

Hardware Installation

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Hardware Installation

The following sections describe the hardware installation and initial configuration for all NetScaler hardware platforms.

Hardware Platforms	Describes the NetScaler hardware platforms and provides detailed information about each platform and its components.
Preparing for Installation	Describes how to unpack the NetScaler appliance and prepare the site and rack for installing the appliance. Lists the cautions and warnings that you should review before you install the appliance.
Installing the Hardware	Describes the steps to install the rails, mount the hardware, connect the cables, and turn on the appliance.
Initial Configuration	Describes how to perform initial configuration of your NetScaler appliance and assign management and network IP addresses.
Lights Out Management Port of the NetScaler Appliance	Describes the different operations you can perform on your NetScaler appliance by using the Lights Out Management Port.

For information about NetScaler hardware and software compatibility and the supported upgrade and downgrade paths, see <http://support.citrix.com/article/CTX113357>.

Common Hardware Components

Each platform has front panel and back panel hardware components. The front panel has an LCD display and an RS232 serial console port. The number, type, and location of ports—copper Ethernet, copper and fiber 1G SFP, 10G SFP+, and XFP—vary by hardware platform. The back panel provides access to the fan and the field replaceable units (power supplies, CompactFlash card, and solid-state and hard-disk drives).

This document includes the following details:

- LCD Display and LED Status Indicators
- Ports

LCD Display and LED Status Indicators

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 properly and is operating normally. If the appliance is not operating normally, the LCD displays troubleshooting messages.

The LCD displays real-time statistics, diagnostic information, and active alerts. The dimensions of the LCD limit the display to two lines of 16 characters each, causing the displayed information to flow through a sequence of screens. Each screen shows information about a specific function.

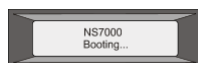
The LCD has a neon backlight. Normally, the backlight glows steadily. When there is an active alert, it blinks rapidly. If the alert information exceeds the LCD screen size, the backlight blinks at the beginning of each display screen. When the appliance shuts down, the backlight remains on for one minute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

There are nine types of display screens on the LCD display. The first two screens in the following list, the booting screen and the startup screen, appear when your appliance is starting up. The other screens, except the out-of-service screen, can appear while the appliance is operating. They show configuration information, alerts, HTTP information, network traffic information, CPU load information, and port information for your appliance.

Booting Screen.

The booting screen is displayed immediately after the appliance is turned on. The first line displays the hardware platform, as shown in the following figure.

Figure 1. LCD Booting Screen

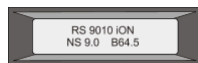


The newer MPX appliances display NSMPX followed by the platform number in the first line. For example, the MPX 7500/9500 appliances display NSMPX-7500. To view the model number, at the NetScaler command line, type show license. Scroll to the end of the command output to view the model number.

Startup Screen.

The startup screen is displayed for a few seconds after the appliance successfully begins operation. The first line displays the hardware platform, and the second line displays the software version and build number, as shown in the following figure.

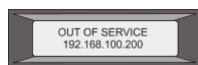
Figure 2. LCD Startup Screen



Out-of-Service Screen.

The out-of-service screen is displayed when the appliance has undergone a controlled shutdown, as shown in the following figure.

Figure 3. LCD Out-of-service Screen



Configuration Screen.

The first line displays the appliance status (STA, PRI, or SEC) and uptime. STA indicates that the appliance is in standalone mode, PRI indicates that the appliance is a primary node in a high availability (HA) pair, and SEC indicates that the appliance is a secondary node in an HA pair. Appliance uptime is displayed in HH:MM format. The second line displays the IP address of the appliance, as shown in the following figure.

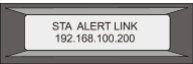
Figure 4. LCD Configuration Screen



Alert Screen.

The first line displays the appliance status (STA, PRI, or SEC). STA indicates that the appliance is in standalone mode, PRI indicates that the appliance is a primary node in a high availability (HA) pair, and SEC indicates that the appliance is a secondary node in an HA pair. The second line displays the IP address of the appliance.

Figure 5. LCD Known Alert Screen



HTTP Statistics Screen.

The first line displays the rate of HTTP GETS per second. The second line displays the rate of HTTP POSTS per second, as shown in the following figure.

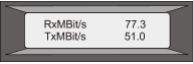
Figure 6. LCD HTTP Statistics Screen



Network Traffic Statistics Screen.

The first line displays the rate at which data is received, in megabits per second. The second line displays the rate of data transmission, in megabits per second, as shown in the following figure.

Figure 7. LCD Network Traffic Statistics Screen

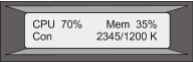


CPU Load, Memory, and Connections Screen.

The first line displays CPU utilization and memory utilization as percentages. The second line displays the ratio of the number of server connections to the number of client connections.

Note: If the number of server or client connections exceeds 99,999, the number is displayed in thousands, indicated by the letter K.

Figure 8. LCD CPU Load, Memory, and Connections Screen



Port Information Screen.

The S row displays port speed, flow control, and duplex information. The R row displays megabits received per second on the interface. The first port in each row is the management port.

Figure 9. Port Information for an 8-port Appliance

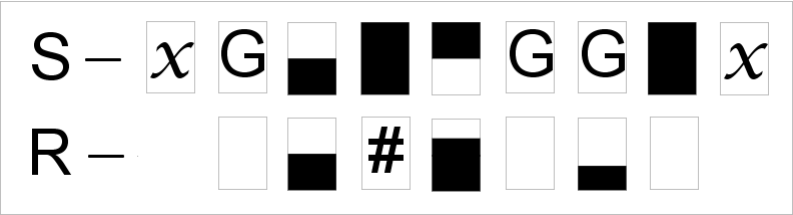
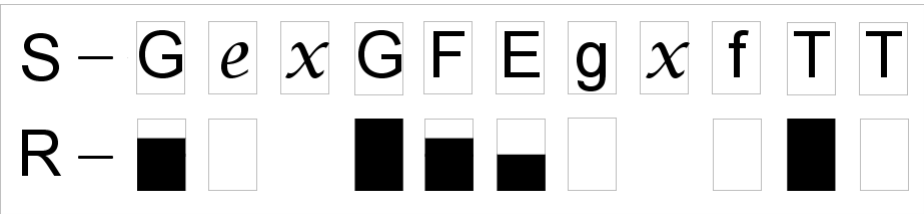


Figure 10. Port Information for a 10-port Appliance



The following table defines the various abbreviations and symbols that appear in the S row of the port information screen.




Table 1. Port Abbreviations and Symbols for S Row



S row abbreviation/symbol	Indicates
E	A rate of 10 megabits per second, full duplex mode, and flow control OFF.
F	A rate of 100 megabits per second, full duplex mode, and flow control OFF.

	A rate of 1 gigabit per second, full duplex mode, and flow control OFF.
	A rate of 10 gigabits per second, full duplex mode, and flow control OFF.
	A disconnected port. Note: The R row does not display an abbreviation or symbol for a disconnected port.
	Receive flow control regardless of speed or duplex mode.
	Transmit flow control regardless of speed or duplex mode.
	Receive and transmit flow control regardless of speed or duplex mode.
	A rate of 10 megabits per second, half duplex mode, and flow control OFF.
	A rate of 100 megabits per second, half duplex mode, and flow control OFF.
	A rate of 1 gigabit per second, half duplex mode, and flow control OFF.

The following table defines the various abbreviations and symbols that appear in the R row of the port information screen.

Table 2. Port Abbreviations and Symbols for R Row

R row abbreviation/symbol	Indicates
	The port is disabled.
	Receive speed is about 10% of line speed.
	Receive speed is about 50% of line speed.
	Receive speed is about 75% of line speed.

	
	Receive speed is about 100% of line speed.

On the appliance's 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 the MPX 22040/22060/22080/22100/22120 and MPX 24100/24150 appliances.

LED Color	LED Indicates
OFF	No power
Green	Appliance is receiving power
Red	Appliance has detected an error

On the appliance's back panel, power status LEDs indicate the status of each power supply. The following table describes the indicators of the power status LED.

LED Color	LED Indicates
OFF	No power
Green	Appliance is receiving power
Red	Power supply 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 the MPX 5500, MPX 5550/5650, MPX 7500/9500, MPX 8005/8015/8200/8400/8600/8800, MPX 9700/10500/12500/15500, MPX 17500/19500/21500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 14000, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, and MPX 25100T/25160T appliances.

Table 3. LED port-status indicators

Port Type	LED Location	LED Function	LED Color	LED Indicates
10G SFP+ (10 Gbps)	Top	Speed	Off	No connection.
			Solid blue	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	Speed	Off	No connection, or a traffic rate of 10 megabits per second (Mbps).
			Green	Traffic rate of 100 Mbps.
			Yellow	Traffic rate of 1 gigabit per second.
	Right	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.
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.
			Blinking yellow	Traffic is passing through the port.

On each power supply, a bicolor LED indicator shows the condition of the power supply. The LEDs of the AC power supplies for MPX 15000 and 17000 appliances are different from the LEDs of the other appliances.

Table 4. LED Power Supply Indicators

Power Supply Type	LED Color	LED Indicates
AC	OFF	No power to any power supply.
	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.
DC	OFF	No power to any power supply.
	Flashing RED	No power to this power supply.
	Flashing BLUE	Power supply is in standby mode.
	BLUE	Power supply is functional.
	RED	Power supply failure.
MPX 15000 and 17000	OFF	Power supply is not plugged in to a power source. If the LED is off when the power supply is plugged in, the power supply has a malfunction.
	AMBER	Power supply has been plugged in for less than a few seconds. If the LED does not turn GREEN, the power supply has a malfunction.
	GREEN	Power supply is functioning properly.
	BLINKING	Power supply has a malfunction

Ports

Ports are used to connect the appliance to external devices. NetScaler appliances support RS232 serial ports, 10/100/1000Base-T copper Ethernet ports, 1-gigabit copper and fiber 1G SFP ports, and 10-gigabit fiber SFP+ ports. All NetScaler appliances have a combination of some or all of these ports. For details on the type and number of ports available on your appliance, see the section describing that platform.

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 or 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 ["Installing 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 may 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, ten 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, you plug one end of a standard Ethernet cable into the port and plug the other end into the appropriate network connector.

Management Ports

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

1G SFP, 10G SFP+, and XFP 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+ and XFP ports are high-speed ports that can operate at speeds of up to 10 Gbps. You need a fiber optic cable to connect to a 10G SFP+ or XFP port. If the other end of the fiber optic cable is attached to a 1G SFP port, the 10G SFP+ port automatically negotiates to match the speed of the 1G SFP port.

Ports Compatibility

The 10G slot supports **copper** 1G transceivers, which can operate at up to 1 Gbps in a 10 Gbps slot.

Note: You cannot insert a fiber 1G transceiver into a 10G slot.

Note: You cannot insert a 10G transceiver into a 1G slot.

The following tables list the maximum distance specifications for NetScaler pluggable media (1G SFP, 10G SFP+, and XFP transceivers).

Note: The tables are categorized by 1G pluggable media and 10G pluggable media.

The 10G SFP+ modules are dual-speed capable and support both 1G and 10G, depending on the peer switch that the model connects to. These are listed in both tables.

Both tables have the following columns:

- SKU: Citrix maintains multiple SKUs for the same part.
- 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. This is especially true with 10G on multi-mode fiber (MMF), where various dispersion components become dominant. For more information, see <http://www.thefta.org/tech/ref/basic/fiber.html>.
- Typical Reach: Maximum transmit distance.
- Products: Some chassis are available with different media options. Use the appropriate data sheet to confirm that your particular chassis type supports the media.

1G Pluggable Media

The following table lists the maximum distance specifications for 1G transceivers.

Table 5. Copper 1G SFP Distance Specifications

SKU	Description	Transmitter Wavelength (nm)	Cable Type	Typical Reach (m)	Products
EW3A0000235, EW3B0000235, EW3C0000235, EW3D0000235, EW3E0000235, EW3F0000235, EW3P0000143, EW3X0000235, EW3Z0000087	Citrix NetScaler 1G SFP Ethernet Copper (100m) - 4 Pack	n/a	Category 5 (Cat-5) Copper Cable	100 m	MPX 7500/9500, MPX 8005/8015/8200/8400/8600/8800, MPX 9700/10500/12500/15500, 9010 FIPS, MPX 22040/22060/22080/22100/22120, MPX 24100/24150

Table 6. Short Reach Fiber 1G SFP Distance Specifications

SKU	Description	Transmitter	Fiber Type	Typical	Products
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		Wavelength (nm)		Reach (m)	
EW3A0000234, EW3B0000234, EW3C0000234, EW3D0000234, EW3E0000234, EW3F0000234, EW3P0000142, EW3X0000234, EW3Z0000086	Citrix NetScaler 1G SFP Ethernet SX (300m) - 4 Pack	850nm (nominal)	50/125um MMF, 2000MHz- km (OM3)	550 m	MPX 7500/9500, MPX 8005/8015/ 8200/8400/8600/8800, MPX 9700/10500/12500/15500, 9010 FIPS, MPX 22040/22060/22080/22100/22120, MPX 24100/24150
			50/125um MMF, 500MHz-km (OM2)	550 m	
			50/125um MMF, 400MHz-km	550 m	
			62.5/125um MMF, 200MHz-km (OM1)	300 m	
			62.5/125um MMF, 160MHz-km	300 m	

Table 7. Short Reach Fiber 1G SFP Distance Specifications

SKU	Description	Transmitter Wavelength (nm)	Fiber Type	Typical Reach (m)	Products
EW3A0000710, EW3B0000710, EW3C0000710, EW3D0000710, EW3E0000710, EW3F0000710, EW3P0000557, EW3X0000710, EW3Z0000585	Citrix NetScaler 1G SFP Ethernet Short Range (300m) - Single	850nm (nominal)	50/125um MMF, 2000MHz- km (OM3)	550 m	MPX 8005/8015/8200/8400/8600/8800, MPX 9700/10500/12500/15500, MPX 17500/19500/21500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542,, MPX 22040/22060/22080/22100/22120, MPX 24100/24150
			50/125um MMF, 500MHz-km (OM2)	550 m	
			50/125um MMF, 400MHz-km	550 m	
			62.5/125um MMF, 200MHz-km (OM1)	275 m	
			62.5/125um MMF, 160MHz-km	220 m	

Table 8. Long Reach Fiber 1G SFP Distance Specifications

SKU	Description	Transmitter Wavelength (nm)	Fiber Type	Typical Reach (m)	Products
EW3A0000712, EW3B0000712, EW3C0000712, EW3D0000712, EW3E0000712, EW3F0000712, EW3P0000559, EW3X0000712, EW3Z0000587	Citrix NetScaler 1G SFP Ethernet LX - Single	1310nm (nominal)	9/125um SMF	10 km	MPX 7500/9500, MPX 8005/8015/ 8200/8400/8600/8800, MPX 9700/10500/12500/15500, 9010 FIPS, MPX 22040/22060/22080/22100/22120, MPX 24100/24150

Table 9. Long Reach Fiber 1G SFP Distance Specifications

SKU	Description	Transmitter Wavelength (nm)	Fiber Type	Typical Reach (m)	Products
EW3A0000711, EW3B0000711, EW3C0000711, EW3D0000711, EW3E0000711,	Citrix NetScaler 1G SFP Ethernet Long Range	1310nm (nominal)	9/125um SMF	10 km	MPX 8005/8015/8200/8400/8600/8800, MPX 9700/10500/12500/15500, MPX 17500/19500/21500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542,,

EW3F0000711, EW3P0000558, EW3X0000711, EW3Z0000586	(10km) - Single				MPX 22040/22060/22080/22100/22120, MPX 24100/24150
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10 GE Pluggable Media

The following table lists the maximum distance specifications for 10G transceivers.

Table 10. Short Reach Fiber 10G SFP+ Distance Specifications

SKU	Description	Transmitter Wavelength (nm)	Fiber Type	Typical Reach (m)	Products
EW3A0000710, EW3B0000710, EW3C0000710, EW3D0000710, EW3E0000710, EW3F0000710, EW3P0000557, EW3X0000710, EW3Z0000585	Citrix NetScaler 10G SFP+ Ethernet Short Range (300m) - Single	850nm (nominal)	50/125um MMF, 2000MHz-km (OM3)	300 m	MPX 8005/8015/8200/8400/8600/8800, MPX 9700/10500/12500/15500, MPX 17500/19500/21500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 14000, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, MPX 25100T/25160T
			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	

Table 11. Short Reach XFP (10G) Distance Specifications

SKU	Description	Transmitter Wavelength (nm)	Fiber Type	Typical Reach (m)	Products
EW3A0000713, EW3B0000713, EW3C0000713, EW3D0000713, EW3E0000713, EW3F0000713, EW3P0000560, EW3X0000713, EW3Z0000588	Citrix NetScaler XFP Short Range 10 Gigabit Ethernet (300m) - Single	850nm (nominal)	50/125um MMF, 2000MHz-km (OM3)	300 m	MPX 15000/17000
			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	

Table 12. Long Reach Fiber 10G SFP+ Distance Specifications

SKU	Description	Transmitter Wavelength (nm)	Fiber Type	Typical Reach (m)	Products
EW3A0000711, EW3B0000711, EW3C0000711,	Citrix NetScaler 10G SFP+	1310nm (nominal)	9/125um SMF	10 km	MPX 8005/8015/8200/8400/8600/8800, MPX 9700/10500/12500/15500, MPX 17500/19500/21500, MPX

EW3D0000711, EW3E0000711, EW3F0000711, EW3P0000558, EW3X0000711, EW3Z0000586	Ethernet Long Range (10km) - Single			11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 14000, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, MPX 25100T/25160T
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Table 13. Long Reach Fiber XFP (10G) Distance Specifications

SKU	Description	Transmitter Wavelength (nm)	Fiber Type	Typical Reach (m)	Products
EW3A0000714, EW3B0000714, EW3C0000714, EW3D0000714, EW3E0000714, EW3F0000714, EW3P0000561, EW3X0000714, EW3Z0000589	Citrix NetScaler XFP Long Range 10 Gigabit Ethernet(10 km) - Single	1310nm (nominal)	9/125um SMF	10 km	MPX 15000/17000

Table 14. Citrix Direct Attached (DAC) Copper TwinAx 10G SFP+ Passive Cables Specifications

SKU	Description	Products
3007776	Citrix NetScaler 1m DAC SFP+ Cable for up to 1m distance	MPX 8005/8015/8200/8400/8600/8800, MPX 17500/19500/21500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 14000, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, MPX 25100T/25160T
3007777	Citrix NetScaler 3m DAC SFP+ Cable for up to 3m distance	MPX 8005/8015/8200/8400/8600/8800, MPX 17500/19500/21500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 14000, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, MPX 25100T/25160T
3007778	Citrix NetScaler 5m DAC SFP+ Cable for up to 5m distance	MPX 8005/8015/8200/8400/8600/8800, MPX 17500/19500/21500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 14000, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, MPX 25100T/25160T

Note: **To obtain these cables, contact Citrix Sales Support.**

Table 15. Cisco 40G QSFP+ Cable Specifications

Cisco Part Number	Description	Products
L45593-D178-C30	40GBASE-CR4 QSFP+ to four 10GBASE-CU SFP+ direct attach breakout cable assembly, 3 meter passive	MPX 11500/13500/14500/16500/18500/20500, MPX 17500/19500/21500, MPX 17550/19550/20550/21550, MPX 14000, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, MPX 25100T/25160T

Note: Support for this cable is available in release 10.1 build 122.17 and later.

Note: **To obtain these cables, contact Cisco partner representatives.**

Field Replaceable Units

Citrix NetScaler field replaceable units (FRU) are NetScaler components that can be quickly and easily removed from the appliance and replaced by the user or a technician at the user's site. The FRUs in a NetScaler appliance can include a CompactFlash card, DC or AC power supplies, and solid-state or hard-disk drives, and a direct attach cable (DAC).

