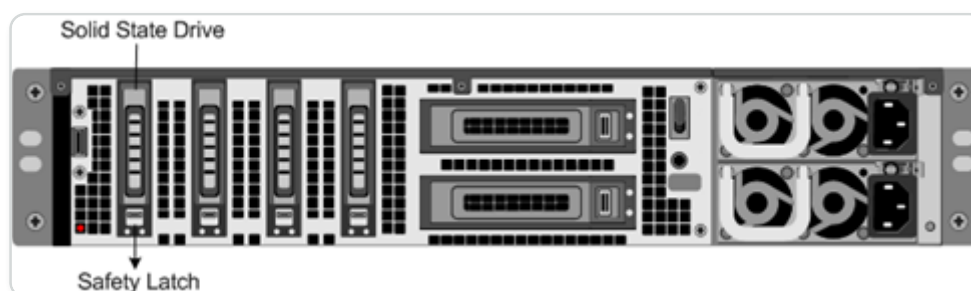
```
shutdown -p now
```

3. Locate the SSD on the back panel of the appliance. Push the safety latch of the drive cover to the right or down, depending on the platform, while pulling out on the drive handle to disengage. Pull out the faulty drive.

NOTE

The illustration in the following figures might not represent the actual NetScaler appliance.

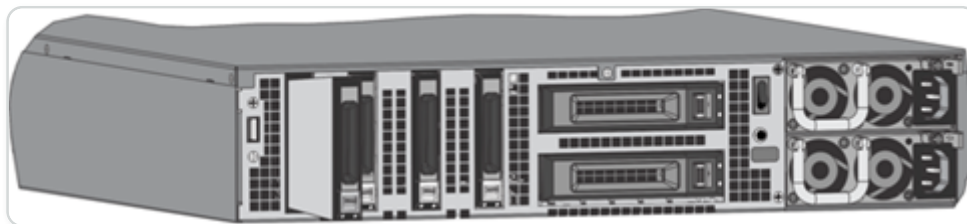
Figure 4. Remove the existing solid-state drive



4. Verify that the replacement SSD is the correct type for the platform.
5. Pick up the new SSD, open the drive handle fully to the left or up, and insert the drive into the slot as far as possible. To seat the drive, close the handle flush with the rear of the appliance so that the drive locks securely into the slot.

Important: When you insert the drive, make sure that the NetScaler® product label is at the top if the drive is inserted horizontally. The label must be at the right if the drive is inserted vertically.

Figure 5. Insert the replacement solid-state drive



6. Turn on the NetScaler appliance. When the appliance starts, it no longer has the previous working configuration. Therefore, the appliance is reachable only through the default IP address of 192.168.100.1/16, or through the console port.
7. Perform the initial configuration of the appliance, as described in [Initial Configuration](#). Log on to the default IP address by using a web browser, or connect to the serial console by using a console cable, to perform the initial configuration.
8. Upload a platform license and any optional feature licenses, including universal licenses, to the NetScaler appliance. For more information, see [Licensing](#).
9. Once the correct NetScaler software version is loaded, you can restore the working configuration. Copy a previous version of the ns.conf file to the `/nsconfig` directory by using an SCP utility. Alternately, paste the previous configuration into the `/nsconfig/ns.conf` file from the NetScaler command prompt. To load the new `ns.conf` file, you must restart the NetScaler appliance by entering the reboot command at the NetScaler command prompt.

Hard disk drive

A hard disk drive (HDD) stores logs and other data files. Files stored on the HDD include the `newslog` files, `dmesg` and messages files, and any core/crash files. The HDD comes in various capacities, depending on the NetScaler platform. Hard drives are used for storing files required at runtime. An HDD is mounted as `/var`.

Replace a hard disk drive

A hard disk drive (HDD) stores log files and other user files. Collection of new log files begins upon boot-up with the new HDD.

To install a hard disk drive:

1. At the NetScaler command prompt, exit to the shell prompt. Type:

```
shell
```

2. Shut down the NetScaler appliance by typing one of the following commands at the shell prompt.

- On an MPX appliance, type:

```
shutdown -p now
```

- On a non-MPX appliance, type:

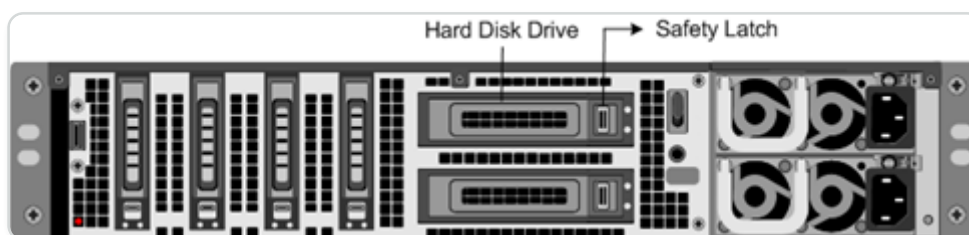
```
shutdown
```

3. Locate the hard disk drive on the back panel of the appliance.
4. Verify that the replacement hard disk drive is the correct type for the NetScaler platform.
5. Disengage the hard disk drive by pushing the safety latch of the drive cover to the right or down, depending on the platform, while pulling out on the drive handle. Pull out the faulty drive.

NOTE:

The illustration in the following figures might not represent the actual NetScaler appliance.

Figure 6. Removing the existing hard disk drive



6. Pick up the new disk drive, open the drive handle fully to the left, and insert the new drive into the slot as far as possible. To seat the drive, close the handle flush with the rear of the appliance so that the hard drive locks securely into the slot.

IMPORTANT

When you insert the drive, make sure that the NetScaler product label is at the top.

Figure 7. Insert the replacement hard disk drive



7. Turn on the NetScaler appliance. The appliance starts the NetScaler software and reads the configuration file from the CompactFlash card.

Direct attach cable

A direct attach cable (DAC) assembly is a high performance integrated duplex data link for bi-directional communication. The cable is compliant with the IPF MSA (SFF-8432) for mechanical form factor and SFP+ MSA for direct attach cables. The cable, which can be up to 5 meters long, is data-rate agnostic. Supporting speeds more than 10 Gbps, it is a cost-effective alternative to optical links (SFP+ transceivers and fiber optic cables.)

The transceiver with DAC is hot-swappable. You can insert and remove the transceiver with the attached cable without shutting down the appliance. The NetScaler appliance supports only a passive DAC.

Important:

- DAC is supported only on 10G ports. Do not insert a DAC into a 1G port.
- Do not attempt to unplug the integrated copper cable from the transceiver and insert a fiber cable into the transceiver.

Install a direct attach cable

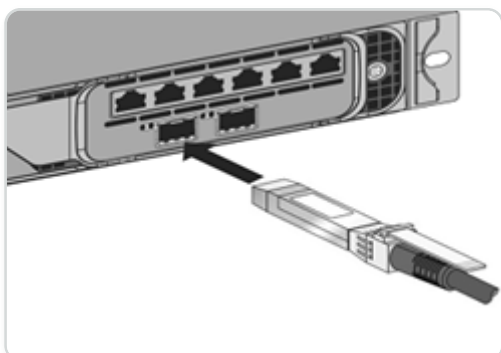
NOTE

The illustrations in the following figures are only for reference and might not represent the actual NetScaler appliance.

To install or remove a direct attach cable:

1. To install the DAC, slide it into the 10G port on the appliance, as shown in the following figure. You hear a click when the DAC properly fits into the port.

Figure 8. Insert a DAC into the 10G port



2. To remove the DAC, pull the tab on the top of the DAC, and then pull the DAC out of the port, as shown in the following figure.

Figure 9. Remove a DAC from the 10G port



Bezel

The bezel of a NetScaler appliance is now available as a FRU and can be replaced in the field.

NOTE:

The bezel FRU is supported only on the MPX/SDX 9100 platform.

To replace the bezel

1. Remove the five screws that attach the bezel to the chassis front.
2. Disconnect the cable (see image).

3. Discard the old bezel.
4. Reconnect the cable to the new bezel.
5. Attach the new bezel to the chassis front using screws.

Figure 1: Replacing the 2U bezel

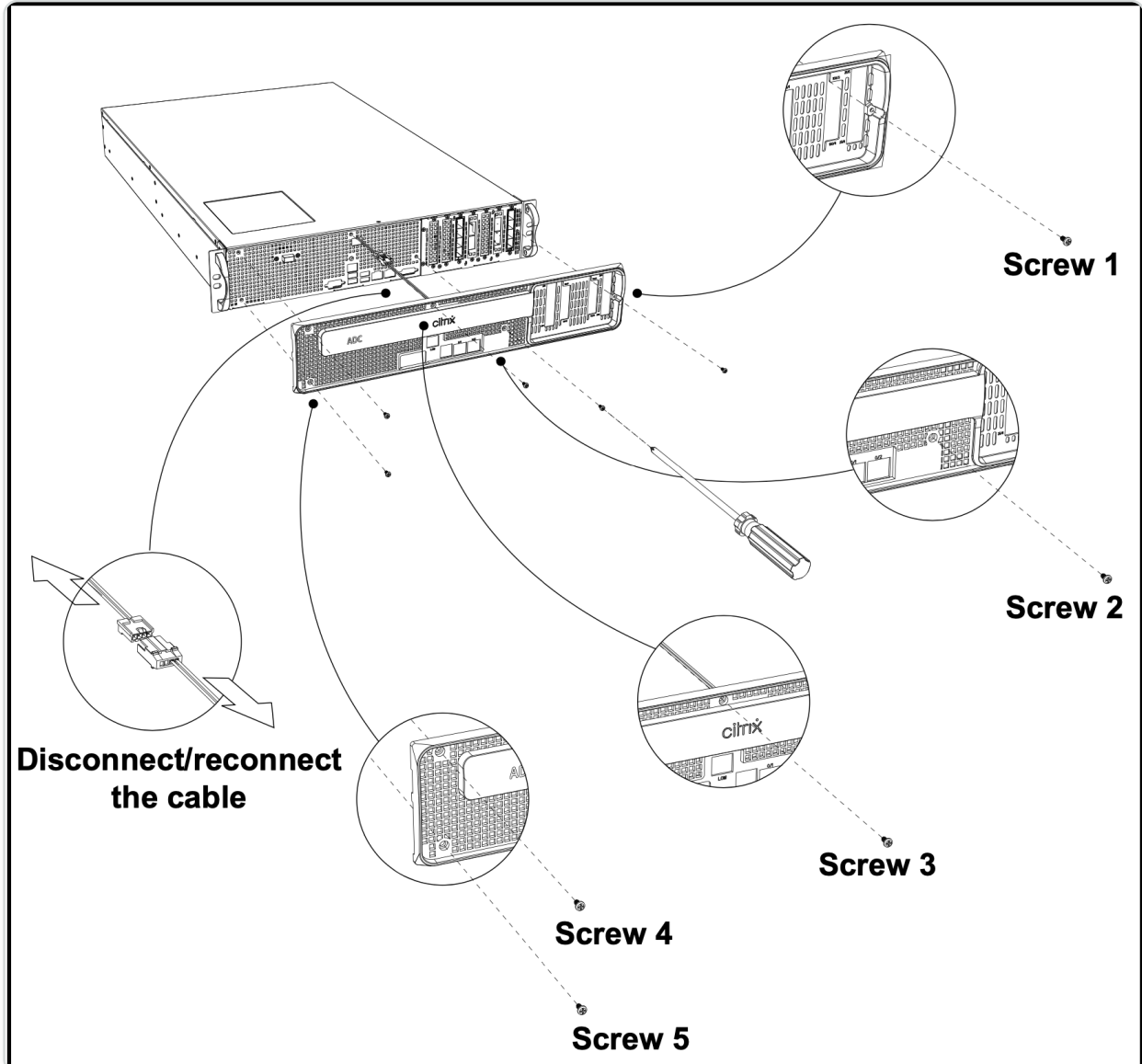
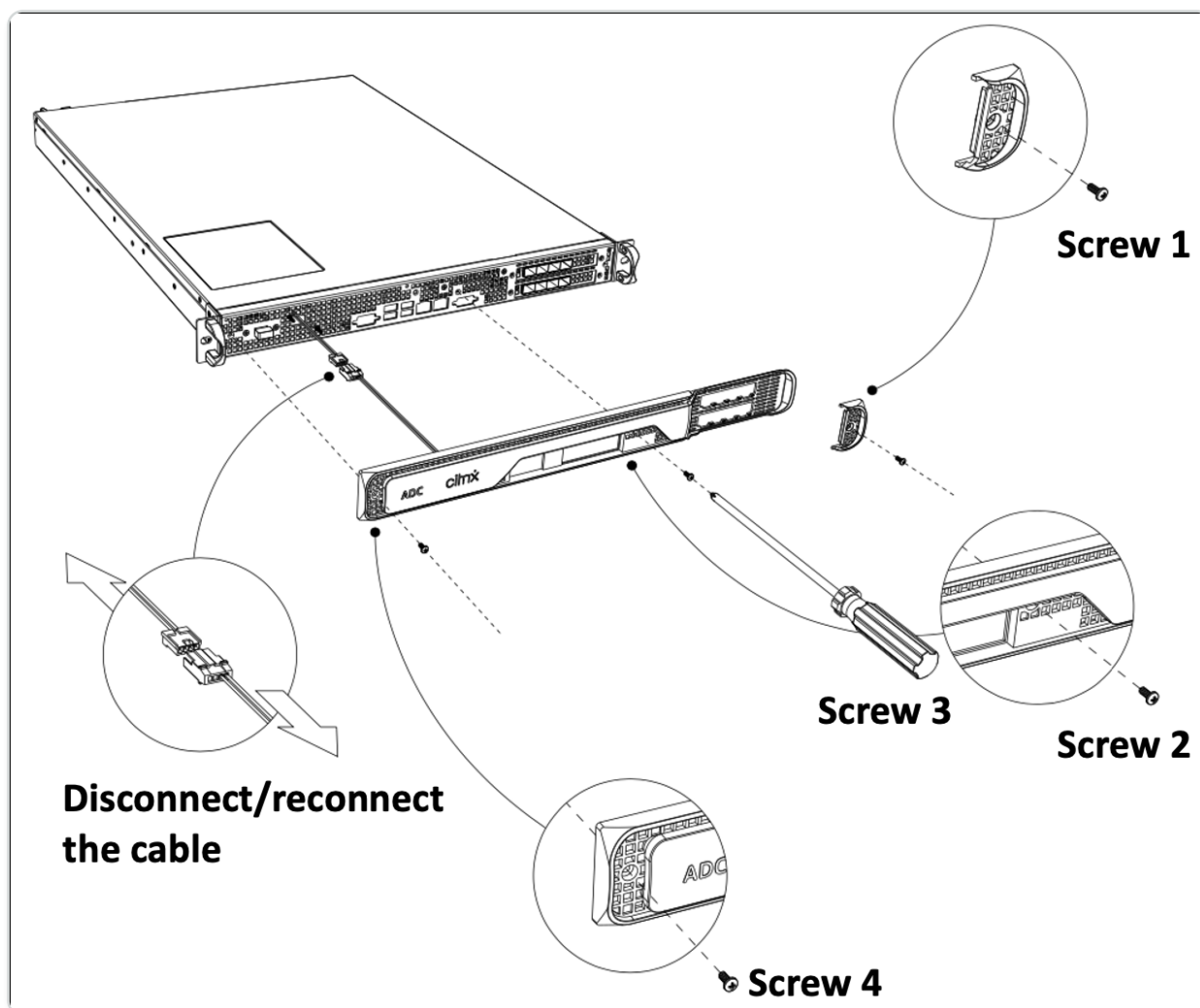


Figure 2: Replacing the 1U bezel



Transceivers

Transceivers, in different speeds, are available as a FRU. Reach out to your NetScaler sales contact or partner to order transceivers.

For information about removing and installing transceivers, see [Install and remove 1G SFP transceivers](#).

Rail kits

Rail kits are available as a FRU. Rail kits are available in 28 inches (38 inches extended) and 23 inches (33 inches extended). Reach out to your NetScaler sales contact or partner to order rail kits.

For information about attaching the rail kits to the appliance, see [Rack-mount the appliance](#).

Transceivers for MPX 9200 and 17000 platforms

This section describes the transceivers, direct-attach copper (DAC) cables, and active optical cables (AOCs) that are supported on the NetScaler MPX 9200 and MPX 17000 platforms. It also provides answers to frequently asked questions and real-world interoperability use cases to help you plan and validate your deployments.

The MPX 9200 provides 8 SFP56 ports (10G/25G/50G) and has no QSFP-class ports. The MPX 17000 provides the same 8 SFP56 ports along with 4 QSFP56 ports (40G/100G/200G). As a result, all 40G, 100G, and 200G modules are supported only on the MPX 17000.

Use the following topics to find the information that you need:

- [Supported transceivers, DACs, and AOCs](#): The platform port topology and the complete matrix of supported transceivers, DACs, and AOCs, including speed, form factor, reach, and per-platform support.
- [FAQs](#): Answers to common questions about supported speeds, form factors, and module types for the MPX 9200 and MPX 17000 platforms.
- [Transceiver Interop use cases](#): Validated real-world deployment topologies and negotiation details for connecting the MPX 17000 to industry-standard data center switches.

Transceiver, DACs, AOCs' matrix

Platform port topology

PLATFORM	FORM FACTOR	NIC CONFIGURATION	SFP56 PORTS (10G/25G/50G)	QSFP56 PORTS (40G/100G/200G)
NetScaler MPX/SDX 9200	1U	2x ConnectX-7 quad-port 50G	8	0
NetScaler MPX/SDX 17000	2U	2x ConnectX-7 quad-port 50G AND 2x	8	4

PLATFORM	FORM FACTOR	NIC CONFIGURATION	SFP56 PORTS (10G/25G/50G)	QSFP56 PORTS (40G/100G/200G)
		ConnectX-7 dual-port 200G		

Implication: The 9200 has no QSFP-class ports. Any 40G, 100G, or 200G transceiver, DAC, or AOC is supported only on the MPX/SDX 17000 via the two 200G NICs. The 8x SFP56 ports on both platforms accept 10G SFP+, 25G SFP28, and 50G SFP56 modules, DACs, and AOCs.

Supported Transceivers, DACs & AOCs' matrix

NOTE:

When customers order a transceiver using a Citrix SKU, the received package or box may show only the Citrix MPN.

CITRIX SKU	CITRIX MPN	DESCRIPTION	SPEED	FORM FACTOR	ENCODING	REACH / MEDIA	FORWARD ERROR CORRECTION	AUTO-NEG	MPX / SDX 9200	MPX / SDX 17000
6003085	9530401	NetScaler 50GbE SFP56 SR LC, OM3 70m ; NS 920	50G	SFP56	PAM4	OM3 70m / OM4 100m	RS-FEC	Yes	Supported	Supported

CIT RIX SKU	CIT RIX MPN	DES CRI PTION	SPE ED	FOR M FAC TOR	ENC ODI NG	REA CH / MED IA	FOR WA RD ERR OR COR REC TION	AUT O- NEG	MPX / SDX 9200	MPX / SDX 1700 0
		0/17 000								
600 308 8	953 040 2	Net Scal er 25G bE SFP 28 SR LC, OM 3 70m ; NS 920 0/17 000	25G	SFP 28	NRZ	OM 3 70m / OM 4 100 m	FC- FEC	Yes	Sup port ed	Sup port ed
600 309 0	953 040 3	Net Scal er 10G bE SFP + SR LC, OM 3 300 m; NS	10G	SFP +	NRZ	OM 3 300 m / OM 4 400 m	Non e	Yes	Sup port ed	Sup port ed

CIT RIX SKU	CIT RIX MPN	DES CRI PTION	SPE ED	FOR M FAC TOR	ENC ODI NG	REA CH / MED IA	FOR WA RD ERR OR COR REC TION	AUT O- NEG	MPX / SDX 9200	MPX / SDX 1700 0
		920 0/17 000								
600 314 2	953 040 5	Net Scal er 50G bE SFP 56 LR LC, OS2 10k m; NS 920 0/17 000	50G	SFP 56	PAM 4	SMF (OS 2) 10 km	RS- FEC	Yes	Sup port ed	Sup port ed
600 312 7	953 040 6	Net Scal er 25G bE SFP 28 LR LC, OS2 10k m; NS	25G	SFP 28	NRZ	SMF (OS 2) 10 km	FC- FEC	Yes	Sup port ed	Sup port ed

CIT RIX SKU	CIT RIX MPN	DES CRI PTION	SPE ED	FOR M FAC TOR	ENC ODI NG	REA CH / MED IA	FOR WA RD ERR OR COR REC TION	AUT O- NEG	MPX / SDX 9200	MPX / SDX 1700 0
		920 0/17 000								
600 312 8	953 040 7	Net Scal er 10G bE SFP + LR LC, OS2 10k m; NS 920 0/17 000	10G	SFP +	NRZ	SMF (OS 2) 10 km	Non e	Yes	Sup port ed	Sup port ed
600 309 3	953 050 1	Net Scal er 50G BAS E- CU SFP 56- to- SFP 56 DAC , 3m	50G	SFP 56	PAM 4	Pas sive cop per	RS- FEC	Yes	Sup port ed	Sup port ed

CIT RIX SKU	CIT RIX MPN	DES CRI PTION	SPE ED	FOR M FAC TOR	ENC ODI NG	REA CH / MED IA	FOR WA RD ERR OR COR REC TION	AUT O- NEG	MPX / SDX 9200	MPX / SDX 1700 0
		(Mel lano x/ Juni per); NS 920 0/17 000								
600 308 6	953 050 7	Net Scal er 50G BAS E- CU SFP 56- to- SFP 56 DAC , 2.5 m; NS 920 0/17 000	50G	SFP 56	PAM 4	Pas sive cop per	RS- FEC	Yes	Sup port ed	Sup port ed
600 313 1	953 040 9	Net Scal er	200 G	QSF P56	PAM 4	OM 3 70m	RS- FEC	Yes	Not pres ent	Sup port ed

CIT RIX SKU	CIT RIX MPN	DES CRI PTION	SPE ED	FOR M FAC TOR	ENC ODI NG	REA CH / MED IA	FOR WA RD ERR OR COR REC TION	AUT O- NEG	MPX / SDX 9200	MPX / SDX 1700 0
		200 GbE QSF P56 SR4 MP O-1 2, OM 3 70m ; NS 170 00			(4x5 0G)	/ OM 4 100 m				
600 313 2	953 041 0	Net Scal er 100/ 40G bE Dual - Rate QSF P28 SR4 MP O-1 2, OM 3 70m ; NS	100/ 40G	QSF P28	NRZ (4x2 5G at 100 G; 4x1 0G at 40G)	OM 3 70m / OM 4 100 m	RS- FEC at 100 G; Non e at 40G	100 G: Yes; 40G : Forc ed spe ed both end s	Not pres ent	Sup port ed

CIT RIX SKU	CIT RIX MPN	DES CRI PTION	SPE ED	FOR M FAC TOR	ENC ODI NG	REA CH / MED IA	FOR WA RD ERR OR COR REC TION	AUT O- NEG	MPX / SDX 9200	MPX / SDX 1700 0
		170 00								
600 313 3	953 0411	Net Scal er 40G bE QSF P+ BiDi SR LC, OM 3 100 m; NS 170 00	40G	QSF P+	NRZ (4x1 0G)	OM 3 100 m / OM 4 150 m	Non e	Forc ed spe ed to 40G ; Citri x MP N requ ired on both end s	Not pres ent	Sup port ed
600 313 5	953 041 3	Net Scal er 100 GbE QSF P28 LR4 LC, OS2 10k m; NS	100 G	QSF P28	NRZ (4x2 5G CW DM)	SMF (OS 2) 10 km	Non e	Yes	Not pres ent	Sup port ed

CIT RIX SKU	CIT RIX MPN	DES CRI PTION	SPE ED	FOR M FAC TOR	ENC ODI NG	REA CH / MED IA	FOR WA RD ERR OR COR REC TION	AUT O- NEG	MPX / SDX 9200	MPX / SDX 1700 0
		170 00								
600 314 3	953 041 6	Net Scal er QSF P28- to- SFP 28 cag e ada pter; NS 170 00	Ada pter for 25G or 10G	QSF P28- to- SFP 28	Pas sthr oug h (1 lane)	N/A - acce pts SFP 28 (25 G) or SFP + (10 G) optic	Inhe rits from inse rted optic	Inhe rits from inse rted optic	Not pres ent	Sup port ed
600 314 4	953 051 3	Net Scal er 40G bE QSF P+ Pas sive DAC , 5m; NS 170 00	40G	QSF P+ DAC	NRZ (4x1 0G)	Pas sive cop per	Non e	Yes	Not pres ent	Sup port ed

CIT RIX SKU	CIT RIX MPN	DES CRI PTION	SPE ED	FOR M FAC TOR	ENC ODI NG	REA CH / MED IA	FOR WA RD ERR OR COR REC TION	AUT O- NEG	MPX / SDX 9200	MPX / SDX 1700 0
600 314 5	953 051 4	Net Scal er 200 G QSF P56- to- QSF P56 Pas sive Twin ax 2.5 m; NS 170 00	200 G	QSF P56 DAC	PAM 4 (4x5 0G)	Pas sive cop per	RS- FEC	Yes	Not pres ent	Sup port ed
600 314 6	953 051 7 *	Net Scal er 100 GbE QSF P28 AO C, 20m ; NS 170 00	100 G	QSF P28 AO C	NRZ (4x2 5G)	Acti ve opti cal (inte grat ed)	RS- FEC	Yes	Not pres ent	Sup port ed

CIT RIX SKU	CIT RIX MPN	DES CRI PTION	SPE ED	FOR M FAC TOR	ENC ODI NG	REA CH / MED IA	FOR WA RD ERR OR COR REC TION	AUT O- NEG	MPX / SDX 9200	MPX / SDX 1700 0
600 314 7	953 052 2	Net Scal er 200 GbE QSF P56 AOC, 20m (Mel lano x); NS 170 00	200 G	QSF P56 AOC	PAM 4 (4x5 0G)	Acti ve opti cal (inte grat ed)	RS- FEC	Yes	Not pres ent	Sup port ed

*Note:

Qualified as 100G only. Although the AOC may appear to partially train at lower per-lane rates in some lab environments or automation reports, it does not advertise lower-speed compliance in its EEPROM. Lower-speed operation requires manual force on both ends and is not supported. For 10G / 25G / 40G / 50G links, use the dedicated Citrix MPN qualified for that speed.

Pre-Deployment checklist

1. Confirm platform and port count. MPX/SDX 9200 is SFP56-only (8 ports). MPX/SDX 17000 has 8x SFP56 + 4x QSFP56 ports.

2. Match the form factor to MPN. SFP+ / SFP28 / SFP56 go in SFP56 ports; QSFP+ / QSFP28 / QSFP56 go in QSFP56 ports on the MPX/SDX 17000.
3. Verify reach and fiber type:
 - SR / SR4 -> OM3 or OM4 multimode
 - LR / LR4 -> OS2 single-mode
 - MPO-12 SR4 -> Type B polarity
4. Configure the FEC on the peer switch to match the speed and modulation (see the FEC table in the FAQ KB).
5. For Cisco Nexus 9000 deployments, enable "service unsupported-transceiver" on the Cisco switch side to allow non-Cisco-branded optics.
6. For 40G QSFP+ links and 40G via 9530410 dual-rate, force 40G on both host and switch; auto-negotiation does not converge.
7. For 40G BiDi via 9530411, install the same Citrix MPN on both ends.
8. For LR4 links (9530413), verify OS2 fiber cleanliness and polarity. If a link does not come up, switch-side RX power at the floor (-40 dBm) on all lanes indicates a fiber-path issue, not a transceiver issue.
9. Verify MPO polarity and LC duplex polarity before powering up the link. Most "link-down with clean optics" tickets resolve to a polarity issue.
10. For 9530416 adapter deployments, install a qualified Citrix SFP28 or SFP+ optic into the adapter and configure host and peer switch for the lower link speed (25G or 10G).

Glossary

TERM	DEFINITION
AOC	Active Optical Cable => fixed-length cable with integrated optical electronics at each end
BiDi	Bi-Directional => uses two wavelengths over a single fiber pair, enabling 40G over duplex LC (instead of 8-fiber MPO)
DAC	Direct Attach Copper => fixed-length passive copper cable with integrated SFP/QSFP connectors

TERM	DEFINITION
FC-FEC	Firecode FEC (IEEE 802.3 Clause 74 / BASE-R) => used at 25G NRZ
LR / LR4	Long Reach - single-mode-fiber optic, typically up to 10 km
MPO-12	Multi-fiber Push-On 12-fiber connector used by 40G/100G/200G SR4 modules
NRZ	Non-Return-to-Zero binary signaling (2-level) used at 10G/25G/100G NRZ links
OS2	Single-mode fiber for LR4 and other long-reach optics
OM3 / OM4	Multi-mode fiber grades - OM3 (300 m at 10G, 70 m at SR4); OM4 (extended reach)
PAM4	4-Level Pulse-Amplitude Modulation => used at 50G/200G/400G to double bit density per symbol
QSFP+	4-lane 40G form factor - superseded by QSFP28
QSFP28	4-lane form factor for 100G NRZ; backwards-compatible with 40G in dual-rate modules
QSFP56	4-lane form factor for 200G PAM4
RS-FEC	Reed-Solomon FEC (IEEE 802.3 Clause 91 / 108) => used at 50G PAM4, 100G SR4 NRZ, 200G PAM4
SFP+	1-lane 10G form factor
SFP28	1-lane 25G form factor
SFP56	1-lane 50G PAM4 form factor
SR / SR4	Short Reach - multimode-fiber optic (single-fiber-pair for SR; 8-fiber MPO for SR4)

Transceiver, DAC, AOC FAQs

Speed & Form Factor

Q1: Are 1G SFP transceivers supported?

No. The SFP56 and QSFP56 ports on the 50G and 200G NICs of NetScaler MPX/SDX 9200 and 17000 appliances do not negotiate to 1G SGMII or 1000BASE-X (Ethernet over fiber). The minimum supported port speed is 10G.

Q2: Which 10G transceivers are supported?

NetScaler-qualified 10GbE SFP+ optics are supported on both the MPX/SDX 9200 and MPX/SDX 17000 platforms. This includes SR (multimode, OM3, up to 300m) and LR (single-mode, up to 10km) transceivers. For more information, see the [Transceiver, DACs, AOCs' matrix](#).

Q3: Which 25G transceivers are supported?

NetScaler-qualified 25GbE SFP28 optics are supported on both the MPX/SDX 9200 and MPX/SDX 17000 platforms. Supported options include SR (multimode, OM3 up to 70m / OM4 up to 100m) and LR (single-mode, up to 10km) transceivers. For more information, see the [Transceiver, DACs, AOCs' matrix](#)[(/en-us/netscaler-hardware-platforms/mpx/mpx-9200-17000-master-matrix)].

Q4: Is 50G supported?

Yes. NetScaler-qualified 50GbE SFP56 SR and LR optics, as well as 50G SFP56 Direct-attach copper (DAC) cables, are supported on both the MPX/SDX 9200 and MPX/SDX 17000 platforms. For more information, see the [Transceiver, DACs, AOCs' matrix](#)[(/en-us/netscaler-hardware-platforms/mpx/mpx-9200-17000-master-matrix)].

Q5: Are 40G QSFP+ transceivers supported?

Yes, only on the MPX and SDX 17000 platform. The Citrix-qualified options are:

- **9530411 (Citrix MPN)** (40GbE QSFP+ BiDi SR LC optical): Ensure that the same NetScaler-branded module is used on both ends of the connection. Mixing this transceiver with a Cisco-branded 40G-BiDi module on the switch side can cause link flapping.

- **9530513 (Citrix MPN)** (40GbE QSFP+ DAC, 5 m passive copper): A DAC alternative to BiDi optics, ideal for short-reach 40G links.

Q6: Are 100G/40G QSFP28 transceivers supported?

Yes, only on the MPX and SDX 17000 platform. The Citrix-qualified options are:

- **9530410 (Citrix MPN)**: 100/40GbE Dual-Rate QSFP28 SR4 (MPO-12 MMF)
- **9530413 (Citrix MPN)**: 100GbE QSFP28 LR4 (LC, SMF, 10 km)
- **9530517 (Citrix MPN)**: 100GbE QSFP28 AOC (20 m)

Q7: Is 200G supported?

Yes, only on the QSFP56 ports of the dual-port 200G NICs on the MPX/SDX 17000 platform. The Citrix-qualified options are:

- **9530409 (Citrix MPN)**: 200GbE QSFP56 SR4 (MPO-12 MMF)
- **9530514 (Citrix MPN)**: 200GbE QSFP56 to QSFP56 Passive Twinax DAC (2.5 m)
- **9530522 (Citrix MPN)**: 200GbE QSFP56 AOC (20 m)

Q8: Can I use a QSFP28 adapter at 25G or 10G with regular SFP optics on the MPX/SDX 17000 200G QSFP56 ports?

Yes, by using the Citrix adapter (Citrix MPN: 9530416). This is a QSFP28-to-SFP28 mechanical adapter based on the Mellanox/Nvidia MAM1Q00A-QSA28 design.

The adapter slots into a 200G QSFP56 port on the MPX/SDX 17000 platform and accepts any qualified Citrix-branded SFP28 (25G) or SFP+ (10G) optic. This is particularly useful when the appliance's native SFP56 ports are fully utilized, allowing customers to provision an additional 25G or 10G uplink from an available QSFP56 port.

Auto-Negotiation, Speed Forcing & FEC

Q1: Do ports auto-negotiate speed with these transceivers?

It depends on the link speed and the transceiver type:

SPEED	ENCODING	AUTO-NEGOTIATION BEHAVIOR
10G SFP+	NRZ	Yes
25G SFP28	NRZ	Yes (with FC-FEC)
50G SFP56 (PAM4)	PAM4	Yes (with RS-FEC)
40G QSFP+ BiDi	NRZ	No - forced speed may be required on the Nexus N9K/ N3K peer switch
100G QSFP28 SR4	NRZ (4x25G)	Yes (with RS-FEC)
100G QSFP28 LR4	NRZ (4x25G CWDM)	Yes (No FEC - clean SMF link)
200G QSFP56 PAM4	PAM4 (4x50G)	Yes (with RS-FEC)

Q2: What FEC mode should I configure on the peer switch?

Match FEC to the link speed and media. FEC mismatch is the #1 cause of link-up-but-no-traffic or high-CRC-error symptoms.

LINK SPEED	MODULATION	REQUIRED FEC
10GbE	NRZ	None
25GbE NRZ (SFP28)	NRZ	FC-FEC
40GbE QSFP+	NRZ (4x10G)	None
50GbE SFP56	PAM4	RS-FEC
100GbE SR4	NRZ (4x25G)	RS-FEC
100GbE LR4	NRZ (4x25G CWDM)	None
200GbE SR4 / AOC	PAM4 (4x50G)	RS-FEC

Q3: Why does not my 40G link come up with auto-negotiation?

Whether a 40G link comes up on its own depends on the type of cable or transceiver used, not on the NIC card itself. The behavior differs by cable type:

- **40G copper cable (passive DAC):** The link comes up at 40G automatically. No configuration is needed on either end.
- **40G fiber transceiver (BiDi):** These run at a fixed speed and do not support auto-negotiation. If a port is left set to auto-negotiate, it does not find a matching partner and the link does not come up. To fix this, set the port to a fixed 40G speed on whichever device defaults to auto-negotiation, typically the Cisco peer switch (set "speed 40000" on the Nexus peer switch).
- **100G transceiver (QSFP28) used at 40G:** With auto-negotiation enabled, the link comes up at its native 100G speed, not 40G. To run it at 40G, manually set a fixed 40G speed on both ends.