Note: The solid-state or hard-disk drive stores your configuration information, which has to be restored from a backup after replacing the unit.

This document includes the following details:

- Power Supply
- CompactFlash Card
- Solid-State Drive
- Hard Disk Drive
- Direct Attach Cable

Power Supply

For appliances containing two power supplies, the second power supply acts as a backup. The MPX 22040/22060/22080/22100/22120 and MPX 24100/24150 appliances can accommodate four power supplies, and require two power supplies for proper operation. The third and fourth power supplies act as backup.

The appliance ships with a standard power cord that plugs into the appliance's power supply and an 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 "Hardware Platforms," which describes the various platforms and includes a table summarizing the hardware specifications.

Note: If you suspect that a power-supply fan is not working, please 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.
- Always unplug any appliance before performing repairs or upgrades.
- 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.

Replacing an AC Power Supply

Citrix NetScaler MPX platforms can accommodate two power supplies, except the MPX 22040/22060/22080/22100/22120 and MPX 24100/24150 platforms which can accommodate four power supplies. All NetScaler appliances function properly with a single power supply, except the MPX 22040/22060/22080/22100/22120 and MPX 24100/24150 platforms which need two power supplies for proper operation. The other power supplies serves as a backup. All power supplies must be of the same type (AC or DC).

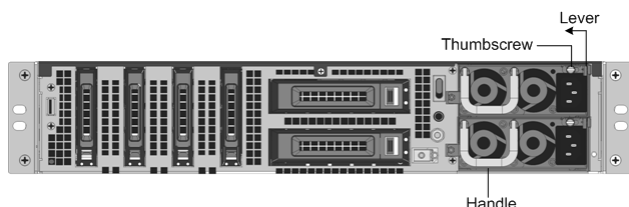
Note: If the appliance has only one power supply, you have to shut down the appliance before replacing the power supply. If the appliance has two power supplies, you can replace one power supply without shutting down the appliance, provided the other power supply is working, and if the appliance has 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 Citrix NetScaler appliance

1. Align the semicircular handle perpendicular to the power supply. Loosen the thumbscrew and press the lever toward the handle and pull out the existing power supply, as shown in the following figure.

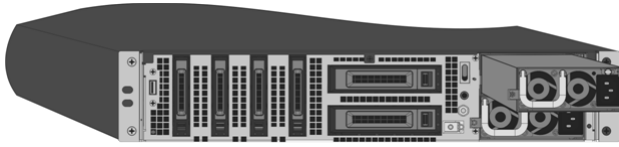
Note: The illustration in the following figures might not represent the actual NetScaler appliance.

Figure 1. Removing 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.

Figure 2. Inserting the Replacement AC Power Supply



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 if one power supply fails or if 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.

Replacing a DC Power Supply

Citrix NetScaler MPX platforms can accommodate two power supplies, except the MPX 22040/22060/22080/22100/22120 and MPX 24100/24150 platforms which can accommodate four power supplies. All NetScaler appliances function properly with a single power supply, except the MPX 22040/22060/22080/22100/22120 and MPX 24100/24150 platforms which need two power supplies for proper operation. The other power supplies serves as a backup. All power supplies must be of the same type (AC or DC).

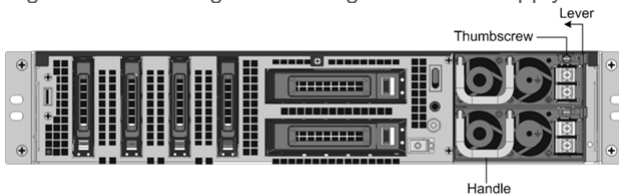
Note: If the appliance has only one power supply, you have to shut down the appliance before replacing the power supply. If the appliance has two power supplies, you can replace one power supply without shutting down the appliance, provided the other power supply is working, and if the appliance has 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 Citrix 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 3. Removing 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 4. Inserting the Replacement DC Power Supply



5. When the power supply is completely 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 if one power supply fails or if 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.

CompactFlash Card

The NetScaler software is stored on either the solid-state drive or the CompactFlash card. The following MPX platforms store the NetScaler software on the CompactFlash card:

- o Citrix NetScaler MPX 5500
- o Citrix NetScaler MPX 7500 and MPX 9500
- o Citrix NetScaler MPX 9700, MPX 10500, MPX 12500, and MPX 15500

- o Citrix NetScaler MPX 15000
- o Citrix NetScaler MPX 17000

Note: The CompactFlash card is mounted as /flash on the above platforms.

The CompactFlash card specifications vary by NetScaler hardware platform. A CompactFlash card from one platform does not necessarily work on a different platform.

Replacing a CompactFlash Card

Note: These instructions apply to the Citrix® NetScaler® MPX 5500, MPX 7500/9500, MPX 9700/10500/12500/15500, MPX 15000, and MPX 17000 appliances only.

Replacement CompactFlash cards contain a preinstalled version of the NetScaler software and a generic configuration file (ns.conf), but they do not contain SSL-related certificates and keys, or custom boot settings. Configuration files and customized settings must be restored from a backup storage location at the customer site, if available. The files to be restored might include:

- o /flash/nsconfig/ns.conf: The current configuration file.
- o /flash/nsconfig/ZebOS.conf: The ZebOS configuration file.
- o /flash/nsconfig/license: The licenses for the NetScaler features.
- o /flash/nsconfig/ssl: The SSL certificates and keys required for encrypting data to clients or to backend servers.
- o /nsconfig/rc.netscaler: Customer-specific boot operations (optional).

Note: Verify that the card you receive is the correct type for your NetScaler appliance.

To replace a CompactFlash card

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.
 - o On an MPX appliance, type:

shutdown -p now

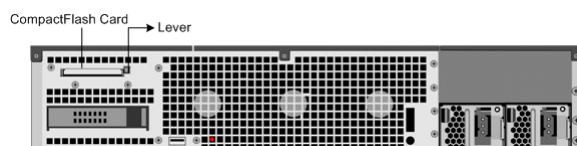
- o On a non-MPX appliance, type:

shutdown

3. Locate the CompactFlash slot on the back panel of the appliance.
4. Disengage the CompactFlash by pushing the lever to the right of the CompactFlash slot. If necessary, use a pen or small screwdriver to push the lever in fully. Pull the existing flash card out of the slot.

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

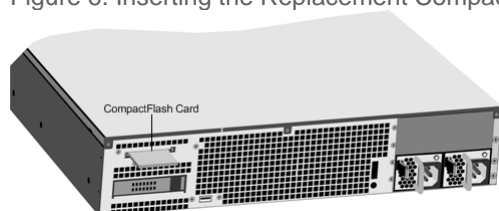
Figure 5. Removing the Existing CompactFlash Card



5. Insert the new flash card received from Citrix.

Important: When you insert the card, make sure that the arrow on top of the card is pointing toward the CompactFlash slot. Position the connector grid on the edge of the CompactFlash card to meet the matching connector pins inside the CompactFlash slot.

Figure 6. Inserting the Replacement CompactFlash Card



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 the licensing chapter of the "Getting Started with Citrix NetScaler."
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 or by pasting the previous configuration into the /nsconfig/ns.conf file from the NetScaler command prompt. To load the new ns.conf file, restart the NetScaler appliance by entering the reboot command at the NetScaler command prompt.

Solid-State Drive

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

The NetScaler software is stored on either the SSD or the CompactFlash card. The following MPX platforms store the NetScaler software on the SSD. The SSD is mounted as /flash.

- o Citrix NetScaler MPX 5550 and MPX 5650
- o Citrix NetScaler MPX 8005, MPX 8015, MPX 8200, MPX 8400, MPX 8600, and MPX 8800
- o Citrix NetScaler MPX 11500, MPX 13500, MPX 14500, MPX 16500, MPX 18500, and MPX 20500
- o Citrix NetScaler MPX 11515, MPX 11520, MPX 11530, MPX 11540, and MPX 11542
- o Citrix NetScaler MPX 14000
- o Citrix NetScaler MPX 17500, MPX 19500, and MPX 21500
- o Citrix NetScaler MPX 17550, MPX 19550, MPX 20550, and MPX 21550
- o Citrix NetScaler MPX 22040, MPX 22060, MPX 22080, MPX 22100, and MPX 22120
- o Citrix NetScaler MPX 24100 and MPX 24150
- o Citrix NetScaler MPX 25100T and MPX 25160T

Note: On the MPX 5550/5650 and MPX 8005/8015/8200/8400/8600/8800 appliances, both /flash and /var are mounted from different partitions of the same SSD drive.

Replacing a Solid-State Drive

Note: These instructions apply to the Citrix NetScaler MPX 5550/5650, MPX 8005/8015/8200/8400/8600/8800, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 14000, MPX 17500/19500/21500, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, and MPX 25100T/25160T appliances.

Replacement solid-state drives (SSDs) contain a pre-installed version of the NetScaler software and a generic configuration file (ns.conf), but they do 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:

- o /flash/nsconfig/ns.conf: The current configuration file.
- o /flash/nsconfig/ZebOS.conf: The ZebOS configuration file.
- o /flash/nsconfig/license: The licenses for the NetScaler features.
- o /flash/nsconfig/ssl: The SSL certificates and keys required for encrypting data to clients or to backend servers.
- o /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

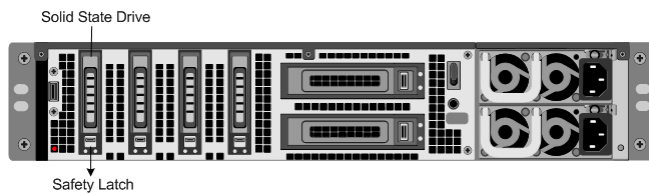
2. Shut down the NetScaler appliance by typing the following command at the shell prompt:

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 7. Removing 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 Citrix product label is at the top if the drive is inserted horizontally or at the right if the drive is inserted vertically.

Figure 8. Inserting 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 the licensing chapter of the "Getting Started with Citrix NetScaler."
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 or by pasting 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 newnslog files, dmesg and messages files, and any core/crash files. The HDD comes in various capacities, depending on the Citrix NetScaler platform. Hard drives are used for storing files required at runtime. An HDD is mounted as /var.

The following MPX platforms support HDD:

- o Citrix NetScaler MPX 9700, MPX 10500, MPX 12500, and MPX 15500
- o Citrix NetScaler MPX 11500, MPX 13500, MPX 14500, MPX 16500, MPX 18500, and MPX 20500
- o Citrix NetScaler MPX 11515, MPX 11520, MPX 11530, MPX 11540, and MPX 11542
- o Citrix NetScaler MPX 15000
- o Citrix NetScaler MPX 17000
- o Citrix NetScaler MPX 17500, MPX 19500, and MPX 21500
- o Citrix NetScaler MPX 17550, MPX 19550, MPX 20550, and MPX 21550
- o Citrix NetScaler MPX 22040, MPX 22060, MPX 22080, MPX 22100, and MPX 22120
- o Citrix NetScaler MPX 24100 and MPX 24150

Replacing 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. Product documentation can be downloaded from "MyCitrix.com" and reinstalled to the /var/netScaler/doc location.

To install a hard disk drive

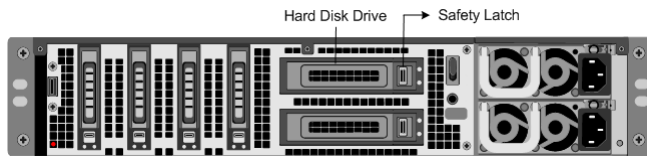
1. At the NetScaler command prompt, exit to the shell prompt. Type:


```
shell
```
2. Shut down the NetScaler appliance by typing one of the following commands at the shell prompt.
 - o On an MPX appliance, type:


```
shutdown -p now
```
 - o 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 to disengage. Pull out the faulty drive.
- Note: The illustration in the following figures might not represent the actual NetScaler appliance.
- Figure 9. 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 Citrix product label is at the top.
- Figure 10. Inserting 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 in excess of 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 Citrix NetScaler appliance supports only 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.

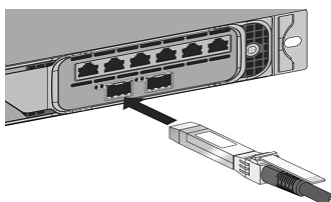
Installing a Direct Attach Cable

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

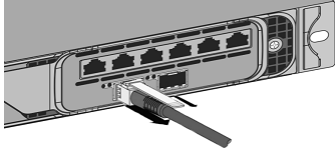
1. To install the DAC, slide it into the 10G port on the appliance, as shown in the following figure. You will hear a click when the DAC properly fits into the port.

Figure 11. Inserting 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 12. Removing a DAC from the 10G port



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 processor MPX 5500 platform to the high-capacity, MPX 22040/22060/22080/22100/22120 hardware platform. 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.

Some of the hardware platforms are available as dedicated application firewall appliances or secure application access appliances.

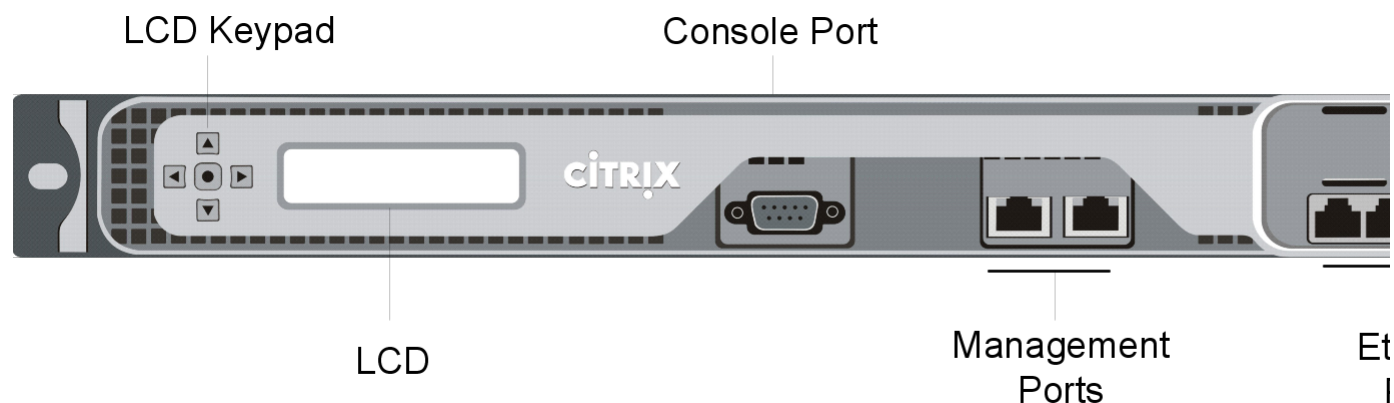
For information on the software releases supported on the NetScaler hardware platforms, see [Supported Releases on NetScaler Hardware](#).

Citrix NetScaler MPX 5500

The Citrix NetScaler MPX 5500 is a 1U appliance, with 1 dual-core processor, and 4 gigabytes (GB) of memory.

The following figure shows the front panel of the MPX 5500.

Figure 1. Citrix NetScaler MPX 5500, front panel



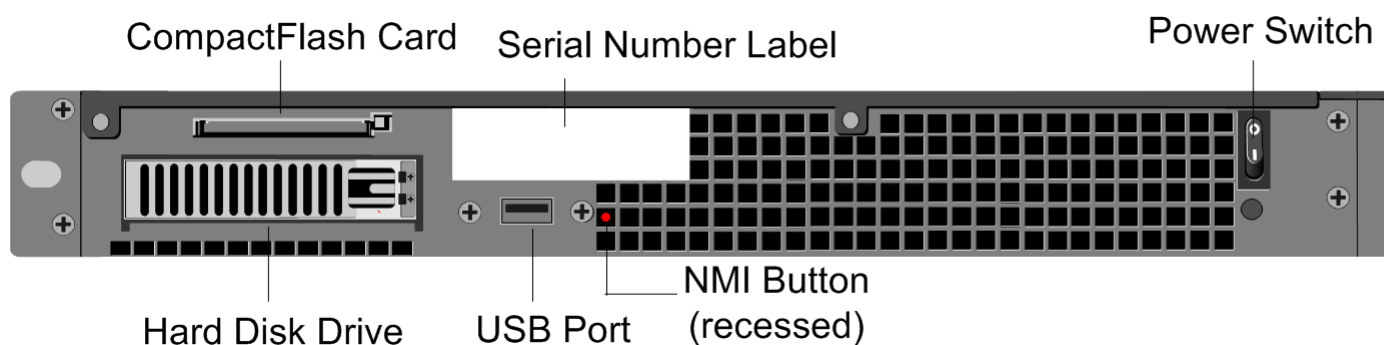
The MPX 5500 has the following ports:

- o RS232 serial console port.
- o Two 10/100/1000Base-T copper Ethernet management ports, numbered 0/1 and 0/2 from left to right. You can use these ports to connect directly to the appliance for system administration functions.
- o Four 10/100/1000Base-T copper Ethernet ports numbered 1/1, 1/2, 1/3, and 1/4 from left to right.

Note: The network port numbers on all appliances consist of two numbers separated by a forward slash. The first number is the port adapter slot number. The second number is the interface port number. Ports on appliances are numbered sequentially starting with 1.

The following figure shows the back panel of the MPX 5500.

Figure 2. Citrix NetScaler MPX 5500, back panel



The following components are visible on the back panel of the MPX 5500:

- o Four GB removable CompactFlash card that is used to store the NetScaler software.
- o Power switch, which turns off power to the MPX 5500, just as if you were to unplug the power supply. Press the switch for five seconds to turn off the power.
- o Removable hard-disk drive (HDD) that is used to store user data. Appliances shipped before February, 2012 store user data on a HDD. In appliances shipped after February, 2012, a solid-state drive replaces the HDD. Both types of drive have the same functionality and support the same software releases.
- o USB port (reserved for a future release).
- o Non-maskable interrupt (NMI) Button that is used at the request of Technical Support and produces a core dump on the NetScaler. You must use a pen, pencil, or other pointed object to press this red button, which is recessed to prevent unintentional activation.
- o Power supply rated at 300 watts, 110-220 volts. The power-supply fan is designed to turn on only when the internal temperature of the power supply reaches a certain value. You cannot see the fan turning on the back panel. What you can see is the fixed part of the fan that holds the spinning motor.

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

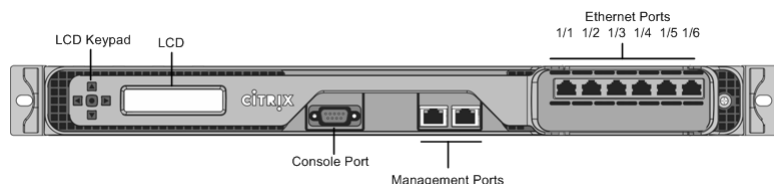
For information about performing initial configuration of your appliance, see "[Initial Configuration](#)."

Citrix NetScaler MPX 5550 and MPX 5650

The Citrix NetScaler models MPX 5550 and MPX 5650 are 1U appliances. Each model has one quad-core processor and 8 gigabytes (GB) of memory.

The following figure shows the front panel of the MPX 5550/5650 appliance.

Figure 1. Citrix NetScaler MPX 5550/5650, front panel

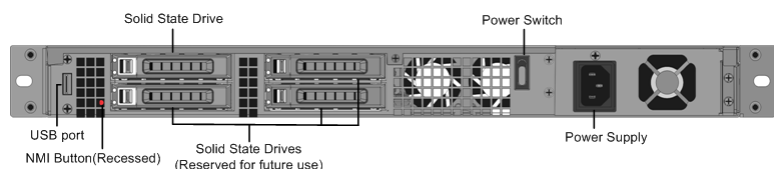


Depending on the model, the appliance has the following ports:

- RS232 serial console port.
- Two 10/100/1000Base-T copper Ethernet management ports (RJ45), numbered 0/1 and 0/2 from left to right. The management port is used to connect directly to the appliance for system administration functions.
- Six 10/100/1000Base-T copper Ethernet ports numbered 1/1, 1/2, 1/3, 1/4, 1/5, and 1/6 from left to right.