Mixing & Compatibility

Q1: Can I use third-party optics or DAC/AOC cables?

Only Citrix-qualified, Citrix-branded MPNs (953xxxx series) are supported. Using non-qualified modules may cause link bring-up issues, FEC mismatch, or DDM read failures, and may not be covered under standard support terms.

Q2: Can I mix SR and LR (or different vendor optics) on each end of the link?

Both ends of a link must use compatible optics, which means same wavelength, same compliance code (for example, SR4 to SR4, LR4 to LR4), and matching connector or fiber type. Mixing SR with LR will not establish a link. For 40G BiDi optical, both ends must be the same Citrix MPN 9530411.

Q3: How do I choose SR vs LR?

- **SR (Short Reach):** Multimode fiber (OM3 70m / OM4 100m typical for SR4 at 100G+; OM3 300m / OM4 400m for 10G SR). Use within a single rack or row.
- **LR (Long Reach):** Single-mode fiber (OS2), typically up to 10 km. Use for inter-row, inter-DC, or campus links.

Always confirm the qualified reach in the Transceiver, DACs, AOCs' matrix](/en-us/netscaler-hardware-platforms/mpx/mpx-9200-17000-master-matrix). Actual reach depends on the optic and the fiber grade.

Q4: What MPO polarity do I need for SR4 modules (40G/100G/200G)?

All Citrix-qualified MPO-12 SR4 modules (Citrix MPN 9530409, 9530410) require Type B (key-up to key-down) MPO-12 trunk cables for correct fiber polarity. Type A or Type C trunks result in no-link or a one-way link.

Verification & Troubleshooting

Q1: How do I verify that the transceiver is detected and the link is up?

- Check the NetScaler host interface state: link, speed, FEC.
- Check the peer switch interface: link, speed, FEC, error counters.
- If the link is down: reseal the module, verify cable polarity (LC duplex or MPO Type B), confirm both sides match in speed and FEC.

Q2: Can I use a Cisco Nexus N9K with non-Cisco optics?

Yes, with the `service unsupported-transceiver` command enabled in the global configuration of the Nexus switch. Without this command, the Nexus N9K may refuse to bring up the port even if the optic is electrically compatible. Per-lane DDM may be reported as N/A on the N9K for non-Cisco QSFP modules. This is cosmetic, not a fault.

Q3: My 9530413 (Citrix MPN) 100G LR4 link is not coming up over OS2 fiber to a Mellanox SN3700 or Cisco N9K switch. The transceivers are seated and powered. What should I check first?

The 9530413 (Citrix MPN) samples should auto-negotiate to 100G LR4 over OS2 single-mode fiber without any manual speed forcing. If the link is not coming up, the most common root cause is

a fiber-side issue (dirty or damaged LC connector, or a bad/broken patch cable), not the transceiver or NIC.

Diagnostic indicator: Check switch-side per-lane RX power. If all four lanes report approximately -40 dBm (the optical floor / "no light"), this is not a transceiver fault. It means that no optical signal is reaching the switch receiver. The link never reaches PHY training under these conditions, which is why auto-negotiation appears to fail.

Example symptom on a Mellanox SN3700:

```
Rx Power (per channel):
```

```
Ch1 Rx Power : 0.00010 mW / -40.00000 dBm ← floor / no light
```

```
Ch2 Rx Power : 0.00010 mW / -40.00000 dBm ← floor / no light
```

```
Ch3 Rx Power : 0.00010 mW / -40.00000 dBm ← floor / no light
```

```
Ch4 Rx Power : 0.00010 mW / -40.00000 dBm ← floor / no light
```

```
Ch1-Ch4 Rx Power Alarm : Rx Pwr Too Low
```

Meanwhile, TX power on both host and switch reads normal (~1.5–1.7 mW / ~2 dBm per channel) with no Tx alarms and the lasers are healthy. The optical path between them is broken.

Resolution steps:

1. Replace the OS2 LC-to-LC duplex single-mode patch cable with a known-good fiber.
2. Reseat both transceivers (host side and switch side) after fiber replacement.
3. Verify LC polarity and confirm that the duplex connectors are not crossed or mis-keyed.
4. Re-check switch-side RX power. After fiber replacement, RX power on all four channels should return to a normal range (typically +1 to +3 dBm), all "Rx Pwr Too Low" alarms should clear, and the link should come up at 100Gx4, auto-negotiation, without manual configuration.

Example after fiber replacement (Mellanox SN3700):

```
Eth1/31 Operational state: Up / Speed: 100Gx4 / Negotiation: Auto
```

```
Rx Power (per channel) → alarms now NONE
```

TX Power (per channel) → alarms NONE

Q4: What is the QSFP28-to-SFP28 adapter 9530416 (Citrix MPN) and when do I use it?

This QSFP28-to-SFP28 mechanical adapter (based on the Mellanox MAM1Q00A-QSA28) fits a 1-lane SFP-class optic into a 4-lane QSFP56 port on the MPX/SDX 17000. With this adapter installed, the 200G QSFP56 port can operate at lower link speeds, specifically 25G with an SFP28 optic (for example, 9530402 SR), or 10G with an SFP+ optic (for example, 9530403 SR), when the host NIC and peer switch are configured to match.

Q5: When would I use the QSFP28-to-SFP28 adapter 9530416 (Citrix MPN) instead of just using an SFP56 port directly?

Use the adapter when:

- All 8x SFP56 ports on the MPX/SDX 17000 are already in use and you need an additional 25G or 10G uplink.
- A deployment design specifically requires a 25G or 10G link from a QSFP56 port (for example, to match a particular switch panel layout).

For a fresh deployment, prefer the native SFP56 ports on the MPX/SDX 9200 and 17000 for 10G / 25G / 50G optics as they require no adapter and have the simplest interop path.

Q6: Is the QSFP28-to-SFP28 adapter 9530416 (Citrix MPN) supported on the MPX/SDX 9200?

No. The MPX/SDX 9200 has no QSFP56 ports. The 9530416 (Citrix MPN) is only applicable to the MPX/SDX 17000.

Q7: Does the QSFP28-to-SFP28 adapter 9530416 (Citrix MPN) add latency or signal loss?

No. The 9530416 (Citrix MPN) is a passive mechanical adapter. It physically routes a single lane between the SFP28/SFP+ optic and one lane of the QSFP56 port with no active components or retiming. Signal integrity and latency are the same as a native SFP socket.

Transceiver Interop Use Cases

The following use cases reflect real-world deployment topologies. These setups were validated on the NetScaler MPX and SDX 17000 platform using Mellanox ConnectX-7 200G NICs (FW 28.43.3608) with industry-standard data center peer switches. All QSFP-class use cases apply exclusively to the 17000 series. The MPX and SDX 9200 platform do not feature QSFP56 ports.

Citrix MPN: 9530409 (200G QSFP56 SR4 MPO-12)

Use Case: Native 200G to Mellanox SN3700

MPX/SDX 17000 (200G NIC) >> 9530409 <--- MPO-12 (Type B) ---> 9530409 << Mellanox SN3700 (QSFP56 port)

- **Negotiation:** Auto-negotiation at 200G PAM4 (4 x 50G), RS-FEC (544,514).

Citrix MPN: 9530410 (100/40G QSFP28 SR4 MPO-12)

Use Case 1: 100G Native Link to Cisco Nexus N9K

MPX/SDX 17000 (200G NIC) >> 9530410 <--- MPO-12 (Type B) ---> 9530410 << Cisco N9K-C93180YC-FX (QSFP28 port)

- **Customer scenario:** Data-center deployment uplinking the NetScaler appliance into a Cisco Nexus 100G port using Citrix-branded optics on both host and switch ends.
- **Negotiation:** Auto-negotiation establishes the link at 100G (4 x 25G NRZ) with RS-FEC (528,514). No manual configuration required.

Use Case 2: 40G Forced Link to Cisco Nexus N9K (Mixed-Speed Interop)

MPX/SDX 17000 (200G NIC) >> 9530410 <--- MPO-12 (Type B) ---> Cisco QSFP-40G-SR4 or Intel FTL410QE2C-IT << Cisco N9K-C93180YC-FX (QSFP+ port)

- **Customer scenario:** Migration or mixed-generation environments where the appliance must connect to an existing 40G Nexus port using a legacy QSFP-40G-SR4 transceiver on the switch side.
- **Negotiation:** Auto-negotiation is **not possible**. Speed must be set manually to 40G on both the host and the switch.

- **IEEE 802.3 architectural constraint:** The host QSFP28 SerDes initializes at 4 x 25G. The switch QSFP-40G-SR4 runs 4 x 10G. These are incompatible lane rates that require a common forced rate first.
- On the Nexus 9000, enable `service unsupported-transceiver` to allow the non-Cisco-branded QSFP-40G-SR4 on the switch side.
- Per-lane DDM may show **N/A** on the N9K side at 40G. This is expected and has no impact to link health.

Use Case 3: 100G Native Link to Mellanox SN3700 (Spectrum-2)

MPX/SDX 17000 (200G NIC) >> 9530410 <--- MPO-12 (Type B) ---> 9530410 << Mellanox SN3700 (QSFP28 port)

- **Customer scenario:** Data-center deployment uplinking the NetScaler appliance into a Mellanox/NVIDIA SN3700 100G switch.
- **Negotiation:** Auto-negotiation establishes 100G with RS-FEC. No manual configuration required.

Key takeaway for 9530410: Native 100G works automatically on both N9K and SN3700. The 40G path requires forced speed on both ends and applies only when the peer switch port carries a QSFP-40G-SR4 module.

MPN: 9530411 (40G QSFP+ BiDi SR LC)

Use Case 1: BiDi Link with 9530411 on Both Ends (Stable)

MPX/SDX 17000 (200G NIC) >> 9530411 <--- LC duplex MMF ---> 9530411 << Cisco N9K or Mellanox SN3700 (QSFP+ port)

- **Result:** Link is stable, **no flap observed** when the same Citrix MPN 9530411 is installed at both host and switch ends. Forced 40G speed required on peer switch sides (no auto-negotiation at 40G).

Use Case 2: Mixed BiDi Pairing (Link Flap Observed)

9530411 on host, Cisco-branded 40G-BiDi (for example, AFBR-79EBPZ-CS2) on switch side.

- **Symptom:** Intermittent link flaps when the switch side uses a Cisco-branded 40G-BiDi module while the host uses 9530411.
- **Status: Not recommended.** For supported BiDi deployments, use the Citrix MPN 9530411 on **both** ends.

Key takeaway for 9530411: Use the same Citrix-branded BiDi MPN on host **and** switch ends. Cross-vendor BiDi pairings (Citrix host + Cisco-branded switch) are known to flap and are not supported.

Citrix MPN: 9530413 (100G QSFP28 LR4 LC, 10 km)

Use Case 1: 100G LR4 to Cisco Nexus N9K

MPX/SDX 17000 (200G NIC) >> 9530413 <--- OS2 LC-LC duplex SMF ---> 9530413 << Cisco N9K-C93180YC-FX (QSFP28 port)

- **Negotiation:** Auto-negotiation at 100G (4 x 25G NRZ), no FEC (LR4 SMF link has sufficient SNR margin to operate without FEC).

Use Case 2: 100G LR4 to Mellanox SN3700

MPX/SDX 17000 (200G NIC) >> 9530413 <--- OS2 LC-LC duplex SMF ---> 9530413 << Mellanox SN3700 (QSFP28 port)

- **Negotiation:** Auto-negotiation at 100G (4 x 25G NRZ), no FEC.

Key takeaway for 9530413: Native 100G LR4 links auto-negotiate cleanly with no FEC between host and both validated interop switches over OS2 SMF.

Citrix MPN: 9530416 (QSFP28-to-SFP28 Adapter)

Use Case 1: 25G SFP28 SR Uplink via QSFP56 Port

MPX/SDX 17000 (200G NIC) >> 9530416 adapter >> 9530402 (25G SFP28 SR) <--- LC duplex MMF ---> Cisco SFP-25G-SR-S << Cisco Nexus (25G port)

- **Customer scenario:** The MPX/SDX 17000's eight native SFP56 ports are already fully utilized. The customer needs an additional 25G uplink and uses a QSFP56 port through the 9530416 adapter + a 9530402 SFP28 SR optic on the host side, matched against a Cisco SFP-25G-SR-S on a Cisco Nexus 25G switch port.

- **Negotiation:** Standard 25G auto-negotiation behavior. Link comes up at 25G with FC-FEC.

Use Case 2: 10G SFP+ SR Uplink via QSFP56 Port

MPX/SDX 17000 (200G NIC) >> **9530416** adapter >> **9530403** (10G SFP+ SR) <--- LC duplex MMF ---> **Cisco SFP-10G-SR** << Cisco Nexus (10G port)

- **Customer scenario:** The customer needs an additional 10G uplink from a 17000 QSFP56 port and uses a 9530416 adapter + 9530403 SFP+ SR optic against a Cisco SFP-10G-SR on a Nexus 10G port.
- **Negotiation:** Standard 10G operation. The link comes up at 10G with no FEC.

Key takeaway for 9530416: The adapter enables a 200G QSFP56 port to operate as a single-lane 25G or 10G port using a standard SFP28 / SFP+ optic. Configure the host and switch for the matching lower speed. For 10G or 25G deployments, prefer the native SFP56 cages on the MPX/SDX 17000 (or any port on the MPX/SDX 9200) as they require no adapter.

Citrix MPN: 9530513 (40G QSFP+ DAC, 5 m)

Use Case 1: 40G QSFP+ DAC to Cisco Nexus N9K

MPX/SDX 17000 (**200G NIC**, host end labeled **CITRIX/9530513**) >> **9530513** <--- 5 m passive copper ---> **9530513** << (switch end labeled **CISCO-CITRIX/C-QCIQMX-PDAC5M**) << **Cisco N9K-C93180YC-FX** (QSFP+/QSFP28 port)

- **Customer scenario:** Short-reach 40G uplink (within a rack or adjacent rack) from the NetScaler appliance to a Cisco Nexus 40G port using a passive copper DAC.
- **Cable end labeling (by design):** The host end is labeled "CITRIX / 9530513". The switch end is labeled "CISCO-CITRIX / C-QCIQMX-PDAC5M". The asymmetric labeling is intentional so each end is recognized natively by the peer it faces.
- **Negotiation:** Auto-negotiation at 40G (4 x 10G NRZ), no FEC.

Use Case 2: 40G QSFP+ DAC to Mellanox SN3700

MPX/SDX 17000 (**200G NIC**, host end labeled **CITRIX/9530513**) >> **9530513** <--- 5 m passive copper ---> **9530513** << (switch end labeled **CISCO-CITRIX/C-QCIQMX-PDAC5M**) << **Mellanox SN3700** (QSFP+/QSFP28 port)

- **Customer scenario:** Short-reach 40G uplink (within a rack or adjacent rack) from the NetScaler appliance to a Mellanox SN3700 switch port using a passive copper DAC.
- **Negotiation:** Auto-negotiation at 40G (4 x 10G NRZ), no FEC.

Key takeaway for 9530513: The 40G QSFP+ DAC is a passive copper alternative to the 9530411 BiDi optic for short (5 m or less) 40G links. Unlike the 9530411 BiDi case, mixed-end labeling (CITRIX on host / CISCO-CITRIX on switch) is the expected design for the 9530513, not a constraint.

Citrix MPN: 9530517 (100G QSFP28 AOC, 20 m)

Use Case 1: 100G AOC to Cisco Nexus N9K

MPX/SDX 17000 (200G NIC, CITRIX end) >> 9530517 <--- 20 m AOC ---> 9530517 (CISCO-CITRIX end / Vendor PN Q100GBAOC20MCMXC) << Cisco N9K (QSFP28 port)

- **EEPROM programming asymmetry:** Host end is labeled "CITRIX / 9530517" (Vendor OUI: 00:00:00); switch end is labeled "CISCO-CITRIX / Q100GBAOC20MCMXC" (Vendor OUI: 00:00:00). Vendor Rev: End A = **A1**, End B = **D1**. The asymmetric labeling is intentional so each end is recognized natively by the peer it faces. No anomalies observed against intended host/switch role mapping.

Use Case 2: 100G AOC to Mellanox SN3700

MPX/SDX 17000 (200G NIC, CITRIX end) >> 9530517 <--- 20 m AOC ---> 9530517 (CISCO-CITRIX end / Vendor PN Q100GBAOC20MCMXC) << Mellanox SN3700 (QSFP28 port)

Key constraint for 9530517: This module also advertises 40G capability in EEPROM, but does not link in a QSFP+ peer-switch port (the AOC end-electronics are QSFP28-only). For 40G interop, use 9530411 (BiDi) or 9530513 (40G QSFP+ DAC, 5 m) instead.

Safety, cautions, warnings, and other information

Note: For the list of safety certifications, standards, and ROHS compliance for each model, see the data sheet. The data sheet is available on www.netscaler.com. Navigate to **Platform > Form Factors > Hardware**.

Safety statements

The following safety statements provide the caution and danger information you need to know, before installing the product.

Statement 1:

Danger: Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that is attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.

Connect cables

- Shut OFF all power sources and equipment to be attached to this product.
- Attach all cables to the devices.
- Attach signal cables to the connectors.
- Attach power cords to power sources. For DC systems, ensure correct polarity of -48 VDC connections: RTN is (+) and -48 VDC is (-). Earth ground must use a two-hole lug for safety.
- Turn ON all the power sources.

Disconnect cables

- Shut OFF all power sources and equipment to be attached to this product.
- For AC systems, remove all power cords from the shelf power receptacles or interrupt power at the ac power distribution unit.
- For DC systems, disconnect DC power sources at the breaker panel or by turning off the power source, then remove the DC cables.
- Remove the signal cables from the connectors.
- Remove all cables from the devices

Statement 2:

Caution: When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product might result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than the ones specified here might result in hazardous radiation exposure.

Danger: Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

- Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Statement 3:

Caution:

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Statement 4:

Danger: Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. See the information that is provided with your device for electrical specifications.

Statement 5 (applies to NetScaler® ADC appliances with -48 VDC input):

Caution: This equipment is designed to permit the connection between the earthed conductor of the DC supply circuit and the earthing conductor at the equipment. If this connection is made, the following conditions must be met:

- This equipment must be connected directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.
- This equipment must be located in the same immediate area (such as, adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system must not be earthed elsewhere.
- The DC supply source must be located within the same premises as this equipment.
- Switching or disconnecting devices must not be in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

Statement 6:

Caution: To reduce the risk of electric shock or energy hazards:

- This equipment must be installed by trained service personnel in a restricted-access location, as defined by the NEC and IEC/UL/CSA 60950-1 and 62368-1, the Standard for Safety of IT Equipment.
- Connect the equipment to a properly grounded safety extra low voltage (SELV) source. A SELV source is a secondary circuit that is designed so that normal and single fault conditions do not cause the voltages to exceed a safe level (60 V direct current).
- Incorporate a readily available approved and rated disconnect device in the field wiring.
- See the specifications in the product documentation for the required circuit-breaker rating for branch circuit overcurrent protection.
- Use copper wire conductors only. See the specifications in the product documentation for the required wire size.
- See the specifications in the product documentation for the required torque values for the wiring-terminal nuts.

Statement 7:

Caution: Shock hazard. Equipment might be powered by multiple sources.



Statement 8:

Caution: During installation or maintenance procedures, wear a grounding wrist strap to avoid ESD damage to the electronics of the appliance. Use a conductive wrist strap attached to a good earth ground or to the appliance. You can attach it to the connector beside the ESD symbol on the back.



Statement 9:

Warning: Hazardous moving parts. Keep away from moving fan blades.



Fiber optic safety information

Danger: Hazardous Radiation

Fiber optic products use laser radiation with the potential to cause injury. Uncovered ports might release this radiation. Avoid direct exposure to laser radiation. Do not stare into the beam, and do not view directly with optical instruments. Do not remove any protective shields on fiber optic transceiver modules.

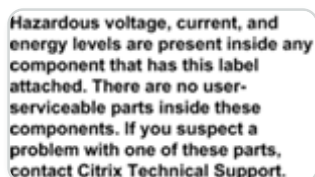
Cautions, warnings, and other information

Electrical safety precautions:

Follow basic electrical safety precautions to protect yourself from harm and the appliance from damage.

- Be aware of the location of the emergency power off (EPO) switch, so that you can quickly remove power to the appliance if an electrical accident occurs.
- Remove all jewelry and other metal objects that might come into contact with power sources or wires before installing or repairing the appliance. When you touch both a live power source or wire and ground, any metal objects can heat up rapidly and might cause burns, set clothing on fire, or fuse the metal object to an exposed terminal.
- Use a regulating, uninterruptible power supply to protect the appliance from power surges and voltage spikes, and to keep the appliance operating if power fails.
- Never stack the appliance on top of any other server or electronic equipment.
- All appliances are designed to be installed on power systems that use TN earthing. Do not install your device on a power system that uses either TT or IT earthing.

- Ensure that the appliance has a direct physical connection to the earth during normal use. When installing or repairing an appliance, always ensure that the ground circuit is connected first and disconnected last.
- Ensure that a fuse or circuit breaker no larger than 120 VAC, 15 A U.S. (240 VAC, 16 A international) is used on all current-carrying conductors on the power system to which your appliances are connected.
- Do not work alone when working with high voltage components.
- Always disconnect the appliance from power before removing or installing any component, unless the component is hot-swappable. When disconnecting power, first shut down the appliance, and then unplug the power cords of all the power supply units connected to the appliance. As long as the power cord is plugged in, line voltages can be present in the power supply, even when the power switch is OFF.
- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been designed as electrical insulators.
- Ensure that the power source can handle the appliance's maximum power consumption rating with no danger of an overload. Always unplug any appliance before performing repairs or upgrades.
- Do not overload the wiring in your server cabinet or on your server room rack.
- During thunderstorms, or anticipated thunderstorms, avoid performing any hardware repairs or upgrades until the danger of lightning has passed.
- When you dispose of an old appliance or any components, follow any local and national laws on the disposal of electronic waste.
- To prevent possible explosions, replace expired batteries with the same model or a manufacturer-recommended substitute and follow the manufacturer's instructions for battery replacement and disposal.
- This product is also designed for an IT power distribution system with phase-to-phase voltage 230 V.
- Never remove a power supply cover or any sealed part that has the following label:



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no user-serviceable parts inside these components. If you suspect a problem with one of these parts, contact Citrix Technical Support.

Appliance precautions:

- Determine the placement of each component in the rack before you install the rails.
- Install the heaviest appliance first, at the bottom of the rack, and then work upward. Distribute the load on the rack evenly. An unbalanced rack is hazardous.
- Allow the power supply units and hard drives to cool before touching them.
- Install the equipment near an electrical outlet for easy access.
- Mount equipment in a rack with sufficient airflow for safe operation.
- For a closed or multiple-unit rack assembly, the ambient operating temperature of the rack environment might be greater than the ambient temperature of the room. Therefore, consider the lowest and highest operating temperatures of the equipment when making a decision about where to install the appliance in the rack.

Rack precautions:

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor, with the full weight of the rack resting on them.
- For a single-rack installation, attach a stabilizer to the rack.
- For a multiple-rack installation, couple (attach) the racks together.
- Always ensure that the rack is stable before extending a component from the rack.
- Extend only one component at a time. Extending two or more simultaneously might cause the rack to become unstable.
- The handles on the left and right of the front panel of the appliance must be used only for extending the appliance out of the rack. Do not use these handles for mounting the appliance on the rack. Use the rack-rail hardware, described later, instead.

Taiwan BSMI RoHS statement

The following tables are a declaration of the presence condition of restricted substances in NetScaler MPX and SDX hardware appliances.

限用物質含有情況標示聲明書						
Declaration of the Presence Condition of Restricted Substances						
設備名稱：網路負載均衡設備(服務器)						
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁶⁺)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
金屬外殼	○	○	○	○	○	○
印刷電路板	○	○	○	○	○	○
電源供應器	○	○	○	○	○	○
風扇	○	○	○	○	○	○
外殼前面板	○	○	○	○	○	○
配件(電源線、傳輸線)	○	○	○	○	○	○
備考1. “超出0.1 wt %”及“超出0.01 wt %”係指限用物質之百分比含量超出百分比含量基準值。 Note 1 : “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.						
備考2. “○”係指該項限用物質之百分比含量未超出百分比含量基準值。 Note 2 : “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.						
備考3. “—”係指該項限用物質為排除項目。 Note 3 : The “—” indicates that the restricted substance corresponds to the exemption.						

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金屬外殼	○	○	○	○	○	○
印刷電路板	○	○	○	○	○	○
電源供應器	○	○	○	○	○	○
風扇	○	○	○	○	○	○
外殼前面板	○	○	○	○	○	○
配件(電源線、傳輸線)	○	○	○	○	○	○
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FCC compliance statement

Supplier's declaration of conformity

The FCC Compliance Statements listed on this page apply to all NetScaler MPX and SDX hardware models.

Responsible Party – U.S. Contact Information:

Citrix® Systems, Inc. 4988 Great America Parkway Santa Clara, CA 95054 USA

compliance.prime@cloud.com

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device might not cause harmful interference, and (2) this device must accept any interference received, including interference that might cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, according to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the interference at their own expense.

Prepare for installation

NOTE:

This section does not apply to the MPX 9200 and MPX 17000 platforms. For information specific to the MPX 9200 platform, see [NetScaler MPX 9200](#). For information specific to the MPX 17000 platform, see [NetScaler MPX 17000](#).

Before you install your new appliance, carefully unpack your appliance and make sure that all parts were delivered. Verify that the location where the appliance is to be installed meets temperature and power requirements. Also verify that the server cabinet or floor-to-ceiling cabinet is securely bolted to the floor and has sufficient airflow.

Note: On all appliances, the air flows from front to rear.

Only trained and qualified personnel must install, maintain, or replace the appliance. Ensure that all cautions and warnings are followed.

Unpack the appliance

The hardware accessories for your particular appliance, such as cables, adapters, and rail kit, vary depending on the hardware platform you ordered. Unpack the box that contains your new appliance on a sturdy table with plenty of space, and inspect the contents.

Verify that you received the cables, adapter, and rail kits specified for your appliance.

NOTE

Make sure that a power outlet is available for each cable.

If the kit that you received does not fit your rack, contact your NetScaler® sales representative to order the appropriate kit.

Transceiver modules are sold separately. Contact your NetScaler sales representative to order transceiver modules for your appliance. Only transceivers supplied by Citrix® are supported on the appliance.

For Brazilian customers, NetScaler does not ship a power cable. Use a cable that conforms to the ABNT NBR 14136:2002 standard.

In addition to the items included in the box with your new appliance, you need the following items to complete the installation and initial configuration process.

- Ethernet cables for each additional Ethernet port that you connect to your network.
- One available Ethernet port on your network switch or hub for each NetScaler Ethernet port you want to connect to your network.
- A computer to serve as a management workstation.

Prepare the site and rack

There are specific site and rack requirements for the NetScaler appliance. Make sure that adequate environmental control and power density are available. Racks must be bolted to the ground, have sufficient airflow, and have adequate power and network connections. Preparing the site and rack are important steps in the installation process and help ensure a smooth installation.

Site requirements

The appliance must be installed in a server room or server cabinet with the following features:

- Environment control

An air conditioner, preferably a dedicated computer room air conditioner (CRAC), capable of maintaining the cabinet or server room at a temperature of no more than 27 degrees C/80.6 degrees F at altitudes of up to 2100 m/7000 ft, or 18 degrees C/64.4 degrees F at higher altitudes, a humidity level no greater than 45 percent, and a dust-free environment.

- Power density

Wiring capable of handling at least 4000 watts per rack unit in addition to power needs for the CRAC.

Rack requirements

The rack on which you install your appliance must meet the following criteria:

- **Rack characteristics:**

Racks must be either integrated into a purpose-designed server cabinet or be the floor-to-ceiling type, bolted down at both top and bottom to ensure stability. If you have a cabinet, it must be installed perpendicular to a load-bearing wall for stability and sufficient airflow. If you have a server room, your racks must be installed in rows spaced at least 1 meter/3 feet apart for sufficient airflow. Your rack must allow your IT personnel unfettered access to the front and back of each server and to all power and network connections.

- **Power connections:**

At minimum, two standard power outlets per unit.

- **Network connections:**

At minimum, four Ethernet connections per rack unit.

- **Space requirements:**

One empty for the 1U models and two consecutive empty rack units for all other appliance models.

Note: You can order the following rail kits separately.

- Compact 4-post rail kit, which fits racks of 23–33 inches.
- 2-post rail kit, which fits 2-post racks.

Important:

See [Safety, cautions, warnings, and other information](#) for detailed electrical, appliance, and rack safety precautions.

Install the hardware

NOTE:

This section does not apply to the MPX 9200 and MPX 17000 platforms. For information specific to the MPX 9200 platform, see [NetScaler MPX 9200 platform](#). For information specific to the MPX 17000 platform, see [NetScaler MPX 17000 platform](#).

You are ready to install the hardware after you determine that the location meets the environmental standards and the server rack is in place according to the instructions. After you mount the appliance, you are ready to connect it to the network, to a power source, and to the console terminal. The console terminal can be used for initial configuration. To complete the installation, you turn on the appliance. Be sure to observe the cautions and warnings listed with the installation instructions.

Note: Keep the serial number handy before mounting the appliance on the rack. The serial number is the password for the first time login to the appliance and can be found at the back of the appliance.

Watch this quick video about [How to rack mount a NetScaler hardware appliance](#).

Mount the appliance on a rack

Most appliances can be installed in standard server racks that conform to the EIA-310-D specification. The appliances ship with a set of rails, which you must install before you mount the appliance. The only tools that you need for installing an appliance are a Phillips screwdriver and a flathead screwdriver.

WARNING

If you are installing the appliance as the only unit in the rack, mount it at the bottom. Make sure that the heaviest unit is at the bottom if the rack contains other units. Install stabilizing devices, if available, in the rack before mounting the appliance.

Your appliance requires one or two rack units depending on the height of the appliance.

Remove the inner rails from the rail assembly

1. Place the rail assembly on a flat surface.
2. Slide out the inner rail toward the front of the assembly.
3. Press the latch until the inner rail comes all the way out of the rail assembly.
4. Repeat steps 1 through 3 to remove the second inner rail.

Attach the inner rails to the appliance

1. Position the right inner rail behind the handle on the right side of the appliance.
2. Align the holes on the rail with the corresponding holes on the side of the appliance.
3. Attach the rail to the appliance with the provided screws: 4 per side for a 1U appliance and 5 per side for a 2U appliance, as shown in the following figure.

Figure 1. Attach inner rails

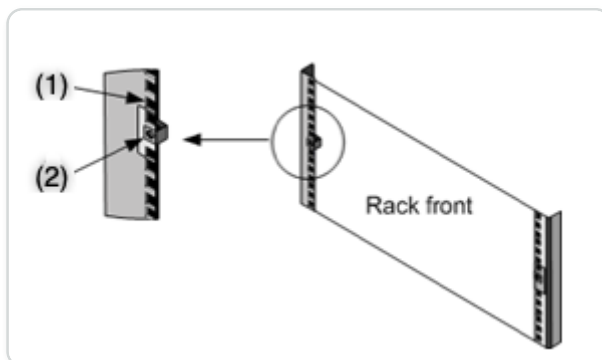


4. Repeat steps 1 through 3 to install the left inner rail on the other side of the appliance.

Install the rack rails on the rack

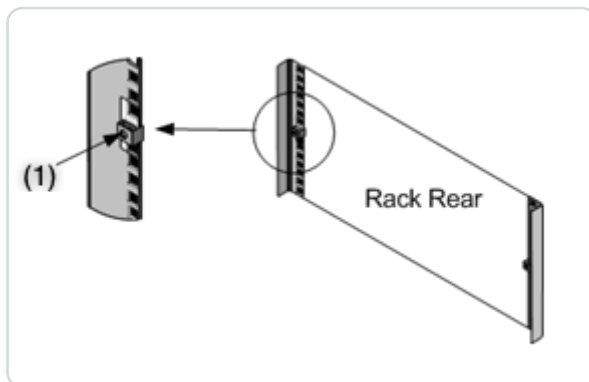
1. If you have a round-hole, threaded rack, skip to step 3.
2. Install square nut retainers into the front post and back post of the rack as shown in the following figures. Before inserting a screw, be sure to align the square nut with the correct hole for your 1U or 2U appliance. The three holes are not evenly spaced.

Figure 2. Install retainers into the front rack posts



(1)-Install in this hole for a 2U appliance. (2)-Install in center hole for a 1U appliance.

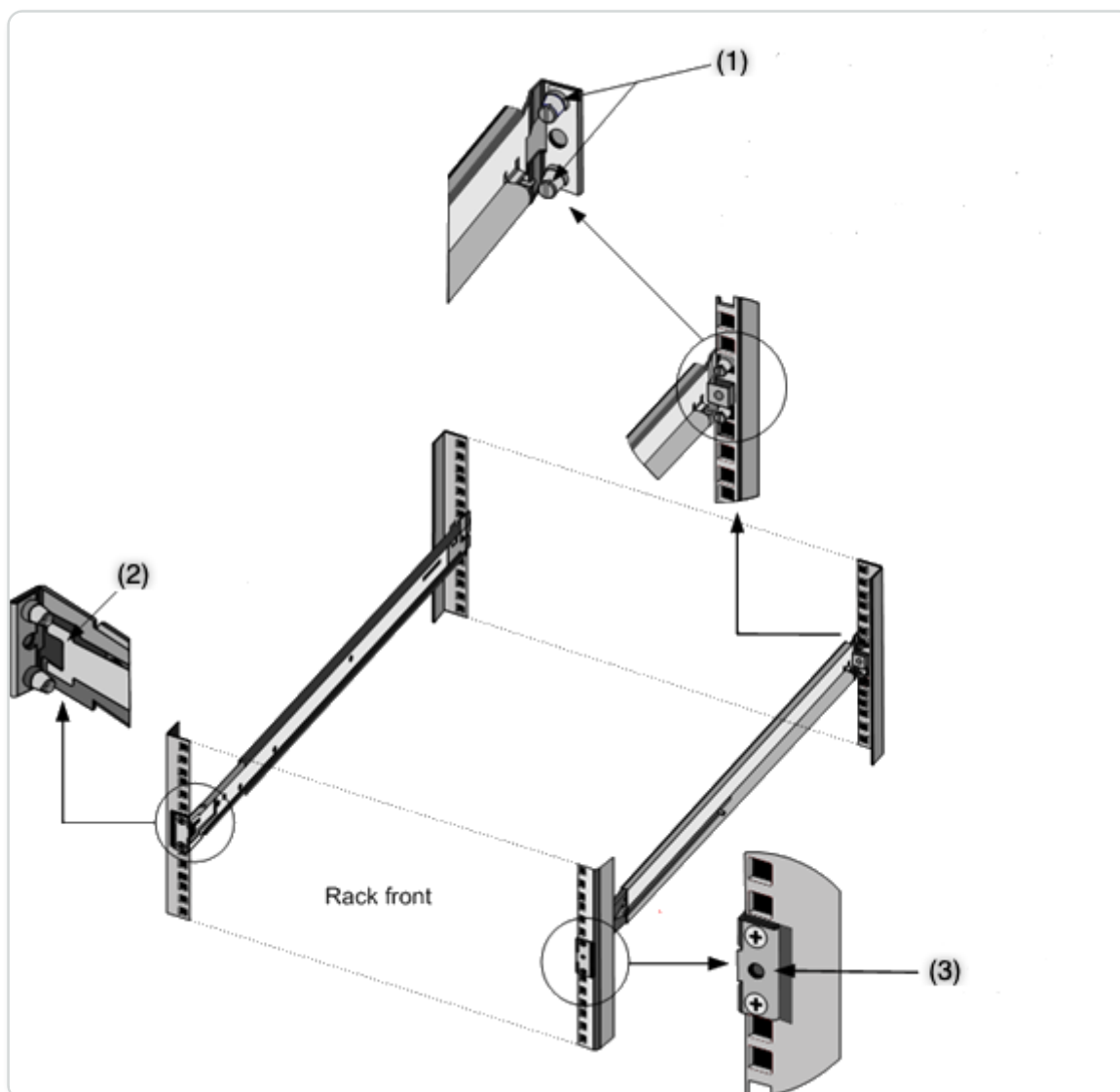
Figure 3. Install retainers into the rear rack posts



(1)-Install in the center hole for a 1U or a 2U appliance.

3. Install the adjustable rail assembly into the rack as shown in the following figures. Use a screw to lock the rear rail flange into the rack. With the screw securing the rail in place, you can optionally remove the latching spring.

Figure 4. Install the rail assembly to the rack

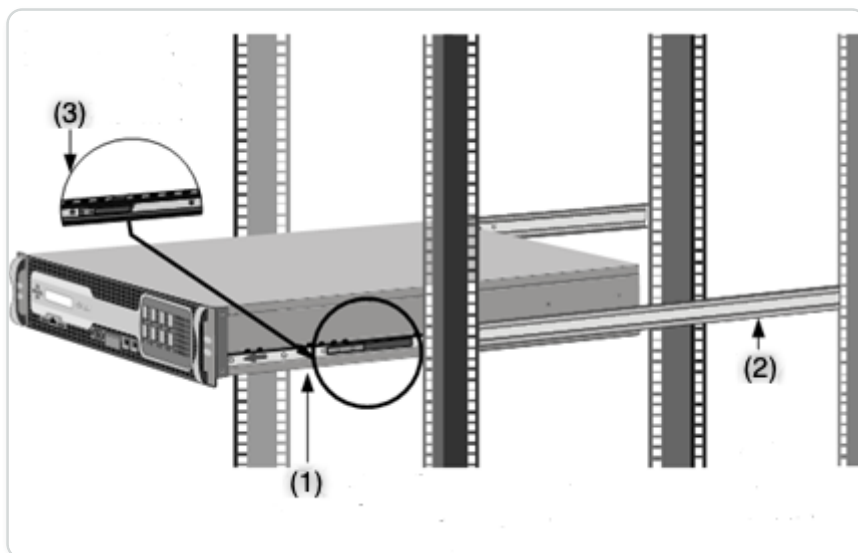


(1)-For round-hole threaded racks, remove the stud, and discard. Secure the rail to the rack by using the flat head screws that were holding the studs in place. For square-hole and round-hole non-threaded racks, insert studs into the hole in the rear of the rack. (2)-Latching spring. (3)-Don't insert the screw into this hole until you have installed the appliance into the rack.

Install the appliance in the rack

1. Align the inner rails, attached to the appliance, with the rack rails.
2. Slide the appliance into the rack rails, keeping the pressure even on both sides.
3. Verify that the appliance is locked in place by pulling it all the way out from the rack.

Figure 5. Mount the appliance on a rack



(1)-Attach the inner rails to the appliance by using the screws provided. (2)-Attach the outer rails to the rack. (3)-Press the latch to slide the appliance in or out of the rack.

A Small Form-Factor Pluggable (SFP) is a compact transceiver that can operate at speeds of up to 1 gigabit per second. It is available in both copper and fiber types. Inserting a 1G SFP copper transceiver converts the 1G SFP port to a 1000BASE-T port. Inserting a 1G SFP fiber transceiver converts the 1G SFP port to a 1000BASE-X port.

Auto-negotiation is enabled by default on the ports into which you insert your transceiver. When a link between the port and the network is established, the mode is matched on both ends of the cable for the transceivers. The speed is also auto-negotiated.

Install and remove transceivers

NOTES

The 1G SFP transceiver is hot-swappable. The 40G QSFP+/10G SFP+ transceivers are hot-swappable on the NetScaler appliances that use the `ixgbe` (ix) interface. > The 100G ports support native 40G/50G/100G transceivers, direct attach copper cables (DAC) and active optical cables (AOC).

Native 10G and 25G transceivers are supported on appliances that do not have 10G and 25G ports, but require the use of an SFP+ to QSFP+ adapter. Contact your NetScaler® representative to purchase this adapter.

NetScaler appliances do not support transceivers from vendors other than Citrix Systems. Attempting to install third-party transceivers on your NetScaler appliance voids the warranty.

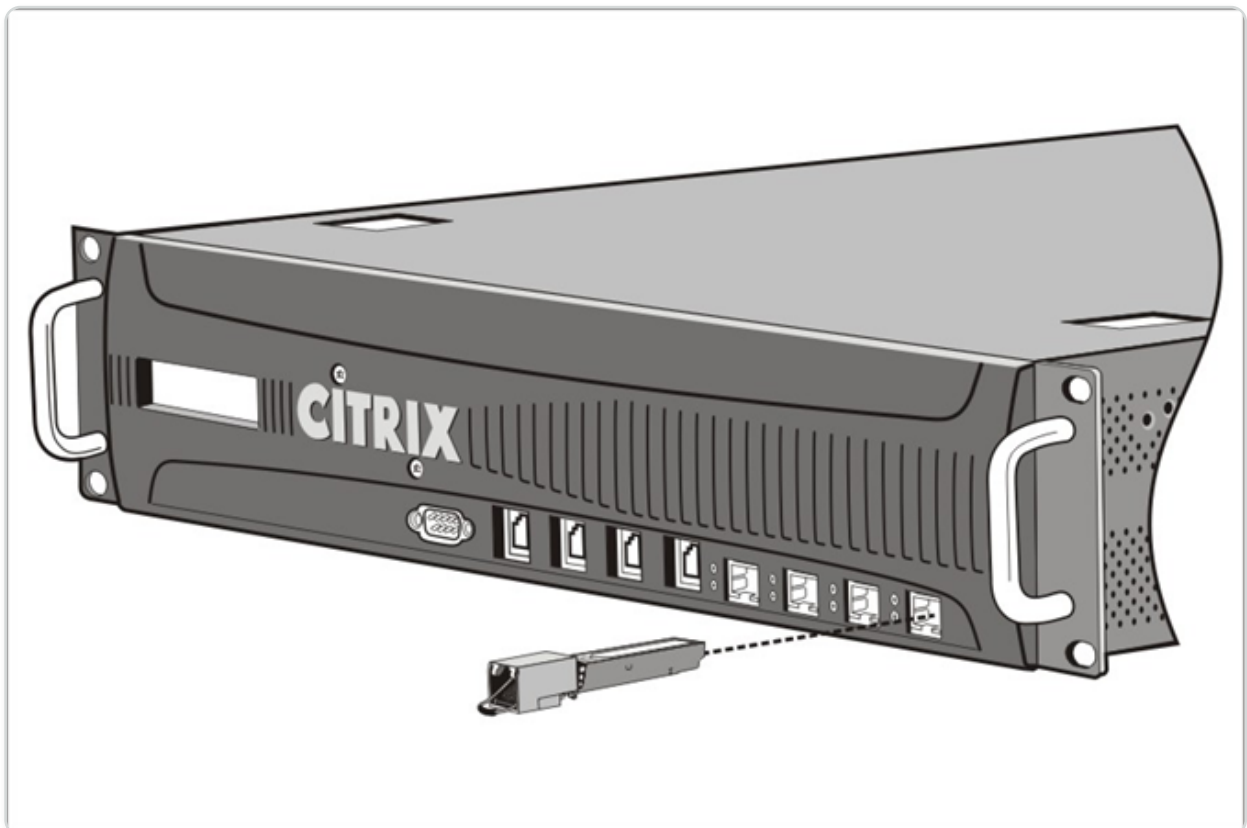
Do not install the transceivers with the cables attached. Doing so can damage the cable, the connector, or the optical interface of the transceiver.

Frequent installation and removal of transceivers shortens their life span. Follow the removal procedure carefully to avoid damaging the transceiver or the appliance.

Install a transceiver

1. Remove the transceiver carefully from its box. Danger: Do not look directly into fiber optic transceivers or cables. They emit laser beams that can damage your eyes.
2. Align the transceiver to the front of the appropriate transceiver port on the front panel of the appliance. Note: The illustration in the following figures might not represent your actual appliance.

Figure 6. Install a transceiver



3. Hold the transceiver between your thumb and index finger and insert it into the transceiver port. Press it in until you hear the transceiver snap into place.
4. Lock the transceiver.

5. Verify that the LED is green and blinks twice, which indicates that the transceiver is functioning correctly.
6. If you are using a fiber transceiver, do not remove the dust caps attached to the transceiver and the cable until you are ready to insert the cable.

Remove a transceiver

1. Disconnect the cable from the transceiver. If you are using a fiber optic cable, replace the dust cap on the cable before putting it away. **Danger:** Do not look directly into fiber optic transceivers or cables. They emit laser beams that can damage your eyes.
2. Unlock the transceiver.
3. Hold the transceiver between your thumb and index finger and slowly pull it out of the port.
4. If you are removing a fiber transceiver, replace the dust cap before putting it away.
5. Put the transceiver into its original box or another appropriate container.

To know which transceivers are supported on your appliance, look for your platform details in [Hardware Platforms](#).

Connect the cables

When the appliance is securely mounted on the rack, you are ready to connect the cables. Ethernet cables and the optional console cable are connected first. Connect the power cable last.

Danger: Before installing or repairing the appliance, remove all jewelry and other metal objects that might come in contact with power sources or wires. Touching both a live power source or wire and ground, can cause any metal objects to heat up rapidly. It can also cause burns, set clothing on fire, or fuse the metal object to an exposed terminal.

Connect the Ethernet cables

Ethernet cables connect your appliance to the network. The type of cable you need depends on the type of port used to connect to the network. Use a category 5e or category 6 Ethernet cable

with a standard RJ-45 connector on a 10/100/1000BASE-T port or 1G SFP copper transceiver. Use a fiber optic cable with an LC duplex connector with a 1G SFP fiber transceiver, 10G SFP+, or 40G QSFP+ transceiver. The type of connector at the other end of the fiber optic cable depends on the port of the device that you are connecting.

To connect an Ethernet cable to a 10/100/1000BASE-T port or 1G SFP copper transceiver

1. Insert the RJ-45 connector on the Ethernet cable into an appropriate port on the front panel of the appliance, as shown in the following figure.

Figure 8. Insert an Ethernet cable



2. Insert the RJ-45 connector on the other end into the target device, such as a router or switch.
3. Verify that the LED glows amber when the connection is established.

To connect the Ethernet cable to a 1G SFP fiber, 10G SFP+, or 40G QSFP+ transceiver

1. Remove the dust caps from the transceiver and cable.
2. Insert the LC connector on the fiber optic cable into the appropriate port on the front panel of the appliance.
3. Insert the connector on the other end into the target device, such as a router or switch.
4. Verify that the LED glows amber when the connection is established.

Connect the console cable

Use the console cable to connect your appliance to a computer or terminal, from which you can configure the appliance. Alternatively, you can use a computer connected to the network. Before connecting the console cable, configure the computer or terminal to support VT100 terminal emulation as follows:

- 9600 baud
- 8 data bits
- 1 stop bit, parity, and flow control set to NONE.

Then connect one end of the console cable to the RS232 serial port on the appliance and the other end to the computer or terminal.

To connect the console cable to a computer or terminal

1. Insert the DB-9 connector of the cable into the console port on the front panel of the appliance.

Figure 9. Insert a console cable



Note: To use a cable with an RJ-45 converter, insert the optional converter provided into the console port and attach the cable to it.

2. Insert the RJ-45 connector into the serial port of the computer or terminal.

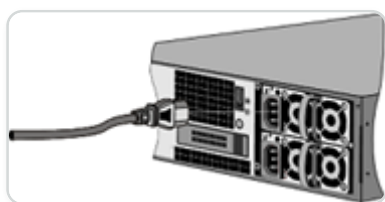
Connect the power cable

The number of power cables shipped with an appliance depends on the number of power supplies on the appliance. Appliances that come with two power cables can also operate if only one power cable is connected. Appliances that come with four power cables can also operate if only two power cables are connected. A separate ground cable might not be required, because the three-prong plug provides grounding.

To connect the appliance to the power source

1. Connect the power cable to one of the inlet receptacles on the back of the appliance. Connect the other end of the power cable to a power outlet.

Figure 10. Insert a power cable



2. If your appliance has more than one power supply, repeat this process. The additional power supply is a redundant, hot-swappable power supply.
3. The NetScaler logo and the LCD on the front of the appliance illuminate after the appliance starts, and the LCD indicates the operational status of the appliance.

NOTE

Appliances with two power supplies emit a high-pitched alert if one power supply fails or if you connect only one power cable to the appliance. Press the small red button on the back panel of the appliance to silence the alarm.

Switch on the appliance

After you have installed the appliance in a rack and connected the cables, verify that the power cable is properly connected. If you have installed more than one power supply, make sure the other cable is connected to an outlet for a different circuit than the first. After verifying the connections, you are ready to switch on the appliance.

To switch on the appliance

1. Verify that the appliance is connected through a console or Ethernet port. This connection ensures that you can configure the appliance after it is switched on.
2. Press the ON/OFF toggle power switch on the back panel of the appliance. Figure 11. Power switch on back panel

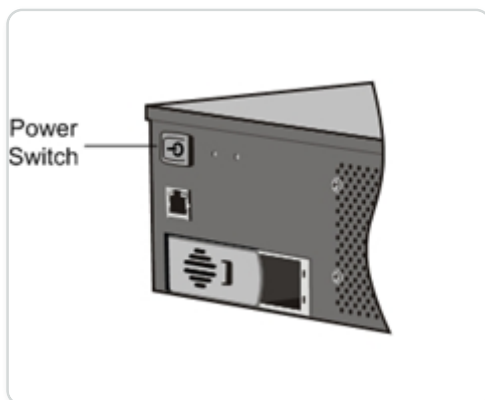
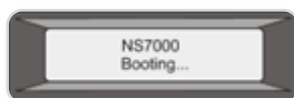


Figure 12. LCD startup screen



Caution: Be aware of the location of the emergency power off (EPO) switch, so that if an electrical accident occurs you can quickly remove power from the appliance.

Initial configuration

NOTE:

This section does not apply to the MPX 9200 and MPX 17000 platforms. For information specific to the MPX 9200 platform, see [NetScaler MPX 9200](#). For information specific to the MPX 17000 platform, see [NetScaler MPX 17000](#).

After you have installed your appliance in a rack, you are ready to perform the initial configuration. Once the initial configuration is complete, refer to the specific configuration guides for the features you are using.

Initial configuration is the same for the multifunction NetScaler, NetScaler Gateway, and the dedicated NetScaler Web App Firewall appliances. You can use any of the following interfaces for the initial configuration of your appliance:

- First-time use wizard: If you use a web browser to connect to the appliance, you are prompted to enter the network configuration and licensing information, if it is not already specified.
- LCD keypad: You can specify the network settings, but you must use a different interface to upload your licenses.
- Serial console: After connecting to the serial console, you can use the NetScaler command line to specify the network settings and upload your licenses,
- Dynamic Host Configuration Protocol (DHCP): To configure an appliance from a remote network, use DHCP to assign each new appliance an IP address at which you can access the appliance for remote configuration. You can also use DHCP to install multiple NetScaler appliances and then configure them without using the console port.

For initial configuration, use the default password as both the administrative user name and the password. For subsequent access, use the password assigned during initial configuration.

After you complete the initial configuration of the appliance, you can configure secure access to your appliance. As a result, you are no longer prompted for a password when logging on. This configuration is especially helpful in environments for which you would otherwise have to keep track of many passwords.

Using the first-time setup wizard

To configure a NetScaler appliance (or NetScaler virtual appliance) for the first time, you need an administrative computer configured on the same network as the appliance.

Assign a NetScaler IP (NSIP) address as the management IP address of your NetScaler appliance. You access the appliance for configuration, monitoring, and other management tasks at this address. Assign a subnet IP (SNIP) address for your NetScaler to communicate with the back-end servers. Specify a host name to identify your appliance, an IP address for a DNS server to resolve domain names, and the time zone in which your appliance is located.

The wizard automatically appears if any of the following conditions are met:

- The appliance is configured with the default IP address.
- A subnet IP address is not configured.
- Licenses are not present on the appliance.

Perform first-time configuration of your appliance

1. In a web browser, type:

```
http://192.168.100.1
```

Note: The NetScaler software is preconfigured with this default IP address. If you have already assigned as NSIP address, type that address in a web browser.

2. In **User Name**, type `nsroot`. In **Password**, if the earlier default password does not work, try typing the serial number of the appliance. The serial number bar code is available at the back of the appliance. Citrix recommends that you change the password after the first logon. For information about changing the password, see [Change the administrative password](#).

The following screen appears.

Welcome!

Use this wizard for initial configuration of your NetScaler virtual appliance. To configure or to change a previously configured setting, click each of the sections below. If a parameter has already been configured, a check mark appears within a green circle. An orange circle containing a dash indicates that you have chosen to skip this section.



NetScaler IP Address
IP address at which you access the NetScaler for configuration, monitoring, and other management tasks.
NetScaler IP Address: 10.102.29.165
Network: 255.255.255.0





Subnet IP Address
Specify an IP address for your NetScaler to communicate with the backend servers.
Subnet IP Address: Not configured





Host Name, DNS IP Address, and Time Zone
Specify a host name to identify your NetScaler, an IP address for a DNS server to resolve domain names, and the time zone in which your NetScaler is located.
Host Name: ns
DNS IP Address: Not configured
Time Zone: GMT-11:00-SST-Pacific/Midway





Licenses
Upload licenses from your local computer or allocate licenses from the Citrix licensing portal.
There are 3 license file(s) present on this NetScaler.



Continue

- 3. To configure or to change a previously configured setting, click inside each section. When done, click **Continue**.
- 4. When prompted, select **Reboot**.

Using the LCD keypad

When you first install the appliance, you can configure the initial settings by using the LCD keypad on the front panel of the appliance. The keypad interacts with the LCD display module, which is also on the front panel of these appliances.

Note: You can use the LCD keypad for initial configuration on a new appliance with the default configuration. The configuration file (ns.conf) must contain the following command and default values.

```
set ns config -IPAddress 192.168.100.1 -netmask 255.255.0.0
```

The functions of the different keys are explained in the following table.

Table 1. LCD key functions

KEY	FUNCTION
<	Moves the cursor one digit to the left.
>	Moves the cursor one digit to the right.
^	Increments the digit under the cursor.

KEY	FUNCTION
v	Decrements the digit under the cursor.
.	Processes the information, or terminates the configuration, if none of the values are changed. This key is also known as the ENTER key.

To perform the initial configuration by using the LCD keypad press the "<" key.

You are prompted to enter the subnet mask, NetScaler IP address (NSIP), and gateway in that order respectively. The subnet mask is associated with both the NSIP and default gateway IP address. The NSIP is the IPv4 address of the NetScaler appliance. The default gateway is the IPv4 address for the router, which handles the external IP traffic that the appliance cannot otherwise route. The NSIP address and the default gateway must be on the same subnet.

If you enter a valid value for the subnet mask, such as 255.255.255.224, you are prompted to enter the IP address. Similarly, if you enter a valid value for the IP address, you are prompted to enter the gateway address. If the value you entered is invalid, the following error message appears for three seconds. Here `xxx.xxx.xxx.xxx` is the IP address you entered, followed by a request to reenter the value.

```
Invalid addr!
```

```
xxx.xxx.xxx.xxx
```

If you press the ENTER (.) key without changing any of the digits, the software interprets it as a user exit request. The following message is displayed for three seconds.

```
Exiting menu...
```

```
xxx.xxx.xxx.xxx
```

If all the values entered are valid, when you press the **ENTER** key, the following message appears.

```
Values accepted,
```

```
Rebooting...
```

The subnet mask, NSIP, and gateway values are saved in the configuration file.

NOTE:

For information about deploying a high availability (HA) pair, see [High Availability](#).

Using the NetScaler serial console

When you first install the appliance, you can configure the initial settings by using the serial console. With the serial console, you can change the system IP address, create a subnet or mapped IP address, configure advanced network settings, and change the time zone.

Note: To locate the serial console port on your appliance, see the front panel illustration of your specific appliance.

Configure initial settings by using a serial console

1. Connect the console cable into your appliance. For more information, see "Connecting the Console Cable" in "[Installing the Hardware](#)."
2. Run the vt100 terminal emulation program of your choice on your computer to connect to the appliance and configure the following settings: 9600 baud, 8 data bits, 1 stop bit, parity, and flow control set to NONE.
3. Press ENTER. The terminal screen displays the Logon prompt.

Note: You might have to press ENTER two or three times, depending on which terminal program you are using.

4. Log on to the appliance with the administrator credentials. In **User Name**, type `nsroot`. In **Password**, if the earlier default password does not work, try typing the serial number of the appliance. The serial number bar code is available at the back of the appliance. Citrix recommends that you change the password after the first logon. For information about changing the password, see [Change the administrative password](#).
5. At the prompt, type `config ns` to run the NetScaler configuration script.

6. To complete the initial configuration of your appliance, follow the prompts.

Note: To prevent an attacker from breaching your ability to send packets to the appliance, choose a non-routable IP address on your organization's LAN as your appliance IP address.

You can replace steps 5 and 6 with the following commands. At the NetScaler command prompt, type:

```
set ns config -ipaddress<IPAddress> -netmask<subnetMask>

add ns ip<IPAddress> <subnetMask> -type<type>

add route<network> <netmask> <gateway>

set system user <userName> -password

save ns config

reboot
```

Example:

```
set ns config -ipaddress 10.102.29.60 -netmask 255.255.255.0

add ns ip 10.102.29.61 255.255.255.0 -type snip

add route 0.0.0.0 0.0.0.0 10.102.29.1

set system user nsroot -password

Enter password: *****

Confirm password: *****

save ns config

reboot
```

You have now completed the initial configuration of your appliance.

Using DHCP for initial access

Note: The terms NetScaler appliance and appliance are used interchangeably.

For initial configuration of a NetScaler appliance, the Dynamic Host Configuration Protocol (DHCP) can eliminate dependency on the console. DHCP provides a subnet IP (SNIP) address at which you can access the appliance to configure it remotely. You can also use DHCP after initial configuration if, for example, you want to move an appliance to a different subnet.

To use DHCP, you must first specify the appliance vendor class identifier on a DHCP server. Optionally, you can also specify the pool of IP addresses from which your NetScaler appliance can acquire an IP address. If a pool is not specified, the address is acquired from the general pool.

A new NetScaler appliance does not have a configuration file. When you connect an appliance without a configuration file to the network, its DHCP client automatically polls the DHCP server for an IP address. If you have specified the appliance vendor class identifier on the DHCP server, the server returns an address. You can also enable the DHCP client on a previously configured appliance.

Prerequisites

To use DHCP, you must:

1. Note the system ID (`sysid`) on the serial number sticker on the back panel of the appliance. On an older appliance, the system ID might not be available. In this case, use the MAC address instead of the system ID.
2. Set up a DHCP server and configure it with the appliance vendor class identifier.

Configure a Linux/UNIX DHCP server for the NetScaler appliance

1. Specify `citrix-NS` as the vendor class identifier for the NetScaler appliance by adding the following configuration to the server's `dhcpd.conf` file. The subclass declaration must be inside the subnet declaration.

```
option space auto;

option auto.key code 1 = text;


class "citrix-1" {

    match option vendor-class-identifier;

}


subclass "citrix-1" "citrix-NS"{

vendor-option-space auto;

option auto.key "citrix-NS";
```

NOTE:

The location of the `dhcpd.conf` file can be different in different versions and flavors of the Linux/UNIX-based operating system. For example, in FreeBSD 6.3 the file is present in the `/etc` folder. For the location, see the `dhcpd` manpage of the DHCP server.

2. If you do not want NetScaler appliances to use IP addresses from the general pool, specify a pool of addresses for the appliance. Include this pool declaration inside the subnet declaration. For example, adding the following configuration to the `dhcpd.conf` file specifies a pool of IP addresses ranging from 192.168.2.120 to 192.168.2.127.

```
pool {

    allow members of "citrix-1";

    range 192.168.2.120 192.168.2.127;

    option subnet-mask 255.255.255.0;
```

```
}
```

3. Terminate the DHCP process and restart it to reflect the change to the configuration file. At the shell prompt, type:

```
killall dhcpd
```

```
dhcpd&
```

Sample DHCP configuration (dhcpd.conf)

```
option space auto;

option auto.key code 1 = text;


class "citrix-1" {

    match option vendor-class-identifier;

}


subnet 192.168.2.0 netmask 255.255.255.0 {

option routers10.217.242.1;

option domain-name"jeffbr.local";

option domain-name-servers8.8.8.8;

default-lease-time 21600;

max-lease-time 43200;
```

```
subclass "citrix-1" "citrix-NS" {  
  
    vendor-option-space auto;  
  
    option auto.key "citrix-NS";  
  
}  
  
pool {  
  
    allow members of "citrix-1";  
  
    range 192.168.2.120 192.168.2.127;  
  
    option subnet-mask 255.255.255.0;  
  
}  
  
}
```

Configure a Windows DHCP server for the NetScaler appliance

1. Open Server Manager and make sure DHCP service is running.
2. Open **DHCP Manager**, click **DHCP** and select **IPv4**.
3. To configure Vendor Class as `..citrix-NS`, right-click **IPv4** and select **Define Vendor Classes**. Add a new class by specifying a display name, description, and `..citrix-NS` as the ASCII value or hex value `01 09 63 69 74 72 69 78 2d 4e 53`. Click **OK**.
4. Create a scope to configure IP range, subnetwork, DNS server, WIN server, default Gateway, and excluded IP address range. To create a scope, in the **IPv4** list, right-click **Scope Options** and enter a name and description. Click **Next**.
5. Click **Scope Options** and add `043 Vendor specific info` and add the ASCII value `..citrix-NS` or hex value `01 09 63 69 74 72 69 78 2d 4e 53`.
6. Provide an IP address range and subnet mask corresponding to the interface IP address bound to the Server. Click **Next**.

7. To exclude an IP address, add it in **Add Exclusion and Delay**. Click **Next**.
8. Add a lease duration and click **Next**.
9. Select **Yes, I want to configure these options now** and click **Next**.
10. Optionally, provide a default gateway and click **Next**.
11. Optionally, provide a domain name and a DNS server, and click **Next**.
12. Optionally, provide a WINS server and click **Next**.
13. Activate scope by selecting **Yes, I want to activate this scope now** and click **Next**.
14. Click **Finish**. You can view the configured scope in the **IPv4** tab.

Implementing an initial NetScaler configuration from a remote computer

When a new NetScaler appliance starts, it automatically polls the DHCP server for an IP address and provides the DHCP server with its `sysid`. This action is also true for any appliance that does not have a configuration file. The DHCP server selects one IP address from its pool and assigns it as a subnet IP (SNIP) address to the appliance. The DHCP server includes the `sysid` of the appliance and the IP address that it assigns to the appliance in the server's `dhcpd.leases` file. To find the IP address of your appliance, look in the `dhcpd.leases` file for the last entry with the `sysid` of your appliance in the `uid` or `client-hostname` field. Verify that the binding state in this entry is active. If the binding state is not active but free, the IP address is not yet associated with the appliance.

You can use this address to connect to the appliance and remotely configure the initial settings. For example, you can change the IP address, subnet mask, and gateway settings that were fetched from the DHCP server. After completing the initial configuration, you can manually return the DHCP IP address to the server pool. Alternatively, restarting the appliance automatically releases the DHCP IP address back to the server pool.

You can find out the SNIP address assigned to the appliance from the NetScaler console or from the DHCP server.

Find the SNIP address from the NetScaler console

At the console prompt, type:

```
sh dhcpParams

DHCP Client on next reboot is ON

DHCP Client Current State: Active

DHCP Client Default route save: OFF

DHCP acquired IP:192.168.2.127

DHCP acquired Netmask:255.255.255.0

DHCP acquired Gateway:192.168.2.1

Done
```

Find the SNIP address from the DHCP server

Look in the dhcpd.leases file for the last entry with the `sysid` of your appliance in the uid or client-hostname field.

Example:

The following entry in a DHCP server's dhcpd.leases file verifies the binding state of the appliance whose `sysid` is 45eae1a8157e89b9314f.

```
lease 192.168.2.127 {

    starts 3 2013/08/19 00:40:37;
```

```
ends 3 2013/08/19 06:40:37;

cltt 3 2013/08/19 00:40:37;

binding state active;

next binding state free;

hardware ethernet 00:d0:68:11:f4:d6;

uid "45eae1a8157e89b9314f";

client-hostname "45eae1a8157e89b9314f";
```

In the preceding example, the binding state is ACTIVE and the IP address assigned to the appliance is 192.168.2.127 .

The following table describes DHCP-related CLI commands that you might want to use when configuring a new NetScaler appliance.

Table 2. NetScaler CLI commands for using DHCP with a new NetScaler appliance

TASK	AT THE COMMAND PROMPT, TYPE
To verify the DHCP fetched details, such as IP address, subnet mask, and gateway on the appliance	> sh dhcpParams
To release the DHCP IP address and return it to the IP address pool on the DHCP server when the NetScaler configuration is complete	> release dhcpIP

Using DHCP when a configuration file is present

If you need to move a NetScaler appliance to a different subnet, you can use DHCP to access an appliance that already has a configuration file. Before moving the appliance, enable its DHCP client and save the configuration. As a result, when the appliance restarts, it automatically polls the

DHCP server for an IP address. Enable the DHCP client and save the configuration before shutting down the appliance. If you did not enable, you need to connect to the appliance through the console and dynamically run the DHCP client on the appliance. The DHCP server provides an IP address, a gateway, and a subnet mask. You can use the IP address to access the appliance and configure the other settings remotely.

If the DHCP client is enabled in the configuration file, disable it and then save the configuration file. If the DHCP client is enabled, the appliance polls the DHCP server again for an IP address when it restarts.

The CLI commands associated with each task are listed:

- To dynamically run the DHCP client to fetch an IP address from the DHCP server

```
set dhcpParams dhcpClient on
```

- To configure the DHCP client to run when the appliance restarts

```
set dhcpParams dhcpClient on
```

```
save config
```

- To prevent the DHCP client from running when the appliance restarts

```
set dhcpParams dhcpClient off
```

```
save config
```

Note: This command is required only if the ON setting was saved.

- To save the DHCP acquired route so that it is available when the appliance restarts

```
> set dhcpParams -dhcpclient on -saveroute on
```

```
> save config
```

- To prevent saving the DHCP acquired route (default behavior)

```
set dhcpParams -dhcpclient on -saveroute off
```

```
save config
```

Note: This command is required only if the ON setting was saved.

Access a NetScaler appliance by using SSH keys and no password

If you administer many NetScaler appliances, storing and looking up passwords for logging on to individual appliances can be cumbersome. To avoid being prompted for passwords, you can set up secure shell access with public key encryption on each appliance.

NetScaler features can also use SSH key based authentication for internal communication when the internal user is disabled (by using the `set ns param -internaluserlogin disabled` command). In such cases, the key name must be set as `ns_comm_key`.

To set up access using SSH keys, you must generate the public-private key pair on a client and copy the public key to the remote NetScaler appliance.

Generate the keys and connect to a remote NetScaler appliance by using SSH keys

1. On a client (Linux client or a NetScaler) change the directory to `/root/.ssh`.

```
cd /root/.ssh
```

2. Generate the public-private key pair.

```
ssh-keygen -t <key_type> -f <optional_key_file_name>
```

Example:

To create an RSA key with default file name.

```
ssh-keygen -t rsa
```

3. Press ENTER when prompted for a file name for the key pair.

Note:

- If you update the default file name for the key pair, use the new name instead of the default name in the rest of this procedure.

- If you want to disable the internal user login, use "ns_comm_key" as the file name for the public-private key pair.

4. Press ENTER two times when prompted for a passphrase.

Note: If the client is a NetScaler appliance, move the private key file to a persistent location such as the subdirectories of the /flash and /var directories.

5. Log on to the remote NetScaler appliance from the client by using FTP, and perform the following:

a. Change directory to /nsconfig/ssh. At the prompt, type:

```
cd /nsconfig/ssh
```

b. Use the binary transfer mode to copy the public key to this directory.

```
bin put id_rsa.pub
```

6. Open a connection to the remote NetScaler appliance by using an SSH client, such as PuTTY, and perform the following:

a. Log on to the remote appliance using the administrator credentials.

b. Go to the NetScaler shell.

```
shell
```

c. At the shell prompt, change the directory to /nsconfig/ssh.

```
root@ns# cd /nsconfig/ssh
```

d. Append the public key to the authorized_keys file. At the shell prompt, type:

```
root@ns# cat id_rsa.pub >> authorized_keys
```

Note: If the authorized_keys file does not exist on the appliance, you must first create the file and then append the contents.

e. Change the permission of the /flash, nsconfig, and ssh directories to 755.

```
root@ns# chmod 755 /flash root@ns# chmod 755 /flash/nsconfig root@ns#  
chmod 755 /flash/nsconfig/ssh
```

f. Change the permission of the authorized_keys file to 744.

```
root@ns# chmod 744 authorized_keys
```

g. Optionally, remove the public key.

```
root@ns# rm id_rsa.pub
```

7. On the client, verify that you can connect to the remote NetScaler appliance by using SSH, without entering the password.

If using the default file name for the public-private key pair.

```
ssh <user_name>@<CitrixADCIPAddress>
```

If using "ns_comm_key" (when internal user is disabled) for the public-private key pair.

```
ssh -i /nsconfig/ssh/ns_comm_key <user_name>@<CitrixADCIPAddress>
```

If using any other name for the public-private key pair.

```
ssh -i <path_to_client_private_key> <user_name>@<CitrixADCIPAddress>
```

Change the administrative password

The default user account is the administrative account, which provides complete access to all features of the NetScaler appliance. To preserve security, the administrative account must be used only when necessary. Only individuals whose duties require full access must know the password for the administrative account.

Note: Citrix® recommends changing the administrative password frequently.

Change the administrative password by using the GUI

1. Log on to the appliance by using the administrative credentials.
2. Navigate to **System > User Administration > Users**.
3. In the **Users** pane, click the default user account, and then click **Change Password**.
4. In the **Change Password** dialog box, in **Password** and **Confirm Password**, type the password of your choice.
5. Click **OK**.

Change the administrative password by using the CLI

At the command prompt, type:

```
set system user <userName> -password
```

Example:

```
set system user nsroot -password
```

```
Enter password: *****
```

```
Confirm password: *****
```

```
Done
```

Lights out management port of NetScaler MPX

Some NetScaler appliances have an Intelligent Platform Management Interface (IPMI), also known as the lights out management (LOM) port, on the front panel of the appliance. You can use the LOM port to remotely monitor and manage the appliance, independently of the NetScaler software.

Connect the LOM port to a dedicated channel that is separate from the data channel, to maintain connectivity to the appliance even if the data network is down. You eliminate the data cable and data network as a single point of failure.

You can access the LOM port through a browser and use the GUI (GUI) for most tasks. All tasks can be performed through the NetScaler shell.