The following figure shows the back panel of the MPX 5550/5650 appliance.

Figure 2. Citrix NetScaler MPX 5550/5650 appliance, back panel



The following components are visible on the back panel of the MPX 5550/5650 appliance:

- 160 GB removable solid-state drive, which is used to store the NetScaler software and the user data.
- Power switch, which turns off power to the appliance, just as if you were to unplug the power supply. Press the switch for five seconds to turn off the power.
- USB port (reserved for a future release).
- Non-maskable interrupt (NMI) button, which is used at the request of Technical Support to produce a NetScaler core dump. You must use a pen, pencil, or other pointed object to press this red button, which is recessed to prevent unintentional activation.
- Single power supply, rated at 300 watts, 110-220 volts.

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

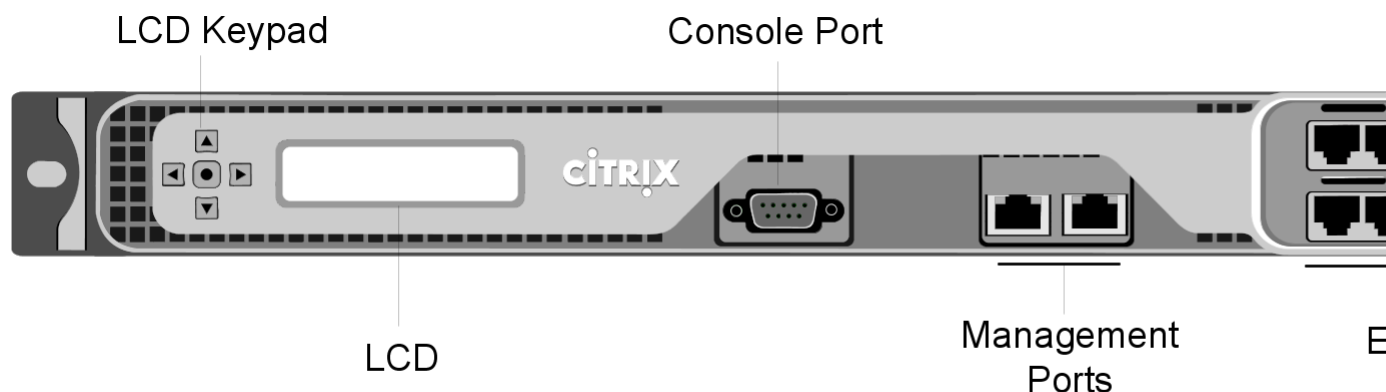
For information about performing initial configuration of your appliance, see ["Initial Configuration."](#)

Citrix NetScaler MPX 7500 and MPX 9500

The Citrix NetScaler MPX 7500/9500 are 1U appliances, each with 1 quad-core processor, and 8 gigabytes (GB) of memory. The MPX 7500/9500 appliances are available in two port configurations: 8x10/100/1000Base-T copper Ethernet ports and 4x1G SFP + 4x10/100/1000Base-T copper Ethernet ports.

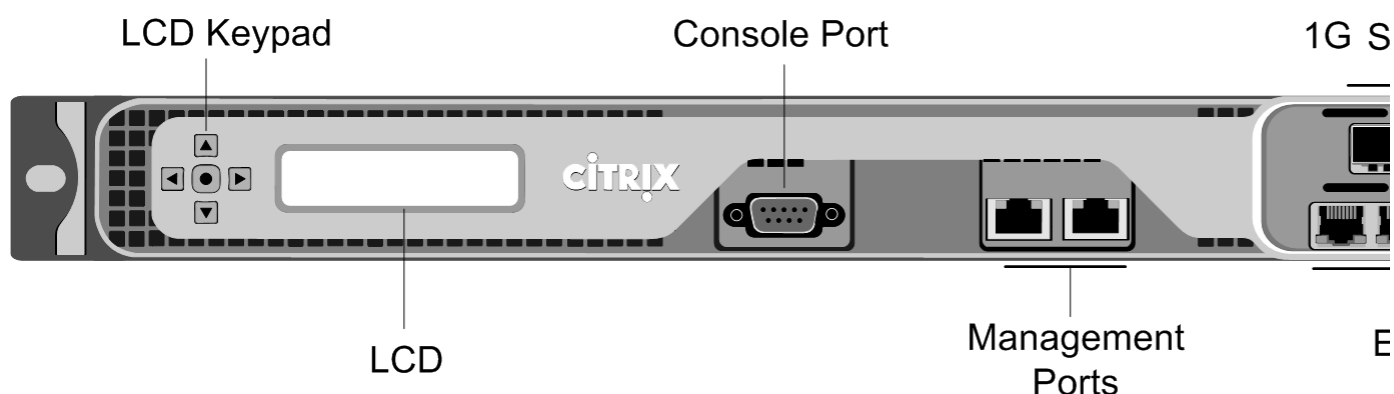
The following figure shows the front panel of the MPX 7500/9500 (8x10/100/1000Base-T copper Ethernet ports) appliances.

Figure 1. Citrix NetScaler MPX 7500/9500 (8x10/100/1000Base-T copper Ethernet ports), front panel



The following figure shows the front panel of the MPX 7500/9500 (4x1G SFP + 4x10/100/1000Base-T copper Ethernet ports) appliances.

Figure 2. Citrix NetScaler MPX 7500/9500 (4x1G SFP + 4x10/100/1000Base-T copper Ethernet ports), front panel

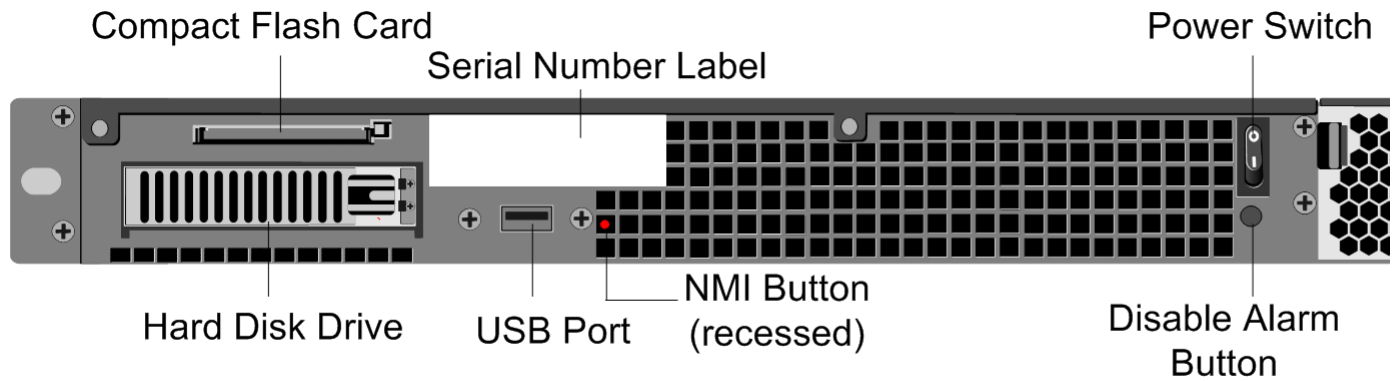


Depending on the model, the appliance has the following ports:

- RS232 serial console port.
- Two 10/100/1000Base-T copper Ethernet 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
 - MPX 7500/9500 (8x10/100/1000Base-T copper Ethernet ports). Eight 10/100/1000Base-T copper Ethernet ports numbered 1/1, 1/2, 1/3, and 1/4 on the top row from left to right, and 1/5, 1/6, 1/7, and 1/8 on the bottom row from left to right.
 - MPX 7500/9500 (4x1G SFP + 4x10/100/1000Base-T copper Ethernet ports). Four 1-gigabit copper or fiber 1G SFP ports numbered 1/1, 1/2, 1/3, and 1/4 on the top row from left to right, and four 10/100/1000BASE-T copper Ethernet ports (RJ45) numbered 1/5, 1/6, 1/7, and 1/8 on the bottom row from left to right.

The following figure shows the back panel of the MPX 7500/9500 appliance.

Figure 3. Citrix NetScaler MPX 7500/9500, back panel



re

The following components are visible on the back panel of the MPX 7500/9500:

- Four-gigabyte removable CompactFlash card that is used to store the NetScaler software.
- Power switch, which turns off power to the MPX 7500/9500, just as if you were to unplug the power supply. Press the switch for five seconds to turn off the power.
- Removable hard-disk drive (HDD) that is used to store user data. Appliances shipped before February, 2012 store user data on a HDD. In appliances shipped after February, 2012, a solid-state drive replaces the HDD. Both types of drive have the same functionality and support the same software releases.
- USB port (reserved for a future release).
- Non-maskable interrupt (NMI) button that is used at the request of Technical Support and produces a core dump on the appliance. You must use a pen, pencil, or other pointed object to press this red button, which is recessed to prevent unintentional activation.
- 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 MPX 7500/9500 into only one power outlet or when one power supply is malfunctioning and you want to continue operating the MPX 7500/9500 until it is repaired.

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."](#)

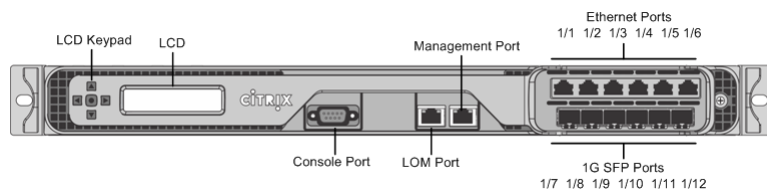
Citrix NetScaler MPX 8005,MPX 8015,MPX 8200, MPX 8400, MPX 8600, and MPX 8800

The Citrix NetScaler models MPX 8005, MPX 8015, MPX 8200, MPX 8400, MPX 8600, and MPX 8800 are 1U appliances. Each model has one quad-core processor and 32 gigabytes (GB) of memory. The MPX 8005/8015/8200/8400/8600/8800 appliances are available in two port configurations:

- Six 10/100/1000Base-T copper Ethernet ports and six 1G SFP ports (6x10/100/1000Base-T copper Ethernet ports + 6x1G SFP)
- Six 10/100/1000Base-T copper Ethernet ports and two 10G SFP+ ports (6x10/100/1000Base-T copper Ethernet ports + 2x10G SFP+)

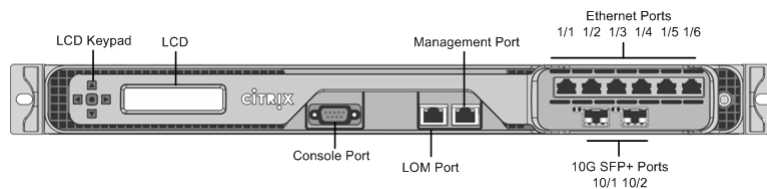
The following figure shows the front panel of the MPX 8005/8015/8200/8400/8600/8800 (6x10/100/1000Base-T copper Ethernet ports + 6x1G SFP) appliance.

Figure 1. Citrix NetScaler MPX 8005/8015/8200/8400/8600/8800 (6x10/100/1000Base-T copper Ethernet ports + 6x1G SFP), front panel



The following figure shows the front panel of the MPX 8005/8015/8200/8400/8600/8800 (6x10/100/1000Base-T copper Ethernet ports + 2x10G SFP+) appliance.

Figure 2. Citrix NetScaler MPX 8005/8015/8200/8400/8600/8800 (6x10/100/1000Base-T copper Ethernet ports + 2x10G SFP+), front panel

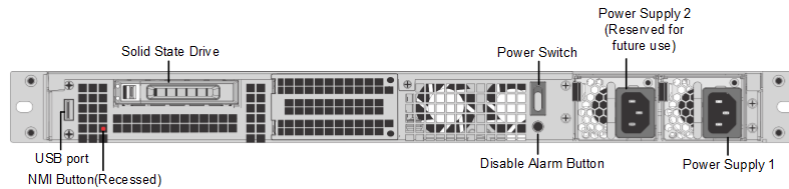


Depending on the model, the appliance has the following ports:

- RS232 serial console port.
- One 10/100Base-T copper Ethernet Port (RJ45), also called LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.
- One 10/100/1000Base-T copper Ethernet management port (RJ45), numbered 0/1. The management port is used to connect directly to the appliance for system administration functions.
- Network Ports
 - MPX 8005/8015/8200/8400/8600/8800 (6x10/100/1000Base-T copper Ethernet ports + 6x1G SFP). Six 10/100/1000BASE-T copper Ethernet ports (RJ45) numbered 1/1, 1/2, 1/3, 1/4, 1/5, and 1/6 on the top row from left to right, and six 1-gigabit copper or fiber 1G SFP ports numbered 1/7, 1/8, 1/9, 1/10, 1/11, and 1/12 on the bottom row from left to right.
 - MPX 8005/8015/8200/8400/8600/8800 (6x10/100/1000Base-T copper Ethernet ports + 2x10G SFP+). Six 10/100/1000BASE-T copper Ethernet ports (RJ45) numbered 1/1, 1/2, 1/3, 1/4, 1/5, and 1/6 on the top row from left to right and two 10-gigabit SFP+ ports numbered 10/1 and 10/2 on the bottom row from left to right.

The following figure shows the back panel of the MPX 8005/8015/8200/8400/8600/8800 appliance.

Figure 3. Citrix NetScaler MPX 8005/8015/8200/8400/8600/8800 appliance, back panel



The following components are visible on the back panel of the MPX 8005/8015/8200/8400/8600/8800 appliance:

- One 256 GB removable solid-state drive, which is used to store the NetScaler software and the user data.

Note: Earlier MPX 8005/8015/8200/8400/8600/8800 appliances had three additional SSD slots for future use. Current NetScaler MPX 8005/8015/8200/8400/8600/8800 appliances do not have any additional SSD slots for future use.

- Power switch, which turns off power to the appliance, just as if you were to unplug the power supply. Press the switch for five seconds to turn off the power.
- USB port (reserved for a future release).
- Non-maskable interrupt (NMI) button, which is used at the request of Technical Support to produce a NetScaler core dump. You must use a pen, pencil, or other pointed object to press this red button, which is recessed to prevent unintentional activation.
- Disable alarm button, which is nonfunctional. This button is functional only if you install a second power supply.

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.

- Single power supply, rated at 450 watts, 110-220 volts.

Note: The MPX 8005/8015/8200/8400/8600/8800 appliance supports dual power supplies, but ships with one power supply. Contact your Citrix sales representative to order a second power supply.

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

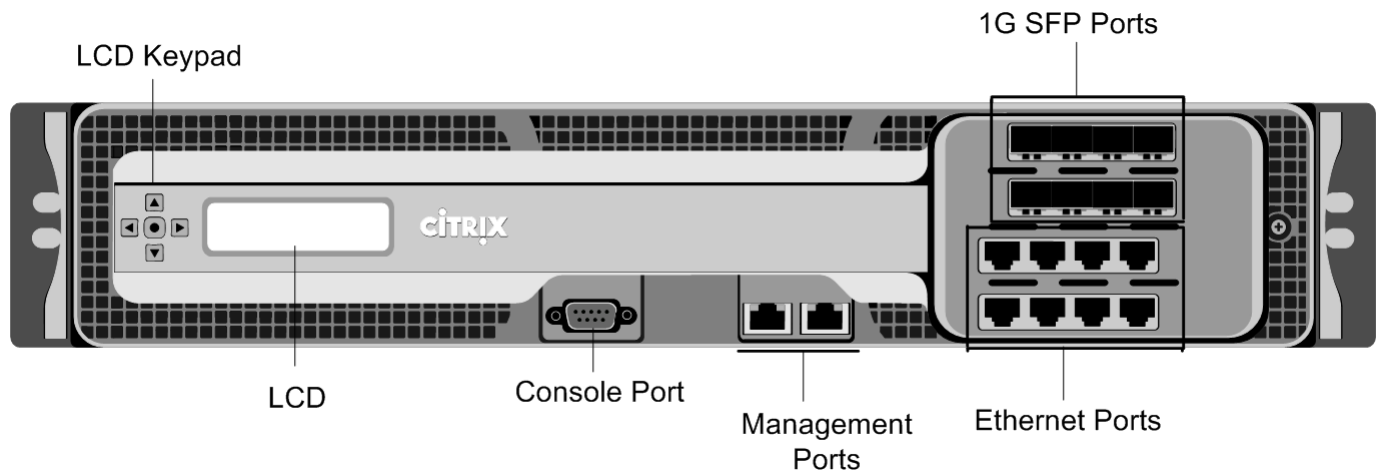
For information about performing initial configuration of your appliance, see ["Initial Configuration."](#)

Citrix NetScaler MPX 9700, MPX 10500, MPX 12500, and MPX 15500

The Citrix NetScaler MPX 9700/10500/12500/15500 are 2U appliances, each with 2 quad-core processors, and 16 gigabytes (GB) of memory. All these appliances are also available in a 10G model and a FIPS model.

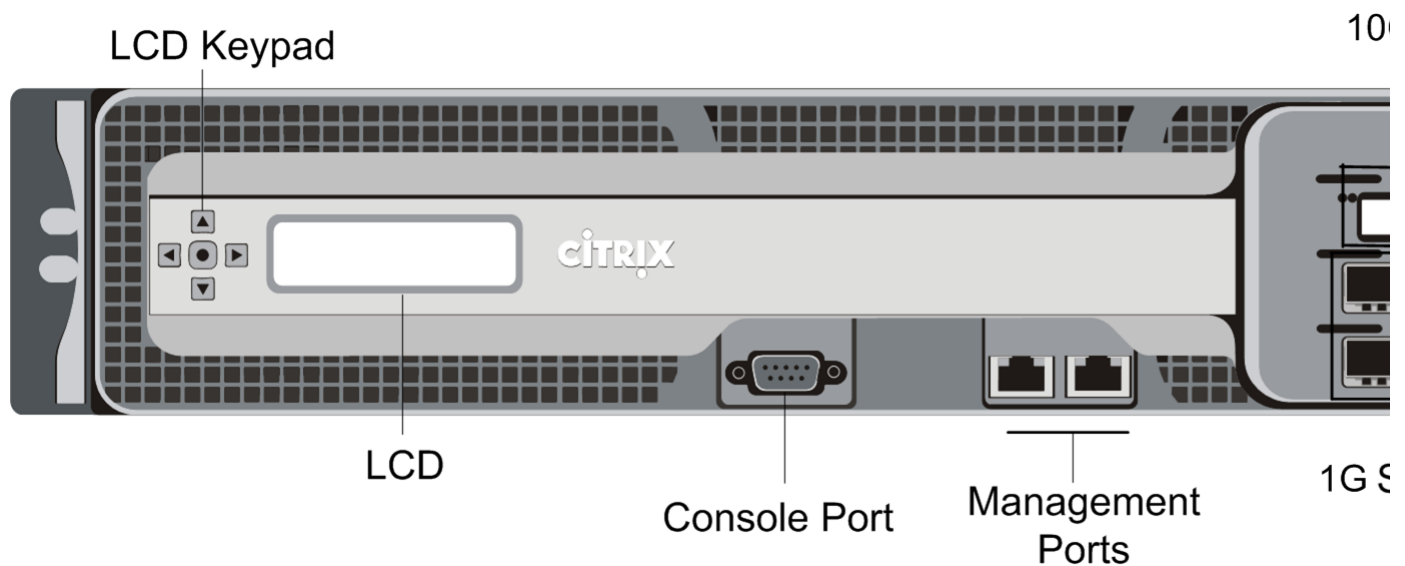
The following figure shows the front panel of the MPX 9700/10500/12500/15500.