You can use either the GUI or a shell for the following tasks:

- Configuring the network settings
- Health monitoring
- Power control operations
- Factory reset
- Enable or disable RAKP

Different NetScaler® ADC appliances support different shells:

- For FreeBSD based NetScaler MPX, use the `bash nsroot` shell (also known as NS Shell).
- For Linux-based appliances, use the Linux bash root shell.

NOTE

The terms LOM and Baseboard Management Controller (BMC) are used interchangeably.

LOM support matrix

The LOM support matrix shows the recommended LOM firmware version for different platforms.

PLATFORM	RECOMMENDED VERSION
MPX 5900	4.70
MPX 8000	3.56
MPX 8900	4.70
MPX 9100	3.11.0
MPX 9100 FIPS	3.11.0
MPX 9200	4.1.2
MPX 14000	4.14
MPX 14000-40S	4.14
MPX 14000 FIPS	4.14
MPX 14000-40G	4.14
MPX 15000	5.70
MPX 15000-50G	5.70
MPX 16000	3.11.0
MPX 25000A	4.14
MPX 25000TA	4.14
MPX 25000-40G	4.14
MPX 26000	5.70
MPX 26000-50S	5.70
MPX 26000-100G	5.70

NOTE:

The following NetScaler software versions support LOM versions 4.70 and 5.70:

- Release 13.1 Build 51.x and later
- Release 14.1 Build 12.x and later
- Release 13.1-FIPS Build 37.164 and later

Set the LOM password length using the IPMI tool

On NetScaler MPX™, you can set different lengths (between 16 and 20 characters) for the LOM password using the IPMI tool. If you create a LOM password by using the LOM GUI, the maximum LOM password length is 20 characters. If you create a LOM password by using the IPMI tool from the host environment, the maximum LOM password length is 19 characters.

To set the LOM password length using the IPMI tool

1. Log in to the NetScaler® shell.
2. Type `ipmitool user set password <userid> <password> <20>`

If you don't type 20 at the end, you cannot log in to the LOM GUI with a password of length greater than 16 characters. You don't need to type 20 if your password length is fewer than 16 characters. To include special characters in your password, enclose it within double quotation marks.

Examples

Here are some sample commands with output by varying the LOM password length starting with 19 characters and decreasing to 17 characters, which require <20> at the end of the command.

Example#1 - LOM password length = 19

```
root@ns# ipmitool user set password 2 examplelompasword1 20
```

Set user password command successful (user 2)

Example#2 - LOM password length = 18

```
root@ns# ipmitool user set password 2 examplelompasword 20
```

Set user password command successful (user 2)

Example#3 - LOM password length = 17

```
root@ns# ipmitool user set password 2 example1ompasswor 20
```

Set user password command successful (user 2)

Points to note

- For MPX 5900, MPX 8900, MPX 14000, and MPX 15000 platforms, the LOM firmware supports a password length of up to 19 characters.
- For MPX 9100 and MPX 16000 platforms, the LOM firmware supports a password length of up to 20 characters.

Configure the network settings on the LOM port

The default IP address for initial access to the LOM port is 192.168.1.3. Change the default credentials and IP address the first time you log on. All LOM GUI operations require you to connect to the appliance by typing the LOM IP address in a web browser and then entering the administrator credentials. Alternatively, you can access LOM functionality through the command line by using the `ipmitool` utility. Using the `ipmitool` utility remotely, you can:

- Determine the LOM firmware version number.
- Perform warm and cold restarts.
- Configure LOM network settings.
- Monitor the health of the appliance.
- Perform power control operations.

The utility is available for download at <http://ipmitool.sourceforge.net/>. The `ipmitool` utility is also included in NetScaler MPX and CloudBridge/SDX (dom0) appliances for initial LOM port network configuration. When using the shell, you can choose to use DHCP or static IP settings for initial network configuration. After configuring the network settings, you can use the `ipmitool` commands over the network. For example, the BMC firmware revision command would need the same user name, password, and IP address that is used to access the BMC/LOM GUI port.

For initial configuration, connect the network port on your laptop or workstation directly to the LOM port with a crossover cable. Or connect to a switch in the same local subnet(192.168.1.x) as the LOM port. Assign a network-reachable IP address and change the default credentials. After saving

the new settings, the LOM restarts and the changes take effect. After the restart, you must use the new address to access to the LOM.

If you make a mistake that results in losing network connectivity at both the old and new IP addresses, you must use the local shell method to recover.

See the [Secure Deployment Guide](#) for best practices for managing administrative credentials and configuring your network for a secure LOM deployment.

Tip: For first-time setup in a network, to facilitate troubleshooting, make sure that a laptop/PC is connected directly to the LOM port. Do the following if you can ping and access the LOM GUI at the default IP address (192.168.1.3) by using static addressing on the laptop/PC, but remote access does not work.

- Take a closer look at network firewall settings and access control list (ACL) policies of all network devices along the network path.

Tip: If some LOM GUI features work but others do not (for example, normal ADC console output is visible in the ADC console window in the LOM GUI, but typing in the console does not work), try the preceding method to isolate the cause to the specific BMC protocol being blocked by the network.

Tip: Use the iKVM (HTML5) feature to access the LOM GUI. Alternately, use Java. Ensure that the latest Java updates are installed on your computer.

Configure the NetScaler LOM port by using the GUI

1. In a web browser, type `<http://192.168.1.3>` and enter the default user credentials.

NOTE:

The NetScaler LOM port is preconfigured with IP address 192.168.1.3 and subnet mask 255.255.255.0.

2. On the Configuration tab, click Network and type new values for the following parameters:
 - IP Address—IP address of the LOM port

NOTE:

You can configure an IPv6 address on MPX/SDX models 8900, 15000, 16000, 26000, and 9100 using either the Web UI or `ipmitool lan6` commands.

- Subnet Mask—Subnet mask used to define the subnet of the LOM port
- Default Gateway—IP address of the router that connects the LOM port to the network

3. Click **Save**.
4. If you want to change the user credentials, navigate to **Configuration > Users**, select the user, click **Modify User**, and change the credentials.

Configure the NetScaler LOM port by using the shell

NOTE:

You need superuser (admin) credentials to access the shell.

1. Configure the IP addressing mode:

- To use DHCP, at the shell prompt, type:

```
ipmitool lan set 1 ipsrc dhcp
```

No further IP-level configuration is required.

- To use static addressing, at the shell prompt type:

- a. `ipmitool lan set 1 ipsrc static`

- b. `ipmitool lan set 1 ipaddr <LOM IP address>`

- c. `ipmitool lan set 1 netmask <netmask IP address>`

- d. `ipmitool lan set 1 defgw ipaddr <default gateway IP address>`

The BMC reboots to apply the changes. Pings to the BMC succeed after approximately 60 seconds.

2. Optionally, to configure Ethernet VLAN ID and priority, at the NetScaler shell prompt type:

- `ipmitool lan set 1 vlan id <off|<ID>>`

- `ipmitool lan set 1 vlan priority <priority>`

You can either disable or enable the VLAN. Set the VLAN ID to a value from 1 to 4094, and the VLAN priority to a value from 0 to 7. After the network settings have been correctly applied, you can access the `ipmitool` remotely from a physically separate machine over the network. For remote access, enter the BMC user name, BMC password, and the BMC IP address. For example, to run the `ipmitool mc info` command, at the shell prompt on a remote machine, type:

```
ipmitool -U <username> -P <password> -H <bmc IP address> mc info
```

Obtain health monitoring information

There are two ADC MIBs: the NetScaler software management MIB and the ADC IPMI LOM hardware management MIB. The software management MIB is primarily used for monitoring the application software and the application software's utilization of hardware resources, such as CPU % and memory %. It provides a high level view of the appliance and is therefore suitable for the application monitoring function carried out by an application group within an organization. The LOM MIB is used for monitoring the hardware health and therefore provides a lower level view of the appliance. It is more applicable to the network monitoring function carried out by a network monitoring group.

The LOM SNMP traps in the LOM MIB report hardware failures. The ADC SNMP traps in the ADC MIB report software failures and hardware load issues.

The ADC MIB has a small subset of hardware sensors. It does not cover any BIOS level failures, because the BIOS checks the hardware primarily during boot time, before the NetScaler software starts. If the BIOS detects a failure, it does not load the boot loader. If the boot loader does not load, the operating system does not load, and therefore the ADC SNMP software service responsible for sending the traps does not load.

The NetScaler software Management MIB issues a warning under the following conditions only:

1. If the failure is gradual enough for the main CPU to issue an SNMP alert. An electrical failure close to the CPU, such as a failed electrical capacitor, occurs too quickly for the CPU to issue an alert.
2. If the failure happens after the BIOS, Operating System, and SNMP service have started and normal boot-up has been successful.
3. If the failure happens while the operating system and other system software are in a stable enough state for the SNMP software service to run.

Whenever the ADC MIB is unable to report these warnings, because of hardware or software failure, the LOM MIB monitors and reports the warnings. The LOM microcontroller operates independently of the NetScaler software. To monitor the hardware and software of the NetScaler appliance, you must use both the ADC MIB and the LOM MIB.

The ADC IPMI LOM hardware management MIB SNMP firmware runs on the BMC microcontroller chip. The BMC chip CPU sends a warning in the case of a hardware failure, regardless of whether any of the preceding conditions occur. For example, if the BIOS halts the system during boot-up because of a memory DIMM failure, the BMC chip uses the BIOS POST code snooping mechanism to detect the failure. And then sends a bad DIMM SNMP alert.

You can log on to the LOM port to view the health information about the appliance. All system sensor information, such as system temperature, CPU temperature, and status of fans and power supplies, appears on the sensor readings page. The Event Log records time stamps of routine events such as a power cycle, in addition to recording hardware-failure events. If SNMP traps are enabled, these events can be sent to your SNMP Network Monitoring software. For more information about how to set up an SNMP alert, see [Configuring SNMP Alerts](#).

1. In the **Menu** bar, click **System Health**.
2. Under **Options**, click **Sensor Readings**.

Install the MIB

Download the IPMI SNMP management information base (MIB) for your LOM firmware version, and import it into the SNMP monitoring software.

For a sample configuration, see `<http://www.net-snmp.org/tutorial/tutorial-5/commands/snmptrap.html>`. For the exact steps of this procedure specific to your environment, contact your SNMP network monitoring software provider.

Configure SNMP alerts

You can configure SNMP alerts on the LOM. Optionally, you can configure an alert to send emails.

To configure the alerts, you can use the LOM GUI or the NetScaler shell.

Configure SNMP alerts on the LOM by using the GUI

1. Download the IPMI View utility from `<ftp://ftp.supermicro.com/utility/IPMIView/>` and install it on your computer. Use this utility to test the configuration. For more information,

see the section about configuring the alert settings in the IPMI View User Guide at [<http://supermicro.com>](http://supermicro.com).

2. Open the IPMI View utility.
3. In the LOM GUI, navigate to **Configuration > Alerts**, click Alert No 1, and then click **Modify**.
4. Select the severity level of the events for which to generate alerts.
5. Set Destination IP to the IP address at which you installed the IPMI View utility.
6. Optionally, to receive alerts by email, specify an email address. To avoid receiving email for routine alerts, specify a severity higher than Informational.
7. Click **Save**.
8. The LOM starts sending alerts to the IPMI View utility within in a minute or two. After the IPMI View utility starts receiving alerts from the LOM, reconfigure the destination IP address to point to your SNMP Network Management Software, such as HP OpenView.

Set up SNMP alerts on the LOM by using the NetScaler shell

To customize your filter and policy settings, see the IPMI Specification 2.0 rev. 1.1 documentation.

The latest IPMI specifications are available from the IPMI section of the Intel website:

```
<http://www.intel.com/content/www/us/en/servers/ipmi/ipmi-specifications.html>
```

Usually, customization in the SNMP Network Management Software is the preferred method, because it can be done one time at a central location. Therefore, the following settings send all events for all sensors to the SNMP network management software. These events are low traffic events and therefore do not result in any significant network usage.

Set up SNMP filters

The following commands set up SNMP to allow all events:

```
ipmitool raw 4 0x12 0x6 0x10 0x80 1 1 0 0xff 0xff 0xff 0xff 0xff 0xff 0xff 0
0xff 0 0 0xff 0 0 0xff 0
```

Set up a policy list

The following command creates a policy list for all sensors and events:


```
ipmitool raw 4 0x12 9 0x10 0x18 0x11 0x81
```

Set up the destination address for SNMP events

The following command sets up a destination IP address for an SNMP event:

```
ipmitool lan alert set 1 1 ipaddr <x.x.x.x>
```

Where, <x.x.x.x> is the IP address to which the SNMP event is sent.

Specify an SNMP community string name

At the prompt, type:

```
ipmitool lan set 1 snmp <community string>
```

Create and install an SSL certificate on NetScaler MPX 9100 and MPX 16000

Use OpenSSL to create a key, generate a certificate signing request (CSR), and generate a self-signed SSL certificate. Use the LOM GUI to install the SSL certificate. After successful installation, the LOM GUI uses the new SSL certificate for secure connections.

Prerequisites

- Access to an MPX platform running FreeBSD or Linux machine with OpenSSL installed.
- Administrative access credentials (nsroot/password) to the LOM web interface.

Create an SSL certificate by using OpenSSL

Perform the following steps from OpenSSL:

1. Generate a 2048-bit RSA private key. Type:

```
openssl genrsa -out private_key.pem 2048
```

A file named private_key.pem is created in the current directory containing the RSA private key.

2. Generate a CSR using this private key. Type:

```
openssl req -new -key private_key.pem -out request.csr
```

 Enter values for the following parameters:

- Country Name (2 letter code): For example, US
- State or Province Name (full name): For example, California

- Locality Name: For example, San Francisco
- Organization Name: For example, My Company
- Organizational Unit Name: For example, IT Department
- Common Name For example, yourname (or your server's hostname)
- Email Address: For example, <mailto:admin@mycompany.com>
- Challenge password: Leave blank
- Optional company name: Leave blank

A file named request.csr is created in the current directory containing the certificate signing request.

3. Generate a self-signed SSL certificate using the CSR and the private key. The certificate is valid for 365 days. Type: `openssl x509 -req -in request.csr -signkey private_key.pem -out lom_certificate.pem -days 365`

A file named lom_certificate.pem is created in the current directory containing the self-signed SSL certificate.

Install an SSL certificate by using the LOM GUI

1. Log in to the LOM web interface using the default administrator (`nsroot`) account.
2. Navigate to **Configuration > Network > SSL Certificates**.
3. In **New SSL Certificate**, click **Select File**.
4. Browse to the location of the certificate file (lom_certificate.pem).
5. In **New Private Key**, click **Select File**.
6. Browse to the location of the key file (private_key.pem).
7. Click **Upload**.

The BMC will reboot after uploading the SSL certificate and private Key to the LOM UI and the system is locked by default. Check the SSL certificate details in the browser to confirm it matches the lom_certificate.pem you generated.

Example

```
[root@netscaler-sdx SSL_Cert]# openssl version

OpenSSL 1.0.2k-fips  26 Jan 2017

[root@netscaler-sdx SSL_Cert]# uname -a

Linux netscaler-sdx 4.4.0+2 #1 SMP Fri Apr 30 02:46:33 UTC 2021 x86_64
x86_64 x86_64 GNU/Linux

[root@netscaler-sdx SSL_Cert]# cat /etc/centos-release

XenServer release 7.1.2 (xenenterprise)

[root@netscaler-sdx SSL_Cert]# openssl genrsa -out private_key.pem 2048

Generating RSA private key, 2048 bit long modulus

.....+++

.....+++

e is 65537 (0x10001)

[root@netscaler-sdx SSL_Cert]# ls

private_key.pem

[root@netscaler-sdx SSL_Cert]# openssl req -new -key private_key.pem -out
request.csr

You are about to be asked to enter information that will be incorporated
into your certificate request.

What you are about to enter is what is called a Distinguished Name or a
DN.

There are quite a few fields but you can leave some blank

For some fields there will be a default value,
```

If you enter '.', the field will be left blank.

Country Name (2 letter code) [XX]:US

State or Province Name (full name) []:California

Locality Name (eg, city) [Default City]:Santa_Clara

Organization Name (eg, company) [Default Company Ltd]:CSG

Organizational Unit Name (eg, section) []:Engineering

Common Name (eg, your name or your server's hostname) []: cloud.com

Email Address []: none@cloud.com

Please enter the following 'extra' attributes

to be sent with your certificate request

A challenge password []:

An optional company name []:

```
[root@netscaler-sdx SSL_Cert]# ls
```

```
private_key.pem  request.csr
```

```
[root@netscaler-sdx SSL_Cert]# openssl x509 -req -in request.csr -signkey  
private_key.pem -out lom_certificate.pem -days 365
```

Signature ok

```
subject=/C=US/ST=California/L=Santa_Clara/O=CSG/OU=Engineering/  
CN=cloud.com/emailAddress=none@cloud.com
```

Getting Private key

```
[root@netscaler-sdx SSL_Cert]# ls
```

```
lom_certificate.pem private_key.pem request.csr
```

Sample private_key.pem (2048 bits)

```
-----BEGIN RSA PRIVATE KEY-----

MIIeogIBAAKCAQEAlW0N9EghsirHkPsgAiwXHuPdNw6D0stWC9V7ZLu38g36pqYk
X1yh0N4yF61nCqS+Mfiu+p1PEDbXc5dwtd7Le4JEW80FHko5mBz3Uj9MSenJTBVT
V1d+hyu82nR0VWdAxe72kPiiTG7PuM34ZZqeHuy+tLU9FkAXDtxyj1Pf/TDJPQ1/
7h1k1nTw5t9s2rSXznj3jsX0g88xF8S/ksGP106F507XoZYtpafUB/SqfZuX95qv
12EbbusifBwrnKVd/Z5/FguSGCeszBmrCol0dfUT441MRPP2zw0m60234j4HmOuh
Z/qL34seA1SmIMHkr9K57VHWqWoc3NmTDK2n0wIDAQABAoIBAEaI7AVb50wLFZ1C
caGU3nUeatYKa7fdQE7VvyGV2wbPwnnYA2NgfloxymOUfwdvLLi6Ax8YL1IgESPn
YLT5LmRm4Y3PhY7+yqEbS0PvzTs2uGbJykv4b6mu477bKe8GhnTokEtukm4yAKvj
z1Vn3ywJ5Ru4UdWm+ztwPEK7JQiGvkoMSn7+qDhEAw5sw9cdCRxqLITm0xVhda5L
x0576NCAvSMCG1kwu9F6nnscP2TIT6Do44AiERAQRudWVrNWNAbQQwQ+9Q0LRLIn
lg+h8UIzBdUo4+HPm6ewSKTM1VBtQWTrLzKSEatUoqxXBznx1FpPbjo0G5xcTnXS
pzoztIECgYEAxxV1c706Hcy56hNv1q4G1UYDhRvBMiyeCnZWrr5lFD0Q5v7I/azH
i2EN4B/XZEQjstGxjGzCUXwngZoMykth67+bfynGkuAzdDQFgTXZCT1LSGwbJJQw
XhMTkL9Qpc9F1pByeX3G/o5pBc4xtjInMqf1wPEFD14ujeE/WMC0eCsCgYEAwCU9
azqLK1LMPgjcmeP4Zl51xTVbaCzo5mreQAMoljxc4QDEW+HIK7/hhD57/MyA7Zya
6xIhIQ0q26xGV+MrJ9tWIhyUfoC07kv9jc0TcszaMAzNk0+vKVEwmvQC7833csC9
Tx/hS4jSiYkyqeIVYV0IZWjZvSlFqfmsZC11UvkCgYAGSPo1RkMQb8cqyaRNPb8/
em9gA2lM9B0FNwkziRU9110yRzbnM041a0H54md1ZeV0nuohCcn0spu4rrlapZiY
```

```

zbrF//ah6mwVbhMCakXI0e0PjI2iUP9Z6PZEKpYMNgf5ZyQGC999Z9e09FyDaP/t
zHmotrM3Mfz8Q7ExRxwrcwKbgCwRnneUcszZ7Zwgvi/S9hBMg+haJ3/KJRSL2D0I
RevHJmo4mdCVBSr7lEaXaip940gebe2SN+Tztyuw5GVN5dz7U1L6iRhGfrjTWUuH
iHlhAH3awd+SfBMW2vX/Fx1W/PTlvcWDA1ImrFr9C5CpGMw+4SkZFi9rYt3sNJy4
YX9JAOgAbAKC332U9iTPXajrygPkAtDjJQXnwp0BAXHU9NxNHF00X2gkU+RQSotC
8muqyDgA0SLuagd0bAZS59wQCjTtHXB8WR5R5fri7a1Mdmw+/0nhGG09CwV4Vw/n
ZEFexXmC1uU01jffj0HtXrKgmka1j/1e60tjr/r6UxV/vM900gtw=
-----END RSA PRIVATE KEY-----

```

Sample request.csr

```

-----BEGIN CERTIFICATE REQUEST-----

MIIC3DCCACQCAQAwwgZYxCzAJBgNVBAYTAlVTMRMwEQYDVQQIDApDYWxpZm9ybmlh
MRQwEgYDVQQHDAtTYW50YV9DbGFyYTEMMAoGA1UECgwDQ1NHMRQwEgYDVQQLDAtF
bmdpbmVlcm1uZzESMBAGA1UEAwwJY2xvdWQuY29tMSQwIgYJKoZIhvcNAQkBFhVr
aG9hLm5ndXl1bkBjbG91ZC5jb20wgGEmA0GCSqGSIsb3DQEBAQUAA4IBDwAwggEK
AoIBAQCvBq30SCGyKseQ+yACLBce4903DoM6y3AL1Xtku7fyDfqmpIRfXKE43jIX
rWcKpL4x+K76mU8QNtdz13C13st7gkRbw4UeSjmYHPdSP0xJ6c1MFVNxV36HK7za
dHRVZ0DF7vaQ+KJMbs+4zfh1mp4e7L60tT0WQBc03HK0U9/9MMk9CX/uHWSwDNbm
32zatJf0ePe0xc6DzzEXxL+SwY/U7oXk7teh1i2lp9QH9Kp9m5f3mq/XYRtu6yJ8
HCuYpV39nn8WC5IYJ6zMGasKiXR19RPjiUxE8/bNbSbo7bfiPgeY66Fn+ovfix4D
VKYgweSv0rntUdapahzc2ZMMrafTAgMBAAGgADANBgkqhkiG9w0BAQsFAA0CAQEA
I9rsE/tsUgGNHzgsJ6Bq45a1AFN1hDS2IPuvEVl+3eGECR6ZRMxcHRn3ZGS0ISmD

```

```

mYeTfzwxT/IcCRXbVqFvAPkdiRwZwDvCjDg3BN1petrSURbyYbd9BTRkthSn+N10

9Szyik0EKbuHnQ9TbeCB0vAKpSFiz+jImfNYXYI1vFTsJRJaDFDN0X1v6QgDAX2J

qxjVai0isJVz5QXjzD/NpWtFFQJYb1LphS4uXmM1lg3sWaAI9LhfAd1wJC9uSr8R

CZyqnV6UjC0AXMsBbchr2SNa5lWNBH6F9Kjv2St1rpg1mJfq63MqDQLq3HffKrfa

aQi90lrjSMwkdIQX22pZxw==

-----END CERTIFICATE REQUEST-----

```

Sample lom_certificate.pem

```

-----BEGIN CERTIFICATE-----

MIIDqjCCApICCCQDaiXN+twSKSjANBgkqhkiG9w0BAQsFADCBljELMAkGA1UEBhMC

VVMxEzARBgNVBAgMCkNhbg1mb3JuaWExFDASBgNVBACMC1NhbnRhX0NsYXJhMQww

CgYDVQQKDANDU0cxFDASBgNVBASMC0VuZ2luZWVyaW5nMRIwEAYDVQQDDAljbG91

ZC5jb20xJDAiBgkqhkiG9w0BCQEFWtob2Eubmd1ewVuQGNSb3VkLmNvbTAeFw0y

NDA2MTEwMjAxMDRaFw0yNTA2MTEwMjAxMDRaMIGWMQswCQYDVQQGEwJVUzETMBEG

A1UECAwKQ2FsaWZvcn5pYTEUMBIGA1UEBwwLU2FudGFfQ2xhcmExDDAKBgNVBAoM

A0NTRzEUMBIGA1UECwwLRW5naW5lZXJpbmcxEjAQBgNVBAMMCWNsb3VkLmNvbTEk

MCIGCSqGS1b3DQEJARYVa2hvYS5uZ3V5ZW5AY2xvdWQuY29tMIIBIjANBgkqhkiG

9w0BAQEFAAOCAQ8AMIIBCgKCAQEAlW0N9EghsirHkPsgAiwXHuPdNw6D0stwC9V7

ZLu38g36pqYkX1yh0N4yF61nCqS+Mfiu+p1PEDbXc5dwtd7Le4JEW80FHko5mBz3

Uj9MSenJTBVTV1d+hyu82nR0VWdAxe72kPiiTG7PuM34ZZqeHuy+tLU9FkAXDtxy

j1Pf/TDJPQ1/7h1k1nTW5t9s2rSXznj3jsX0g88xF8S/ksGP106F507XoZYtpafU

B/SqfZuX95qv12EbbusifBwrnKVd/Z5/FguSGCeszBmrCol0dfUT441MRPP2zW0m

```

```

60234j4Hm0uhZ/qL34seA1SmIMHkr9K57VHWqWoc3NmTDK2n0wIDAQABMA0GCSqG
SIb3DQEBCwUAA4IBAQBLojhxNsw24N0uTIQ3dJh6WZATiiBjw8kQyEJqyiB8oCm0
oAVleDAjI44C2eaR1vj321yNQI6bmBGPffwUoIX6YMAf1l6nJq0f19+rJd1FYCCd
FIqt76sC9YTU8WL3j7X1LE2lhQj7RZUt321QcG30qxQoXlQIM5oP7q17WkmPY0tW
JQZ4LjQRGHtc9rDiSlkzeMeBgtG3HqdNSorn2S15JJf/4sm5JXQXd7GByicv9aNm
Aagjqw1kziJUpL02r2bRX+3Qn0NE5WlxaYYisIPe9py3TsnLXHcrnTqrHbh6e4wc
+yF9+4nouCHPj0s2i0QV7koFHZ8lnEiUYaxYT8w1

-----END CERTIFICATE-----

```

Install a certificate and key on older platforms using the LOM GUI

Citrix® recommends using HTTPS to access the LOM GUI. To use HTTPS, you must replace the default SSL certificate with one from a trusted certificate authority and upload a private key to the LOM GUI.

To encrypt SNMP alerts, set up an SSL certificate and private key. In the GUI, navigate to **Configuration > SSL Certification** and apply the SSL certificate and private key. See the NetScaler Secure Deployment Guide for more information about how to securely deploy the LOM in your network. To enable encryption and learn the security measures for LOM, see [NetScaler Secure Deployment Guide](#).

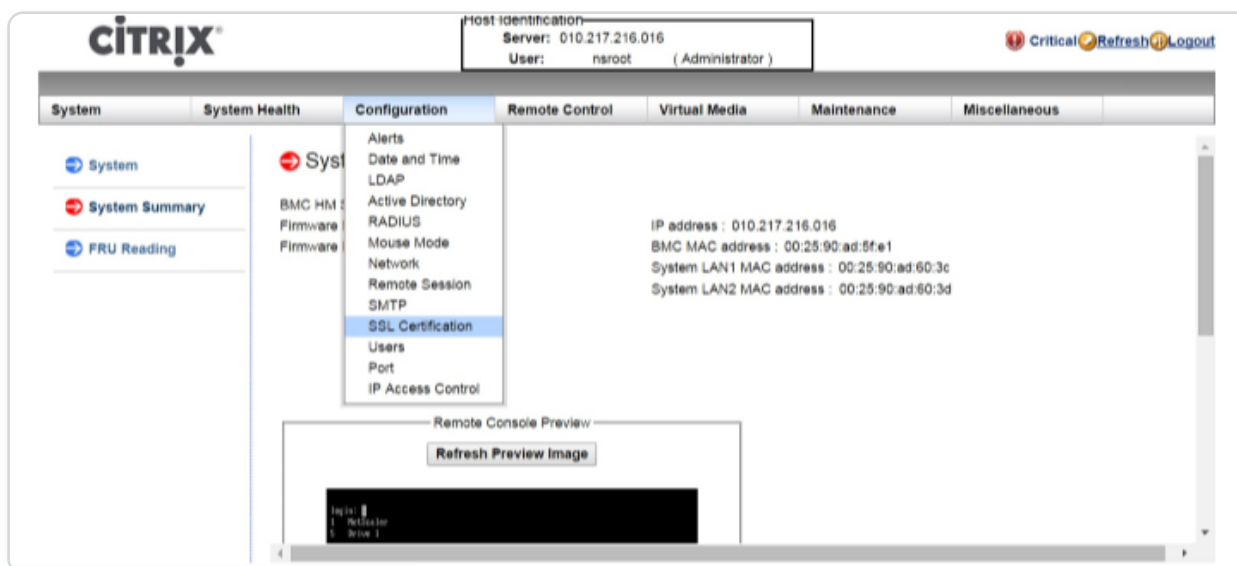
If you make a mistake, you must restore the BMC to the factory defaults to erase the certificate and key. Use the following shell command:

```
ipmitool raw 0x30 0x40
```

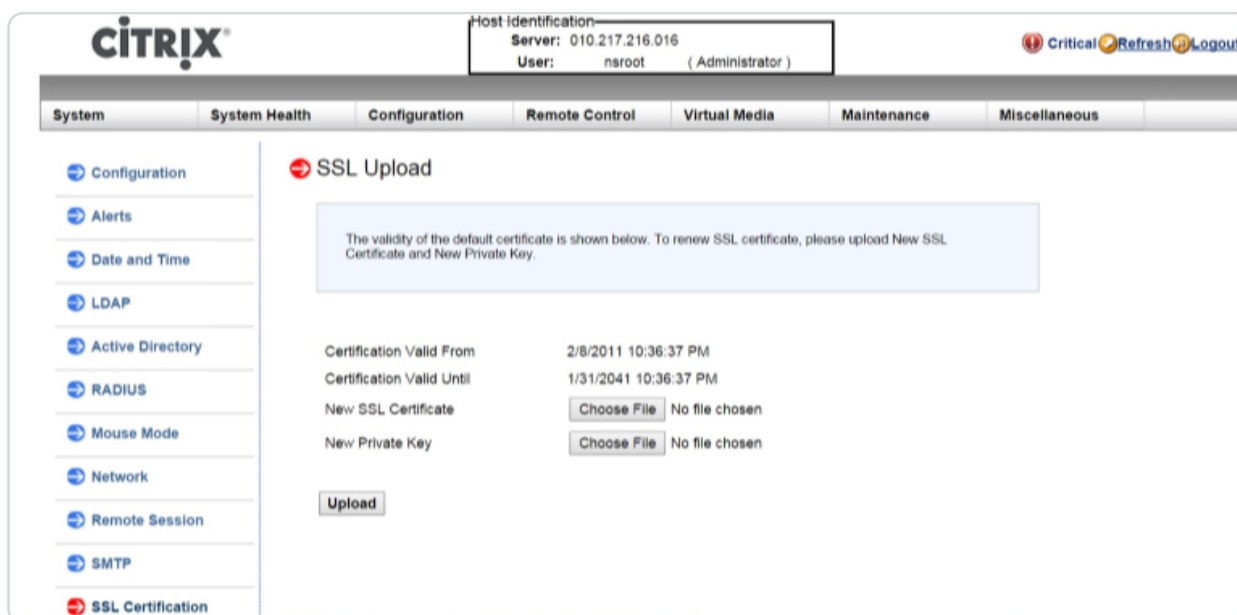
Note: The certificate file must contain only the certificate. The certificate and key must not be in the same file. Make sure that the certificate contains only the certificate and that the key file contains only the key.

Upload a trusted certificate and private key by using the LOM GUI

1. Navigate to **Configuration > SSL Certification**.



2. In the right pane, click the **Choose File** buttons to select a new SSL certificate and a new private key.



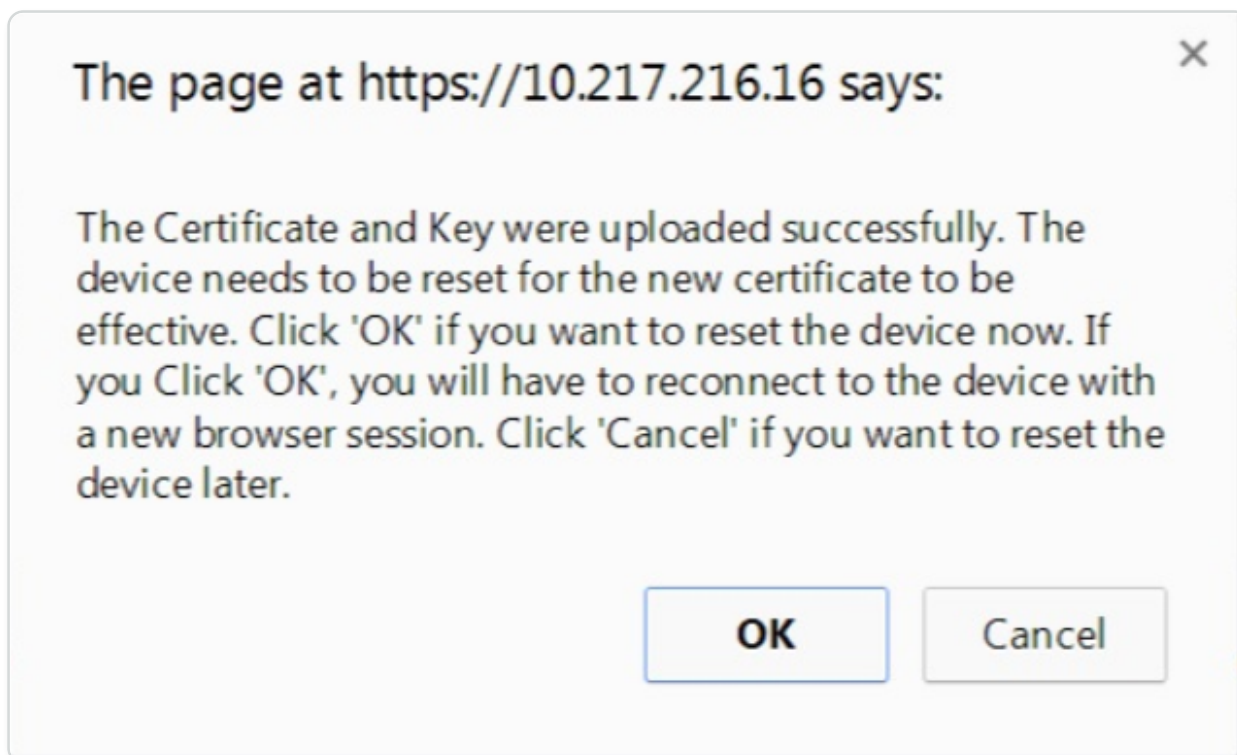
3. To verify that you have selected the correct certificate and private key, check the file names of the certificate and key, which appear next to the **Choose File** buttons.

The screenshot shows the Citrix NetScaler MPX web interface. At the top, the Citrix logo is on the left, and a 'Host Identification' box displays 'Server: 010.217.216.016' and 'User: nsroot (Administrator)'. To the right are links for 'Critical', 'Refresh', and 'Logout'. Below this is a navigation bar with tabs: 'System', 'System Health', 'Configuration', 'Remote Control', 'Virtual Media', 'Maintenance', and 'Miscellaneous'. The 'Configuration' tab is selected, and a left sidebar lists various configuration options, with 'SSL Certification' at the bottom. The main content area is titled 'SSL Upload' and contains a message: 'The validity of the default certificate is shown below. To renew SSL certificate, please upload New SSL Certificate and New Private Key.' Below this message, there are two rows of information: 'Certification Valid From' (2/8/2011 10:36:37 PM) and 'Certification Valid Until' (1/31/2041 10:36:37 PM). For 'New SSL Certificate', a 'Choose File' button is followed by the filename 'certbundle-one.pem'. For 'New Private Key', a 'Choose File' button is followed by the filename 'certkey.pem'. At the bottom of this section is an 'Upload' button.

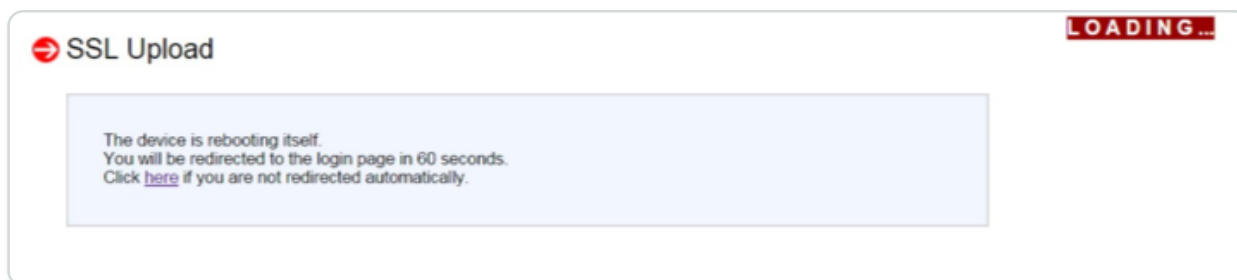
4. Click **Upload**. A message informs you that uploading a new SSL certificate replaces the existing (default) certificate.
5. Click **OK**.

The screenshot shows a confirmation dialog box with a close button (X) in the top right corner. The text inside the dialog reads: 'The page at https://10.217.216.16 says: A SSL Certificate already exists. Loading a new SSL certificate will replace the existing certificate. Do you want to continue?'. At the bottom of the dialog are two buttons: 'OK' and 'Cancel'.

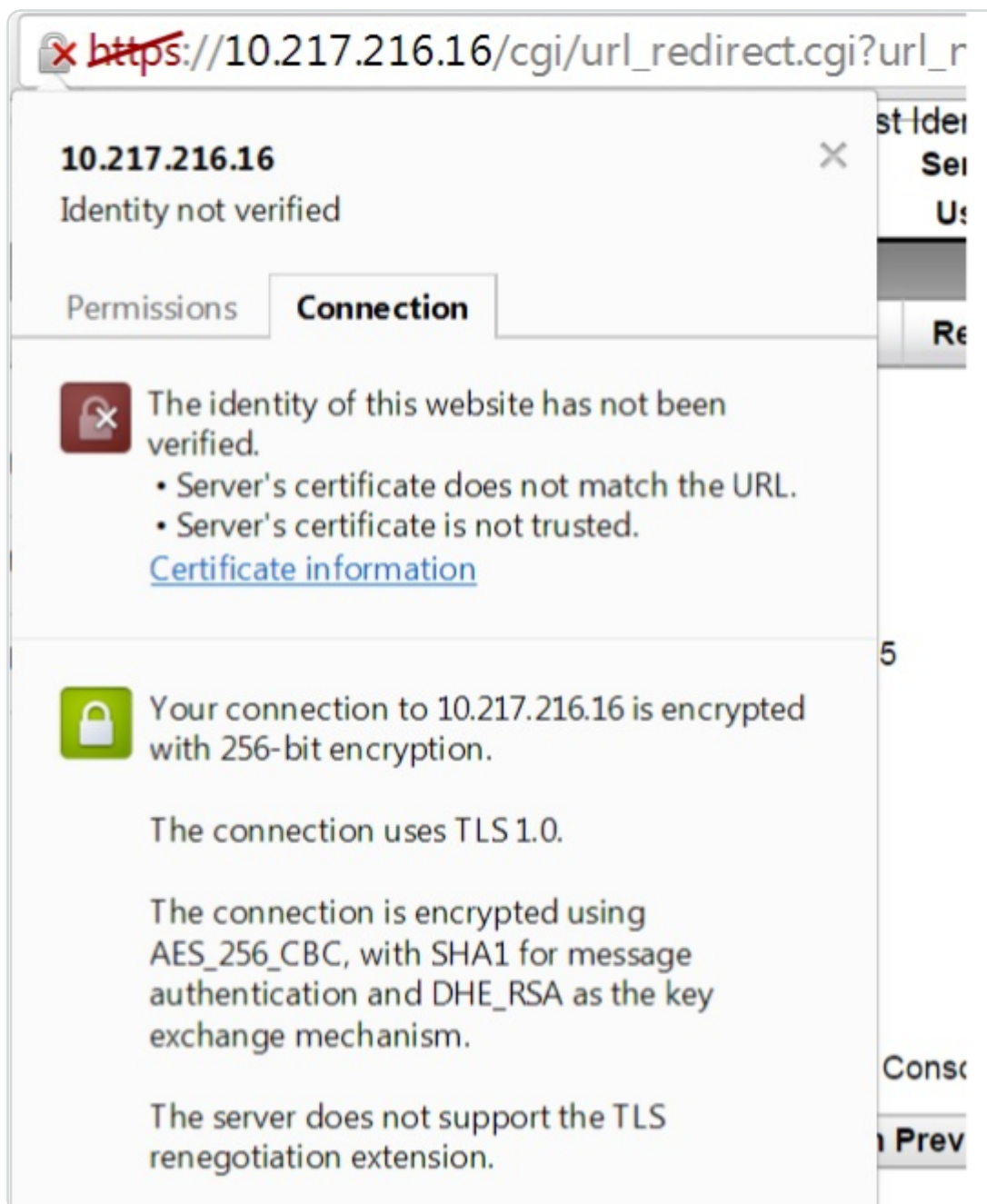
6. When a message informs you that the certificate and key have been uploaded successfully, click **OK** to reset the device.



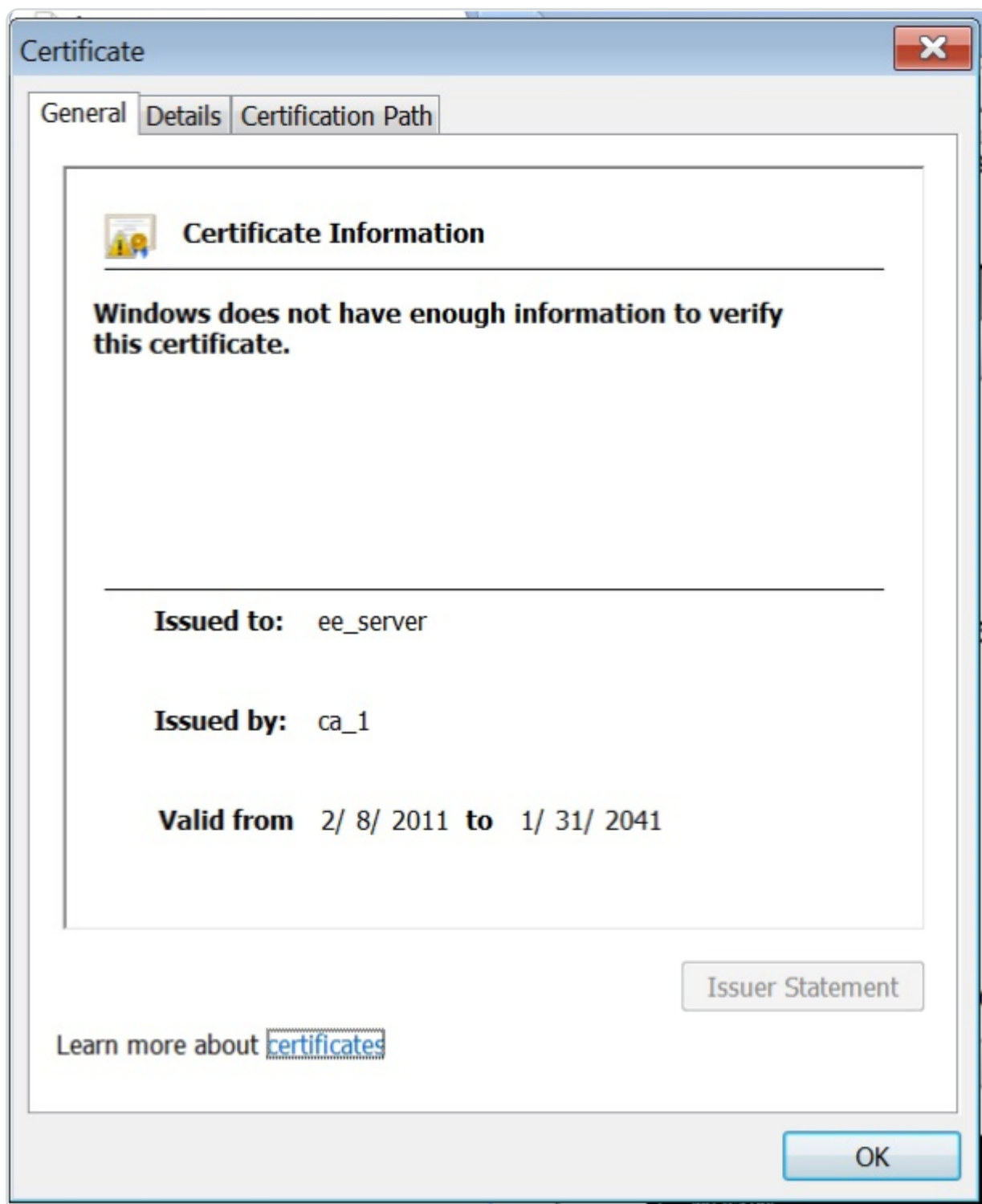
The reset takes approximately 60 seconds. You are then redirected to the login page.



7. Log on to the LOM GUI by using your default credentials. Note: If the certificate or key is invalid, the BMC reboots, tries the new settings, and reverts to using the previous settings.
8. In the address bar, click the lock icon to display the connection tab, as shown in the following screenshot.



9. Click Certificate information to display details about the certificate that you uploaded.



Note: Best practices for LOM and ADC security are covered in [NetScaler Secure Deployment Guide](#).

Obtain the MAC address, serial number, and host properties of the appliance

A Media Access Control address (MAC address) is a unique identifier assigned to network interfaces for communication on the physical network segment. The serial number is on the back

panel of the appliance. If you do not have easy access to the back panel, you can get the appliance's serial number by logging on to the light out management (LOM) port. You can also retrieve the parameter settings assigned to the IP addresses, such as the state of ARP, ICMP, telnet, secure shell access, and dynamic routing.

To obtain the MAC address, serial number, and host properties of the appliance by using the LOM GUI

1. Log on to the LOM GUI.
2. Navigate to **System > Component Info**.
3. In the **Overview** tab, you can view the MAC address, serial number, and host properties of the appliance.

Obtain the MAC address and host properties of the BMC by using the appliance shell

At the shell prompt, type:

```
ipmitool lan print
```

Example:

```
Set in Progress      : Set Complete

Auth Type Support    : MD2 MD5 OEM

Auth Type Enable     : Callback : MD2 MD5 OEM

                     : User      : MD2 MD5 OEM

                     : Operator  : MD2 MD5 OEM

                     : Admin     : MD2 MD5 OEM

                     : OEM       :

IP Address Source    : Static Address

IP Address           : 192.168.1.3
```

Subnet Mask : 255.255.255.0

MAC Address : 00:25:90:3f:5e:d0

SNMP Community String : public

IP Header : TTL=0x00 Flags=0x00 Precedence=0x00 TOS=0x00

BMC ARP Control : ARP Responses Enabled, Gratuitous ARP Disabled

Gratituous ARP Intrvl : 0.0 seconds

Default Gateway IP : 0.0.0.0

Default Gateway MAC : 00:00:00:00:00:00

Backup Gateway IP : 0.0.0.0

Backup Gateway MAC : 00:00:00:00:00:00

802.1q VLAN ID : Disabled

802.1q VLAN Priority : 0

RMCP+ Cipher Suites : 1,2,3,6,7,8,11,12,0

Cipher Suite Priv Max : aaaaXXaaaXXaaXX

: X=Cipher Suite Unused

: c=CALLBACK

: u=USER

: o=OPERATOR

: a=ADMIN

: O=OEM

Perform power control operations by using the LOM port

Through the LOM port, you can remotely perform power control operations, such as graceful shutdown and restart, power cycling the appliance, and restarting the BMC microcontroller. A cold restart takes longer than a warm restart. In a cold restart, you switch off power to the appliance and then switch it back on.

Perform power control operations by using the GUI

1. In the **Menu** bar, click **Remote Control**.
2. Under **Options**, click **Power Control**, and then select one of the following options:
 - **Reset System**—Gracefully restart the appliance. All operations on the appliance are stopped, no new connections to the client or server are accepted, and all existing connections are closed. This option is similar to a warm restart, such as by entering the reboot command. The BMC does not reboot itself during this operation.
 - **Power Off System – Immediate**—Disconnect power to the appliance immediately, without gracefully shutting down the appliance. The BMC continues to operate normally in this mode to allow the user to remotely power on the appliance. This option is the same as pushing the power button until the unit powers off.
 - **Power Off System – Orderly Shutdown**—Gracefully shut down the appliance, and then disconnect power to the appliance. This option has the same effect as pressing the power button on the back panel of the appliance for less than four seconds. All operations on the appliance are stopped, no new connections to the client or server are accepted, and all existing connections are closed before the appliance shuts down. The BMC continues to operate normally in this mode to allow the user to remotely power on the appliance. This option is the same as entering the shutdown command in the appliance shell.
 - **Power On System**—Switch on the appliance. The BMC does not reboot itself during this operation. This option is the same as pushing the power button.
 - **Power Cycle System**—Switch off the appliance, and then switch it back on. The BMC does not reboot itself during this operation. This option is the same as pushing the power button until the unit powers off, and then pushing the power button to power on the unit.
3. Click **Perform Action**.

Perform a power cycle of the BMC

A warm restart, cold restart, or a power cycle of the appliance, using the power button, does not include power cycling the BMC. The BMC runs on standby power directly from the power supply. Therefore, the state of the power button on the appliance does not affect the BMC. The only way to power cycle the BMC is to remove all power cords from the appliance for 60 seconds.

Perform power control operations on the BMC by using the appliance shell

When performing either a warm or cold restart of the BMC microcontroller, you cannot communicate with the LOM port. Both actions restart the BMC but not the main CPU. To perform a warm restart of LOM from the appliance, type:

```
ipmitool mc reset warm
```

Perform a warm restart remotely from another computer on the network

```
ipmitool -U <bmc_gui_username> -P <bmc_gui_password> -H <bmc IP address> mc  
reset warm
```

Perform a cold restart of the LOM from the appliance

```
ipmitool mc reset cold
```

Perform a warm restart remotely from another computer on the network

```
ipmitool -U <bmc_gui_username> -P <bmc_gui_password> -H <bmc IP address> mc  
reset cold
```

Perform a core dump

If the appliance fails or becomes unresponsive, you can remotely perform a core dump. This procedure has the same effect as pressing the **NMI** button on the back panel of the appliance.

Perform a core dump by using the GUI

1. In the **Menu** bar, click **Remote Control**.
2. Under **Options**, click **NMI**, and then click **Initiate NMI**.

Perform a core dump remotely from another computer on the network by using the shell

At the shell prompt, type:

```
ipmitool -U <bmc_gui_username> -P <bmc_gui_password> -H <bmc IP address> chassis  
power diag
```

Restore the BMC configuration to factory defaults

You can restore the BMC to its factory-default settings, including deleting the SSL Certificate and SSL key.

Reset the configuration to factory defaults by using the GUI

1. Navigate to **Maintenance > Factory Default**.
2. Click **Restore**.

Reset the configuration to factory defaults by using the shell

At the shell prompt, type:

```
ipmitool raw 0x30 0x40
```

NOTE:

For MPX 9000 or 16000 platforms, use `ipmitool raw 0x30 0x48 0x0` or `ipmitool raw 0x30 0x42`.

Use the BIOS POST code to detect errors

You can read the BIOS POST code by using the LOM GUI or the shell. To interpret the BIOS Beep codes, see [<https://www.supermicro.com/manuals/other/AMI_AptioV_BIOS_POST_Codes_for_SM_Motherboards.pdf>](https://www.supermicro.com/manuals/other/AMI_AptioV_BIOS_POST_Codes_for_SM_Motherboards.pdf).

Read the BIOS post code by using the LOM GUI

Navigate to **Miscellaneous > BIOS Post Snooping**.

Read the BIOS post code by using the shell

At the prompt, type:

```
ipmitool raw 0x30 0x2a
```

Upgrade the LOM firmware on a NetScaler MPX appliance

Citrix has automated the upgrade of LOM firmware within NetScaler MPX software. It is no longer necessary to know your hardware platform or download any LOM firmware.

NOTE

This procedure requires two reboots to complete and therefore a disruption in production traffic is expected. Citrix recommends that you perform the upgrade during a maintenance window. In a high availability setup, perform the upgrade on the secondary node to minimize disruption to production traffic. Run the `upgrade_bmc.sh` script on the following supported platforms. The script is available in the `/netscaler` folder.

- MPX 5900
- MPX 8900
- MPX 14000
- MPX 15000
- MPX 22000
- MPX 25000
- MPX 26000

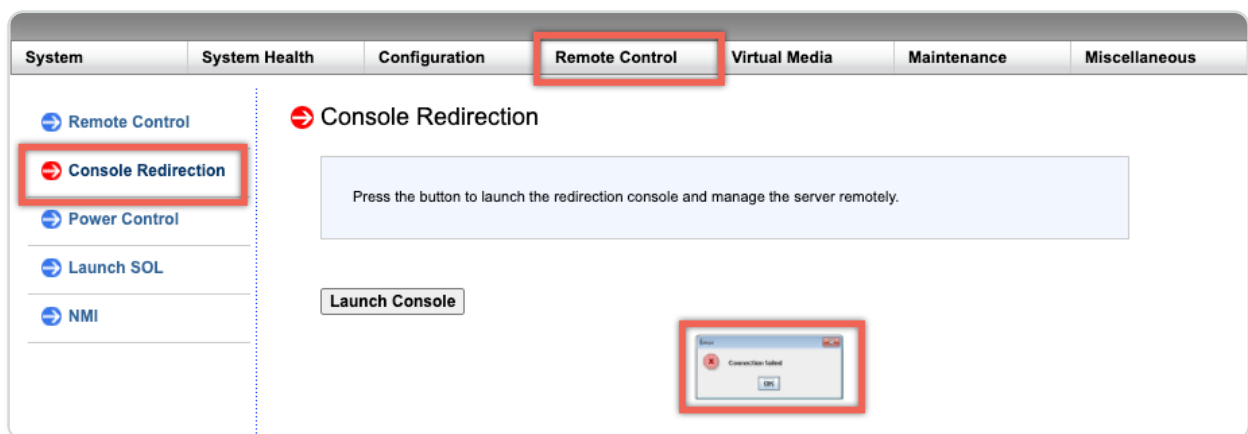
For information about upgrading the NetScaler appliance, see [Upgrade and downgrade a NetScaler appliance](#)

NOTE

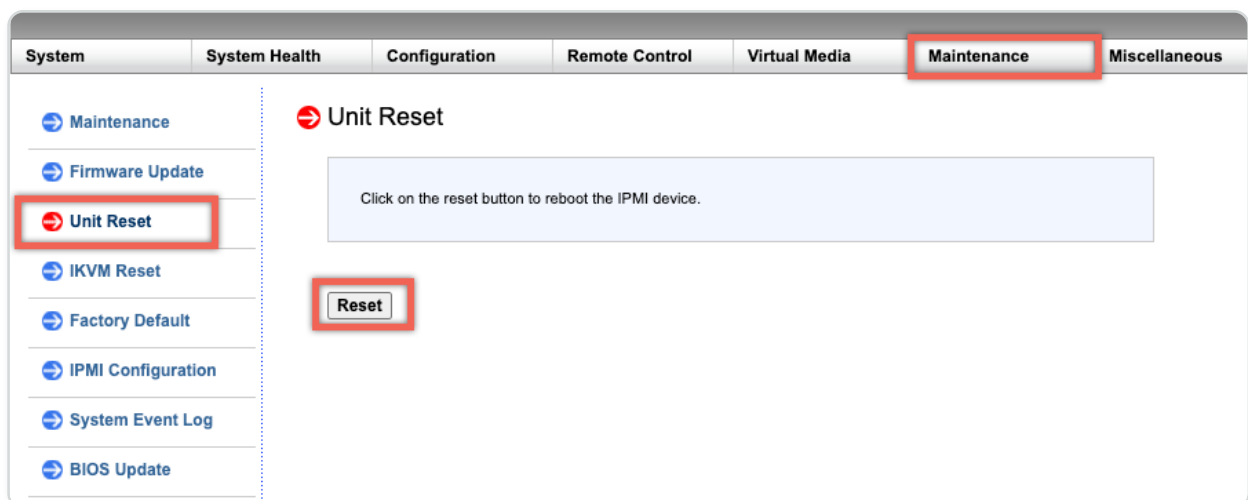
If you cannot log into the LOM GUI on the MPX 5900, MPX 8900, MPX 15000, or MPX 26000, reset the LOM password. To reset the password type `shell` in the command prompt and then `ipmitool user set password 2 <your preferred password>` after upgrade to 5.56 or 4.61.

Troubleshooting

- Console redirection fails after upgrading the LOM to 4.61 on the MPX 5900 and MPX 8900 platforms or 5.56 on the MPX 15000 and MPX 26000 platforms.



Perform a unit reset from the Maintenance tab, which resets the BMC.



Upgrading LOM version to 3.11.0

LOM version 3.11.0 is now available for the following platforms. This version addresses multiple functional issues.

- MPX 9100
- MPX 9100 FIPS
- MPX 16000

NOTES:

- The upgrade process requires two reboots, so a disruption in production traffic is expected. It is highly recommended to perform this upgrade during a maintenance window.
- In a high availability setup, upgrade the secondary node first to minimize impact on production.

Upgrade procedure

1. At the command prompt, run the `upgrade_bmc.sh` script on supported platforms.
2. During execution, you are prompted to choose Yes or No.
 - If you select Yes, make sure to record all previous configuration settings before proceeding with the upgrade.
 - If you select No, the upgrade will not continue.
3. Alternatively, you can use the command `upgrade_bmc.sh -y` to bypass interactive prompts. This script is available in the `/netscaler` folder.

Configuration compatibility

The LOM configuration format is not compatible between the 2.12.12 and 2.13.12 LOM versions and the new 3.11.00 LOM version.

You might lose some LOM configurations during the upgrade process from the 2.12.12 or 2.13.12 version to the new LOM 3.11.00 version. Once the upgrade is complete, you cannot use any

manually created LOM 2.12.12 or 2.13.12 version configuration backups to restore the configuration.

NOTE

Citrix® advises noting all the current LOM configuration before the upgrade. This allows you to manually reapply any missing settings afterwards.

The upgrade process does not retain all LOM configuration settings; manual re-application may be necessary in the following areas:

- Manually created local LOM user accounts (specifically, all accounts except the default nsroot).
- RADIUS server shared secret.
- LDAP Binds Password.
- SMTP password under **Notifications > SMTP** section.
- All SNMP settings can be found in the **Notifications > SNMP** section.
- Find the authentication key and encryption key for SNMPv3 alerts in the **Notifications > Alerts** section.
- The SNMPv1 alert Trap Community string is located under the **Notifications > Alerts** section.

Enable RADIUS authentication in the LOM GUI

RADIUS (Remote Authentication Dial-In User Service) is a network protocol that allows you to manage remote user authentication, authorization, and auditing.

Configure RADIUS authentication in the LOM GUI

1. Log on to the LOM GUI.
2. Navigate to **Configuration > Radius**.
3. Select **Enable RADIUS**.
4. Specify the port and IP address of the RADIUS server.
5. Specify the secret (password) for the user to access the RADIUS server.
6. Click **Save**.

The screenshot shows the NetScaler MPX Configuration page. The 'Configuration' tab is selected. In the left sidebar, the 'RADIUS' option is highlighted. The main content area displays the 'RADIUS Settings' form. A message box at the top states: 'Check the box below to enable RADIUS and enter the required information to access the RADIUS server. Press the Save button to save your changes.' Below this, the 'Enable RADIUS' checkbox is checked. The 'Port' field is set to 1812, the 'IP Address' field is set to 198.51.100.15, and the 'Secret' field is masked with dots. A 'Save' button is located at the bottom of the form.

Parameters:

RADIUS username and password:

The maximum LOM password length varies depending on whether the LOM account uses RADIUS for user authentication.

For LOM 2.13.12, the maximum password length is 16 characters if you are using a RADIUS user account to log on to the LOM GUI. An "Invalid Username or Password" message appears for passwords longer than 16 characters.

For LOM 3.11.0, the maximum password length is 45 characters if you are using a RADIUS user account to log on to the LOM GUI. If the password length is longer than 45 characters, the LOM GUI might block the login page and the following message appears "Your session has timed out. You will need to open a new session."

RADIUS secret:

BMC valid characters are 0-9, a-z, A-Z, !, @, +, -, /, :, and _.

The 'secret password' shared between the RADIUS server and the LOM device cannot exceed 31 characters for both LOM 2.13.12 and 3.11.0. That is, if the RADIUS server sets the "secret password" length above 31 characters, LOM's RADIUS setting for secret password under LOM GUI is truncated to 31 characters.

Configure an external computer running Windows or Ubuntu OS to access the LOM using RADIUS' network protocol

RADIUS is an application that runs on an external computer to access the Citrix® LOM. Before you run RADIUS, you need to configure the user account and client information.

Perform the following actions:

1. Configure a user account in Ubuntu.
2. Configure client information in Ubuntu.
3. Start the RADIUS server in Ubuntu.
4. Add roles in Windows server.
5. Add an object – Group.
6. Add an object – User.
7. Add a network policy.
8. Add a vendor specific attribute.
9. Configure a RADIUS client.

For more information, see the documentation for Ubuntu.

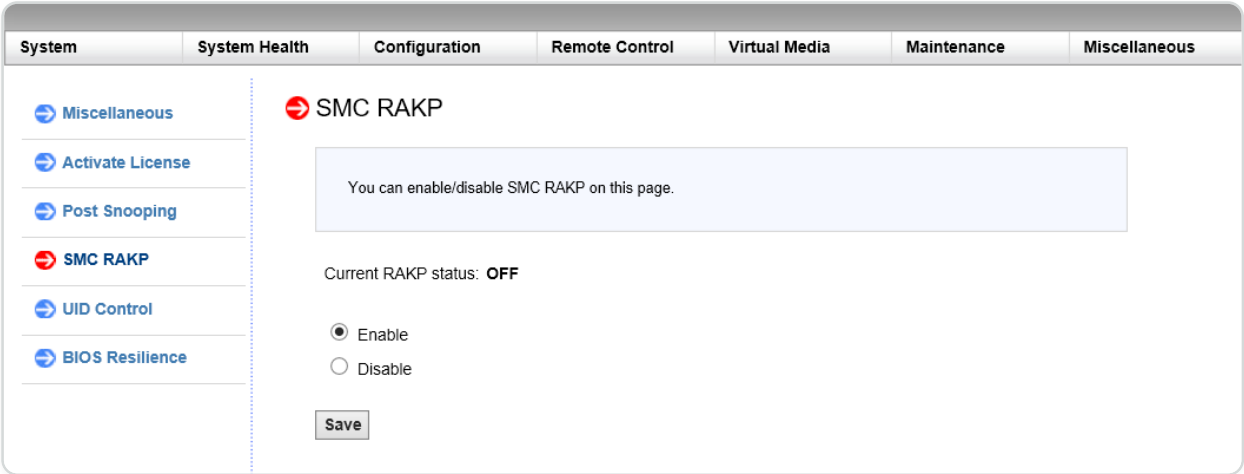
RAKP topology on NetScaler appliances

Remote Authenticated Key-Exchange Protocol (RAKP) is used with the IPMI tool for remote authentication. On NetScaler appliances that support RAKP, it is disabled by default. You can enable or disable it using one of the following methods:

1. LOM GUI
2. ADC shell

Enable or disable RAKP using the LOM GUI

1. In a web browser, log on to the LOM GUI.
2. Navigate to **Miscellaneous > SMC RAKP**. The current RAKP status is displayed.
3. Select **Enable** or **Disable**.
4. Click **Save**.



Enable or disable RAKP using the ADC bash shell

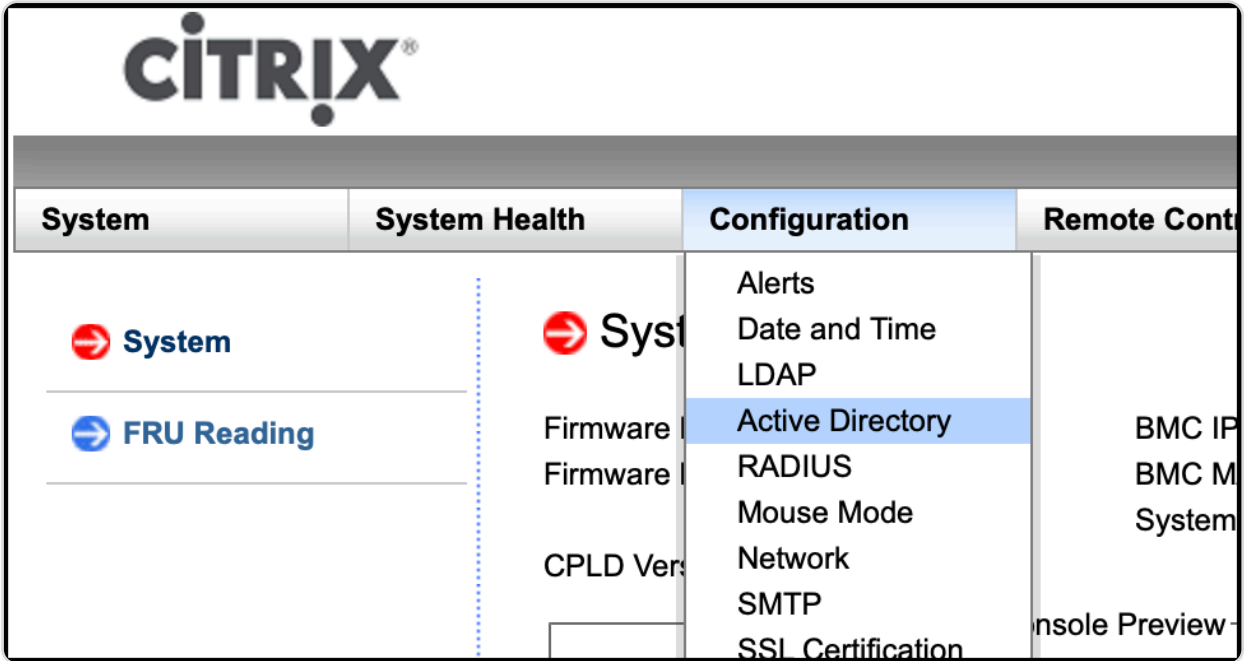
- To enable RAKP, type: `ipmitool raw 0x30 0x72 0x01 0x01`
- To disable RAKP, type: `ipmitool raw 0x30 0x72 0x01 0x00`

Configure Active Directory in LOM

Add an active directory in LOM to use LDAP authentication with LOM.

Follow these steps to add an Active Directory in LOM.

1. Log on to the LOM GUI.
2. Navigate to **Configuration > Active Directory**.



3. Click the link to configure or edit active directory settings.

here'."/>

4. Type values for the different parameters and click **Save**.

The following message appears after a successful save.

5. Click **Active Directory** and add a role group. A role group is required to give an Active Directory user a specific type of privilege on LOM.

Role Group ID	Group Name	Group Domain	Network Privilege
1	-	-	Reserved
2	-	-	Reserved
3	-	-	Reserved
4	-	-	Reserved
5	-	-	Reserved

6. Select **Administrator** to give admin privileges to the role group and click **Save**.

Alerts

Date and Time

DAP

Active Directory

RADIUS

Mouse Mode

Network

Enter the information for the new role group below and press Add. Press Cancel

Role Group Name:

Role Group Domain:

Role Group Privilege: ☒ Administrator ☐ Operator ☐ User ☐ No Access

The role group appears in the table.

Role Group ID	Group Name	Group Domain	Network Privilege
1	SDXgroup1	SDX-BLR.com	Administrator
2	-	-	Reserved
3	-	-	Reserved

Number of Configured Role Groups: 1

- Log on as an Active Directory user.

CITRIX®

Please Login

Username

Password

You have completed the steps to add an Active Directory.

Change the BMC host name

When changing the host name for BMC version 2.12, you must enter an IP address in the **DNS Server IP** field. Leaving this field blank results in the following error.

The screenshot shows the Citrix NetScaler LOM GUI. The left sidebar contains navigation links: Dashboard, System, Configuration, Account Services, Notifications, Network, Virtual Media, BMC Settings, Remote Control, and Maintenance. The main content area is titled 'Network' and includes sections for Gateway, DNS Server IP, DNS Server2 IP, General, and IPv6 Address. The Gateway field is set to 10.217.195.129. The DNS Server IP field has a red error message: 'It is illegal IPv4 format!'. The General section shows Hostname as 'matua_9', MAC Address as '3c:ec:ef:5a:79:f9', VLAN as 'OFF', VLAN ID as '9', LAN Interface as 'Dedicated', RMCP Port as '623', Active Interface as 'Share', Status as 'Connected', Speed as '1G', and Duplex as 'Full Duplex'. A 'Save' button is at the bottom.

Entering a dummy IP address, such as 0.0.0.0 is supported.

Perform the following steps to change the host name for BMC version 2.12 using the LOM GUI.

1. Log on to the LOM GUI.
2. Navigate to **Configuration > Network**.
3. In the **DNS Server IP** field, type an IP address. Type 0.0.0.0 if you don't have an IP address.
4. Type a host name.
5. Click **Save**.

The screenshot shows the Citrix NetScaler LOM GUI with the 'Network' tab selected. The left sidebar has 'Configuration' and 'Network' highlighted with red boxes. The main content area shows the 'Network' configuration. The 'IPv4' section is active, showing 'Obtain an IP address automatically (use DHCP)' as 'OFF' and 'Use the following IP address' as 'ON'. The IP Address is 10.221.62.71, Subnet Mask is 255.255.255.0, and Gateway is 10.221.62.1. The 'Advanced Settings' section shows 'DNS Server IP' as '0.0.0.0' (highlighted with a red box) and 'DNS Server2 IP' as an empty field. The 'General' section shows 'Hostname' as 'example' (highlighted with a red box), 'MAC Address' as '3c:ec:ef:2f:d5:5a', and 'VLAN' as 'OFF'. The 'IPv6' section is inactive, showing 'DHCP' as 'OFF' and 'DHCPv6' options as 'DHCPv6 Stateless'.

LOM port management for MPX 9200 and MPX 17000

This section provides step-by-step instructions for the initial configuration of the Lights Out Management (LOM) interface on NetScaler MPX 9200 and 17000 series platforms. The LOM enables essential out-of-band management, allowing you to manage the appliance independently of the main operating system.