Figure 1. Citrix NetScaler MPX 9700/10500/12500/15500, front panel



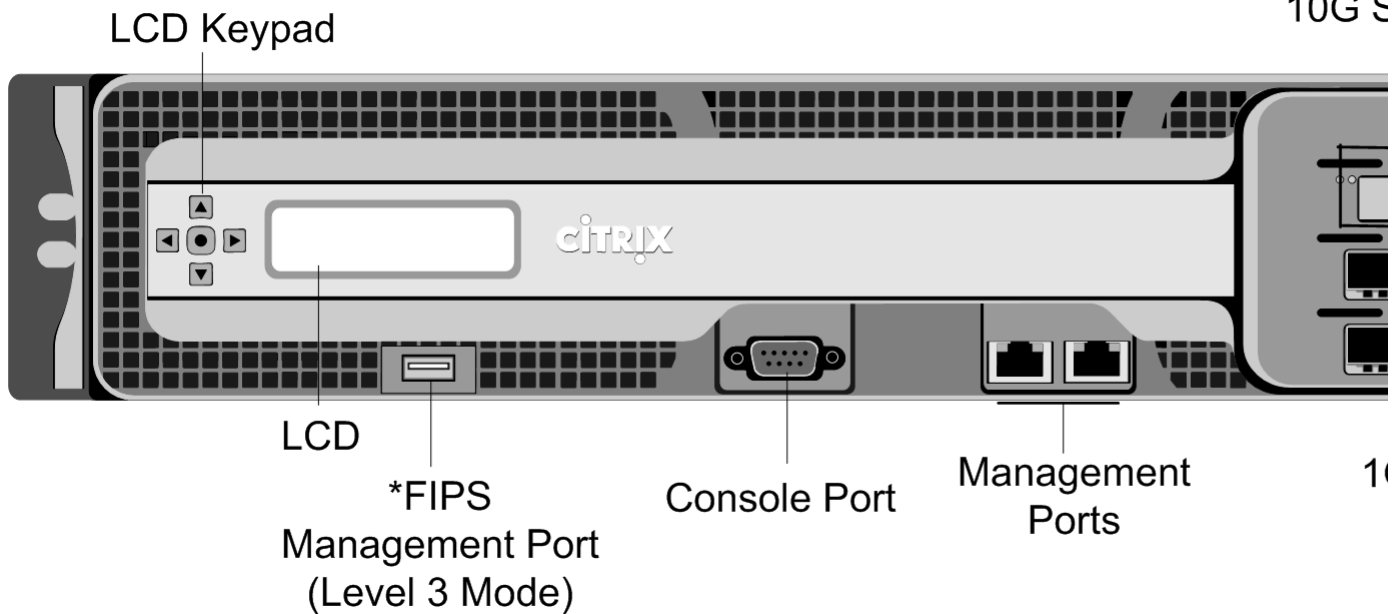
The following figure shows the front panel of the MPX 9700/10500/12500/15500 10G.

Figure 2. Citrix NetScaler MPX 9700/10500/12500/15500 10G, front panel



The following figure shows the front panel of the MPX 9700/10500/12500/15500 FIPS.

Figure 3. Citrix NetScaler MPX 9700/10500/12500/15500 FIPS, front panel



*The FIPS Management Port (Level 3 Mode) is reserved for a future release.

Caution: Do not insert a USB device into the FIPS Management Port. This will cause the FIPS card to fail.

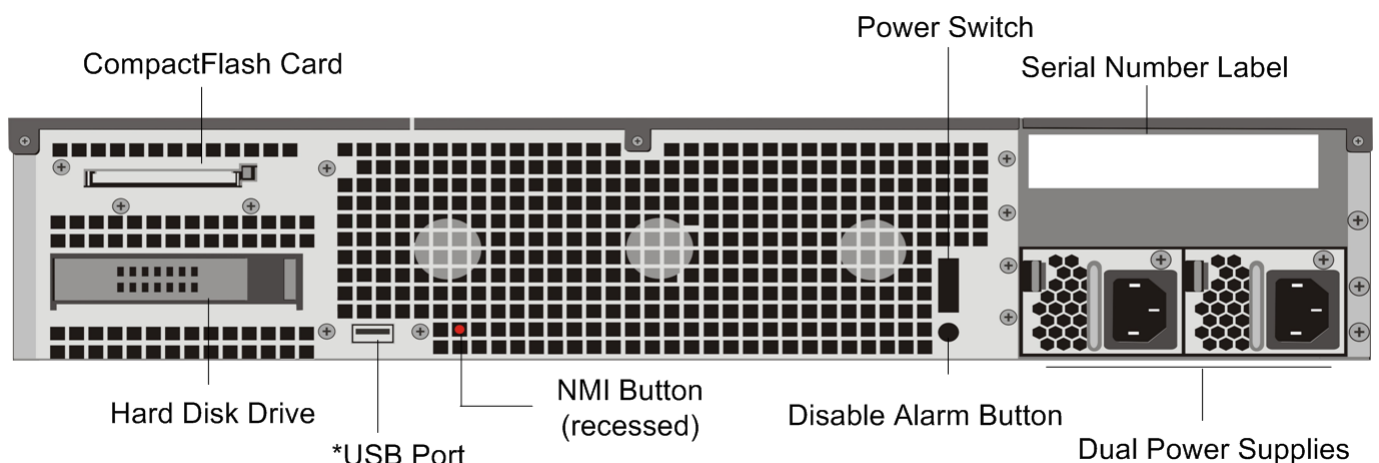
Depending on the model, the appliance has the following ports:

- o FIPS Management Port (reserved for a future release).
- o RS232 serial Console Port.
- o 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.
- o Network Ports
 - MPX 9700/10500/12500/15500. Eight copper or fiber 1G SFP ports numbered 1/1, 1/2, 1/3, and 1/4 on the first row from left to right, and 1/5, 1/6, 1/7, and 1/8 on the second row from left to right. Eight 10/100/1000BASE-T copper Ethernet Ports (RJ45) numbered 1/9, 1/10, 1/11, and 1/12 on the third row from left to right, and 1/13, 1/14, 1/15, and 1/16 on the fourth row from left to right.
 - MPX 9700/10500/12500/15500 10G and MPX 9700/10500/12500/15000 FIPS. Two 10G SFP+ Ports numbered 10/1 and 10/2 on the top row, eight 1-gigabit copper or fiber 1G SFP Ports numbered 1/1, 1/2, 1/3, and 1/4 on the middle row from left to right, and 1/5, 1/6, 1/7, and 1/8 on the bottom row from left to right.

Important: The 10-gigabit ports on this appliance are labeled 10/1 and 10/2.

The following figure shows the back panel of the MPX 9700/10500/12500/15500 appliances, including the 10G model and FIPS model.

Figure 4. Citrix NetScaler MPX 9700/10500/12500/15500, MPX 9700/10500/12500/15500 FIPS, and MPX 9700/10500/12500/15500 10G, back panel



*The USB Port is reserved for a future release.

The following components are visible on the back panel of the MPX 9700/10500/12500/15500, including the 10G model and FIPS model:

- Four GB removable CompactFlash Card that is used to store the NetScaler software.
- Power Switch, which turns off power to the appliance, just as if you were to unplug the power supply. Press the switch for five seconds to turn off the power.
- Removable Hard Disk Drive that is used to store user data.
- USB Port (reserved for a future release).
- Non-maskable interrupt (NMI) Button that is used at the request of Technical Support and produces a core dump on the NetScaler. You must use a pen, pencil, or other pointed object to press this red button, which is recessed to prevent unintentional activation.
- 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.

- Dual Power Supplies, each rated at 450 watts, 110-220 volts.

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

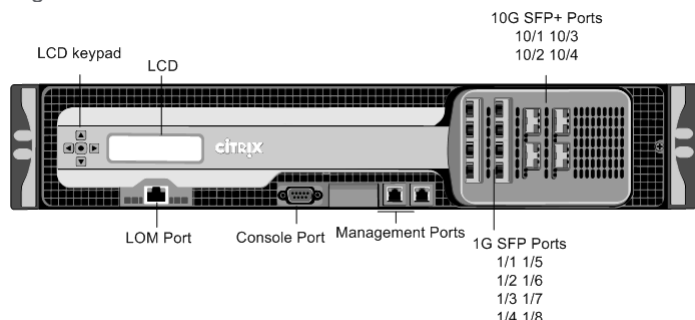
For information about performing initial configuration of your appliance, see "[Initial Configuration](#)."

Citrix NetScaler MPX 11500,MPX 13500,MPX 14500,MPX 16500,MPX 18500, andMPX 20500

The Citrix NetScaler models MPX 11500/13500/14500/16500/18500/20500 are 2U appliances. Each model has two 6-core processors for a total of 12 physical cores (24 cores with hyper-threading), and 48 gigabytes (GB) of memory.

The following figure shows the front panel of the MPX 11500/13500/14500/16500/18500/20500 appliance.

Figure 1. Citrix NetScaler MPX 11500/13500/14500/16500/18500/20500 appliance, front panel

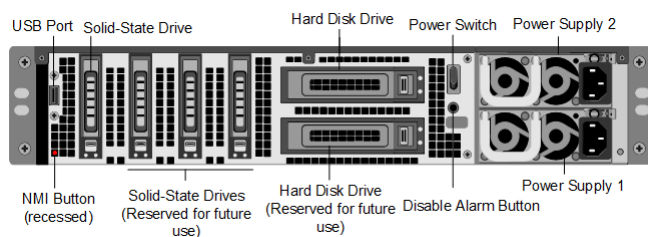


The MPX 11500/13500/14500/16500/18500/20500 appliances have the following ports:

- 10/100Base-T copper Ethernet Port (RJ45), also called LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.
Note: The LEDs on the LOM port are not operational by design.
- RS232 serial console port.
- 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.
- Eight 1G SFP ports numbered 1/1, 1/2, 1/3, 1/4 from top to bottom in the first column, and 1/5, 1/6, 1/7, and 1/8 from top to bottom in the second column.
- Four 10G SFP+ ports numbered 10/1 and 10/2 from top to bottom in the first column, and 10/3 and 10/4 from top to bottom in the second column.

The following figure shows the back panel of the MPX 11500/13500/14500/16500/18500/20500 appliance.

Figure 2. Citrix NetScaler MPX 11500/13500/14500/16500/18500/20500 appliance, back panel



The following components are visible on the back panel of the MPX 11500/13500/14500/16500/18500/20500 appliance:

- 160 GB removable solid-state drive that is used to store the NetScaler software.
- USB port (reserved for a future release).
- Power switch, which turns off power to the appliance, just as if you were to unplug the power supply. Press the switch for five seconds to turn off the power.
- Non-maskable interrupt (NMI) Button that is used at the request of Technical Support and produces a core dump on the NetScaler. You must use a pen, pencil, or other pointed object to press this red button, which is recessed to prevent unintentional activation.
- Two removable hard-disk drives that are used to store user data.
- 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.

- Dual power supplies, each rated at 650 watts, 110-220 volts.

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

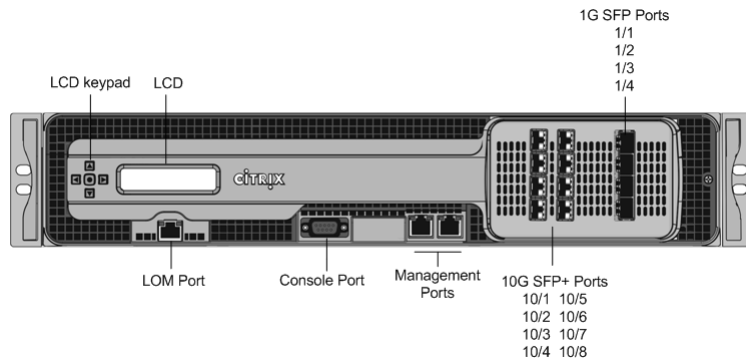
For information about performing initial configuration of your appliance, see "[Initial Configuration](#)."

Citrix NetScaler MPX 11515, MPX 11520, MPX 11530, MPX 11540, and MPX 11542

The Citrix NetScaler models MPX 11515/11520/11530/11540/11542 are 2U appliances. Each model has two 6-core processors for a total of 12 physical cores (24 cores with hyper-threading), and 48 gigabytes (GB) of memory.

The following figure shows the front panel of the MPX 11515/11520/11530/11540/11542 appliance.

Figure 1. Citrix NetScaler MPX 11515/11520/11530/11540/11542 appliance, front panel

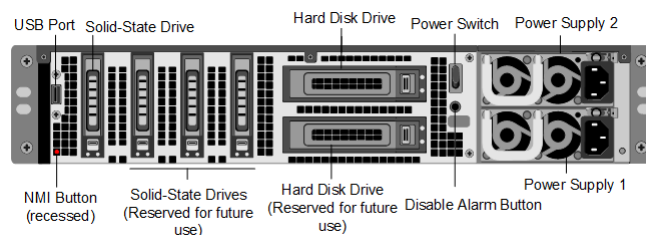


The MPX 11515/11520/11530/11540/11542 appliances have the following ports:

- o RS232 serial console port.
- o 10/100Base-T copper Ethernet Port (RJ45), also called LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.
Note: The LEDs on the LOM port are not operational by design.
- o 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.
- o Eight 10G SFP+ ports and four copper or fiber 1G SFP ports.

The following figure shows the back panel of the MPX 11515/11520/11530/11540/11542 appliance.

Figure 2. Citrix NetScaler MPX11515/11520/11530/11540/11542 appliance, back panel



The following components are visible on the back panel of the MPX 11515/11520/11530/11540/11542 appliance:

- o 256 GB removable solid-state drive that is used to store the NetScaler software.
- o USB port (reserved for a future release).
- o Power switch, which turns off power to the appliance, just as if you were to unplug the power supply. Press the switch for five seconds to turn off the power.
- o Non-maskable interrupt (NMI) Button that is used at the request of Technical Support and produces a core dump on the NetScaler. You must use a pen, pencil, or other pointed object to press this red button, which is recessed to prevent unintentional activation.
- o Two removable hard-disk drives that are used to store user data.
- o 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.

- o Dual power supplies, each rated at 650 watts, 110-220 volts.

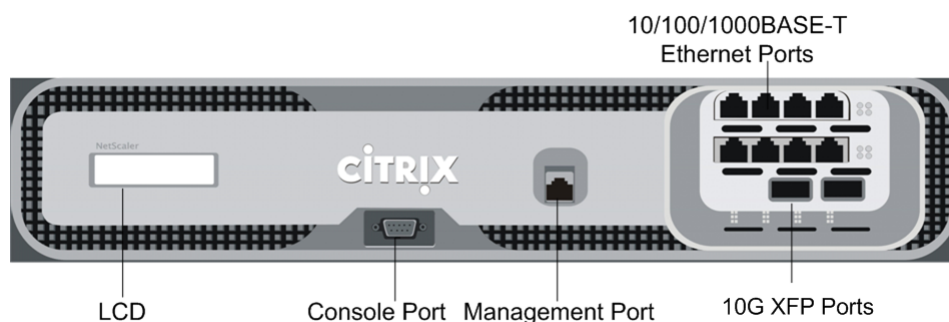
For information about installing the rails, rack mounting the hardware, and connecting the cables, see "[Installing the Hardware](#)."

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

Citrix NetScaler MPX 15000

The Citrix NetScaler MPX 15000 appliance is a 2U appliance, with 2 dual-core processors, and 16 GB of memory. The MPX 15000 is a high-capacity hardware platform intended for heavy use in enterprise and service provider environments. The following figure shows the front panel of the MPX 15000 appliance.

Figure 1. Citrix NetScaler MPX 15000 appliance, front panel



The appliance has the following ports:

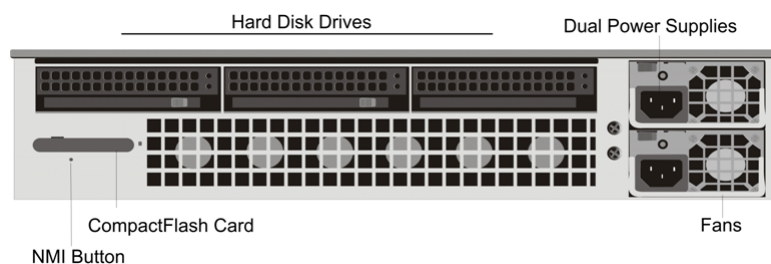
- RS232 serial console port.
- 10/100/1000BASE-T copper Ethernet management port, numbered 0/1.
- Two XFP (10-Gigabit Small Form-Factor Pluggable) fiber optic ports, numbered from left to right 1/1 and 1/2.
- Eight 10/100/1000BASE-T copper Ethernet ports, numbered from upper left to bottom right 1/3, 1/4, 1/5, 1/6, 1/7, 1/8, 1/9, and 1/10.

When facing the bezel, the upper LEDs to the left of each port represent connectivity. They are lit and amber in color when active. The lower LEDs represent throughput. They are lit and green when active.

Note: The network port numbers on all appliances consist of two numbers separated by a forward slash. The first number is the port adapter slot number and will always be either 0 or 1. The second number is the interface port number. Ports on appliances are numbered sequentially starting with 1.

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

Figure 2. Citrix NetScaler MPX 15000 appliance, back panel



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

- Removable hard-disk drive that is used to store user data.
- Dual power supplies, each rated at 500 watts, 110-220 volts.

You plug separate power cords into the power supplies and connect them to separate wall sockets. The MPX 15000 functions properly with a single power supply; the extra power supply serves as a backup.

- Non-maskable interrupt (NMI) button, which signals the MPX 15000 to perform an orderly shutdown after saving all files. You must use a pen, pencil, or other pointed object to press this button, which is located inside a small hole to prevent it from being pressed accidentally.
- Removable CompactFlash card that is used to store the NetScaler software.

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

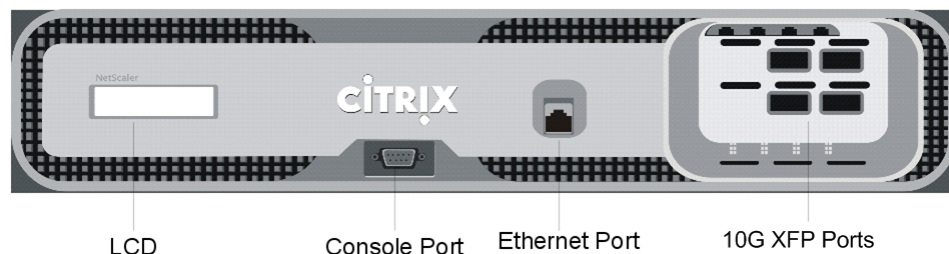
For information about performing initial configuration of your appliance, see "[Initial Configuration](#)."

Citrix NetScaler MPX 17000

The Citrix NetScaler MPX 17000 appliance is a 2U appliance, with 2 quad-core processors, and 32 GB of memory. The MPX 17000 is a high-capacity hardware platform intended for any high traffic, intensive processing data center environment. There are two MPX 17000 models: the four network-port model and the ten network-port model.

The following figure shows the front panel of the MPX 17000, four network-port model.

Figure 1. Citrix NetScaler MPX 17000 four network-port model, front panel



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

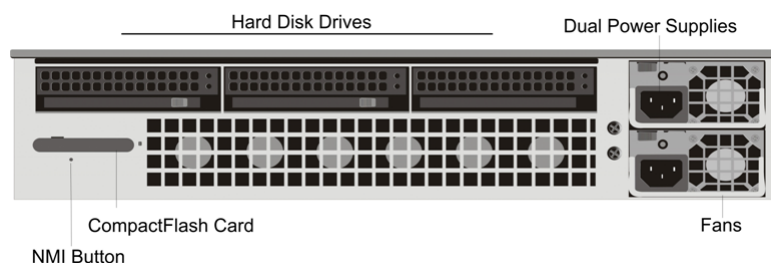
- o RS232 serial console port.
- o 10/100/1000BASE-T copper Ethernet management port, numbered 0/1.
- o Network Ports
 - MPX 17000 four network-port model. Four XFP (10-Gigabit Small Form-Factor Pluggable) ports, numbered from upper left to bottom right 1/1, 1/2, 1/3, and 1/4.
 - MPX 17000 ten network-port model. Two XFP ports, numbered from left to right 1/1 and 1/2 and eight 10/100/1000BASE-T Ethernet ports, numbered from upper left to bottom right 1/3, 1/4, 1/5, 1/6, 1/7, 1/8, 1/9 and 1/10.

Note: The network port numbers on all appliances consist of two numbers separated by a forward slash. The first number is the port adapter slot number and will always be either 0 or 1. The second number is the interface port number. Ports on appliances are numbered sequentially starting with 1.

When facing the bezel, the upper LEDs to the left of each port represent connectivity. They are lit and amber in color when active. The lower LEDs represent throughput. They are lit and green when active.

The following figure shows the back panel of the MPX 17000 appliance.

Figure 2. Citrix NetScaler MPX 17000 appliance, back panel



The following components are visible on the back of the MPX 17000 appliance:

- o Removable hard-disk drive that is used to store user data.
- o Dual power supplies, each rated at 500 watts, 110-220 volts.

You plug separate power cords into the power supplies and connect them to separate wall sockets. The MPX 17000 functions properly with a single power supply; the extra power supply serves as a backup.

- o Non-maskable interrupt (NMI) button, which signals the MPX 17000 to perform an orderly shutdown after saving all files. You must use a pen, pencil, or other pointed object to press this button, which is located inside a small hole to prevent it from being pressed accidentally.
- o Removable CompactFlash card that is used to store the NetScaler software.

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

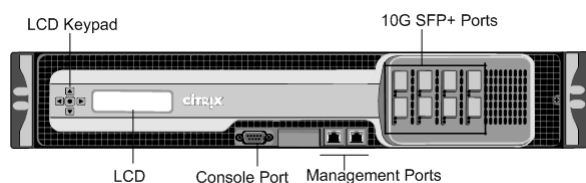
For information about performing initial configuration of your appliance, see "[Initial Configuration](#)."

Citrix NetScaler MPX 17500, MPX 19500, and MPX 21500

The Citrix NetScaler models MPX 17500/19500/21500 are 2U appliances. Each model has two 6-core processors and 48 gigabytes (GB) of memory.

The following figure shows the front panel of the MPX 17500/19500/21500 appliance.

Figure 1. Citrix NetScaler MPX 17500/19500/21500 appliance, front panel

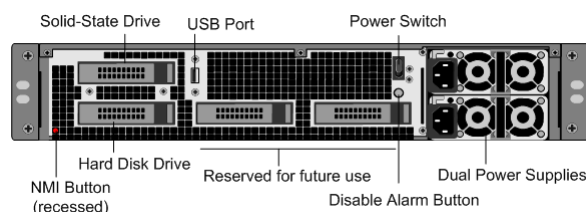


The MPX 17500/19500/21500 appliances have the following ports:

- o RS232 serial console port.
- o 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.
- o Eight 10G SFP+ ports numbered 10/1, 10/2, 10/3, and 10/4 on the top row from left to right, and 10/5, 10/6, 10/7, and 10/8 on the bottom row from left to right.

The following figure shows the back panel of the MPX 17500/19500/21500 appliance.

Figure 2. Citrix NetScaler MPX 17500/19500/21500 appliance, back panel



The following components are visible on the back panel of the MPX 17500/19500/21500 appliance:

- o 160 GB removable solid-state drive that is used to store the NetScaler software.
- o USB port (reserved for a future release).
- o Power switch, which turns off power to the appliance, just as if you were to unplug the power supply. Press the switch for five seconds to turn off the power.
- o Non-maskable interrupt (NMI) button that is used at the request of Technical Support and produces a core dump on the NetScaler. You must use a pen, pencil, or other pointed object to press this red button, which is recessed to prevent unintentional activation.
- o Removable hard-disk drive that stores user data.
- o 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.

- o Dual power supplies, each rated at 650 watts, 110-220 volts.

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

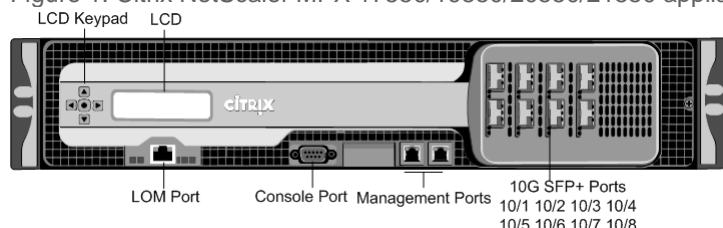
For information about performing initial configuration of your appliance, see "[Initial Configuration](#)."

Citrix NetScaler MPX 17550, MPX 19550, MPX 20550, and MPX 21550

The Citrix NetScaler models MPX 17550, MPX 19550, MPX 20550, and MPX 21550 are 2U appliances. Each model has two 6-core processors for a total of 12 physical cores (24 cores with hyper-threading), and 96 gigabytes (GB) of memory.

The following figure shows the front panel of the MPX 17550/19550/20550/21550 appliance.

Figure 1. Citrix NetScaler MPX 17550/19550/20550/21550 appliance, front panel

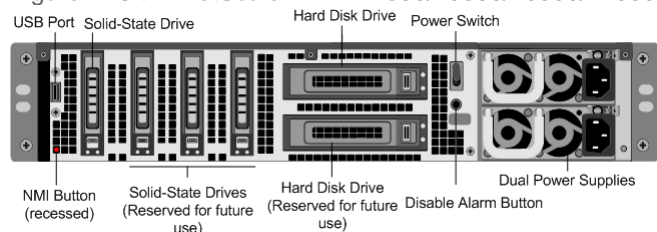


The MPX 17550/19550/20550/21550 appliance has the following ports:

- 10/100Base-T copper Ethernet Port (RJ45), also called LOM port. You can use this port to remotely monitor and manage the appliance independently of the NetScaler software.
Note: The LEDs on the LOM port are not operational by design.
- RS232 serial console port.
- 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.
- Eight 10G SFP+ ports numbered 10/1, 10/2, 10/3, and 10/4 on the top row from left to right, and 10/5, 10/6, 10/7, and 10/8 on the bottom row from left to right.

The following figure shows the back panel of the MPX 17550/19550/20550/21550 appliance.

Figure 2. Citrix NetScaler MPX 17550/19550/20550/21550 appliance, back panel



The following components are visible on the back panel of the MPX 17550/19550/20550/21550 appliance:

- 160 GB removable solid-state drive that is used to store the NetScaler software.
- USB port (reserved for a future release).
- Power switch, which turns off power to the appliance, just as if you were to unplug the power supply. Press the switch for five seconds to turn off the power.
- Non-maskable interrupt (NMI) button that is used at the request of Technical Support and produces a core dump on the NetScaler. You must use a pen, pencil, or other pointed object to press this red button, which is recessed to prevent unintentional activation.
- Two removable hard-disk drives that store user data.
- 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.

- Dual power supplies, each rated at 850 watts, 110-220 volts.

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](#)."

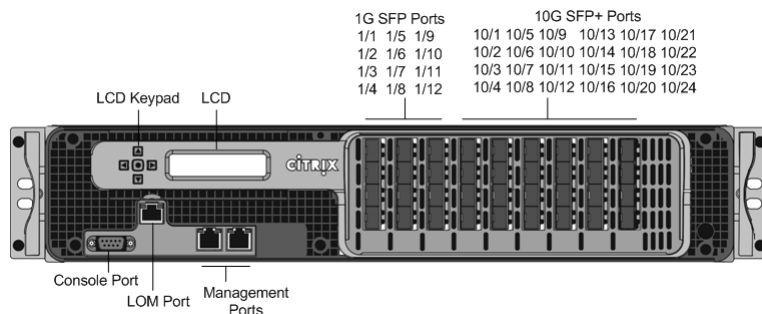
Citrix NetScaler MPX 22040, MPX 22060, MPX 22080, MPX 22100, and MPX 22120

The Citrix NetScaler MPX 22040/22060/22080/22100/22120 are 2U appliances. Each model has two 8-core processors and 256 gigabytes (GB) of memory. The MPX 22040/22060/22080/22100/22120 appliances are available in two port configurations:

- Twelve 1G SFP ports and twenty-four 10G SFP+ ports (12x1G SFP + 24x10G SFP+)
- Twenty-four 10G SFP+ ports (24x10G SFP+)

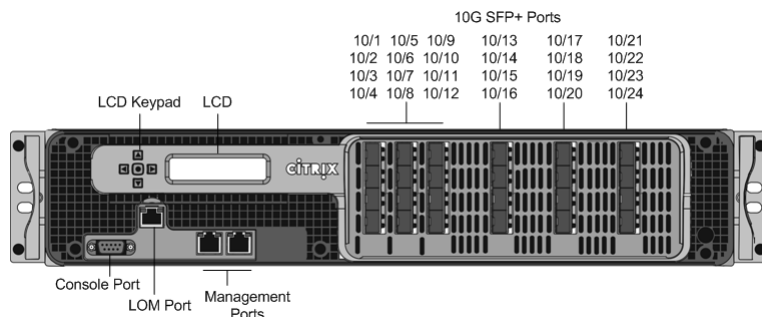
The following figure shows the front panel of the MPX 22040/22060/22080/22100/22120 (12x1G SFP + 24x10G SFP+) appliance.

Figure 1. Citrix NetScaler MPX 22040/22060/22080/22100/22120 (12x1G SFP + 24x10G SFP+), front panel



The following figure shows the front panel of the MPX 22040/22060/22080/22100/22120 (24x10G SFP+) appliance.

Figure 2. Citrix NetScaler MPX 22040/22060/22080/22100/22120 (24x10G SFP+), front panel

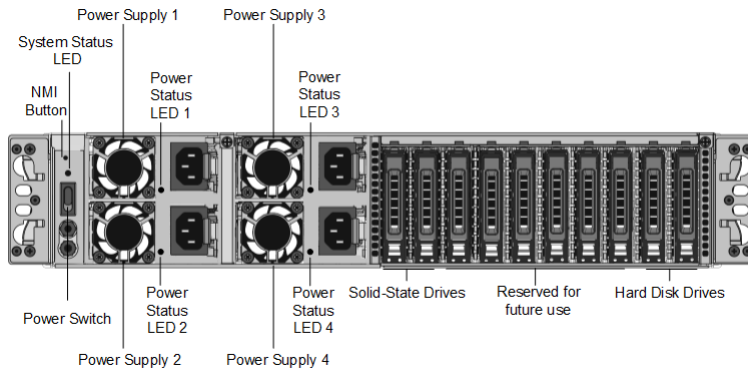


Depending on the model, the appliance has the following ports:

- 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
 - MPX 22040/22060/22080/22100/22120 (12x1G SFP + 24x10G SFP+). Twelve copper or fiber 1G SFP ports and twenty-four 10G SFP+ ports.
 - MPX 22040/22060/22080/22100/22120 (24x10G SFP+). Twenty-four 10G SFP+ ports.

The following figure shows the back panel of the MPX 22040/22060/22080/22100/22120 appliances.

Figure 3. Citrix NetScaler MPX 22040/22060/22080/22100/22120, back panel



The following components are visible on the back panel of the MPX 22040/22060/22080/22100/22120 appliance:

- 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.
- System status LED, which indicates the status of the appliance, as described in <http://support.citrix.com/proddocs/topic/netScaler-hrdwre-installation-10-5/ns-hardware-common-components-ref.html>.
Note: On an MPX 22040/22060/22080/22100/22120 appliance running LOM firmware version 3.22, the system status LED indicates an error (continuously glows RED) even though the appliance is functioning properly.
- Four power supplies, each rated at 750 watts, 100-240 volts. A minimum of two power supplies are required for proper operation. The extra power supplies act as backup. Each power supply has an LED that indicates the status of the power supply, as described in <http://support.citrix.com/proddocs/topic/netScaler-hrdwre-installation-10-5/ns-hardware-common-components-ref.html>.
- Power switch, which turns off power to the appliance. Press the switch for less than two seconds to turn off the power.
- Two 256 GB removable solid-state drives. The leftmost solid-state drive stores the NetScaler software. The other solid-state drive stores user data.
- Two 1TB removable hard disk drives that are used to store user data.

For information about installing the rails, rack mounting the hardware, and connecting the cables, see "Installing the Hardware."

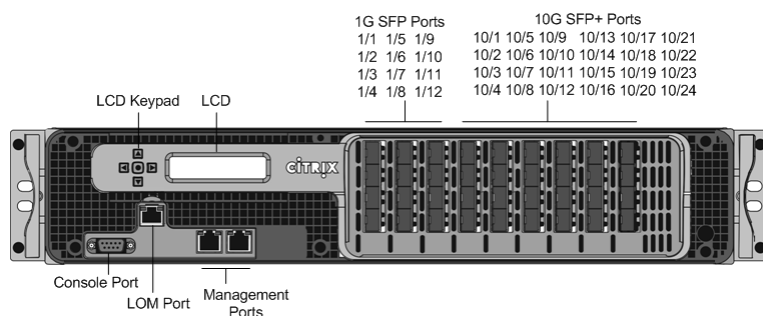
For information about performing initial configuration of your appliance, see "Initial Configuration."

Citrix NetScaler MPX 24100 and MPX 24150

The Citrix NetScaler MPX 24100/24150 are 2U appliances. Each model has two 8-core processors and 256 gigabytes (GB) of memory. The MPX 24100/24150 appliances are available in the twelve 1G SFP ports and twenty-four 10G SFP+ ports (12x1G SFP + 24x10G SFP+) configuration.

The following figure shows the front panel of the MPX 24100/24150 (12x1G SFP + 24x10G SFP+) appliance.

Figure 1. Citrix NetScaler MPX 24100/24150 (12x1G SFP + 24x10G SFP+), front panel

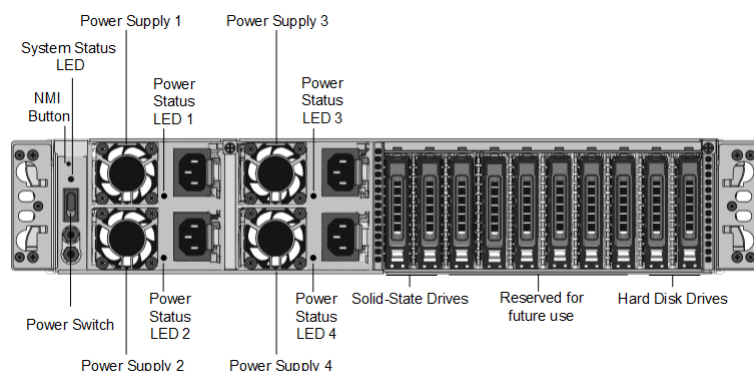


Depending on the model, the appliance has the following ports:

- 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
MPX 24100/24150 (12x1G SFP + 24x10G SFP+). Twelve copper or fiber 1G SFP ports and twenty-four 10G SFP+ ports.

The following figure shows the back panel of the MPX 24100/24150 appliances.

Figure 2. Citrix NetScaler MPX 24100/24150, back panel



The following components are visible on the back panel of the MPX 24100/24150 appliance:

- 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.
- System status LED, which indicates the status of the appliance, as described in <http://support.citrix.com/proddocs/topic/netscaler-hrdwre-installation-10-5/ns-hardware-common-components-ref.html>.
Note: On an MPX 24100/24150 appliance running LOM firmware version 3.22, the system status LED indicates an error (continuously glows RED) even though the appliance is functioning properly.
- Four power supplies, each rated at 750 watts, 100-240 volts. A minimum of two power supplies are required for proper operation. The extra power supplies act as backup. Each power supply has an LED that indicates the status of the power supply, as described in <http://support.citrix.com/proddocs/topic/netscaler-hrdwre-installation-10-5/ns-hardware-common-components-ref.html>.

- Power switch, which turns off power to the appliance. Press the switch for less than two seconds to turn off the power.
- Two 128 GB removable solid-state drives.
- One 500 GB removable hard disk drive that is used to store user data.

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](#)."

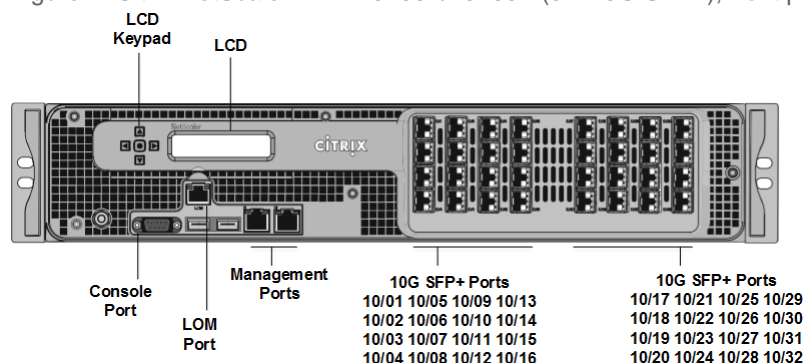
Citrix NetScaler MPX 25100T and MPX 25160T

The Citrix NetScaler MPX 25100T and 25160T are 2U appliances. Each model has two 10-core processors and 128 gigabytes (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. Citrix NetScaler MPX 25100T/25160T (32x10G SFP+), front panel



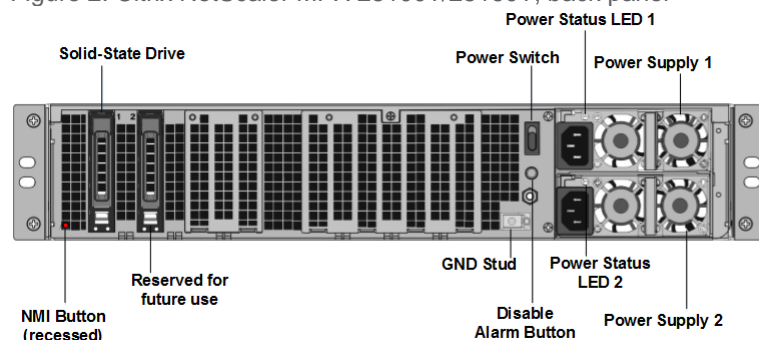
Depending on the model, the appliance has the following ports:

- o RS232 serial Console Port.
- o 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.
- o 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.
- o 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. Citrix NetScaler MPX 25100T/25160T, back panel



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

- o One 300 GB removable solid-state drive.
- o Power switch, which turns power to the appliance on or off. Press the switch for less than two seconds to turn off the power.
- o 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 <http://support.citrix.com/proddocs/topic/netscaler-hrdwre-installation-10-5/ns-hardware-common-components-ref.html>.
- o 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, or when one power supply is malfunctioning, and you want to continue operating the appliance until it is repaired.

- o 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 on the Lights Out Management Port of the appliance, see <http://support.citrix.com/proddocs/topic/netScaler-hrdwre-installation-10-5/ns-hardware-lom-intro-wrapper-con.html>.

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."

Application Firewall Platforms

For information about the Application Firewall platforms, see [Citrix NetScaler Application Firewall](#).

Summary of Hardware Specifications

The following tables summarize the specifications of the hardware platforms.