Prerequisites

Before beginning the LOM configuration, ensure that the following requirements are met:

- Physical or console access to NetScaler.
- Network connectivity to the LOM port (direct or switched).
- Device serial number (required for initial authentication).
- Planned IP addressing scheme for the LOM network segment.
- Administrative access credentials.
- Web browser with HTML5 support (Chrome, Firefox, Edge, or Safari).
- Standard HTTPS (port 443) network access to the LOM IP address.

NOTE:

Java or third-party plugins are not required.

Initial network access

The LOM interface is configured with default settings to facilitate initial configuration.

Default LOM settings

PARAMETER	DEFAULT VALUE
IP Address	192.168.1.3
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.1
Username	nsroot

PARAMETER	DEFAULT VALUE
Password	Device serial number (case-sensitive)

Network connection methods

Select one of the following connection methods for initial setup:

Direct connection:

- Connect a laptop Ethernet port to the LOM interface using a crossover cable.
- Set the laptop static IP address to `192.168.1.10` with a subnet mask of `255.255.255.0`.

Switched connection:

- Connect the LOM interface and a management workstation to the same network switch.
- Ensure that both devices are in the `192.168.1.0/24` broadcast domain.

Configure LOM by using the GUI

Initial login and password change

Access the LOM web interface using the default IP address.

1. Open a web browser

- a. Type `https://192.168.1.3`.
- b. Accept the self-signed SSL certificate warning that appears in the browser.

2. Authenticate with default credentials

- a. Enter `nsroot` as the Username.
- b. Enter the device serial number as the Password (note: this is case-sensitive).
- c. Click **Login**.

3. Mandatory password change

On the first login, the system enforces a password change for security.

- **Current Password:** Enter the device serial number.

- **New Password:** Enter a password that meets the complexity requirements shown on the page.
- **Confirm Password:** Re-enter the new password.
- Click **Submit** to save.

NOTE:

The system logs you out automatically once the password is saved. Log in again using the `nsroot` account and your newly created password.

New Password

Confirm Password

Submit

Password should be changed for default user.

- Password should have a minimum of 8 characters.
- Password is not allowed combination of <-> characters, ex "123~4567~".
- Password is not allowed reverse of username.
- Password should have combination of at least two classes from a-z, A-Z, 0-9, special characters.
- Special characters "!","\$','%','&', '(' ,') ','*', '+', '-', '.', '<' ,'/' ,'\', '| ', '~' , '@ ', '_ ', '` ', '{ ', '} ', '^ ', '~ ', '\$ ', '% ', '& ', '\ ', ' ' are allowed.

Network configuration

To integrate LOM into your production management network:

1. Navigate to **Settings > Network IP Settings > LAN Interface (eth0)**.
2. Enter the following details:
 - a. **IPv4 Address**
 - b. **IPv4 Subnet**
 - c. **IPv4 Gateway**
3. Click **Save**. The Baseboard Management Controller (BMC) takes approximately 30 seconds to apply changes and then disconnects your current session.

4. Verify connectivity by pinging the new LOM IP address by using the following command from your management workstation:

```
ping <New_LOM_IP_Address>
```

5. Access the LOM interface using the new IP address:

```
https://<new_LOM_IP_address>
```

6. Log using `nsroot` and updated password.

The screenshot shows the NetScaler MPX web interface. On the left is a blue sidebar with the 'net>scaler' logo and a menu containing: Dashboard, Sensor, System Inventory, FRU Information, Logs & Reports, Settings, Remote Control, Image Redirection, Power Control, and Maintenance. The main content area is titled 'Network IP Settings'. It contains several configuration sections: 'Enable LAN' (checked), 'LAN Interface' (dropdown menu showing 'eth0'), 'MAC Address' (text field showing '08:35:71:34:46:EC'), 'Enable IPv4' (checked), 'Enable IPv4 DHCP' (unchecked), 'IPv4 Address' (text field showing '10.217.116.83'), 'IPv4 Subnet' (text field showing '255.255.255.0'), 'IPv4 Gateway' (text field showing '10.217.116.1'), 'Enable IPv6' (checked), and 'Enable IPv6 DHCP' (checked).

System lockdown mode restriction

When **System Lockdown** mode is enabled, all out-of-band management interfaces (LOM Web UI, IPMI, and Redfish) are restricted to read-only access. As a result, users cannot modify LOM/BMC settings such as **Network Settings** and **User Management** under the **Settings** menu.

Symptoms of lockdown mode

If the system is locked, you encounter the following issues within the GUI:

- **Error Messages:** Insufficient privilege (code 8000).
- **Notifications:** You do not have permission to view this content.
- **GUI Behavior:** Settings menu items appear grayed out or are completely inaccessible.

Affected functions

The following operations are restricted during lockdown:

- Network configuration changes.
- User management and password operations.
- LOM firmware updates.
- Field Replaceable Unit (FRU) data modifications.

Resolution

System Lockdown must be disabled from the NetScaler host OS using `ipmitool` commands. For information about how to disable lockdown, see [System lockdown management](#) section in the CLI section for lockdown management procedures.

Configure LOM by using the CLI (IPMI tool)

If the GUI is inaccessible or **System Lockdown** is active, use the NetScaler host shell to run the `ipmitool` commands.

MPX 17000 System Lockdown Mode (LOM Security Enhancement)

When system lockdown is enabled in-band from the host OS, the BMC enforces out-of-band configuration protection. All platform configuration interfaces—including LOM firmware updates, network settings, user management, FRU data, and general LOM configuration—are restricted to "read-only" access through the LOM Web UI and IPMI/Redfish interfaces.

No persistent configuration or firmware changes can be performed while lockdown is active.

Access requirements

To run command-line instructions, connect to the appliance by using one of the following methods:

- Serial console connection
- SSH session (if a network is configured)
- Direct access or monitor access

NOTE:

All commands must run from the NetScaler shell environment. If you are at the NetScaler CLI prompt, type `shell` to enter the FreeBSD environment.

System lockdown management

System Lockdown mode enforces read-only access across all out-of-band management interfaces. This security feature prevents unauthorized configuration changes via LOM, IPMI, and Redfish.

- **Check Status:** `ipmitool raw 0x34 0x81 (00 =Disabled (Configuration changes allowed), 01 =Enabled (Read-only mode active)).`
- **Disable Lockdown:** `ipmitool raw 0x34 0x81 0x0 .`

This command enables full read-write access to all BMC configuration interfaces.

- **Enable Lockdown:** `ipmitool raw 0x34 0x81 0x1 .`

This command restricts all BMC interfaces to read-only access for enhanced security.

Static IP configuration

Perform the following procedure to manually configure the interface:

1. **Set the IP address source to static:** Change the interface mode to disable DHCP and prepare the interface for static IP assignment using the following command:

```
ipmitool lan set 1 ipsrc static
```

2. **Assign the IP address:** Specify the static IP address for the LOM interface using the following command:

```
ipmitool lan set 1 ipaddr <LOM_IP_Address>
```

Example: `ipmitool lan set 1 ipaddr 192.0.2.255`

3. **Assign the Subnet mask:** Define the subnet mask for the LOM network segment using the following command:

```
ipmitool lan set 1 netmask <Subnet_Mask>
```

Example: `ipmitool lan set 1 netmask 255.255.255.0`

4. **Configure the default gateway:** Specify the gateway address for routing traffic outside the local segment using the following command:

```
ipmitool lan set 1 defgw ipaddr <Gateway_IP>
```

Example: `ipmitool lan set 1 defgw ipaddr 192.0.2.255`

5. Reset or reboot the BMC to apply changes:

```
ipmitool bmc reset cold
```

The BMC requires approximately 120 seconds to fully initialize after a reset.

Verify configuration

After the 120-second initialization period, verify the new network configuration.

Display current LOM network settings

Run the following command to display all current network parameters, including the IP address, subnet mask, gateway, and MAC address.

```
ipmitool lan print 1
```

Test network connectivity

From an external management workstation, test connectivity to the new LOM IP address:

```
ping <new_LOM_IP_address>
```

Access the LOM web interface to confirm full functionality:

```
https://<new_LOM_IP_address>
```

User password management

Change the default LOM password from the NetScaler host environment for enhanced security.

1. List current users

Run the following command to display all configured LOM user accounts with their user IDs:

```
ipmitool user list 1
```

Example output:

ID	NAME	CALLIN	LINK AUTH	IPMI MSG	CHANNEL PRIV LIMIT
1	nsroot	false	false	false	NO ACCESS
2		false	false	true	ADMINISTRATOR
3		true	false	false	NO ACCESS

NOTE:

The default `nsroot` account has a User ID of `2`.

2. Change user password

Run the following command to change the password for the `nsroot` account (User ID `2`):

```
ipmitool user set password <user_ID> <new_LOM_password>
```

Where:

- `<user_ID>` is the appropriate user ID (typically 2 for nsroot account).
- `<new_LOM_password>` is the new password.

Example:

```
ipmitool user set password 2
```

You are prompted to enter the new password interactively.

Alternative (Non-Interactive):

```
ipmitool user set password 2 NewSecurePassword123
```

NOTE:

The system prompts for the new password interactively. Enter the password when prompted.

LOM factory reset

Restore the BMC to factory default settings. If the **Preserve Configuration (IPMI/network)** option is not enabled in the **Maintenance** → **Preserve configuration** section of the LOM GUI, this operation resets all settings—including LOM network configuration, user accounts, and IPMI web settings—to LOM factory defaults.

Run the following command to reset the LOM to factory default.

```
ipmitool raw 0x32 0x66
```

Reset effect:

- All settings revert to defaults (192.168.1.3/24).
- All passwords reset to the device serial number.
- System Lockdown mode resets to enable, by default.
- SSL certificates reset to self-signed defaults.
- All user configurations and custom settings are erased and restored back to factory defaults.

Post-reset actions:

The BMC automatically restarts after a factory reset. Wait 120 seconds for full initialization, then reconfigure the LOM interface using either GUI or command-line methods.

Remote system power control

The LOM interface provides comprehensive remote power management capabilities for system startup, shutdown, and reset operations.

Power on procedure

Run the following steps to remotely start the system.

1. Pre-startup verification

Before initiating power-on, verify the following conditions:

- Power supplies are connected and operational.
- Network infrastructure is available and stable.
- Environmental conditions are within an acceptable range (temperature, airflow).
- No hardware alerts or critical warnings are active.

2. Access power control

Navigate to the power control interface, **LOM Web UI > Dashboard > Power Control**.

3. Run power on

- a. Select **Power On** from the available power control actions.
- b. Review the confirmation dialog.
- c. Click **Perform Action** to initiate the startup sequence.

4. Monitor startup process

Observe the following indicators during system boot:

- The power LED changes from off to solid green.
- The system completes POST (Power-On Self-Test).
- Network interfaces initialize and link up.
- The operating system loads and becomes accessible.

NOTE:

Use the iKVM console feature to monitor boot progress in real time, if needed.

Graceful shutdown procedure

Perform a graceful operating system shutdown before removing power.

1. Pre-Shutdown verification

Confirm the following conditions before initiating a shutdown:

- No critical operations are in progress.
- All active user sessions are canceled.

- Configuration changes are saved.
- Backup operations are complete.

2. Access power control

Navigate to the power control interface, **LOM Web UI > Dashboard > Power Control**.

3. Initiate ACPI Shutdown

- a. Select **ACPI Shutdown** from the power control actions.
- b. Review the confirmation dialog.
- c. Click **Perform Action** to initiate the graceful shutdown.

The **ACPI Shutdown** option sends a graceful shutdown signal to the operating system, allowing all services to exit.

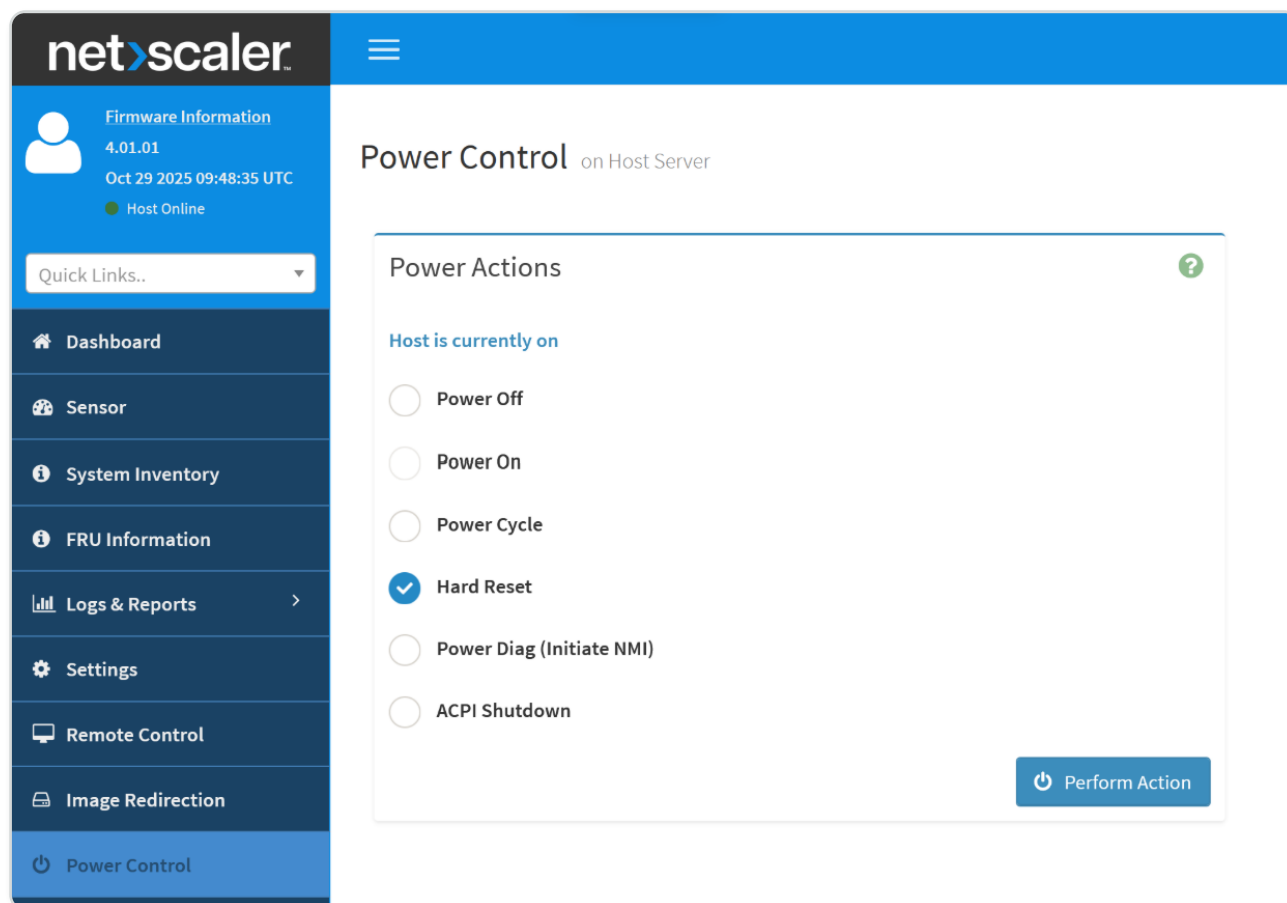
4. Monitor shutdown process

Observe the following indicators during system shutdown:

- The operating system begins the shutdown sequence.
- Network interfaces go offline.
- System services exit gracefully.
- The power LED changes from green to off.

NOTE:

Allow adequate time for a complete shutdown before initiating any power-on operations.



Troubleshooting

Common issues and resolution procedures for LOM initial configuration.

Cannot access the default IP address

Issue: Browser cannot reach `https://192.168.1.3`.

Possible causes:

- The workstation is not configured with the correct IP address.
- Network cable is not connected properly.
- Layer 2 switching issue or VLAN mismatch.
- BMC is not fully initialized after system boot.

Resolution steps:

1. **Verify workstation IP configuration:** Use `ipconfig` (Windows) or `ifconfig/ip addr` (Linux/macOS).
2. **Verify physical cable connection:** Ensure the cable is plugged into the dedicated LOM port.

3. **Check link status:** Verify the LED on the LOM port is active.
4. **Wait for initialization:** Allow up to 5 minutes after system boot for the BMC to initialize.
5. **Direct Connection:** Try a direct crossover cable connection if a switched network issue is suspected.

Login fails with default credentials

Issue: Authentication fails when using `nsroot` and the serial number.

Possible causes:

- Incorrect serial number entry (passwords are case-sensitive).
- The password was previously changed from the default.
- The user account is locked due to multiple failed attempts.

Resolution steps:

1. **Verify serial number:** Check the physical label or device documentation.
2. **Check case-sensitivity:** Ensure the serial number is entered exactly as displayed.
3. **Clear browser data:** Clear the browser cache and cookies, then retry.
4. **Account Lockout:** Wait 15 minutes if the account is locked, then retry.
5. **Factory Reset:** Perform a factory reset if the password is lost and cannot be recovered.

BMC not responding after configuration

Issue: LOM interface becomes inaccessible after applying network changes.

Possible causes:

- An invalid IP address or subnet mask is entered.
- The network gateway is unreachable from the new IP address.
- IP address conflicts with another device on the network.
- BMC requires additional time for initialization.

Resolution steps:

1. **Wait for initialization:** Allow a full 120 seconds for BMC network initialization.

2. **Check for conflicts:** Verify that no other device on the network segment is using the same IP address.
3. **Test connectivity:** Attempt to `ping` the new IP address from a management workstation.
4. **Revert to default:** Try connecting to the original default IP address (`192.168.1.3`) if the new IP address fails.
5. **Factory Reset:** Perform a factory reset if the BMC remains completely inaccessible.

Best practices for LOM configuration and management

Security best practices

Implement the following security measures immediately after the initial LOM configuration to ensure the integrity of the management environment.

Password policy

- **Change default passwords:** Update the default credentials immediately after the first login.
- **Complexity requirements:** Use strong passwords with a minimum of 8 characters.
- **Character variety:** Include a mix of uppercase letters, lowercase letters, numbers, and special characters.
- **Rotation:** Rotate passwords regularly according to your organizational security policy.
- **Uniqueness:** Avoid using common words or device-specific information (such as serial numbers) in passwords.

System lockdown

- **Production readiness:** Enable **System Lockdown** mode in all production environments.
- **Maintenance window:** Disable lockdown only when configuration changes are explicitly required.
- **Re-enablement:** Re-enable lockdown immediately after completing maintenance tasks.

Access logging

- **Audit logging:** Enable audit logging for all administrative actions to maintain a clear history of changes.

- **Regular reviews:** Regularly review access logs for any signs of unauthorized attempts.
- **Alerting:** Implement alerting mechanisms for failed authentication attempts.

SSL/TLS configuration

- **Certificate replacement:** Replace the default LOM self-signed SSL certificate with certificates from a trusted **multi-tier CA root chain**.
- **Chain validation:** Implement proper certificate chain validation.
- **Protocol version:** Use minimum TLS 1.2 protocol.
- **Monitoring:** Configure appropriate monitoring for certificate expiration.

Power control best practices

Follow these guidelines for safe and effective power management:

- **Prioritize graceful shutdowns:** Use graceful shutdown procedures whenever possible to prevent data corruption and service disruption.
- **Observe power cycle delays:** Wait a minimum of 30 seconds between power-off and power-on operations.
- **Maintain documentation:** Document all power control actions in change management or maintenance logs.
- **Schedule operations:** Coordinate all power operations with established maintenance windows to minimize impact.
- **Ensure redundant access:** Maintain alternative access methods (such as serial console or iKVM) while power cycling the system.
- **Verify system state:** Always verify the system's operational state both before and after performing power operations.

Hardware health attributes for the MPX 16000 platform

The following table lists the recommended ranges for the health attributes on the MPX 16000 platform.

Run the `ipmitool sdr list` command from the shell. This command lists the sensory parameters data in detail.

Run the `stat system -detail` command from the CLI. This command lists a subset of the parameters.

HEALTH ATTRIBUTE (SHELL)	HEALTH ATTRIBUTE (CLI)	RECOMMENDED RANGE
CPU1 Temp	CPU 0 Temperature (Celsius)	10–95
CPU2 Temp	CPU 1 Temperature (Celsius)	10–95
PCH Temp	Temperature 1 (Celsius)	10–85
System Temp	Internal Temperature (Celsius)	10–80
Peripheral Temp	Temperature 0 (Celsius)	10–80
Fan 1	CPU Fan 0 Speed (RPM)	1260–8260
Fan 2	CPU Fan 1 Speed (RPM)	1260–8260
Fan 3	System Fan Speed (RPM)	1260–8260
Fan 4	System Fan 1 Speed (RPM)	1260–8260
Fan 5	System Fan 2 Speed (RPM)	1260–8260
Fan 6	Fan 0 Speed (RPM)	1260–8260
12V	+12.0 V Supply Voltage	11.330–12.520

HEALTH ATTRIBUTE (SHELL)	HEALTH ATTRIBUTE (CLI)	RECOMMENDED RANGE
5VCC	+5.0 V Supply Voltage	4.713–5.217
3.3VCC	Main 3.3 V Supply Voltage	3.134–3.464
VBAT	Battery Voltage (Volts)	2.591–3.464
Vcpu1VCCIN	CPU 0 Core Voltage (Volts)	1.616–2.016
Vcpu2VCCIN	CPU 1 Core Voltage (Volts)	1.616–2.016
Vcpu1VDDQABCD	Voltage 0 (Volts)	1.096–1.344
Vcpu1VDDQEFGH	Voltage 1 (Volts)	1.096–1.344
Vcpu2VDDQABCD	Voltage 2 (Volts)	1.096–1.344
Vcpu2VDDQEFGH	Voltage 3 (Volts)	1.096–1.344
5VSB	5V Standby Voltage (Volts)	4.745–5.249
3.3VSB	Standby 3.3 V Supply Voltage	3.117–3.447
1.8V PCH	Voltage 4 (Volts)	1.698–1.883
PS1 Status	Power supply 1 status	not applicable -
PS2 Status	Power supply 2 status	not applicable -

Sample output

The following sections list the different ways to view the system sensor health attributes. The data is a sample representation only. The output from your appliance might be different. For the acceptable ranges, see the previous table.

- From the CLI

- From the shell
- From the LOM GUI

CLI

At the command line, type: `stat system -detail`

```
>stat system -detail
```

NetScaler Executive View

System Information:

Up since Tue Nov 15 13:50:59 2022

Up since(Local) Tue Nov 15 13:50:59 2022

Memory usage (MB) 3562

InUse Memory (%) 6.24

Number of CPUs 9

System Health Statistics (Standard):

CPU 0 Core Voltage (Volts) 1.77

CPU 1 Core Voltage (Volts) 1.77

Main 3.3 V Supply Voltage 3.49

Standby 3.3 V Supply Voltage 3.45

+5.0 V Supply Voltage 5.26

+12.0 V Supply Voltage	12.44
Battery Voltage (Volts)	3.11
Intel CPU Vtt Power(Volts)	0.00
5V Standby Voltage(Volts)	5.04
Voltage Sensor2(Volts)	0.00
CPU Fan 0 Speed (RPM)	3360
CPU Fan 1 Speed (RPM)	3360
System Fan Speed (RPM)	3360
System Fan 1 Speed (RPM)	3360
System Fan 2 Speed (RPM)	3360
CPU 0 Temperature (Celsius)	54
CPU 1 Temperature (Celsius)	53
Internal Temperature (Celsius)	33
Power supply 1 status	NORMAL
Power supply 2 status	NORMAL
Power supply 3 status	NOT SUPPORTED
Power supply 4 status	NOT SUPPORTED
System Disk Statistics:	
/flash Size (MB)	29748
/flash Used (MB)	3927
/flash Available (MB)	23441

/flash Used (%)	14
/var Size (MB)	800856
/var Used (MB)	20127
/var Available (MB)	716660
/var Used (%)	2

System Health Statistics(Auxiliary):

Voltage 0 (Volts)	1.20
Voltage 1 (Volts)	1.20
Voltage 2 (Volts)	1.20
Voltage 3 (Volts)	1.20
Voltage 4 (Volts)	1.88
Voltage 5 (Volts)	0.00
Voltage 6 (Volts)	0.00
Voltage 7 (Volts)	0.00
Fan 0 Speed (RPM)	3360
Fan 1 Speed (RPM)	0
Fan 2 Speed (RPM)	0
Fan 3 Speed (RPM)	0
Temperature 0 (Celsius)	28
Temperature 1 (Celsius)	34
Temperature 2 (Celsius)	0

Temperature 3 (Celsius) 0

Done

>

Shell

At the command line, type: `shell`

```
> shell

root@ns# ipmitool sdr list

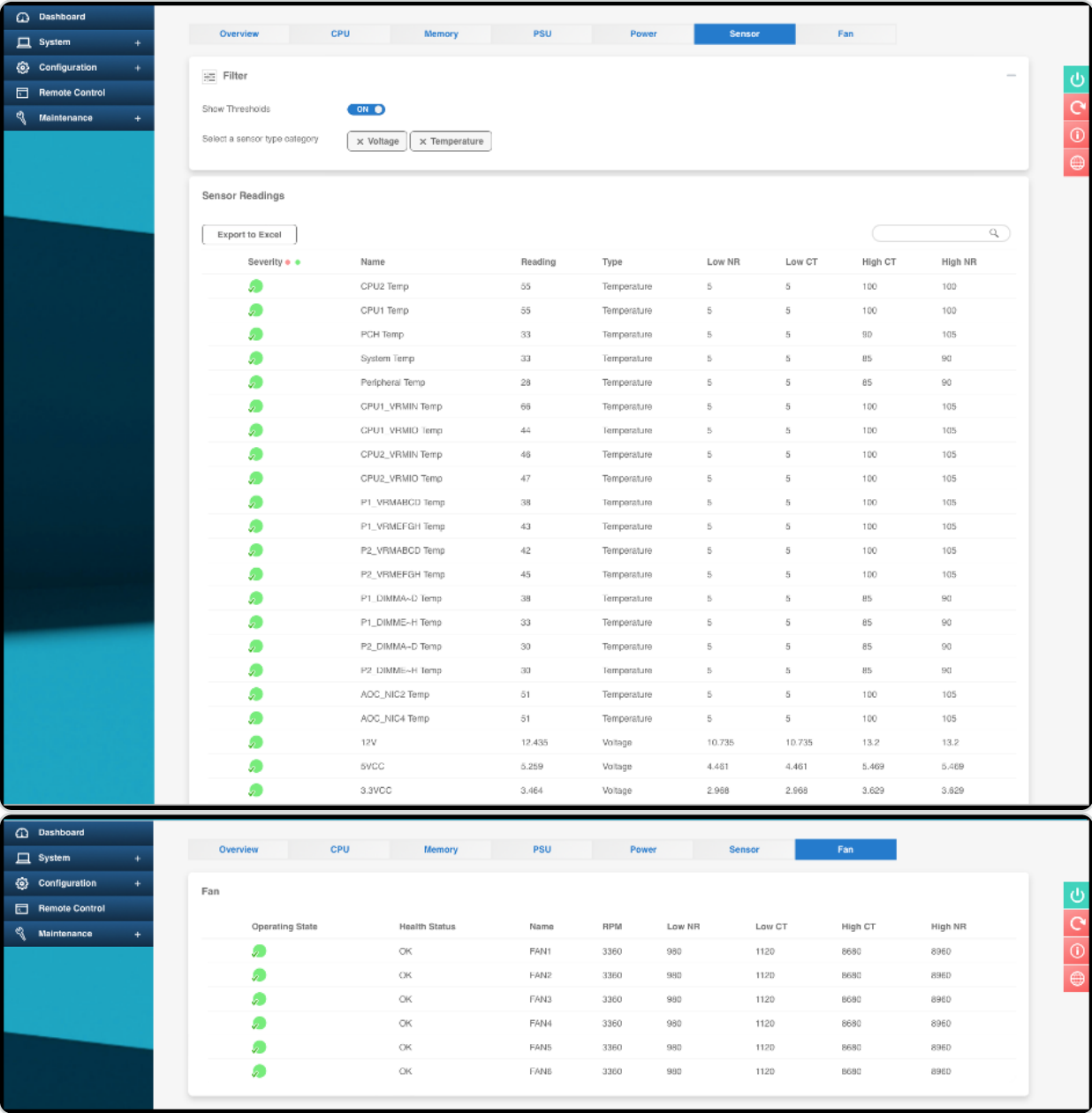
CPU1 Temp      | 54 degrees C      | ok
CPU2 Temp      | 53 degrees C      | ok
PCH Temp       | 34 degrees C      | ok
System Temp    | 33 degrees C      | ok
Peripheral Temp| 28 degrees C      | ok
CPU1_VRMIN Temp| 65 degrees C      | ok
CPU1_VRMIO Temp| 44 degrees C      | ok
CPU2_VRMIN Temp| 46 degrees C      | ok
CPU2_VRMIO Temp| 47 degrees C      | ok
P1_VRMABCD Temp| 38 degrees C      | ok
P1_VRMEFGH Temp| 43 degrees C      | ok
P2_VRMABCD Temp| 42 degrees C      | ok
```

P2_VRMEFGH Temp	45 degrees C	ok
FAN1	3360 RPM	ok
FAN2	3360 RPM	ok
FAN3	3360 RPM	ok
FAN4	3360 RPM	ok
FAN5	3360 RPM	ok
FAN6	3360 RPM	ok
P1_DIMMA~D Temp	38 degrees C	ok
P1_DIMME~H Temp	33 degrees C	ok
P2_DIMMA~D Temp	30 degrees C	ok
P2_DIMME~H Temp	30 degrees C	ok
12V	12.44 Volts	ok
5VCC	5.26 Volts	ok
3.3VCC	3.49 Volts	ok
VBAT	3.11 Volts	ok
Vcpu1VCCIN	1.77 Volts	ok
Vcpu1VCCIO	1.00 Volts	ok
Vcpu2VCCIN	1.77 Volts	ok
Vcpu2VCCIO	1.00 Volts	ok
Vcpu1VDDQABCD	1.20 Volts	ok
Vcpu1VDDQEFGH	1.20 Volts	ok
Vcpu2VDDQABCD	1.20 Volts	ok

```
Vcpu2VDDQEF GH      | 1.20 Volts      | ok
5VSB                  | 5.04 Volts      | ok
3.3VSB                | 3.45 Volts      | ok
2.5V BMC              | 2.56 Volts      | ok
1.8V BMC              | 1.83 Volts      | ok
1.2V BMC              | 1.20 Volts      | ok
1.0V BMC              | 1.02 Volts      | ok
1.8V PCH              | 1.88 Volts      | ok
PVNN PCH              | 1.06 Volts      | ok
1.05V PCH             | 1.06 Volts      | ok
PS1 Status            | 0x01            | ok
PS2 Status            | 0x01            | ok
AOC_NIC2 Temp         | 51 degrees C    | ok
AOC_NIC4 Temp         | 51 degrees C    | ok
root@ns#
```

LOM GUI

1. Log on to the LOM GUI.
2. On the Dashboard, click **Sensor** for temperature and voltage values. Click **Fan** for fan values.



Hardware health attributes for the MPX 9100 platform

The following table lists the recommended ranges for the health attributes on the MPX 9100 platform.

Run the `ipmitool sdr list` command from the shell. This command lists the sensory parameters data in detail.

Run the `stat system -detail` command from the CLI. This command lists a subset of the parameters.

HEALTH ATTRIBUTE (SHELL)	HEALTH ATTRIBUTE (CLI)	RECOMMENDED RANGE
CPU Temp	CPU 0 Temperature (Celsius)	10–95
PCH Temp	Temperature 1 (Celsius)	10–85
System Temp	Internal Temperature (Celsius)	10–80
Peripheral Temp	Temperature 0 (Celsius)	10–80
CPU_VRMIN Temp	• nl -	10–95
VRMABCD Temp	• nl -	10–95
VRMEFGH Temp	• nl -	10–95
DIMMABCD Temp	• nl -	10–80
DIMMEFGH Temp	• nl -	10–80

HEALTH ATTRIBUTE (SHELL)	HEALTH ATTRIBUTE (CLI)	RECOMMENDED RANGE
Fan 1	CPU Fan 0 Speed (RPM)	1260–18060
Fan 2	CPU Fan 1 Speed (RPM)	1260–18060
Fan 3	System Fan Speed (RPM)	1260–18060
Fan 4	System Fan 1 Speed (RPM)	1260–18060
Fan 5	System Fan 2 Speed (RPM)	1260–18060
Fan 6	Fan 0 Speed (RPM)	1260–18060
12V	+12.0 V Supply Voltage	10.704–13.812
5VCC	+5.0 V Supply Voltage	4.466–5.737
3.3VCC	Main 3.3 V Supply Voltage	2.885–3.690
VBAT	Battery Voltage (Volts)	2.591–3.464
5VSB	5V Standby Voltage (Volts)	4.496–5.378
3.3VSB	Standby 3.3 V Supply Voltage	2.954–3.552
1.8V PCH	Voltage 2 (Volts)	1.618–1.943
PVNN PCH	nl -	0.892–1.072
1.05V PCH	nl -	0.915–1.176
2.5V BMC	nl -	2.177–2.804
1.8V BMC	nl -	1.620–1.944
1.2V BMC	nl -	1.074–1.290

HEALTH ATTRIBUTE (SHELL)	HEALTH ATTRIBUTE (CLI)	RECOMMENDED RANGE
1.0V BMC	nl -	0.892–1.072
VcpuVRM	nl -	1.616–1.944
Vcpu	CPU 0 Core Voltage (Volts)	0.931–1.195
VDimmABCD (Volts)	Voltage 0 (Volts)	1.096–1.344
VDimmEFGH (Volts)	Voltage 1 (Volts)	1.096–1.344
PS1 Status	Power supply 1 status	na -
PS2 Status	Power supply 2 status	na -

NOTES

-nl- Parameter not listed in the output of the `stat system -detail` command.

-na- Not applicable.

Sample output

The following sections list the different ways to view the system sensor health attributes. The data is a sample representation only. The output from your appliance might be different. For the acceptable ranges, see the previous table.

- From the CLI
- From the shell
- From the LOM GUI

CLI

At the command line, type: `stat system -detail`

```
>stat system -detail
```

NetScaler Executive View

System Information:

Up since Tue Nov 15 13:50:59 2022

Up since(Local) Tue Nov 15 13:50:59 2022

Memory usage (MB) 3562

InUse Memory (%) 6.24

Number of CPUs 9

System Health Statistics (Standard):

CPU 0 Core Voltage (Volts) 1.07

CPU 1 Core Voltage (Volts) 0.00

Main 3.3 V Supply Voltage 3.32

Standby 3.3 V Supply Voltage 3.39

+5.0 V Supply Voltage 5.12

+12.0 V Supply Voltage 12.38

Battery Voltage (Volts) 3.06

Intel CPU Vtt Power(Volts)	0.00
5V Standby Voltage(Volts)	5.13
Voltage Sensor2(Volts)	0.00
CPU Fan 0 Speed (RPM)	9240
CPU Fan 1 Speed (RPM)	9380
System Fan Speed (RPM)	9380
System Fan 1 Speed (RPM)	9100
System Fan 2 Speed (RPM)	9520
CPU 0 Temperature (Celsius)	58
CPU 1 Temperature (Celsius)	0
Internal Temperature (Celsius)	42
Power supply 1 status	NORMAL
Power supply 2 status	NOT PRESENT
Power supply 3 status	NOT SUPPORTED
Power supply 4 status	NOT SUPPORTED
System Disk Statistics:	
/flash Size (MB)	23801
/flash Used (MB)	3392
/flash Available (MB)	18504
/flash Used (%)	15
/var Size (MB)	341189

/var Used (MB)	12637
/var Available (MB)	301257
/var Used (%)	4

System Health Statistics(Auxiliary):

Voltage 0 (Volts)	1.22
Voltage 1 (Volts)	1.22
Voltage 2 (Volts)	1.85
Voltage 3 (Volts)	0.00
Voltage 4 (Volts)	0.00
Voltage 5 (Volts)	0.00
Voltage 6 (Volts)	0.00
Voltage 7 (Volts)	0.00
Fan 0 Speed (RPM)	9240
Fan 1 Speed (RPM)	0
Fan 2 Speed (RPM)	0
Fan 3 Speed (RPM)	0
Temperature 0 (Celsius)	23
Temperature 1 (Celsius)	33
Temperature 2 (Celsius)	0
Temperature 3 (Celsius)	0

Done

>

Shell

At the command line, type: `shell`

```
> shell

root@ns# ipmitool sdr list

CPU Temp          | 59 degrees C      | ok
PCH Temp          | 32 degrees C      | ok
System Temp       | 42 degrees C      | ok
Peripheral Temp   | 23 degrees C      | ok
CPU_VRMIN Temp    | 51 degrees C      | ok
VRMABCD Temp      | 38 degrees C      | ok
VRMEFGH Temp      | 40 degrees C      | ok
DIMMABCD Temp     | 27 degrees C      | ok
DIMMEFGH Temp     | 30 degrees C      | ok
FAN1              | 9380 RPM          | ok
FAN2              | 9380 RPM          | ok
FAN3              | 9380 RPM          | ok
FAN4              | 9240 RPM          | ok
FAN5              | 9240 RPM          | ok
```

FAN6	9240 RPM	ok
12V	12.38 Volts	ok
5VCC	5.12 Volts	ok
3.3VCC	3.32 Volts	ok
VBAT	3.06 Volts	ok
5VSB	5.13 Volts	ok
3.3VSB	3.39 Volts	ok
1.8V PCH	1.85 Volts	ok
PVNN PCH	1.03 Volts	ok
1.05V PCH	1.06 Volts	ok
2.5V BMC	2.56 Volts	ok
1.8V BMC	1.78 Volts	ok
1.2V BMC	1.18 Volts	ok
1.0V BMC	0.99 Volts	ok
VcpuVRM	1.78 Volts	ok
Vcpu	1.07 Volts	ok
VDimmABCD	1.22 Volts	ok
VDimmEFGH	1.22 Volts	ok
PS1 Status	0x01	ok
PS2 Status	0x00	ok

root@ns#

LOM GUI

1. Log on to the LOM GUI.
2. On the Dashboard, click **Sensor** for temperature and voltage values. Click **Fan** for fan values.

Dashboard

System +

Configuration +

Remote Control

Maintenance +

OverviewCPUMemoryPSUPower

SensorFan

Filter

Show Thresholds

ON

Select a sensor type category

× Voltage

× Temperature

× Battery

Sensor Readings

Export to Excel

Severity	Name	Reading	Type	Low NR	Low CT	High CT	High NR
✓	PCH Temp	35	Temperature	5	5	90	105
✓	CPU Temp	61	Temperature	5	5	100	100
✓	System Temp	43	Temperature	5	5	85	90
✓	Peripheral Temp	25	Temperature	5	5	85	90
✓	CPU_VRMIN Temp	52	Temperature	5	5	100	105
✓	VRMABCD Temp	38	Temperature	5	5	100	105
✓	VRMEFGH Temp	40	Temperature	5	5	100	105
✓	DIMMABCD Temp	31	Temperature	5	5	85	90
✓	DIMMEFGH Temp	33	Temperature	5	5	85	90

Dashboard

System +

Configuration +

Remote Control

Maintenance +

OverviewCPUMemoryPSUPower

SensorFan

Fan

Operating State	Health Status	Name	RPM	Low NR	Low CT	High CT	High NR
✓	OK	FAN1	9240	980	1120	19740	21560
✓	OK	FAN2	9380	980	1120	19740	21560
✓	OK	FAN3	9380	980	1120	19740	21560
✓	OK	FAN4	9100	980	1120	19740	21560
✓	OK	FAN5	9100	980	1120	19740	21560
✓	OK	FAN6	9240	980	1120	19740	21560

Legacy hardware health attributes

Operating ranges for NetScaler hardware platforms vary for different attributes.

Note

Use the `stat system -detail` command to display the current values of the attributes.

Health attributes for the MPX 5900 platform

The following table lists the health attributes for the MPX 5900 platform.

HEALTH ATTRIBUTE	RECOMMENDED RANGE
CPU 0 Temperature (Celsius)	0 to 87
Temperature 1 (Celsius) under Auxiliary	-5 to 90
Internal Temperature (Celsius)	-5 to 80
Temperature 0 (Celsius) under Auxiliary	-5 to 80
CPU Fan 0 Speed (RPM)	1260–18060
CPU Fan 1 Speed (RPM)	1260–18060
System Fan Speed (RPM)	1260–18060
System Fan 1 Speed (RPM)	1260–18060
System Fan 2 Speed (RPM)	1260–18060
Fan 0 Speed (RPM) under Auxiliary	1260–18060
+12.0 V Supply Voltage (Volts)	10.74 to 12.945

HEALTH ATTRIBUTE	RECOMMENDED RANGE
+5.0 V Supply Voltage (Volts)	4.48 to 5.39
Main 3.3 V Supply Voltage (Volts)	2.959 to 3.554
Battery Voltage (Volts)	2.599 to 3.775
CPU 0 Core Voltage (Volts)	1.395 to 1.899
Voltage 0 (Volts) under Auxiliary	1.047 to 1.344
Voltage 1 (Volts) under Auxiliary	1.047 to 1.344
5 V Standby Voltage(Volts)	4.48 to 5.39
Standby 3.3 V Supply Voltage (Volts)	2.959 to 3.544
Power Supply 1 Status	NORMAL
Power Supply 2 Status	NOT PRESENT–NORMAL

Health attributes for the MPX 8900 platform

The following table lists the health attributes for the MPX 8900 platform.

HEALTH ATTRIBUTE	RECOMMENDED RANGE
CPU 0 core (Volts)	1.395 to 1.899
Main 3.3 V Supply (Volts)	2.959 to 3.554
Standby 3.3 V Supply (Volts)	2.959 to 3.554
+5.0 V Supply (Volts)	4.48 to 5.39
+12.0 V Supply (Volts)	10.74 to 12.945
Battery (Volts)	2.599 to 3.775

HEALTH ATTRIBUTE	RECOMMENDED RANGE
5 V Standby (Volts)	4.48 to 5.39
CPU Fan 0 Speed (RPM)	1260–18060
CPU Fan 1 Speed (RPM)	1260–18060
System Fan Speed (RPM)	1260–18060
System Fan 1 Speed (RPM)	1260–18060
System Fan 2 Speed (RPM)	1260–18060
CPU 0 Temperature (Celsius)	0 to 87
Internal Temperature (Celsius)	-5 to 80
Power Supply 1 Status	NORMAL
Power Supply 2 Status	NOT PRESENT–NORMAL

Health attributes for the MPX 15000 and MPX 26000 platforms

The following table lists the health attributes for the MPX 15000 and MPX 26000 platforms.

HEALTH ATTRIBUTE	UNIT	MINIMUM VALUE	NOMINAL VALUE	MAXIMUM VALUE
CPU 0 Core Voltage	Volt	1.47	1.82	1.835
CPU 1 Core Voltage	Volt	1.47	1.82	1.835
3_3VCC	Volt	3.12	3.30	3.48
3_3VSB	Volt	3.12	3.30	3.48

HEALTH ATTRIBUTE	UNIT	MINIMUM VALUE	NOMINAL VALUE	MAXIMUM VALUE
5VCC	Volt	4.72	5.00	5.28
p12V	Volt	11.33	12.00	12.67
VBAT	Volt	2.75	3.00	3.200
Vtt	-NA-	-NA-	-NA-	-NA-
5VSB	Volt	4.72	5.00	5.28
Voltage Sensor 2	-NA-	-NA-	-NA-	-NA-
CPU Fan 0 Speed	RPM	1260	-NA-	18060
CPU Fan 1 Speed	RPM	1260	-NA-	18060
System Fan Speed	RPM	1260	-NA-	18060
System Fan 1 Speed	RPM	1260	-NA-	18060
System Fan 2 Speed	RPM	1260	-NA-	18060
Fan 0 Speed	RPM	1260	-NA-	18060
CPU 0 Temp	Celsius	0	-NA-	85
CPU 1 Temp	Celsius	0	-NA-	85
Internal Temp	Celsius	0	-NA-	80

Health attributes for the MPX 14000 platform

The following table lists the health attributes for the MPX 14000 platform.

HEALTH ATTRIBUTE	RECOMMENDED RANGE
CPU 0 core (Volts)	0.85–0.91
CPU 1 core Volt	0.85–0.93
Main 3.3 V Supply (Volts)	3.31–3.36
Standby 3.3 V Supply (Volts)	3.26–3.31
+5.0 V Supply (Volts)	4.99–5.06
+12.0 V Supply (Volts)	11.98–12.08
Battery Voltage	3.02–3.12
Internal CPU Vtt Power	0.99–1.01
CPU Fan 0 Speed (RPM)	1260–18060
CPU Fan 1 Speed (RPM)	1260–18060
System Fan Speed (RPM)	1260–18060
System Fan 1 Speed (RPM)	1260–18060
System Fan 2 Speed (RPM)	1260–18060
CPU 0 Temperature (Celsius)	0–79
CPU 1 Temperature (Celsius)	0–79
Internal Temperature (Celsius)	0–80
Power Supply 1 Status	NORMAL
Power Supply 2 Status	NORMAL

Health attributes for the MPX 22040 platform

The following table lists the health attributes for the MPX 22040 platform.

HEALTH ATTRIBUTE	UNIT	LOWER NON-RECOVERABLE	LOWER CRITICAL	LOWER NON-CRITICAL	UPPER NON-CRITICAL	UPPER CRITICAL	UPPER NON-RECOVERABLE
CPU1 Temp	degrees C	0.000	0.000	0.000	90.000	93.000	95.000
CPU2 Temp	degrees C	0.000	0.000	0.000	90.000	93.000	95.000
System Temp	degrees C	-9.000	-7.000	-5.000	80.000	85.000	90.000
Peripheral Temp	degrees C	-9.000	-7.000	-5.000	80.000	85.000	90.000
PCH Temp	degrees C	-11.000	-8.000	-5.000	90.000	95.000	100.000
FPC_Temp 1	degrees C	• NA -	• NA -	• NA -	66.000	70.000	75.000
FPC_Temp 2	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000
FPC_Temp 3	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000

HEALTH ATTRIBUTE	UNIT	LOWER NON-RECOVERABLE	LOWER CRITICAL	LOWER NON-CRITICAL	UPPER NON-CRITICAL	UPPER CRITICAL	UPPER NON-RECOVERABLE
HDDBP_Temp 1	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000
HDDBP_Temp 2	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000
FAN 1	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 2	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 3	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 4	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 5	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 6	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 7	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -

HEALTH ATTRIBUTE	UNIT	LOWER NON-RECOVERABLE	LOWER CRITICAL	LOWER NON-CRITICAL	UPPER NON-CRITICAL	UPPER CRITICAL	UPPER NON-RECOVERABLE
FAN 8	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
PS_1 Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_1 FAN	RPM	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_1 Temp	degrees C	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_2 Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_2 FAN	RPM	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_2 Temp	degrees C	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_3 Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_3 FAN	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -

HEALTH ATTRIBUTE	UNIT	LOWER NON-RECOVERABLE	LOWER CRITICAL	LOWER NON-CRITICAL	UPPER NON-CRITICAL	UPPER CRITICAL	UPPER NON-RECOVERABLE
PS_3 Temp	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000
PS_4 Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_4 FAN	RPM	• NA -	1980.000	• NA -	• NA -	• NA -	• NA -
PS_4 Temp	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000
FPC Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
VTT	Volts	0.816	0.864	0.912	1.344	1.392	1.440
CPU1 Vcore	Volts	0.480	0.512	0.544	1.488	1.520	1.552
CPU2 Vcore	Volts	0.480	0.512	0.544	1.488	1.520	1.552
VDIMM AB	Volts	1.104	1.152	1.200	1.648	1.696	1.744
VDIMM CD	Volts	1.104	1.152	1.200	1.648	1.696	1.744
VDIMM EF	Volts	1.104	1.152	1.200	1.648	1.696	1.744

HEALTH ATTRIBUTE	UNIT	LOWER NON-RECOVERABLE	LOWER CRITICAL	LOWER NON-CRITICAL	UPPER NON-CRITICAL	UPPER CRITICAL	UPPER NON-RECOVERABLE
VDIMM GH	Volts	1.104	1.152	1.200	1.648	1.696	1.744
+1.5 V	Volts	1.248	1.296	1.344	1.648	1.696	1.744
3.3 V	Volts	2.640	2.784	2.928	3.648	3.792	3.936
+3.3VSB	Volts	2.640	2.784	2.928	3.648	3.792	3.936
5 V	Volts	4.096	4.288	4.480	5.504	5.696	6.912
12 V	Volts	10.176	10.494	10.812	13.250	13.568	13.886
VBAT	Volts	2.400	2.544	2.688	3.312	3.456	3.600

Health attributes for MPX 24100 platform

The following table lists the health attributes for MPX 24100/24150.

HEALTH ATTRIBUTE	UNIT	LOWER NON-RECOVERABLE	LOWER CRITICAL	LOWER NON-CRITICAL	UPPER NON-CRITICAL	UPPER CRITICAL	UPPER NON-RECOVERABLE
CPU1 Temp	degrees C	0.000	0.000	0.000	90.000	93.000	95.000
CPU2 Temp	degrees C	0.000	0.000	0.000	90.000	93.000	95.000
System Temp	degrees C	-9.000	-7.000	-5.000	80.000	85.000	90.000

HEALTH ATTRIBUTE	UNIT	LOWER NON-RECOVERABLE	LOWER CRITICAL	LOWER NON-CRITICAL	UPPER NON-CRITICAL	UPPER CRITICAL	UPPER NON-RECOVERABLE
Peripheral Temp	degrees C	-9.000	-7.000	-5.000	80.000	85.000	90.000
PCH Temp	degrees C	-11.000	-8.000	-5.000	90.000	95.000	100.000
FPC_Temp 1	degrees C	• NA -	• NA -	• NA -	66.000	70.000	75.000
FPC_Temp 2	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000
FPC_Temp 3	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000
HDDBP_Temp 1	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000
HDDBP_Temp 2	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000
FAN 1	RPM	• NA -	1980.000	• NA -	• NA -	• NA -	• NA -
FAN 2	RPM	• NA -	1980.000	• NA -	• NA -	• NA -	• NA -

HEALTH ATTRIBUTE	UNIT	LOWER NON- RECOVERABLE	LOWER CRITICAL	LOWER NON- CRITICAL	UPPER NON- CRITICAL	UPPER CRITICAL	UPPER NON- RECOVERABLE
FAN 3	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 4	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 5	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 6	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 7	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
FAN 8	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
PS_1 Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_1 FAN	RPM	• NA -	1980.00 0	• NA -	• NA -	• NA -	• NA -
PS_1 Temp	degrees C	• NA -	• NA -	• NA -	72.000	76.000	82.000

HEALTH ATTRIBUTE	UNIT	LOWER NON-RECOVERABLE	LOWER CRITICAL	LOWER NON-CRITICAL	UPPER NON-CRITICAL	UPPER CRITICAL	UPPER NON-RECOVERABLE
PS_2 Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_2 FAN	RPM	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_2 Temp	degrees C	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_3 Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_3 FAN	RPM	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_3 Temp	degrees C	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_4 Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_4 FAN	RPM	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
PS_4 Temp	degrees C	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -

HEALTH ATTRIBUTE	UNIT	LOWER NON- RECOVERABLE	LOWER CRITICAL	LOWER NON- CRITICAL	UPPER NON- CRITICAL	UPPER CRITICAL	UPPER NON- RECOVERABLE
FPC Status	discrete	• NA -	• NA -	• NA -	• NA -	• NA -	• NA -
VTT	Volts	0.816	0.864	0.912	1.344	1.392	1.440
CPU1 Vcore	Volts	0.480	0.512	0.544	1.488	1.520	1.552
CPU2 Vcore	Volts	0.480	0.512	0.544	1.488	1.520	1.552
VDIMM AB	Volts	1.104	1.152	1.200	1.648	1.696	1.744
VDIMM CD	Volts	1.104	1.152	1.200	1.648	1.696	1.744
VDIMM EF	Volts	1.104	1.152	1.200	1.648	1.696	1.744
VDIMM GH	Volts	1.104	1.152	1.200	1.648	1.696	1.744
+1.5 V	Volts	1.248	1.296	1.344	1.648	1.696	1.744
3.3 V	Volts	2.640	2.784	2.928	3.648	3.792	3.936
+3.3VSB	Volts	2.640	2.784	2.928	3.648	3.792	3.936
5 V	Volts	4.096	4.288	4.480	5.504	5.696	6.912
12 V	Volts	10.176	10.494	10.812	13.250	13.568	13.886
VBAT	Volts	2.400	2.544	2.688	3.312	3.456	3.600

Configure the ring size on Mellanox and Fortville interfaces

NetScaler platforms support Mellanox and Fortville interfaces. The ring size on these interfaces is configurable. A higher ring size reduces the packet drops when there is a sudden burst in traffic.

Prerequisite

The interface for which you're configuring the ring size must be UP when applying these changes.

Configure the ring size on Mellanox NICs

NOTE:

This feature is available in release 14.1 build 21.x and later.

50 G and 100 G interfaces on NetScaler platforms are Mellanox NICs. The following platforms contain Mellanox NICs:

- MPX 9100
- MPX 15000-50G
- MPX 15000-50G FIPS certified appliance
- MPX 16000
- MPX 26000
- MPX 26000-50S
- MPX 26000-100G
- MPX 26000T-100G

The maximum ring size that you can set on a Mellanox interface is 16384 bits. Only the fixed ring type is supported. You must do a full reboot of the appliance for the settings to take effect.

To set the ring size on a Mellanox NIC

At the command prompt, type:

```
set interface <id> [-ringsize <positive_integer>] [-ringtype ( Elastic |
Fixed )]
```

Example:

```
>set int 100/1 ringsize 16384 ringtype fixed
```

```
>reboot
```

```
> sh int 100/1
```

```
1)      Interface 100/1 (100G Ethernet, CR4, 100 Gbit) #2

      flags=0xc020 <ENABLED, UP, UP, autoneg, HAMON, HEARTBEAT, 802.1q>

      MTU=1500, native vlan=1, MAC=0c:42:a1:eb:f3:a3, uptime 101h45m50s

      Requested: media AUTO, speed AUTO, duplex AUTO, fctl OFF,

                  throughput 0

      Actual: media UTP, speed 100000, duplex FULL, fctl OFF, throughput
100000

      LLDP Mode: NONE,                  LR Priority: 1024

      RX: Pkts(205951) Bytes(15819732) Errs(0) Drops(204858) Stalls(0)

      TX: Pkts(720) Bytes(828600) Errs(0) Drops(0) Stalls(0)
```

```
NIC: InDisc(0) OutDisc(0) Fctls(0) Stalls(0) Hangs(0) Muted(0)
```

```
Bandwidth thresholds are not set.
```

```
Rx Ring: Configured size=16384, Actual size=16384, Type: Fixed
```

To unset the ring size on a Mellanox NIC

You cannot unset the ring size on a Mellanox NIC. You must set it to the default value.

Example:

```
>set int 100/1 ringsize 2048 ringtype fixed
```

```
>reboot
```

```
> sh int 100/1
```

```
1)      Interface 100/1 (100G Ethernet, CR4, 100 Gbit) #2
```

```
flags=0xc020 <ENABLED, UP, UP, autoneg, HAMON, HEARTBEAT, 802.1q>
```

```
MTU=1500, native vlan=1, MAC=0c:42:a1:eb:f3:a3, uptime 101h45m50s
```

```
Requested: media AUTO, speed AUTO, duplex AUTO, fctl OFF,
```

```
          throughput 0
```

```
Actual: media UTP, speed 100000, duplex FULL, fctl OFF, throughput
100000
```

```
LLDP Mode: NONE,
```

```
LR Priority: 1024
```

```
RX: Pkts(205951) Bytes(15819732) Errs(0) Drops(204858) Stalls(0)
```

```
TX: Pkts(720) Bytes(828600) Errs(0) Drops(0) Stalls(0)
```

```
NIC: InDisc(0) OutDisc(0) Fctls(0) Stalls(0) Hangs(0) Muted(0)
```

```
Bandwidth thresholds are not set.
```

```
Rx Ring: Configured size=2048, Actual size=2048, Type: Fixed
```

Configure the ring size on Fortville NICs

NOTE:

This feature is available in release 13.0 build 90.x and later.

10 G, 25 G, and 40 G interfaces on NetScaler platforms are Fortville interfaces. The following MPX appliances and corresponding zero-capacity appliances contain Fortville NICs:

- MPX 8900
- MPX 8900 FIPS certified appliance
- MPX 9100
- MPX 14000-40C
- MPX 14000-40S
- MPX 14000-40G
- MPX 15000
- MPX 15000-50G
- MPX 15000-50G FIPS certified appliance
- MPX 16000
- MPX 25000-40G
- MPX 25000T
- MPX 25000TA
- MPX 25000-40G
- MPX 26000

- MPX 26000-50S

The maximum ring size that you can set on a Fortville interface is 4096 bits. You can set the ring type as fixed or elastic. An elastic ring type allows the interface to accept a burst in traffic.

Prerequisite

Interface must be UP when applying these changes.

To set the ring size on a Fortville NIC

At the command prompt, type:

```
set interface <id> [-ringsize <positive_integer>] [-ringtype ( Elastic | Fixed )]
```

Example:

```
> set int 25/1 ringsize 4096 ringtype elastic
```

```
Done
```

```
> sh int 25/1
```

```
1)      Interface 25/1 (25G Ethernet, CR, 25 Gbit) #8
```

```
flags=0xc020 <ENABLED, UP, UP, autoneg, HAMON, HEARTBEAT, 802.1q>
```

```
MTU=1500, native vlan=1, MAC=00:e0:ed:dc:11:bf, uptime 101h17m10s
```

```
Requested: media AUTO, speed AUTO, duplex AUTO, fctl OFF,
```

```
throughput 0
```

```
Actual: media UTP, speed 25000, duplex FULL, fctl OFF, throughput  
25000
```


LLDP Mode: NONE, LR Priority: 1024

RX: Pkts(257620) Bytes(21778920) Errs(0) Drops(186380) Stalls(0)

TX: Pkts(417) Bytes(17514) Errs(0) Drops(0) Stalls(0)

NIC: InDisc(0) OutDisc(0) Fctls(0) Stalls(0) Hangs(0) Muted(0)

Bandwidth thresholds are not set.

Rx Ring: Configured size=4096, Actual size=512, Type: Elastic

Done

> set int 25/1 ringsize 4096 ringtype fixed

Done

> sh int 25/1

1) Interface 25/1 (25G Ethernet, CR, 25 Gbit) #8

flags=0xc020 <ENABLED, UP, UP, autoneg, HAMON, HEARTBEAT, 802.1q>

MTU=1500, native vlan=1, MAC=00:e0:ed:dc:11:bf, uptime 101h17m10s

Requested: media AUTO, speed AUTO, duplex AUTO, fctl OFF,

throughput 0

Actual: media UTP, speed 25000, duplex FULL, fctl OFF, throughput
25000

LLDP Mode: NONE, LR Priority: 1024

```
RX: Pkts(257620) Bytes(21778920) Errs(0) Drops(186380) Stalls(0)
```

```
TX: Pkts(417) Bytes(17514) Errs(0) Drops(0) Stalls(0)
```

```
NIC: InDisc(0) OutDisc(0) Fctls(0) Stalls(0) Hangs(0) Muted(0)
```

Bandwidth thresholds are not set.

```
Rx Ring: Configured size=4096, Actual size=4096, Type: Fixed
```

Done

To unset the ring size on a Fortville NIC

At the command prompt, type:

```
unset interface <id> ringsize ringtype
```

Example:

```
> unset int 25/1 ringsize ringtype
```

Done

```
> sh int 25/1
```

```
1)      Interface 25/1 (25G Ethernet, CR, 25 Gbit) #7
```

```
flags=0xc020 <ENABLED, UP, UP, autoneg, HAMON, HEARTBEAT, 802.1q>
```

```
MTU=1500, native vlan=1, MAC=00:e0:ed:dc:11:be, uptime 0h00m02s
```

```
Requested: media AUTO, speed AUTO, duplex AUTO, fctl OFF,
```

throughput 0

Actual: media UTP, speed 25000, duplex FULL, fctl OFF, throughput
25000

LLDP Mode: NONE,

LR Priority: 1024

RX: Pkts(11560) Bytes(971823) Errs(0) Drops(8330) Stalls(0)

TX: Pkts(69) Bytes(2898) Errs(0) Drops(0) Stalls(0)

NIC: InDisc(0) OutDisc(0) Fctls(0) Stalls(0) Hangs(0) Muted(0)

Bandwidth thresholds are not set.

Rx Ring: Configured size=2048, Actual size=512, Type: Elastic

Done

>

Fortville NICs firmware upgrade on NetScaler MPX appliances

NOTE

Firmware version 8.70 is supported on software version 13.1 and later. The default firmware version is 7.00. To upgrade to firmware version 8.70, run the following commands:

```
shell

cd /netscaler

sh upgrade_fortville_nics.sh 8.70
```

Upgrade the firmware on NetScaler MPX appliances containing Fortville NICs to remediate <https://support.citrix.com/article/CTX263807>.

Prerequisites

1. Before upgrading the NIC firmware to version 7.00, you must upgrade the NetScaler MPX appliance to a software version that supports the new firmware. The following versions support firmware version 7.00.

- 11.1 build 64.x and later
- 12.1 build 56.x and later
- 13.0 build 58.x and later

Important: Do not downgrade the software version to a build earlier to these builds.

2. The following script must be present in the `/netscaler` directory:

```
upgrade_fortville_nics.sh
```

If the script is not present, the installed ADC software image does not support the firmware upgrade.

3. The following scripts must be present in the `/var/tmp/Fortville_Silicom_Intel/` scripts directory:

- `fortville_fw_update`
- `fortville_fw_update_intel_1`
- `fortville_fw_update_silicom_1`
- `fortville_fw_update_state_machine`
- `fortville_fw_update_subr`

If these scripts are not present, at the command prompt, run `installns` to install these files. The files are included with all ADC software that supports this firmware upgrade.

Supported Platforms

The firmware upgrade scripts are supported on all NetScaler MPX platforms containing Fortville NICs. The scripts verify if the appliance contains Fortville NICs and exit if none is found.

Note: These firmware upgrade scripts are not supported on the NetScaler SDX platform.

The following MPX appliances and corresponding zero-capacity appliances contain Fortville NICs:

- MPX 8900
- MPX 8900 FIPS certified appliance
- MPX 9100
- MPX 14000-40C
- MPX 14000-40S
- MPX 14000-40G
- MPX 15000
- MPX 15000-50G
- MPX 15000-50G FIPS certified appliance
- MPX 16000
- MPX 25000-40G

- MPX 25000T
- MPX 25000TA
- MPX 25000-40G
- MPX 26000
- MPX 26000-50S
- T1300
- T1310

Upgrade the firmware

Important:

- The upgrade script takes the appliance off the network. The time taken to complete the offline NIC firmware upgrade varies by platform. For example, on an MPX 14000 platform with 6 Fortville NICs, the total time to upgrade is around 30 min.
- After updating the firmware, ensure that the software version on the appliance supports the new firmware.

The firmware upgrade scripts upgrade the NIC firmware to version 7.00. This upgrade is performed on Fortville 10G and 40G NICs manufactured by Silicom or Intel, and Fortville 25G NICs manufactured by Silicom.

Notes:

- After updating the firmware version on the NIC to 7.00 you cannot downgrade the NIC to an earlier version.
- Upgrading some Fortville NICs might take multiple attempts. For example, updating some NICs to firmware version 7.00 might take up to three attempts.

To upgrade the firmware, at the command prompt type:

```
> shell  
  
root@ns# cd /netscaler
```

```
root@ns# sh upgrade_fortville_nics.sh
```

By default, the firmware is upgraded to version 7.00.

Post upgrade

After `fortville_fw_update_state_machine` has run, it deletes the `/nsconfig/.developer` and `/nsconfig/rc.local` files and exits.

- By deleting the `/nsconfig/.developer` file, the NetScaler software comes up on reboot.
- By deleting the `/nsconfig/rc.local` file the `fortville_fw_update_state_machine` script is not invoked on reboot.

After reboot, NetScaler software is up and the firmware upgrade process is complete.

After firmware upgrade, the log file `upgrade_fortville_nic_fw.log` in the `/var/log` directory, contains a detailed record of the firmware upgrade activities. Among other information, it records the duration of the firmware update process.

Also, the file `.fortville_firmware_upgrade_parm_file`, in the directory `/var/tmp/Fortville_Silicom_Intel/scripts`, is not deleted. You can examine it for information about the firmware upgrade.

The `fortville_nic_info` script can be invoked to print an informational summary about the Fortville NICs in the host ADC appliance. The information is recorded in the log file.

To run the script, at the command prompt, type:

```
> shell

root@ns# cd /var/tmp/Fortville_Silicom_Intel/scripts

root@ns# sh fortville_nic_info
```

Mellanox NIC firmware upgrade on NetScaler MPX

NOTE

Firmware upgrade on Mellanox NICs is supported on NetScaler software version 13.0 build 90.x and later.

You must run the upgrade script from the console. Otherwise, you get the following message:

```
The NIC firmware upgrade process will disable all NIC ports during the upgrade.
```

```
All active SSH sessions will be terminated, including this one.
```

```
This NIC upgrade must be run while logged in from the serial console
```

```
Please restart the upgrade from the serial console.
```

To upgrade the firmware, run the following commands:

```
shell

cd /netscaler

sh upgrade_mellanox_nics.sh <firmware_version>
```

Supported versions of Mellanox firmware on different 50 G and 100 G NICs are:

- 12.20.1010
- 12.21.2010
- 12.28.2006

- 20.27.2008
- 20.31.1014
- 20.32.1010
- 22.32.2004
- 22.34.4000
- 22.35.1012

Example:

```
sh upgrade_mellanox_nic.sh 22.35.1012
```

To force an upgrade, type:

```
sh upgrade_mellanox_nic.sh 22.35.1012 -f
```

Prerequisites

1. Before upgrading the NIC firmware, you must upgrade the build on NetScaler MPX to a software version that supports the new firmware. The following NetScaler versions support Mellanox firmware upgrade:

- 13.0 build 90.x and later
- 13.1 all builds
- 14.1 all builds

IMPORTANT:

Do not downgrade the software version to a build earlier than these builds.

2. The following script must be present in the `/netscaler` directory:
`upgrade_mellanox_nic.sh` If the script is not present, the installed NetScaler software image does not support the firmware upgrade.
3. The following scripts must be present in the `/var/tmp/Mellanox/scripts` directory:
 - `mellanox_fw_update_pwr_cycle_mgr`
 - `mellanox_fw_update_subr`

- `mellanox_fw_update_state_machine`
- `mellanox_nic_info`

If these scripts are not present, at the command prompt, run `installns` to install these files. The files are included with all NetScaler software that supports this firmware upgrade.

Supported platforms

Note: The Mellanox firmware upgrade script is not supported on NetScaler SDX.

The following platforms contain Mellanox NICs:

- MPX 9100
- MPX 15000-50G
- MPX 15000-50G FIPS certified appliance
- MPX 16000
- MPX 26000
- MPX 26000-50S
- MPX 26000-100G
- MPX 26000T-100G

Upgrade the firmware

IMPORTANT:

The upgrade script takes the appliance off the network. The time taken to complete the offline NIC firmware upgrade varies by platform. For example, on an MPX 26000 platform with 8 Mellanox NICs, the upgrade can take up to an hour.

This upgrade is performed only on Mellanox 50 G and 100 G NICs.

You can check the current firmware version by running the following command at the shell prompt.

```
> shell

root@ns# cd /var/nslog/

root@ns# vi dmesg.boot
```

Look for an entry similar to the following

```
...

mce0: INFO: firmware version: 12.28.2006

...
```

Post upgrade

After `upgrade_mellanox_nic.sh` has run, it deletes the `/nsconfig/.developer` and `/nsconfig/rc.local` files and exits. By deleting the `/nsconfig/.developer` file, NetScaler comes up on reboot.

After reboot, NetScaler is up and the firmware upgrade process is complete.

After firmware upgrade, the log file `mellanoxFw.log` in the `/var/log` directory, contains a detailed record of the firmware upgrade activities. Among other information, it records the duration of the firmware update process.

Run the `mellanox_nic_info` script to print an informational summary about the Mellanox NICs in the host NetScaler. The information is recorded in the log file.

To run the script, at the command prompt, type:

```
> shell

>root@ns# cd /var/tmp/Mellanox/scripts
```

```
>root@ns# sh mellanox_nic_info
```

```
>>> =====
```

```
>>> Invoking mellanox_nic_info informational script Mon Apr  1 09:57:48
UTC 2024
```

```
>>> NetScaler has at least one Mellanox NIC
```

mce#	NS if#	FW ver	PCI DBSF	PSID	Name
Type					
-----	-----	-----	-----	-----	-----

mce0 (100/2)		20.32.1010	pci0:138:0:0	MT_00000000224	MCX653106A-ECA_Ax
CX_6					

Wiping the data from your NetScaler®

There are two scenarios when you are likely to wipe the data from your NetScaler:

- You are decommissioning or returning the NetScaler and want to remove all of your configuration and files before you return it.
- You are redeploying the NetScaler and want to start with a factory default configuration.

The configuration-wipe scripts remove all customer proprietary information from a NetScaler.

Caution: Running these scripts is dangerous. If something goes wrong during execution, the NetScaler might be rendered unbootable, and we might have to reinstall the software image. The config wipe scripts remove everything on the box, including licenses, configuration, images, and scripts and the configuration is not preserved without a valid backup. Run these scripts only after understanding the consequences. We recommend that you reach out to NetScaler support and open a support case to engage the relevant team.

Points to note

1. The new configuration-wipe scripts are distributed in the official NetScaler software bundle. For example, the tar file for 14.1-4.42 (build-14.1-4.42_nc_64.tgz) contains the scripts.
2. The scripts in the recovery folder (`/flash/.recovery`) must be replaced with these scripts before running the command to wipe out the data.

IMPORTANT!

If the `/flash/.recovery` folder does not exist, the SSD must be replaced.

3. Ensure that the config wipe scripts match the build number. For example, if you plan to upgrade to 14.1-4.42, download the scripts for this build.
4. The number in the script is the date and not the software version. That is, `config_wipe_01_10_23.tgz` refers to 10 January 2023. If you see multiple files in the installation package, use the file with the later date.

5. Run the config wipe script only after upgrading to the matching build.

Supported Platforms

The script is supported on all NetScaler MPX appliances. The script is not supported on NetScaler SDX appliances.