Table 1. MPX Platform Summary

Â	MPX 5500	MPX 5550/MPX 5650	MPX 7500/MPX 9500	MPX 14000
Processors	1 dual-core	1 quad-core	1 dual-core	One 8-core processor
Memory	4 GB	8 GB	8 GB	32 GB
Ports - 1G	4x10/100/1000Base-T copper Ethernet ports	6x10/100/1000Base-T copper Ethernet ports	8x10/100/1000Base-T copper Ethernet ports model: 8x10/100/1000Base-T copper Ethernet ports 4x1G SFP + 4x10/100/1000Base-T copper Ethernet ports model: 4xcopper/fiber 1G SFP ports, 4x10/100/1000Base-T copper Ethernet ports	NA
Ports - 10G	NA	NA	NA	8x10G SFP+ ports
Number of Power Supplies	1	1	1 with second optional	1
AC Power Supply input voltage, frequency, & current	100â€“240 VAC 50â€“60 Hz 3â€“1.5 A	100â€“240 VAC 50â€“60 Hz 2.5 A	100â€“240 VAC 50â€“60 Hz 3â€“1.5 A	100â€“240 VAC 50â€“60 Hz 2.5 A
Maximum Power Consumption	260 W	300 W	260 W	450 W
Heat Dissipation	887 BTU per hour	630 BTU per hour	887 BTU per hour	494 BTU per hour
Weight	22 lbs 9.98 kg	32 lbs 14.5 kg	23 lbs with one power supply 10.43 kg with one power supply	32 lbs 14.5 kg

Height	1U	1U	1U	1U
Width	EIA 310-D for 19-inch racks	EIA 310-D for 19-inch racks	EIA 310-D for 19-inch racks	EIA 310-D for 19-inch racks
Depth	21.75 in or 55 cm	24.02 in or 61 cm	21.75 in or 55 cm	24 in or 61 cm
Operating Temperature	0° to 40° C 32° to 104° F	0° to 40° C 32° to 104° F	0° to 40° C 32° to 104° F	0° to 40° C 32° to 104° F
Humidity range (non-condensing)	5% to 95%	5% to 95%	5% to 95%	20% to 80%
Safety Certifications	CSA	CSA	CSA	TUV
EMC & Susceptibility	FCC (Part 15 Class A), CE, C-Tick, CCC, KCC, NOM, PCT, VCCI, SASO, SABS	FCC (Part 15 Class A), CE, C-Tick, VCCI-A, CCC, KCC, NOM, SASO, SABS, PCT	FCC (Part 15 Class A), CE, C-Tick, CCC, KCC, NOM, PCT, VCCI, SASO, SABS	FCC (Part 15 Class A), CE, C-Tick, VCCI-A
Compliance	RoHS, WEEE	RoHS, WEEE	RoHS, WEEE	RoHS, WEEE

Table 2. MPX Platform Summary (contd.)

Model	MPX 17000	MPX 8005/MPX 8015/ MPX 8200/MPX 8400/MPX 8600/MPX 8800	MPX 9700/MPX 10500/MPX 12500/MPX 15500	MPX 11500/MPX 13500/MPX 14500/MPX 16500/MPX 18500/MPX 20500
Processors	2 quad-core	1 quad-core	2 quad-core	2 six-core
Memory	32 GB	32 GB	16 GB	48 GB
Ports - 1G	Ten network-port model: 8x10/100/1000Base-T copper Ethernet ports	6x1G SFP + 6x10/100/1000Base-T copper Ethernet model: 6xcopper/fiber 1G SFP ports, 6x10/100/1000Base-T copper Ethernet ports	8x10/100/1000Base-T copper Ethernet ports, 8xcopper/fiber 1G SFP ports 10G and FIPS model: 8xcopper/fiber 1G SFP ports	8x1G SFP ports

		2x10G SFP+ 6x10/100/1000Base-T copper Ethernet model: 6xcopper/fiber 1G SFP ports		
Ports - 10G	Four network-port model: 4x10G XFP ports Ten network-port model: 2x10G XFP ports	2x10G SFP+ 6x10/100/1000Base-T copper Ethernet model: 2x10G SFP+ Ports	10G and FIPS model : 2x10G SFP+ ports	4x10G SFP+ ports
Number of Power Supplies	2	1	2	2
AC Power Supply input voltage, frequency, & current	100~240 VAC 47~63 Hz	100~240 VAC 50~60 Hz 2.5 A	100~240 VAC 50~60 Hz 4.5~2.5 A	100~240 VAC 50~60 Hz 6.5~3.5 A
Maximum Power Consumption	700 W	450 W	450 W	650 W
Heat Dissipation	Â	630 BTU per hour	1550 BTU per hour	2200 BTU per hour
Weight	52 lbs 23.59 kg	32 lbs 14.52 kg	31 lbs 14.06 kg	46 lbs 20.87 kg
Height	2U	1U	2U	2U
Width	EIA 310-D for 19-inch racks	EIA 310-D for 19-inch racks	EIA 310-D for 19-inch racks	EIA 310-D for 19-inch racks
Depth	18.5 in or 47 cm	24.01 in or 61 cm	24.5 in or 62 cm	28 in or 71.68 cm
Operating Temperature	0~35Â° C 32~95Â° F	0~40Â° C 32~104Â° F	0~40Â° C 32~104Â° F	0~40Â° C 32~104Â° F
Humidity range (non-condensing)	5%~95%	5%~95%	5%~95%	5%~95%

Safety Certifications	UL & TUV-C	TUV	CSA	CSA
EMC & Susceptibility	FCC (Part 15 Class A), DoC, CE, VCCI, CNS, AN/NES	FCC (Part 15 Class A), CE, C-Tick, VCCI-A	FCC (Part 15 Class A), CE, C-Tick, KCC, NOM, PCT, VCCI, SASO, SABS	FCC (Part 15 Class A), CE, C-Tick, VCCI, CCC, KC, NOM, GOST, SABS, SASO
Compliance	RoHS, WEEE	RoHS, WEEE	RoHS, WEEE	RoHS, SVHC, WEEE

Table 3. MPX Platform Summary (contd.)

Â	MPX 11515/11520/11530/11540/11542	MPX 17500/MPX 19500/MPX 21500	MPX 17550/MPX 19550/MPX 20550/MPX 21550	MPX 22040/MPX 22060/MPX 22080/MPX 22100/MPX 22120
Processors	2 six-core	2 six-core	2 six-core	2 eight-core
Memory	48 GB	48 GB	96 GB	256 GB
Ports - 1G	4xcopper/fiber 1G SFP ports	NA	NA	12x1G SFP + 24x10G SFP+ model: 12xcopper/fiber 1G SFP ports
Ports - 10G	8x10G SFP+ ports	8x10G SFP+ ports	8x10G SFP+ ports	12x1G SFP + 24x10G SFP+ model: 24x10G SFP+ ports 24x10G SFP+ ports model: 24x10G SFP+ ports
Number of Power Supplies	2	2	2	4
AC Power Supply input voltage, frequency, & current	100â€“240 VAC 50â€“60 Hz 6.5â€“3.5 A	100â€“240 VAC 50â€“60 Hz 6.5â€“3.5 A	100â€“240 VAC 50â€“60 Hz 6.5â€“3.5 A	12x1G SFP + 24x10G SFP+ model: 100-240VAC 50/60Hz 6.0-12.0A

				24x10G SFP+ model: 100-240VAC 50/60Hz 6.5-15.5A
Maximum Power Consumption	650 W	650 W	850 W	12x1G SFP + 24x10G SFP+ model: 1050 W 24x10G SFP+ model: 1400 W
Heat Dissipation	2200 BTU per hour	2200 BTU per hour	2900 BTU per hour	12x1G SFP + 24x10G SFP+ model: 2,000-2,6000 BTU per hour 24x10G SFP+ model: 2,700-3,800 BTU per hour
Weight	46 lbs 20.87 kg	40 lbs 18.14 kg	40 lbs 18.14 kg	85 lbs 38.56 kg
Height	2U	2U	2U	2U
Width	EIA 310-D for 19-inch racks	EIA 310-D for 19-inch racks	EIA 310-D for 19-inch racks	EIA 310-D for 19-inch racks
Depth	28 in or 71.68 cm	24.75 in or 62.865 cm	24.75 in or 62.865 cm	28¼ in or 72 cm
Operating Temperature	0° to 40° C 32° to 104° F	0° to 40° C 32° to 104° F	0° to 40° C 32° to 104° F	0° to 40° C 32° to 104° F
Humidity range (non-condensing)	5% to 95%	5% to 95%	5% to 95%	20% to 80%
Safety Certifications	CSA	TUV	TUV	CSA
EMC & Susceptibility		FCC (Part 15 Class	FCC (Part 15 Class	FCC (Part 15 Class A), CE

	FCC (Part 15 Class A), CE, C-Tick, VCCI, CCC, KC, NOM, GOST, SABS, SASO	A), CE, C-Tick, VCCI-A	A), CE, C-Tick, VCCI-A	(EN55022/55024), C-Tick, VCCI
Compliance	RoHS, SVHC, WEEE	RoHS, WEEE	RoHS, WEEE	RoHS, WEEE

Table 4. MPX Platform Summary (contd.)

Â	MPX 25100T/MPX 25160T
Regulatory model number	Citrix 2U1P1X
Processor	2 ten-core
Memory	128 GB
Number of Power Supplies	2
AC power supply input voltage, frequency, and current	100-240V AC 50-60 Hz 8.0 â€“ 4.0 A
DC power supply input voltage and current	-36V to -72V DC 22.4 â€“ 11.2A
Maximum AC power Consumption	717 W
Maximum DC power Consumption	806 W
Airflow (front to rear)	110 CFM Typical
Heat dissipation	2027 BTU per hour Typical
Weight (lbs.)	60
System Weight (lbs.)	39
Height	2U
Width	EIA 310-D for 19-inch racks
Depth	72 cm; 28Â¼ in

Operating Temperature	0-40Â°C; 32-104Â°F
Humidity range (non-condensing)	20%â€“80%
Safety Certifications	CSA
EMC & Susceptibility	USA (FCC), Europe (CE), Japan (VCCI), Australia (RCM), China (CCC), Korea (KCC), India (BIS), Mexico (NOM), Saudi Arabia (CITC), South Africa (ICASA), Russia (EAC, CU-TR), Taiwan (BSMI), Brazil (Inmetro & Anatel), Israel (MoE, MoC)
Compliance	RoHS, WEEE, REACH

Hardware Health Attributes

Operating ranges for NetScaler hardware platforms vary for different attributes. You can use the stat system -detail command to display the current values of the attributes.

You can also query SNMP OIDs to monitor the attributes of the appliance. For more information about SNMP OIDs, see the NetScaler 10.5 SNMP OID Reference below.

NetScaler 10.5 SNMP OID Reference

The following table lists the health attributes and their recommended value ranges.

	SNMP Alarm Support	Recommended Value Ranges				
		MPX 5500/5600	MPX 7500/9500	MPX 9700/10500/12500/15500	MPX 9700/10500/12500/15500 10G	MPX 9700/10500/12500/15500 10G
CPU 0 core (Volts)	No	0.97â€“1.5	1â€“1.5	1â€“1.5	1â€“1.5	0.97â€“1.5
CPU 1 core (Volts)	No	0.97â€“1.5	1â€“1.5	1â€“1.5	1â€“1.5	0.97â€“1.5
Main 3.3 V Supply (Volts)	Yes	3.2â€“3.6	3.2â€“3.54	3.2â€“3.54	3.2â€“3.55	3.2â€“3.55
Standby 3.3 V Supply (Volts)	Yes	3.2â€“3.6	3.2â€“3.54	3.2â€“3.54	3.2â€“3.55	3.2â€“3.55
+5.0 V Supply (Volts)	No	4.8â€“5.2	4.8â€“5.2	4.8â€“5.2	4.8â€“5.2	4.8â€“5.2
+12.0 V Supply (Volts)	No	11.5â€“12.35	11.52â€“12.35	11.5â€“12.31	11.8â€“12.35	11.5â€“12.35
-12.0 V Supply (Volts)	No	- NA -	- NA -	- NA -	- NA -	- NA -
Battery (Volts)	No	3â€“3.5	2.85â€“3.5	2.85â€“3.5	2.85â€“3.5	2.85â€“3.5
Intel CPU Vtt Power (Volts)	No	1â€“1.2	1â€“1.2	1â€“1.2	1â€“1.2	1â€“1.2
5V Standby (Volts)	No	4.9â€“5.2	4.9â€“5.2	4.9â€“5.2	4.9â€“5.2	4.9â€“5.2
Voltage Sensor2 (Volts)	No	1.2â€“2	1.2â€“2	1.2â€“2	1â€“1.8	1.2â€“2
CPU Fan 0 Speed (RPM)	Yes	3000â€“16000	3000â€“16000	3000â€“10000	3000â€“16000	3000â€“16000

CPU Fan 1 Speed (RPM)	Yes	3000~16000	3000~16000	3000~16000	3000~16000	30
System Fan Speed (RPM)	Yes	900~15000	900~13000	900~10000	900~9000	90
System Fan 1 Speed (RPM)	No	900~15000	900~15000	900~10000	900~8000	90
System Fan 2 Speed (RPM)	No	900~15000	900~15000	900~10000	900~10000	90
CPU 0 Temperature	Yes	24~90° C 75.2~194° F	24~90° C 75.2~194° F	24~90° C 75.2~194° F	24~90° C 75.2~194° F	2~71
CPU 1 Temperature	Yes	24~90° C 75.2~194° F	24~90° C 75.2~194° F	24~90° C 75.2~194° F	24~90° C 75.2~194° F	2~71
Internal Temperature	Yes	19~50° C 66.2~122° F	19~50° C 66.2~122° F	19~50° C 66.2~122° F	19~50° C 66.2~122° F	1~61
Power Supply 1 Status	Yes	Not supported	Normal	Normal	Normal	N
Power Supply 2 Status	Yes	Not supported	Normal	Normal	Normal	N

The following table lists the health attributes for MPX 22040/22060/22080/22100/22120.

		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
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
FAN 3	RPM	na	1980.000	na	na	na	na
FAN 4	RPM	na	1980.000	na	na	na	na
FAN 5	RPM	na	1980.000	na	na	na	na
FAN 6	RPM	na	1980.000	na	na	na	na
FAN 7	RPM	na	1980.000	na	na	na	na
FAN 8	RPM	na	1980.000	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	1980.000	na	na	na	na
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
VDIMM GH	Volts	1.104	1.152	1.200	1.648	1.696	1.744
+1.5V	Volts	1.248	1.296	1.344	1.648	1.696	1.744
3.3V	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
5V	Volts	4.096	4.288	4.480	5.504	5.696	6.912
12V	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

The following table lists the health attributes for MPX 24100/24150.

		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
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
FAN 3	RPM	na	1980.000	na	na	na	na
FAN 4	RPM	na	1980.000	na	na	na	na
FAN 5	RPM	na	1980.000	na	na	na	na
FAN 6	RPM	na	1980.000	na	na	na	na
FAN 7	RPM	na	1980.000	na	na	na	na
FAN 8	RPM	na	1980.000	na	na	na	na
PS_1 Status	discrete	na	na	na	na	na	na
PS_1 FAN	RPM	na	1980.000	na	na	na	na
PS_1 Temp	degrees C	na	na	na	72.000	76.000	82.000
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
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
+1.5V	Volts	1.248	1.296	1.344	1.648	1.696	1.744
3.3V	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
5V	Volts	4.096	4.288	4.480	5.504	5.696	6.912
12V	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

Preparing for Installation

Before you install your new appliance, carefully unpack your appliance and make sure that all parts were delivered. Once you are satisfied that your appliance has been delivered to your expectations, verify that the location where the appliance will be installed meets temperature and power requirements and that the server cabinet or floor-to-ceiling cabinet is securely bolted to the floor and has sufficient airflow.

Only trained and qualified personnel should install, maintain, or replace the appliance, and efforts should be taken to ensure that all cautions and warnings are followed.

This document includes the following details:

- [Unpacking the Appliance](#)
- [Preparing the Site and Rack](#)
- [Electrical Safety Precautions](#)

Unpacking 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.

Use the following list to verify that you received everything that should have been included in the box.

- The appliance you ordered
 - One RJ-45 to DB-9 adapter
 - One 6 ft RJ-45/DB-9 cable
 - The following list specifies the number of power cables included for each appliance model:
 - One power cable for the MPX 5500, MPX 5550/5650, MPX 7500/9500, and MPX 8005/8015/8200/8400/8600/8800 appliances
 - Two power cables for the MPX 15000, MPX 17000, MPX 9700/10500/12500/15500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 14000, MPX 17500/19500/21500, and MPX 25100T/25160T appliances
 - Four power cables for the MPX 22040/22060/22080/22100/22120 and MPX 24100/24150 appliances
- Note: Make sure that a power outlet is available for each cable.
- Note: For Brazilian customers, Citrix does not ship a power cable. Use a cable that conforms to the **ABNT NBR 14136:2002** standard.
- One standard 4-post rail kit
- Note: If the kit that you received does not fit your rack, contact your Citrix sales representative to order the appropriate kit.

In addition to the items included in the box with your new appliance, you will need the following items to complete the installation and initial configuration process.

- Ethernet cables for each additional Ethernet port that you will 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
- Note: Transceiver modules are sold separately. Contact your Citrix sales representative to order transceiver modules for your appliance. Only transceivers supplied by Citrix are supported on the appliance.
- A computer to serve as a management workstation

Preparing the Site and Rack

There are specific site and rack requirements for the NetScaler appliance. You must 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 should 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 4,000 watts per rack unit in addition to power needs for the CRAC.

Rack Requirements

The rack on which you install your appliance should meet the following criteria:

Rack characteristics

Racks should 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 should be installed perpendicular to a load-bearing wall for stability and sufficient airflow. If you have a server room, your racks should 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 rack unit for the Citrix NetScaler MPX 5500, MPX 5550/5650, MPX 7500/9500, and MPX 8005/8015/8200, 8400/8600/8800, MPX 14000, 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 to 33 inches.
- 2-post rail kit, which fits 2-post racks.

Cautions and Warnings

Electrical Safety Precautions

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.

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 may cause burns, set clothing on fire, or fuse the metal object to an exposed terminal.
- Use a regulating, uninterruptible power supply (UPS) to protect the appliance from power surges and voltage spikes, and to keep the appliance operating in case of power failure.
- 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.
- Make sure that the appliance has a direct physical connection to the earth during normal use. When installing or repairing an appliance, always make sure that the ground circuit is connected first and disconnected last.
- Make sure 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. 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 specifically designed as electrical insulators.
- Make sure 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 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.
- 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

- Make sure 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 make sure 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 should 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.

Installing the Hardware

After you have determined that the location where you will install your appliance meets the environmental standards and the server rack is in place according to the instructions, you are ready to install the hardware. After you mount the appliance, you are ready to connect it to the network, to a power source, and to the console terminal that you will use 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.

This document includes the following details:

- [Rack Mounting the Appliance](#)
- [Installing and Removing 1G SFP Transceivers](#)
- [Installing and Removing XFP and 10G SFP+ Transceivers](#)
- [Connecting the Cables](#)
- [Switching on the Appliance](#)

Rack Mounting the Appliance

Most appliances can be installed in standard server racks that conform to 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.

Caution: If you are installing the appliance as the only unit in the rack, mount it at the bottom. If the rack contains other units, make sure that the heaviest unit is at the bottom. If the rack has stabilizing devices available, install them before mounting the appliance.

The following table lists the different hardware platforms and the rack units required for each platform.

Table 1. *Height Requirements For Each Platform*

Platform	Number of rack units
MPX 5500	One rack unit
MPX 5550/5650	One rack unit
MPX 7500/9500	One rack unit
MPX 8005/8015/8200/8400/8600/8800	One rack unit
MPX 9700/10500/12500/15500	Two rack units
MPX 14000	One rack unit
MPX 15000, MPX 17000	Two rack units
MPX 11500/13500/14500/16500/18500/20500	Two rack units
MPX 11515/11520/11530/11540/11542	Two rack units
MPX 17500/19500/21500	Two rack units
MPX 17550/19550/20550/21550	Two rack units
MPX 22040/22060/22080/22100/22120	Two rack units
MPX 24100/24150	Two rack units

Each appliance ships with a mounting rail kit that contains two rail assemblies, one for the left side and the other for the right side of the appliance, and screws to attach the rails. An assembly consists of an inner rail and a rack rail. The supplied rail kit is 28 inches long (38 inches extended). Contact your Citrix sales representative to order a 23-inch (33 inches extended) rail kit.