Commands to wipe the config

1. Create a folder for the build, download the tarball, and extract the contents into this folder. The following code sample is for the 14.1-4.42 build. At the command line, type:

```
> shell

root@ns# mkdir -p /var/nsinstall/14.1-4.42

root@ns# cd /var/nsinstall/14.1-4.42/

root@ns# pwd

/var/nsinstall/14.1-4.42

root@ns# tar xvzf /var/build-14.1-4.42_nc_64.tgz

x .ns.version
```

```
x OTP_tool.tgz

x installns

x invalid_config_check_files.tgz

x nsconfig

x skf

x schema.json

x licserververify

x reference_schema.json

x bootloader.tgz

x python.tgz
```

2. Verify that the scripts are part of the tarball. At the command line, type:

```
> shell

root@ns# ls -l config_wipe*

-rw-r--r--  1 root  1001  136782 Jul 26 04:29 config_wipe_01_10_23.tgz
```

3. Run `installns` to install the fresh build.
4. Reboot the NetScaler.
5. Switch to the `/flash/.recovery` folder and extract the contents. If the folder does not exist, the SSD must be replaced.

```
root@ns# cd /flash/.recovery

root@ns# tar xvzf /var/nsinstall/14.1-4.42/config_wipe_01_10_23.tgz

x rc.conf_wipe_subr

x rc.disk_wipe_and_reset

x rc.flash_wipe_recover

x rc.local_disk_wipe_2

x rc.local_flash_wipe_1
```



```
x rc.main_disk_wipe

x rc.main_flash_wipe

x rc.system_wipe_and_reset

x loader

x .new_loader_version

root@ns#
```

6. Wipe the configuration. At the shell prompt, type:

```
sh rc.system_wipe_and_reset
```

Two optional parameters are available to zero the flash and the disk one or more times.

```
sh rc.system_wipe_and_reset [num_flash_loops [num_disk_loops]]
```

Parameters:

num_flash_loops - Number of times to loop through the flash, zeroing all sectors. The default is 0. Acceptable values are from 0 through 16.

num_disk_loops - Number of times to loop through the hard drive, zeroing all sectors. The default is 0. Acceptable values are from 0 through 16.

NOTE:

You can specify num_disk_loops only after you provide num_flash_loops. To zero the disk without zeroing the flash, set the flash parameter to 0.

Examples The following command is used to zero the flash once and zero the hard drive twice.

```
sh rc.system_wipe_and_reset 1 2
```

The following command is used to zero only the hard drive once.

```
sh rc.system_wipe_and_reset 0 1
```

Use any of the following commands to zero the flash four times.

```
sh rc.system_wipe_and_reset 4 0
```

OR

```
sh rc.system_wipe_and_reset 4
```

Script running time

The appliance might reboot one or more times. The time taken for some sample configuration is as follows:

- Without parameters, the script completes in five minutes. That is, the disk is only reformatted and not zeroed. Zeroing adds extra security so that the data cannot be recovered.
- When you zero the flash:
 - On appliances with 256 MB flash, slightly more than one minute is added per pass.
 - On MPX appliances with 4 GB flash, approximately 17 minutes are added per pass.
- When you zero the disk:
 - On appliances with 80 GB hard drives, approximately 52 minutes are added per pass.

- On MPX appliances with 250 GB hard drives, approximately 163 minutes are added per pass.

Appliances with one SSD

A config wipe deletes and rebuilds all the data from the /flash and /var partitions irrespective of whether it is a single SSD system or a system with separate flash and hard drive.

On single SSD systems, there is only one physical storage device. Therefore, you cannot reformat and optionally zero the entire device.

Instead of reformatting the entire flash, only the flash partition is reformatted. Instead of zeroing the entire flash, only the flash partition is zeroed.

Since there is a hard drive partition instead of a physical hard drive, reformatting and optionally zeroing is limited to the hard drive partition.

How to verify the file system integrity of your NetScaler MPX appliance

Complete the following procedure to verify the file system integrity of the NetScaler MPX appliance.

1. Connect a console cable to the serial console of the ADC appliance, which is 9600 baud, 8 bits, 1 stop bit, and No parity.
2. Restart the appliance.
3. Press **Ctrl+C** keys simultaneously when you see the message **Booting [/ns-12.1-60.19]** counting down from 2 to 1 second. At the OK prompt, type **?** to show available commands.

```

BIOS loader 1.00 BIOS version is 1.01
Booting [/ns-12.1-60.19] in 1 second...

Type '?' for a list of commands, 'help' for more detailed help.
OK ?
Available commands:
heap          show heap usage
reboot        reboot the system
bcachestat    get disk block cache stats
autoboot      boot automatically after a delay
boot          boot a file or loaded kernel
lsdev         list all devices
more          show contents of a file
read          read input from the terminal
echo          echo arguments
unset         unset a variable
set           set a variable
show          show variable(s)
?             list commands
help          detailed help
include       read commands from a file
ls            list files
lsmod         list loaded modules
unload        unload all modules
load          load a kernel or module
pnpscan       scan for PnP devices
snap         show BIOS SMAP
boot-conf     load kernel and modules, then autoboot
read-conf     read a configuration file
enable-module enable loading of a module
disable-module disable loading of a module
toggle-module toggle loading of a module
show-module   show module load data
OK ?

```

4. Type **boot -s** to start the kernel in single user mode.

```

OK boot -s
GDB: debug ports: uart
GDB: current port: uart
KDB: debugger backends: ddb gdb
KDB: current backend: ddb
SMAP type=01 base=0000000000000000 len=0000000000009b000
SMAP type=02 base=0000000000009b000 len=00000000000005000
SMAP type=02 base=000000000000e0000 len=00000000000020000
SMAP type=01 base=00000000000100000 len=00000000000078e93000
SMAP type=02 base=00000000000078f93000 len=00000000000091b000
SMAP type=04 base=000000000000798ae000 len=00000000000049f000
SMAP type=02 base=00000000000079d4d000 len=00000000000022b3000
SMAP type=01 base=0000000000010000000 len=00000000f80000000
SMAP type=02 base=0000000000007c000000 len=00000000014000000
SMAP type=02 base=00000000000fed1c000 len=00000000000029000
SMAP type=02 base=0000000000ff000000 len=000000000001000000
Copyright (c) 1992-2013 The FreeBSD Project.

```

5. Press **Enter** after the following message is displayed: Enter full pathname of shell or RETURN for /bin/sh.

Note: The prompt of the appliance changes to `\u@`.

6. Type `fsck_ufs -y /dev/ad0s1a` to verify the disk consistency of the `/flash` partition:

```

\u@fsck_ufs -y /dev/ad0s1a
** /dev/ad0s1a
** Last Mounted on /flash
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl groups
304 files, 391432 used, 8240223 free (63 frags, 1030020 blocks, 0.0% fragmentation)
***** FILE SYSTEM IS CLEAN *****
\u@

```

7. Type `df` to display the currently mounted partitions.

```

\u@df
Filesystem 1K-blocks  Used Avail Capacity  Mounted on
/dev/md0    422318 395666 18206    96%    /
devfs       1         1      0    100%    /dev
\u@

```

8. If the device name `s1a` is not mounted, type `/sbin/mount /dev/ad0s1a /flash` to mount the disk name `s1a` on the `/flash` partition. Type `df` to display the updated partitions.

```

\u@/sbin/mount /dev/ad0s1a /flash
\u@df
Filesystem 1K-blocks  Used  Avail Capacity  Mounted on
/dev/md0    422318 395666 18206    96%    /
devfs       1         1      0    100%    /dev
/dev/ad0s1a 17263310 782864 15099382  5%     /flash
\u@

```

9. Type `fsck_ufs -y /dev/ad0s1e` to verify the disk consistency of the `/var` partition.

```

\u00fscck_ufs -y /dev/ad0s1e
** /dev/ad0s1e
** Last Mounted on /var
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl groups
109777 files, 8193132 used, 65433941 free (957 frags, 8179123 blocks, 0.0% fragmentation)
***** FILE SYSTEM IS CLEAN *****
\u00

```

10. If the device name `s1e` is not mounted, type `/sbin/mount /dev/ad0s1e /var` to mount the disk drive on the `/var` partition. Type `df` to display the mounted partitions.

```

\u00/sbin/mount /dev/ad0s1e /var
\u00df
Filesystem      1K-blocks      Used      Avail Capacity  Mounted on
/dev/md0         422318       395666      18206      96%      /
devfs              1           1           0      100%      /dev
/dev/ad0s1a     17263310      782864    15099382       5%      /flash
/dev/ad0s1e    147254146  16386264  119087552      12%      /var
\u00

```

If the output does not appear to be normal or an error is displayed, reset the hard disk drive, and repeat the procedure again. If the error is displayed again, contact NetScaler® support for further investigation.

Migrate the configuration of an existing NetScaler appliance to another NetScaler appliance

Before migrating to a new appliance, you must make some changes to the configuration of the old appliance before you copy the configuration to the new appliance.

Note: The following procedure does not apply to NetScaler FIPS appliances.

Migrate a configuration

1. On the old appliance, create a backup copy of the configuration file (ns.conf).
2. Use a vi editor to edit the configuration file that you backed up. For example, you might want to change the user name, host name, and password. **Note:** Remove all interface-related configuration, such as `set interface`, `bind vlan`, `add channel`, `bind channel`, and `set channel`.
3. Shut down the old appliance.
4. Perform initial configuration on the new appliance. Connect to the serial console, and at the command prompt type **config ns** to run the NetScaler configuration script. Enter parameter values, such as NetScaler IP address (NSIP) and subnet mask. For information about performing initial configuration by using the configuration utility (GUI) or the LCD keypad, see [Initial Configuration](#).
5. Restart the new appliance.
6. Add a route on the new appliance. At the command prompt, type: `add route <network> <netmask> <gateway>`
7. Copy the edited configuration file to the new appliance.
8. Copy other relevant files, such as bookmarks, SSL certificates, CRLs, Web App Firewall profiles, login schemas, and portal themes to the new appliance. For more information about exporting a Web App Firewall profile, see [Exporting and importing a Web App Firewall profile](#). If you have added any login schemas, copy them from `/nsconfig/loginschema/*.xml` to the

new appliance before copying the config file. After applying the config file, copy the portal theme files from the `/var/netscaler/logon/themes/` and `/var/netscaler/logon/LogonPoint/custom` folders to the new appliance. Return your feature license to the Citrix licensing portal and reallocate it on the new appliance. **Note:** The platform license is different for a new appliance.

9. Restart the new appliance.
10. Add the interface-related configuration specific to your new appliance, switch, and router, and save the configuration.

If you have a high-availability setup, you must perform the preceding procedure on both the nodes.

Migrate the configuration of a FIPS appliance

In the following steps, appliance A is the source appliance and appliance B is the target appliance.

1. Initialize the FIPS card on appliance B. At the command prompt, type the following commands:

```
reset fips
```

```
Done
```

```
reboot
```

```
set fips -initHSM Level-2 so12345 so12345 user123 -hsmLabel NSFIPS
```

```
This command will erase all data on the FIPS card. You must save the  
configuration (saveconfig) after executing this command. Do you want to  
continue?(Y/N)y
```


Done

Note: The following message appears when you run the `set fips` command:

```
This command will erase all data on the FIPS card. You must save the
configuration (saveconfig) after executing this command. [Note: On MPX/
SDX 14xxx FIPS platform, the FIPS security is at Level-3 by default,
and the -initHSM Level-2 option is internally converted to Level-3] Do
you want to continue?(Y/N)y
```

```
saveconfig
```

```
Done
```

```
reboot
```

```
reboot
```

2. **On appliance A**, open an SSH connection to the appliance by using an SSH client, such as PuTTY.
3. Log on to the appliance, using the administrator credentials.
4. Initialize appliance A as the source appliance. At the command prompt, type:

```
init ssl fipsSIMsource <certFile>
```

Example:

```
init fipsSIMsource /nsconfig/ssl/nodeA.cert
```

5. Copy this `<certFile>` file to appliance B, in the `/nconfig/ssl` folder.

Example:

```
scp /nsconfig/ssl/nodeA.cert nsroot@198.51.100.10:/nsconfig/ssl
```

6. **On appliance B**, open an SSH connection to the appliance by using an SSH client, such as PuTTY.
7. Log on to the appliance, using the administrator credentials.
8. Initialize appliance B as the target appliance. At the command prompt, type:

```
init ssl fipsSIMtarget <certFile> <keyVector> <targetSecret>
```

Example:

```
init fipsSIMtarget /nsconfig/ssl/nodeA.cert /nsconfig/ssl/nodeB.key /  
nsconfig/ssl/nodeB.secret
```

9. Copy this <targetSecret> file to appliance A.

Example:

```
scp /nsconfig/ssl/fips1bda10801b.secret nsroot@198.51.100.20:/nsconfig/ssl
```

10. **On appliance A**, enable appliance A as the source appliance. At the command prompt, type:

```
enable ssl fipsSIMSource <targetSecret> <sourceSecret>
```

Example: enable fipsSIMsource /nsconfig/ssl/nodeB.secret /nsconfig/ssl/
nodeA.secret

11. Copy this <sourceSecret> file to appliance B.

Example: scp /nsconfig/ssl/fips1bda10801b.secret nsroot@198.51.100.10:/
nsconfig/ssl

12. **On appliance B**, enable appliance B as the target appliance. At the command prompt, type:

```
enable ssl fipsSIMtarget <keyVector> <sourceSecret>
```

Example: enable fipsSIMtarget /nsconfig/ssl/nodeB.key /nsconfig/ssl/
nodeA.secret

13. Export the FIPS keys on appliance A.

Example:

```
export fipskey Key-FIPS-1 -key Key-FIPS-1.key
```

14. Copy the key file to appliance B, in the `/nconfig/ssl` folder.

Example:

```
scp /nsconfig/ssl/nodeA.key nsroot@198.51.100.10:/nsconfig/ssl
```

15. Import the FIPS keys on appliance B.

Example:

```
import fipskey Key-FIPS-2 -key Key-FIPS-2.key -inform SIM -exponent F4
```

16. Copy the certificate files to appliance B, in the `/nconfig/ssl` folder.

Example:

```
scp /nsconfig/ssl/nodeA.cert nsroot@198.51.100.10:/nsconfig/ssl
```

17. Copy the rest of the configuration from appliance A to appliance B.

Troubleshooting

I cannot access the NetScaler appliance after it is restarted. The NetScaler IP address (NSIP) is not accessible and does not respond to a ping request

Some NetScaler MPX platforms support LOM. Depending on the state of the LOM configuration, start with one of the steps in the following procedure. To configure the LOM port, see [Lights out management port of the NetScaler appliance](#).

1. If the LOM port is configured and known to have been working previously, log on to the LOM GUI, and perform the following steps:
 - a. Navigate to **Remote Control > Console Redirection**, and then click **Launch Console**.
 - b. On the Java iKVM Viewer screen, check the VGA console window for boot errors, such as bad or missing boot media (boot drive/Compact Flash card). Reseat any unconnected boot media. If the appliance boots up, try to log on and run the `show techsupport` command from the NetScaler command line. Complete the Check Network Interfaces steps to find a working interface on which to transfer the support bundle file.
 - c. Navigate to **System Health > Sensor Readings** to check the status of the hardware components (for example, CPU temperature, system temperature, and power supply status). You might have to scroll down. Green indicates that the hardware component is functioning properly. Red indicates that it has failed. Contact NetScaler® support if you observe red indicators.
 - d. Navigate to **Miscellaneous > Post Snooping** and check for BIOS POST initialization codes. If the value of Post Snooping is "00" or "AC," and the AC power supply LED light is green, the BIOS booted up normally. If not, check the Java iKVM Viewer screen to see if the appliance stopped responding during BIOS POST initialization. Perform substeps a through f of Step 2 to recover the appliance. If these steps fail, contact NetScaler support.

2. If the LOM port is configured and the LOM GUI is not accessible, try pinging the LOM IP address. The baseboard management controller (BMC, also known as LOM) runs on standby power. Even if the appliance is powered off by pressing the power button, the BMC is still working. If you are unable to ping the LOM IP address, connect to the COM1 console port through a serial cable. You can also try pinging the NetScaler IP address (NSIP). The serial cable can be connected to a network serial terminal/console server for remote access. On the appliance, do the following:
 - a. Verify that the appliance is receiving power.
 - b. If the appliance is not receiving power, change the power cable and connect the cable to another socket.
 - c. Verify that the power supply is properly seated in the power supply slot.
 - d. Remove all AC power supply cords for 30 seconds to completely remove power from the appliance.
 - e. Reinsert the AC power supply cords and check the LEDs indicating the status of the AC power supplies. If a power-supply LED is not green, troubleshoot the power supply.
 - f. Try pinging the LOM IP again. If successful, go to Step 1.
3. If the appliance does not support the LOM port or the LOM port is not configured, do the following:
 - a. Connect the serial console cable to the appliance.
 - b. Perform the substeps a through e of Step 2.
 - c. On the serial console port window, check for any boot failure errors, such as bad or missing boot media (boot drive/Compact Flash card). Reseat any unconnected boot media. If the appliance boots up, try to log on and run the `show techsupport` command from the NetScaler command line. Complete the Check Network Interfaces steps to find a working interface on which to transfer the support bundle file.

Check network interfaces

1. If management interface 0/1 is not operational, use the Java iKVM Viewer, described previously, to set up management interface 0/2, and connect a network cable to port 0/2. Use the serial console port for appliances that do not support the LOM port.

2. Make sure that the LED port status indicators are green for all interfaces. For more information about LED port status indicators, see "LED Port-Status Indicators" in [Ports](#).
3. Verify that NetScaler supports the SFP/SFP+/XFP transceivers that you are using.

Hardware FAQs

Transceivers

- Are transceivers shipped with the appliance?

No. Transceivers are available for purchase separately. Contact your NetScaler® sales representative to buy transceivers for your appliance.

- Why does the 10G SFP+ transceiver autonegotiate to 1G speed?

Autonegotiation is enabled by default on the 10G SFP+ ports into which you insert your 10G SFP+ transceiver. When a link is established between the port and the network, the speed is autonegotiated. For example, if you connect the port to a 1G network, the speed is autonegotiated to 1G.

- Can I insert a 1G transceiver into a 10G slot?
 - Only MPX 14000 and MPX 25000 appliances support copper transceivers.
 - The 10G slot supports copper 1G transceivers, which can operate at up to 1 Gbps in a 10 Gbps slot.

Note: 10G transceivers are not supported in 1G slots.

The following table shows the compatibility matrix of transceivers and ports available on the NetScaler appliance.

PORTS/ TRANSCEIVERS	10G TRANSCEIVER	1G FIBER TRANSCEIVER	1G COPPER TRANSCEIVER
10G port	Supported	Supported with exceptions (see note)	Supported
1G fiber port	Not Supported	Supported	Not Supported
1G copper port	Not Supported	Not Supported	Supported

Note:

The following appliances do not support the 1G fiber transceiver in a 10G port.

- MPX/SDX 89xx
- MPX/SDX 89xxT
- MPX/SDX 15xxx-50G
- MPX/SDX 14xxx-40G
- MPX/SDX 14xxx-40S
- MPX/SDX 25xxx-40G

Workaround: Use a 10G/1G dual speed transceiver to obtain 1G speeds.

For more information about supported transceivers per port, see [25G](#), [40G](#), [50G](#), and [100G](#) ports.

Ports

- What is QSFP+?

QSFP+ stands for Quad Small Form-factor Pluggable, which is a small, hot-pluggable transceiver for connecting data devices. This transceiver is used for 40G interfaces.

QSFP+ to four SFP+ Copper Breakout Cables: These cables connect to four SFP+ 10GE ports of an ADC appliance on one end and to a QSFP+ 40G port of a Cisco switch on the other end.

Support for 40G connectivity: NetScaler models that have at least four 10G SFP+ ports connect to Cisco 40G interfaces by aggregating four of the 10G SFP+ ports to form a 40G link aggregation channel. QSFP to Four port SFP+ Copper Breakout Cable **QSFP-4SFP10G-CU3M (reports as L45593-D178-C30)** is used. The reverse is not supported. That is, connectivity from a 40G port on a NetScaler appliance and 4x10G ports on the peer switch is not supported.

- Which NetScaler appliances support the **QSFP-4SFP10G-CU3M (reports as L45593-D178-C30)** Breakout Cable?

NetScaler appliances that have at least four 10G SFP+ ports support the QSFP Breakout Cable.

- What is QSFP28?

QSFP28 is a hot-pluggable transceiver module designed for 100G data rate. QSFP28 integrates 4 transmit and 4 receiver channels. "28" means that each lane carries up to 28G data rate. QSFP28 can do 4x25G breakout connection, 2x50G breakout, or 1x100G depending on the transceiver used.

Power supplies

- How many power supplies are shipped with each platform?

Some platforms support two power supplies; some platforms support four power supplies. The number of power supplies shipped with the appliance might be less than the number of power supplies supported. More power supplies are available for purchase.

- Are power supplies hot-swappable?

Yes. If the appliance has two power supplies, you can replace one power supply without shutting down the appliance, provided the other power supply is working.

Rack and rail

- Do you have different rail kits for 1U and 2U appliances?

No. All MPX and SDX appliances use the same rail kit. The kit contains two pairs of slide rails, of different lengths, for a 1U and a 2U appliance.

- Which rail kit must I buy?

The appliance ships with the standard 4-post rail kit that fits racks 28–38 inches.

The compact 4-post rail kit for racks 23–33 inches, or the 2-post rail kit for 2-post racks, has to be purchased separately. Contact your NetScaler sales representative to order the appropriate kit.

- What are the maximum and the minimum lengths of the outer rack rails?

The length of a standard outer rack rail is from 28 inches to 38 inches. The length of a shorter outer rack rail is from 23 inches to 33 inches.

- What is the space required between the front post and rear post of the rack?

Standard racks require 28–38 inches between the front and rear posts. Shorter racks require from 23 inches to 33 inches.

- How far can an appliance extend from the front post of the rack?

The chassis can extend up to 1.25 inches from the front post for all NetScaler MPX and SDX appliances.

- How much space is required for maintaining the front and rear area of an appliance?

Minimum clearance areas of 36 inches for the front area and 24 inches for the rear area are required for maintenance of all NetScaler appliances.

Lights out management (LOM) port

- Which LOM features are supported on the NetScaler MPX Appliance?

Some platforms have an Intelligent Platform Management Interface (IPMI), also known as the Lights out management (LOM) port, on the front panel of the appliance. The following three LOM features are supported on those platforms:

- Configure the LOM port
 - Power cycle the appliance
 - Perform a core dump
- Can the LOM interface be configured to accept only encrypted Virtual Network Computer (VNC) sessions on TCP port 5900?

Yes, customers who enable Transport Layer Security (TLS) on their LOM interface will have their VNC connections delivered over TLS as well.

For more information on LOM security guidelines, see [Secure Deployment Guide for NetScaler MPX, VPX, and SDX Appliances](#).

- Can the version of SSH used on the LOM interface be upgraded? Is there a patch available?

Individual components of the LOM cannot be upgraded independently. You must upgrade the entire LOM firmware as a package. On the MPX appliances, the LOM upgrade is performed explicitly by going out to the shell and running the `upgrade_bmc.sh` script.

- Is it possible to add a third-party or self-signed SSL certificate to the LOM interface?

Yes, you can enable SSL on the latest binaries for third-party and self-signed SSL certificates, except on the 88XX models. On those models, the current LOM release does not support third-party certificates.

General

- What is the recommended terminal emulator?

PuTTY.

- Which platforms support Pay-As-You-Grow licenses?

Check the NetScaler data sheet for the updated list of platforms that support Pay-As-You-Grow licenses. Some of the platforms that support Pay-As-You-Grow licenses are listed here:

- MPX 5901 to MPX 5905 to MPX 5910
 - MPX 8905 to MPX 8910 to MPX 8920 to MPX 8930
 - MPX 14020 to MPX 14030 MPX 14040 MPX 14060 MPX 14080 MPX 14100
 - MPX 14020-40G to MPX 14030-40G MPX 14040-40G MPX 14060-40G MPX 14080-40G MPX 14100-40G
 - MPX 14040-40S MPX 14060-40S MPX 14080-40S MPX 14100-40S
 - MPX 14030 FIPS to 14060 FIPS to 14080 FIPS
 - MPX 15020 to MPX 15030 to MPX 15040 to MPX 15060 to MPX 15080 to MPX 15100
 - MPX 15020-50G to MPX 15030-50G to MPX 15040-50G to MPX 15060-50G to MPX 15080-50G to MPX 15100-50G
 - MPX 22040 to MPX 22060 to MPX 22080 to MPX 22100 to MPX 22120
 - MPX 25100-40G to MPX 25160-40G to MPX 25200-40G
 - T-series platform
- Do NetScaler appliances support direct attach cable (DAC)?

Yes, NetScaler appliances support a passive DAC in release 10.5 and later.

- Which port must I insert the DAC into?

DAC is inserted into the 10G port on the appliance.

- Does the 1G port support a DAC?

No. The DAC might fit into a 1G port but is not supported.

- How can I order a DAC?

Contact your NetScaler sales representative to order a DAC.

- Can I mix DAC and fiber transceivers on the same appliance?

Yes. You can mix DAC and fiber transceivers on the same appliance. Each 10G port supports both options.

- Can I mix SFP+ fiber and DAC in ports that are part of the same link aggregation channel?

No. There must be symmetry between all elements in the same link aggregation channel.

- Which transceivers use the MPO type connector?

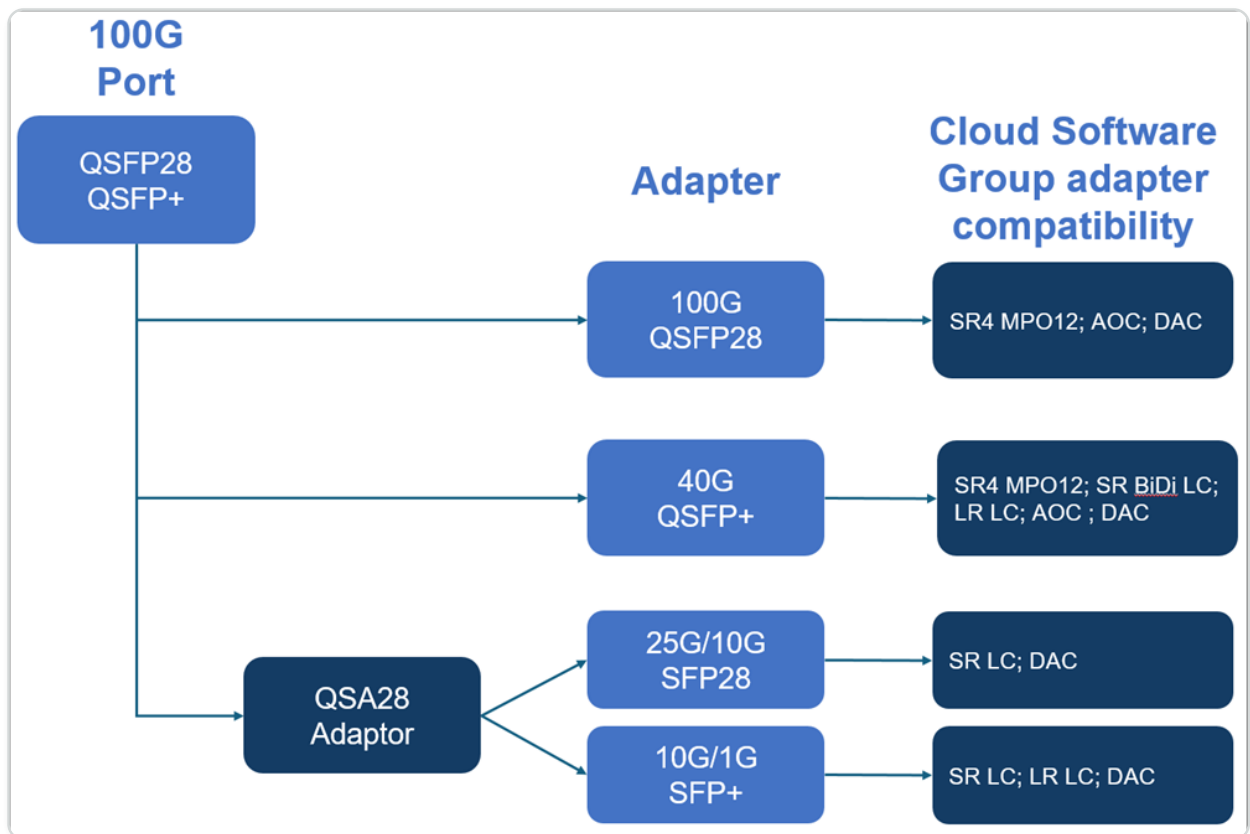
Only 40G QSFP+ SR4 transceiver and 100G QSFP28 SR4 transceivers use the MPO type connector. All other fiber transceivers use the LC type connector.

- Are special adapters required for 25G, 50G, and 100G ports?

A 100G port can support five speeds: 10G, 25G, 40G, 50G, and 100G. 1G speed is not supported on the 100G port. 50G and 100G ports use the same transceiver. The appliance determines the speed, and not the port.

Only 50G/100G (QSFP28) and 40G (QSFP+) transceivers can be directly used on a QSFP28 interface. Use a QSA28 adapter on a QSFP28 interface to use 10G (SFP+) and 25G (SFP28) transceivers.

The following diagram shows the transceiver compatibility.



- Is the 40G SR4 QSFP (also known as BiDi) transceiver supported?

Yes. The following platforms support BiDi transceivers:

- MPX/SDX 14000 40C
- MPX/SDX 14000 40S
- MPX/SDX 14000 40G
- MPX/SDX 15000 50G
- MPX 15041T 50G
- MPX 15081T 50G
- MPX 25000TA
- MPX/SDX 25000 40G
- MPX/SDX 26000
- MPX/SDX 26000 50S
- MPX/SDX 26000 100G

NetScaler MPX hardware document history

The following table describes important changes to the NetScaler MPX hardware documentation. To receive notifications about these updates, subscribe to the RSS feed. To subscribe to the NetScaler SDX hardware document history, see [NetScaler SDX document history](#).

DATE	CHANGE	TOPIC
19 Feb 2025	Updated the LOM GUI steps	See Obtaining the MAC address, serial number, and host properties of the appliance
24 Oct 2024	Support for LOM version 3.11.0 on some platforms	See Upgrading LOM version to 3.11.0
22 Jul 2024	New topic for creating and installing an SSL certificate on MPX 9100 and MPX 16000	See Create and install an SSL certificate on MPX 9100 and MPX 16000
30 May 2024	Updated the LOM version for some platforms and removed platforms that have reached EOL.	See LOM support matrix
10 May 2024	Removed references to EOL platforms	Redirects added to Hardware platforms
09 May 2024	Updates to LOM version on some platforms	See Lights out management port of NetScaler MPX
23 Apr 2024	New topic about configuring the ring size on Mellanox and Fortville interfaces	See Configure the ring size on Mellanox & Fortville interfaces

DATE	CHANGE	TOPIC
04 Apr 2024	New topic about Mellanox NIC firmware upgrade	See Mellanox NICs firmware upgrade on NetScaler MPX appliances
12 Jan 2024	Two power supplies are shipped with MPX 9100 for hardware shipped after 13th Dec, 2023	See NetScaler MPX 9100
12 Jan 2024	Updated power consumption values for MPX 15000	See NetScaler MPX 15000 .
26 Dec 2023	New topic to set the LOM password length using the IPMI tool	See Set the LOM password length using the IPMI tool
13 Sep 2023	Added 5900 to 1G copper and fiber and 10G fiber sections.	See 1G pluggable media and 10 GE pluggable media
11 Sep 2023	Added transceivers and rails kits to the FRU topic	See Field replaceable units
18 Jul 2023	Added LED behavior for 3Y 850 W AC power supply	See 3Y power supply LED behavior
22 Jun 2023	Updated MPX 5900 health attributes	See Health attributes for the MPX 5900 platform
29 May 2023	Updated LOM support matrix for MPX platforms	See LOM support matrix
08 May 2023	Updated the hardware-software compatibility matrix to include only the base platform. The data sheet has the model numbers of the active platforms.	See NetScaler MPX hardware-software compatibility matrix
04 May 2023	Updated the hardware health attributes for MPX 8900	See Hardware health attributes

DATE	CHANGE	TOPIC
25 Apr 2023	New platform MPX 9100 FIPS	See NetScaler MPX 9100 FIPS
06 Dec 2022	Added health attributes for MPX 16000	See Hardware health attributes for the MPX 16000 platform
05 Dec 2022	Added health attributes for MPX 9100	See Hardware health attributes for the MPX 9100 platform
20 Sep 2022	Added support for new platform MPX 16000	See NetScaler MPX 16000
17 Aug 2022	Added 9100 to different sections in the common hardware components topic	See Common hardware components
15 Jun 2022	Updated the hardware-software compatibility matrix for MPX 9100	See NetScaler MPX hardware-software compatibility matrix
17 May 2022	Updated max and typical power consumption for MPX 8900 platform	See NetScaler MPX 8900
26 Apr 2022	New topic on changing the BMC host name	See Change the BMC host name
10 Jan 2022	New topic to configure an Active Directory in LOM	See Configure Active Directory in LOM
26 Oct 2021	Updated the hardware-software compatibility matrix for update to FIPS certified appliances support	See NetScaler MPX hardware-software compatibility matrix
11 Oct 2021	Updated the hardware-software compatibility matrix to include 13.1	See NetScaler MPX hardware-software compatibility matrix

DATE	CHANGE	TOPIC
15 Jul 2021	Added hardware health attributes for MPX 115xx platform	See Health attributes for MPX 5550/8005/115xx/17500/17550 platforms
04 Dec 2020	Added LOM support matrix for MPX	See LOM support matrix
03 Dec 2020	Updated the platform numbers supporting LOM firmware upgrade	See Upgrade the LOM firmware on a NetScaler MPX appliance
03 Nov 2020	Updated the build number for FIPS certified platforms	See NetScaler MPX hardware-software compatibility matrix
29 Sep 2020	Added a topic for RAKP topology in LOM	See RAKP topology on NetScaler appliances
10 Sep 2020	Added a topic for RADIUS documentation in LOM	See Enable RADIUS authentication in the Citrix LOM GUI
09 Sep 2020	Added a section on migrating the configuration of a FIPS appliance	See Migrate the configuration of a FIPS appliance
09 Sep 2020	Added troubleshooting information for LOM upgrade	See Troubleshooting
01 Aug 2020	Updates for CA password	See Initial configuration
16 Jun 2020	Updated for USB port reserved for a future release	Update to multiple topics
10 Jun 2020	Updated for 13.0-58.x support, FIPS certified appliances support, and zero-capacity appliances support	Fortville NIC firmware upgrade on NetScaler MPX appliances

DATE	CHANGE	TOPIC
05 Jun 2020	Added health monitoring information for MPX 15000 and MPX 26000 platforms	Health attributes for the MPX 15000 and MPX 26000 platforms
28 May 2020	Added support for iKVM (HTML5) to access the LOM GUI	Configure the network settings on the LOM port
27 May 2020	Added the list of platforms that support the upgrade script	Upgrade the LOM firmware on a NetScaler MPX appliance
18 May 2020	New topics for MPX FIPS certified platforms	NetScaler MPX 8900 FIPS certified appliance and NetScaler MPX 15000-50G FIPS certified appliance
15 May 2020	New topic for Fortville NIC upgrade	Fortville NIC firmware upgrade on NetScaler MPX appliances
14 May 2020	Added support for BiDi (40G SR4 QSFP) transceivers	Hardware FAQs
23 Apr 2020	Updated the image for MPX 14000-40C	NetScaler MPX 14000-40C
30 Mar 2020	MPX 5550 platform does not support health monitoring	Hardware health attributes
28 Aug 2019	Added a topic	Wiping your data before sending the ADC appliance to Citrix
15 May 2019	Updated support for release 13.0 on all hardware platforms	NetScaler MPX hardware-software compatibility matrix