Note: The same rail kit is used for both square-hole and round-hole racks. See "Installing the Rail Assembly to the Rack" for specific instructions for threaded, round-hole racks.

To mount the appliance, you must first install the rails and then install the appliance in the rack.

Perform the following tasks to mount the appliance:

- Remove the inner rails from the rail assembly.
- Attach the inner rails to the appliance.
- Install the rack rails on the rack.
- Install the appliance in the rack.

The appliance is shipped with rack-rail hardware. This hardware consists of two inner rails that you attach to the appliance, one on each side, and a rack-rail assembly that you attach to the rack. The following figure illustrates the steps involved in mounting the Citrix NetScaler appliance to a rack.

To 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. Depress 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.

To 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. Attaching inner rails



4. Repeat steps 1 through 3 to install the left inner rail on the other side of the appliance.

To 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. Installing Retainers into the Front Rack Posts

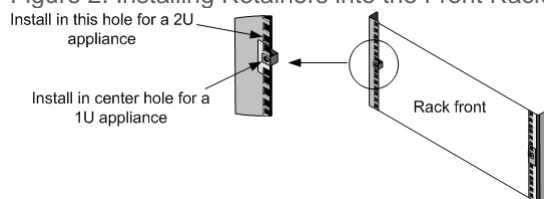
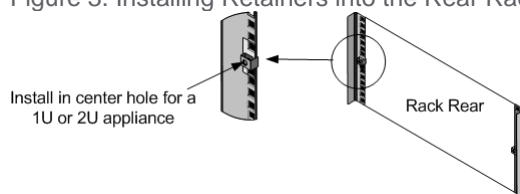
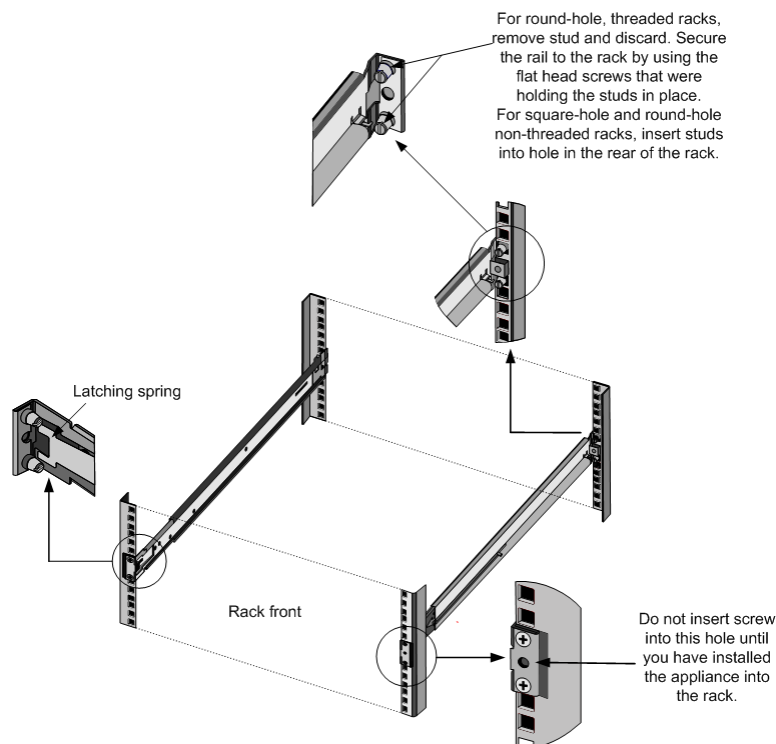


Figure 3. Installing Retainers into the Rear Rack Posts



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.

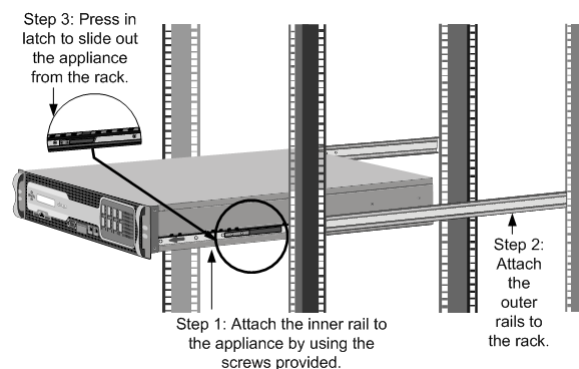
Figure 4. Installing the Rail Assembly to the Rack



To 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. Rack Mounting the Appliance



Installing and Removing 1G SFP Transceivers

Note: This section applies to the MPX 8005/8015/8200/8400/8600/8800, MPX 9700/10500/12500/15500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 22040/22060/22080/22100/22120, and MPX 24100/24150 appliances.

A Small Form-Factor Pluggable (SFP) is a compact transceiver that can operate at speeds of up to 1 gigabit per second and 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 1G SFP port into which you insert your 1G SFP transceiver. As soon as a link between the port and the network is established, the speed and mode are matched on both ends of the cable.

Note: The 1G SFP transceiver is hot-swappable from release 9.3 build 47.5 and later on the NetScaler appliances that use the e1k interface. The following platforms support 1G SFP transceivers:

- o MPX 7500/9500
- o MPX 8005/8015/8200/8400/8600/8800
- o MPX 9700/10500/12500/15500
- o MPX 11500/13500/14500/16500/18500/20500
- o MPX 11515/11520/11530/11540/11542
- o MPX 22040/22060/22080/22100/22120
- o MPX 24100/24150

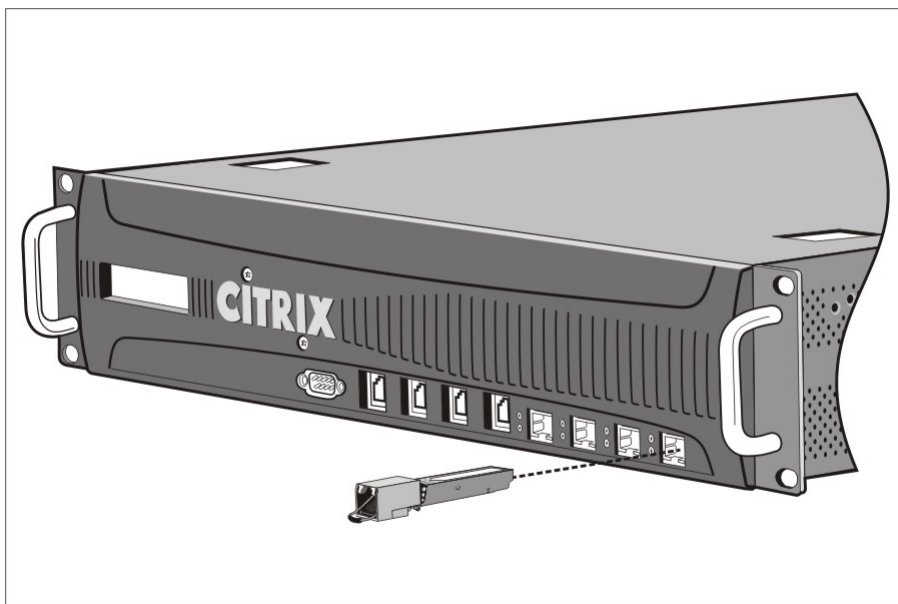
Caution: NetScaler appliances do not support 1G SFP transceivers from vendors other than Citrix Systems. Attempting to install third-party 1G SFP transceivers on your NetScaler appliance voids the warranty.

Insert 1G SFP transceivers into the 1G SFP ports on the front panel of the appliance. Frequent installation and removal of transceivers shortens their life span. Follow the removal procedure carefully to avoid damaging the 1G SFP transceiver or the appliance.

Caution: Do not install the transceivers with the cables attached. Doing so can damage the cable, the connector, or the optical interface of the transceiver.

To install a 1G SFP transceiver

1. Remove the 1G SFP 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 1G SFP transceiver to the front of the 1G SFP transceiver port on the front panel of the appliance, as shown in the following figure.
Note: The illustration in the following figures might not represent your actual appliance.
Figure 6. Installing a 1G SFP transceiver



3. Hold the 1G SFP transceiver between your thumb and index finger and insert it into the 1G SFP transceiver port, pressing 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 1G SFP transceiver, do not remove the dust caps attached to the transceiver and the cable until you are ready to insert the cable.

To remove a 1G SFP transceiver

1. Disconnect the cable from the 1G SFP 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 1G SFP transceiver.
3. Hold the 1G SFP transceiver between your thumb and index finger and slowly pull it out of the port.
4. If you are removing a fiber 1G SFP transceiver, replace the dust cap before putting it away.
5. Put the 1G SFP transceiver into its original box or another appropriate container.

Installing and Removing XFP and 10G SFP+ Transceivers

Note: This section applies to the MPX 8005/8015/8200/8400/8600/8800, MPX 9700/10500/12500/15500, MPX 15000, MPX 17000, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 14000, MPX 17500/19500/21500, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, and MPX 25100T/25160T appliances.

A 10-Gigabit Small Form-Factor Pluggable (XFP or SFP+) is a compact optical transceiver that can operate at speeds of up to 10 gigabits per second. The MPX 15000 and MPX 17000 appliances use XFP transceivers and the MPX 8005/8015/8200/8400/8600/8800, MPX 9700/10500/12500/15500, MPX 11500/13500/14500/16500/18500/20500, MPX 17500/19500/21500, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, and MPX 24100/24150 appliances use 10G SFP+ transceivers. Autonegotiation is enabled by default on the XFP/10G SFP+ ports into which you insert your XFP/10G SFP+ transceiver. As soon as a link between the port and the network is established, the mode is matched on both ends of the cable and for 10G SFP+ transceivers, the speed is also autonegotiated.

Note: An XFP transceiver is **not hot-swappable** on the NetScaler appliances. You must restart a NetScaler appliance after you insert an XFP transceiver.

However, the 10G SFP+ transceiver is hot-swappable from release 9.3 build 57.5 and later on the NetScaler appliances that use the ixgbe (ix) interface. The following platforms support 10G SFP+ transceivers:

- MPX 8005/8015/8200/8400/8600/8800
- MPX 9700/10500/12500/15500 10G and 10G FIPS
- MPX 11500/13500/14500/16500/18500/20500
- MPX 11515/11520/11530/11540/11542
- MPX 14000
- MPX 17500/19500/21500
- MPX 17550/19550/20550/21550
- MPX 22040/22060/22080/22100/22120
- MPX 24100/24150
- MPX 25100T/25160T

The following platforms support XFP transceivers:

- MPX 15000
- MPX 17000

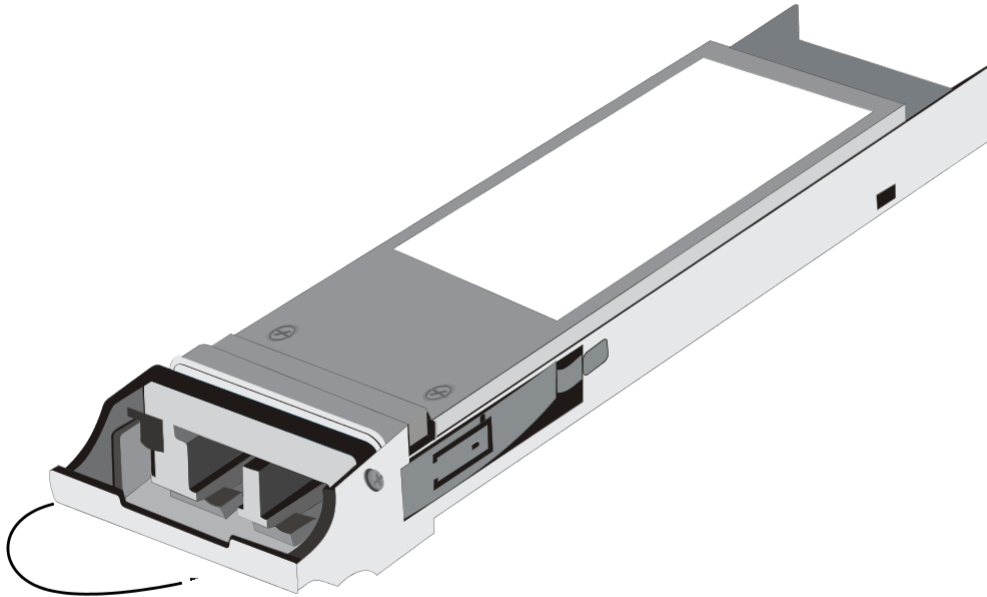
Caution: NetScaler appliances do not support XFP/10G SFP+ transceivers provided by vendors other than Citrix Systems. Attempting to install third-party XFP/10G SFP+ transceivers on your NetScaler appliance voids the warranty.

Insert the XFP/10G SFP+ transceivers into the XFP/10G SFP+ ports on the front panel of the appliance. Frequent installation and removal of transceivers shortens their life span. Follow the removal procedure carefully to avoid damaging the transceiver or the appliance.

Caution: Do not install the transceivers with the cables attached. Doing so can damage the cable, the connector, or the optical interface of the transceiver.

To install an XFP/10G SFP+ transceiver

1. Remove the XFP/10G SFP+ transceiver carefully from its box.
Danger: Do not look directly into fiber optic transceivers and cables. They emit laser beams that can damage your eyes.
2. Align the XFP/10G SFP+ transceiver to the front of the XFP/10G SFP+ transceiver port on the front panel of the appliance.
3. Hold the XFP/10G SFP+ transceiver between your thumb and index finger and insert it into the XFP/10G SFP+ transceiver port, pressing it in until you hear the transceiver snap into place.
4. Move the locking hinge to the DOWN position as shown in the following figure.
Figure 7. Locking an XFP transceiver



5. Verify that the LED is green and blinks twice, which indicates that the transceiver is functioning correctly.
6. Do not remove the dust caps attached to the transceiver and cable until you are ready to insert the cable.

To remove an XFP/10G SFP+ transceiver

1. Disconnect the cable from the XFP/10G SFP+ transceiver. 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 XFP/10G SFP+ transceiver by moving the locking hinge to the UP position.
3. Hold the XFP/10G SFP+ transceiver between your thumb and index finger and slowly pull it out of the port.
4. Replace the dust cap on the transceiver before putting it away.
5. Put the XFP/10G SFP+ transceiver into its original box or another appropriate container.

Connecting 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. When you touch both a live power source or wire and ground, any metal objects can heat up rapidly and cause burns, set clothing on fire, or fuse the metal object to an exposed terminal.

Connecting 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 XFP 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.

To connect an Ethernet cable to a 10/100/1000BASE-T port or 1G SFP copper transceiver

1. Insert the RJ-45 connector on one end of your Ethernet cable into an appropriate port on the front panel of the appliance, as shown in the following figure.
Figure 8. Inserting 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 XFP transceiver

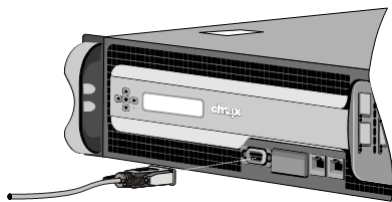
1. Remove the dust caps from the transceiver and cable.
2. Insert the LC connector on one end of the fiber optic cable into the appropriate port on the front panel of the appliance.
3. Insert the connector on the other end into the target device, such as a router or switch.
4. Verify that the LED glows amber when the connection is established.

Connecting the Console Cable

You can 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, 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 at the end of the cable into the console port that is located on the front panel of the appliance, as shown in the following figure.
Figure 9. Inserting 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.

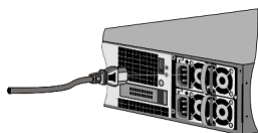
2. Insert the RJ-45 connector at the other end of the cable into the serial port of the computer or terminal.

Connecting the Power Cable

An MPX 5500, MPX 5550/5650, MPX 7500/9500, MPX 8005/8015/8200/8400/8600/8800 appliance has one power cable. All the other appliances come with two power cables, but they can also operate if only one power cable is connected, except the MPX 22040/22060/22080/22100/22120 and MPX 24100/24150 platforms which come with four power cables and require two power cables for proper operation. A separate ground cable is not required, because the three-prong plug provides grounding.

To connect the appliance to the power source

1. Connect one end of the power cable to the power outlet on the back panel of the appliance, next to the power supply, as shown in the following figure.
Figure 10. Inserting a power cable



2. Connect the other end of the power cable to a standard 110V/220V power outlet.
3. If a second power supply is provided, repeat steps 1 and 2 to connect the second power supply.

Note: The MPX 9700/10500/12500/15500, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 17500/19500/21500, and MPX 17550/19550/20550/21550 appliance emit a high-pitched alert if one power supply fails or if you connect only one power cable to the appliance. To silence the alarm, you can press the small red button located on the back panel of the appliance.

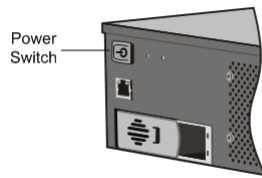
Switching on the Appliance

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 a second power supply, make sure the second 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.

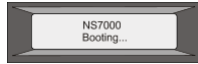
To switch on the appliance

1. Verify that the appliance is connected through a console or Ethernet port. This will ensure 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



3. Verify that the LCD on the front panel is backlit and the start message appears, as shown in the following figure.



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

After you have installed your appliance in a rack, you are ready to perform the initial configuration. Once initial configuration is complete, refer to the specific configuration guides for the features you will be using.

Initial configuration is the same for the multifunction Citrix NetScaler, the dedicated NetScaler Gateway Enterprise Edition, and the dedicated Citrix NetScaler Application Firewall appliances. You can use any of the following interfaces for 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)—If you want to configure a new appliance from a remote network, or if you want to install multiple NetScaler appliances and then configure them without using the console port, you can use DHCP to assign each new appliance an IP address at which you can access the appliance for remote configuration.

For initial configuration, use nsroot 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 is especially helpful in environments for which you would otherwise have to keep track of a large number of passwords.

This document includes the following details:

- [Using the First-time Setup Wizard](#)
- [Using the LCD Keypad](#)
- [Using the NetScaler Serial Console](#)
- [Using DHCP for Initial Access](#)
- [Accessing a NetScaler by Using SSH Keys and No Password](#)
- [Changing the Administrative Password](#)

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.

You must assign a NetScaler IP (NSIP) address as the management IP address of your NetScaler appliance. This is the address at which you access the NetScaler for configuration, monitoring, and other management tasks. Assign a subnet IP (SNIP) address for your NetScaler to communicate with the backend servers. 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.

The wizard automatically appears if any of the following conditions are met:

- The appliance is configured with the default IP address (192.168.100.1).
- A subnet IP address is not configured.
- Licenses are not present on the appliance.

To 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 a default IP address. If you have already assigned as NSIP address, type that address in a web browser.

2. In User Name and Password, type the administrator credentials. 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: 10.100.20.100 Netmask: 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	2
	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) should 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.
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 will handle external IP traffic that the NetScaler cannot otherwise route. The NSIP and the default gateway should 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, where xxx.xxx.xxx.xxx is the IP address you entered, followed by a request to re-enter the value.

```
Invalid addr!
xxx.xxx.xxx.xxx
```

If you press the ENTER (.) key without changing any of the digits, the software interprets this as a user exit request. The following message will be 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 "<http://support.citrix.com/proddocs/topic/ns-system-10-5-map/ns-nw-ha-cnfgng-ha-con.html>."

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 "RS232 Serial Console Port" in "Ports."

To 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 "[Connecting the Cables](#)."
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. Your sales representative or Citrix Customer Service can provide you with the administrator credentials.
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 NetScaler 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 initial configuration of your appliance. To continue configuring the appliance, choose one of the following options:

Citrix NetScaler.

If you are configuring your appliance as a standard NetScaler with other licensed features, see "[Load Balancing](#)."

Citrix NetScaler Application Firewall.

If you are configuring your appliance as a standalone application firewall, see "[Application Firewall](#)."

NetScaler Gateway.

If you are configuring your appliance as a NetScaler Gateway, see "[NetScaler Gateway 10.5](#)."

Note: For information about deploying a high availability (HA) pair, see "[Configuring High Availability](#)."

Using DHCP for Initial Access

Note: The terms NetScaler, NetScaler appliance, and appliance are used interchangeably.

For initial configuration of a NetScaler appliance, Dynamic Host Configuration Protocol (DHCP) can eliminate dependency on the console by providing 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 a NetScaler to a different subnet.

To use DHCP, you must first specify the NetScaler 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 NetScaler 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 may 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 NetScaler vendor class identifier.

To 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 man page 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. You must 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 routers 10.217.242.1;
    option domain-name "jeffbr.local";
    option domain-name-servers 8.8.8.8;
    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;
    }
}
```

```
}  
}  
}
```

Implementing an Initial NetScaler Configuration from a Remote Computer

When a new NetScaler appliance (or any appliance that does not have a configuration file) starts, it automatically polls the DHCP server for an IP address and provides the DHCP server with its sysid. 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 currently assigned to 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.

To 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
```

To 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 above 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 NetScaler 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, such as from a testing environment to a production environment, 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. If you did not enable the DHCP client and save the configuration before shutting down the appliance, you will need to connect to the appliance through the console and dynamically run the DHCP client on the appliance. The DHCP server will then provide 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, you should disable it and then save the configuration file. If the DHCP client is enabled, the appliance will poll the DHCP server again for an IP address when it restarts.

The following table lists the NetScaler CLI commands associated with each task.

Table 3. NetScaler CLI commands for using DHCP with a previously configured NetScaler Appliance

Task	At the NetScaler command prompt, type:
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 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 is required only if the ON setting was saved.

Accessing a NetScaler by Using SSH Keys and No Password

If you administer a large number of 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.

To generate the keys and connect to a remote NetScaler by using SSH keys

1. On a client (Linux client or a NetScaler) change 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 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 sub-directories of the /flash and /var directories.

5. Log on to the remote NetScaler appliance from the client by using a file transfer protocol, 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 at the appliance, you need to 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>@<NetScalerIPAddress>
```

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>@<NetScalerIPAddress>
```

If using any other name for the public-private key pair.

```
ssh -i <path_to_client_private_key> <user_name>@<NetScalerIPAddress>
```

Changing the Administrative Password

The default user account is the administrative account, which provides complete access to all features of the Citrix NetScaler appliance. Therefore, to preserve security, the administrative account should be used only when necessary, and only individuals whose duties require full access should know the password for the administrative account. The

default administrative username and password are nsroot and nsroot, respectively. Citrix recommends changing the administrative password frequently.

To change the administrative password by using the configuration utility

1. Log on to the appliance by using the administrative credentials.
2. On the Configuration tab, in the navigation pane, expand System, and then click Users.
3. In the Users pane, click the default user account (nsroot), 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.

To change the administrative password by using the command line interface

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 the NetScaler MPX Appliance

The MPX 8005/8015/8200/8400/8600/8800, MPX 11500/13500/14500/16500/18500/20500, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, and MPX 25100T/25160T 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.

By connecting the LOM port to a dedicated channel that is separate from the data channel, you can make sure that connectivity to the appliance is maintained even if the data network is down. You thereby 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 graphical user interface (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

Different Citrix appliances support different shells:

- For FreeBSD based NetScaler MPX appliances, 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.

Important: With BMC version 3.xx or later, should the LOM port fail, its functions are switched over to the management port (0/1). In this shared mode, the management port can support both the BMC MAC address and the interface 0/1 MAC address on the same network cable.

Caution: LOM firmware versions are platform specific. Upgrading to a LOM firmware version other than one shown for your platform in the LOM Support Matrix, below, results in the LOM becoming unusable.

The LOM Support Matrix shows the LOM firmware versions shipped with the various platforms, along with the recommended versions, and the earliest NetScaler software versions that support both the shipped and the recommended LOM firmware versions. The latest available LOM package can be found on the Citrix downloads website under LOM Firmware Upgrade.

Hardware	Ships With Version	Recommended Version	Minimum NetScaler Version to avoid PS failure issues
MPX 8005/8015/8200/8400/8600/8800	2.04/2.07/3.02/3.10/3.11	3.11	9.3_65.x, 10.1_123.x, 10.5
MPX 11500/13500/14500/16500/18500/20500	2.52/3.02/3.33/3.34/3.38	3.38	9.3_65.x, 10.1_123.x, 10.5
MPX 11515/11520/11530/11540/11542	2.52/3.02/3.33/3.34/3.38	3.38	9.3_65.x, 10.1_123.x, 10.5
MPX 17550/19550/20550/21550	2.52/3.02/3.33/3.34	3.34	9.3_65.x, 10.1_123.x, 10.5
MPX 22040/22060/22080/22100/22120	2.63/3.22	3.22	9.3_65.x, 10.1_123.x, 10.5
MPX 24100/24150	2.63/3.22	3.22	9.3_65.x, 10.1_123.x, 10.5

Configuring 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, and 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 username, 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 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.

Note: On all MPX platforms, except MPX 22040/22060/22080/22100/22120 and MPX 24100/24150, the LEDs on the LOM port are nonoperational by design.

Tip: For first-time setup in a network, to facilitate troubleshooting, make sure that a laptop/PC is connected directly to the LOM port. 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 NetScaler console output is visible in the NetScaler console window in the LOM GUI, but typing in the console does not work), try the above method to isolate the cause to the specific BMC protocol being blocked by the network.

Tip: Some LOM GUI features, such as the NetScaler console, require the latest Java security updates on the laptop/PC. Make sure that the latest Java updates are installed on your laptop/PC.

To 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
 - 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.

To configure the NetScaler LOM port by using 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 should succeed after approximately 60 seconds.

2. Optionally, to configure Ethernet VLAN ID and priority, at the NetScaler shell prompt type:

- o `ipmitool lan set 1 vlan id <off|<ID>>`
- o `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 username, 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
```

Obtaining Health Monitoring Information

There are two NetScaler MIBs: the NetScaler software management MIB and the NetScaler 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, 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 NetScaler SNMP traps in the NetScaler MIB report software failures and hardware load issues.

The NetScaler MIB has a very 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 NetScaler 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 is in a stable enough state for the SNMP software service to run.

Whenever the NetScaler 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 NetScaler MIB and the LOM MIB.

The NetScaler 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 above conditions occurs. 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 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](#).

To obtain health monitoring information

1. In the Menu bar, click System Health.
2. Under Options, click Sensor Readings.

Installing 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.

Configuring 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.

To 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. You will 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>.
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 should start 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.

Setting 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 settings below send all events for all sensors to the SNMP network management software. These are very low traffic events and therefore should not result in any significant network usage.

To 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 0 0xff 0 0 0xff 0 0 0xff 0
```

To 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
```

To setting 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 should be sent.

To specify an SNMP community string name

At the prompt, type:

```
ipmitool lan set 1 snmp <community string>
```

Installing a Certificate and Key on 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, setup 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 <http://support.citrix.com/article/CTX129514>.

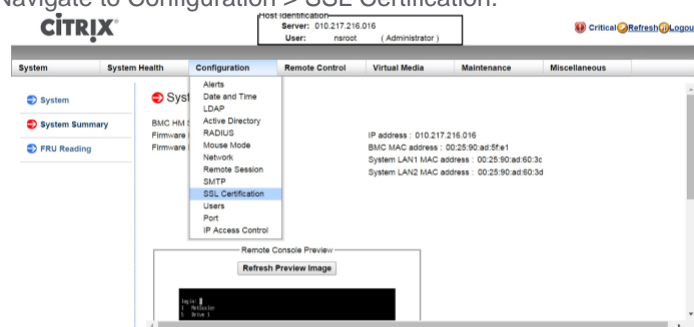
If you make a mistake, you must restore the BMC to the factory defaults to erase the certificate and key. Use the following shell command:

ipmitool raw 0x30 0x41 0x1

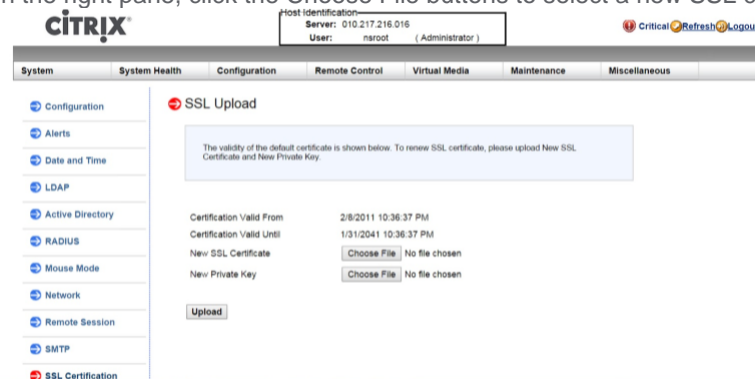
Note: The certificate file must contain only the certificate. The certificate and key must not be in the same file. Make sure that the certificate contains only the certificate and that the key file contains only the key.

To upload a trusted certificate and private key by using the LOM GUI

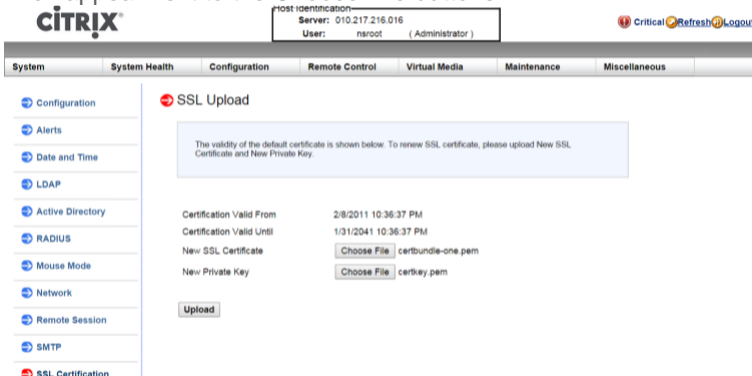
1. Navigate to Configuration > SSL Certification.



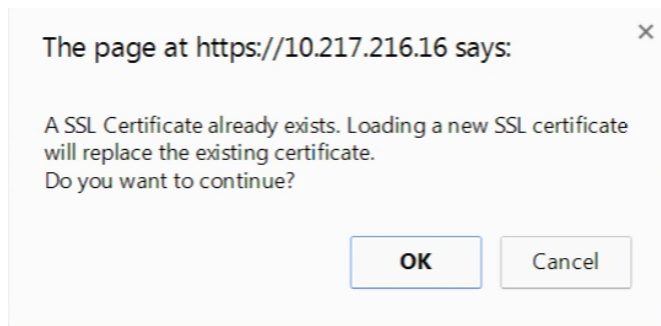
2. In the right pane, click the Choose File buttons to select a new SSL certificate and a new private key.



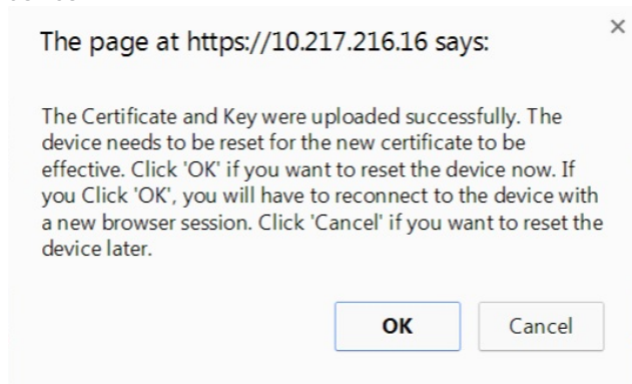
3. To verify that you have selected the correct certificate and private key, check the file names of the certificate and key, which appear next to the Choose File buttons.



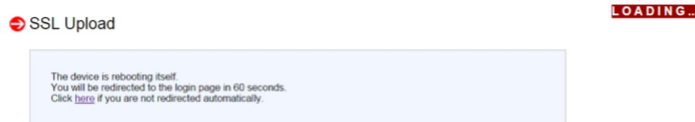
4. Click Upload. A message informs you that uploading a new SSL certificate replaces the existing (default) certificate.
5. Click OK.



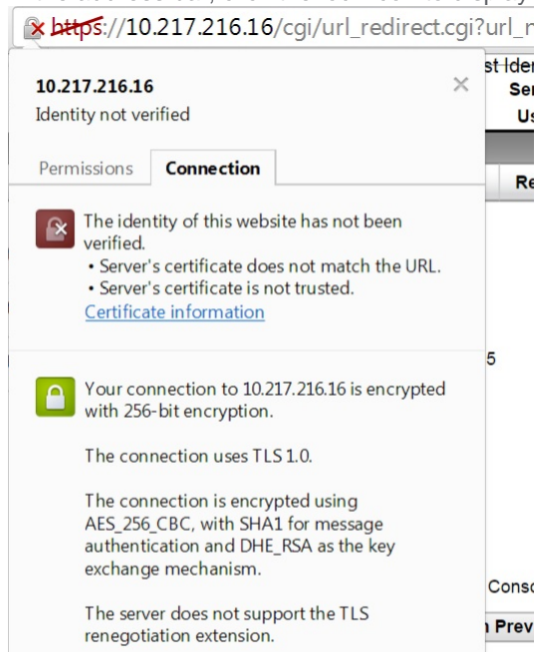
6. When a message informs you that the certificate and key have been uploaded successfully, click OK to reset the device.



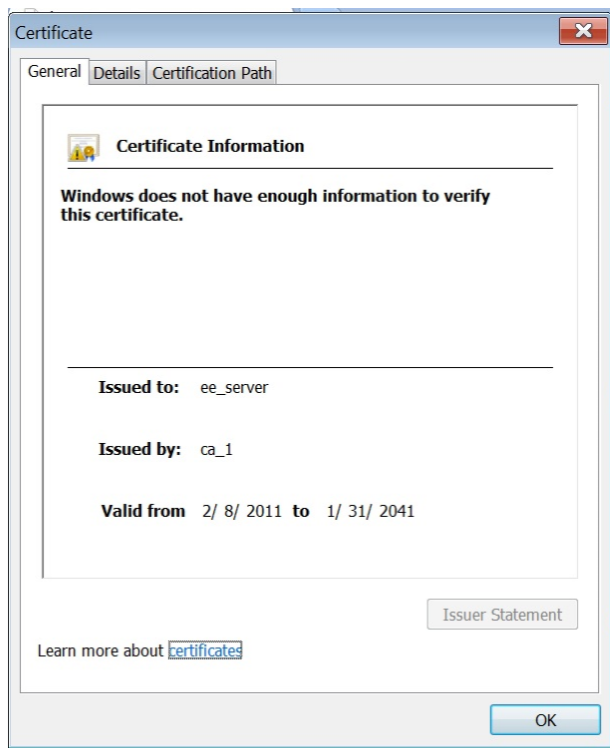
The reset takes approximately 60 seconds. You are then redirected to the logon page.



7. Log on to the LOM GUI by using your default credentials.
 Note: If the certificate or key are 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 on the screen below.



9. Click Certificate information to display details about the certificate that you just uploaded.



Note: For the best practices for LOM and NetScaler security, see <http://support.citrix.com/article/CTX129514>.

Obtaining 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 LOM port. You can also retrieve the parameter settings assigned to the IP addresses configured on the appliance, 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. In the Menu bar, click Remote Control.
2. Under Options, click Console Redirection.
3. Click Launch Console, and then click Yes.
4. Type the administrator credentials.
5. Type show interface <management_interface_id> to display the MAC address.
6. Type show hardware to display the serial number of the appliance.
7. Type sh nsip to display the host properties of the appliance.

To 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
```


Performing 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.

To 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:
 - o **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 before the appliance restarts. This is similar to a warm restart, such as by entering the reboot command. The BMC does not reboot itself during this operation.
 - o **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 is the same as pushing the power button until the unit powers off.
 - o **Power Off System** — **Orderly Shutdown**—Gracefully shut down the appliance, and then disconnect power to the appliance. 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 is the same as entering the shutdown command in the appliance shell.
 - o **Power On System**—Turn on the appliance. The BMC does not reboot itself during this operation. This is the same as pushing the power button.
 - o **Power Cycle System**—Turn off the appliance, and then turn it back on. The BMC does not reboot itself during this operation. This 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.

Performing 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 BMC is not affected by any state of the power button on the appliance. The only way to power cycle the BMC is to remove all power cords from the appliance for 60 seconds.

Performing 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
```

To perform a warm restart remotely from another computer on the network, type:

```
ipmitool -U <bmc_gui_username> -P <bmc_gui_password> -H <bmc IP address> mc reset warm
```

To perform a cold restart of the LOM from the appliance, type:

```
ipmitool mc reset cold
```

To perform a warm restart remotely from another computer on the network, type:

```
ipmitool -U <bmc_gui_username> -P <bmc_gui_password> -H <bmc IP address> mc reset cold
```

Performing 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.

To 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.

To 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
```

Restoring the BMC Configuration to Factory Defaults

You can restore the BMC to its factory-default settings, including deleting the SSL Certificate and SSL key.

To reset the configuration to factory defaults by using the GUI

1. Navigate to Maintenance > Factory Default.
2. Click Restore.

To reset the configuration to factory defaults by using the shell

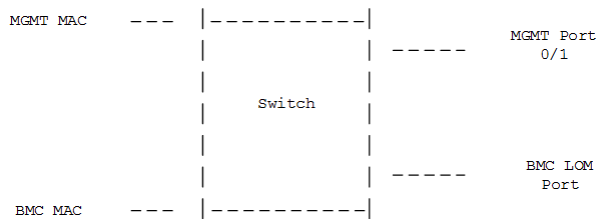
At the shell prompt, type:

```
ipmitool raw 0x30 0x41 0x1
```

Specifying the Port for IPMI BMC Failover

With LOM firmware version 3.x or later, the default mode for failover between the dedicated LOM port and the shared LOM/management port is to fail over to the active port. By default, no user configuration is needed other than selecting the port to which to connect the cable. The motherboard has an Ethernet switch between the management MAC and the management port, and between the LOM MAC and the LOM port. The following figure shows the Ethernet switch.

Figure 1. Ethernet Switch



You can set this switch to direct LOM traffic through the dedicated LOM port or through the shared management port. A dedicated LOM port removes the management port as a single point of failure, while a shared LOM/management port reduces the cabling costs.

Using 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.ami.com/support/doc/AMI_Aptio_4.x_Status_Codes_PUB.pdf.

To read the BIOS Post Code by using the LOM GUI

Navigate to Miscellaneous > BIOS Post Snooping.

To read the BIOS Post Code by using the shell

At the prompt, type:

```
ipmitool raw 0x30 0x2a
```

Migrating the Configuration of an Existing NetScaler Appliance to Another NetScaler Appliance

If you are migrating to a new appliance, you must make some changes to the configuration (ns.conf file) of the old appliance before you copy the configuration to the new appliance.

Note: The following procedure does not apply to NetScaler FIPS appliances.

To 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: You must 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 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, and CRLs, to the new appliance. Return your feature license(s) to the Citrix licensing portal and reallocate it on the new appliance. For more info about returning your licenses, see <http://support.citrix.com/article/CTX131110>.
Note: The platform license is different for a new appliance.
9. Restart the new appliance.
10. Add 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 above procedure on both the nodes.

Troubleshooting

I cannot access the NetScaler appliance after it is restarted. The NetScaler IP address is not accessible and does not respond to a ping request. What should I do?

NetScaler MPX 8005/8015/8200/8400/8600/8800, MPX 11500/13500/14500/16500/18500/20500, MPX 11515/11520/11530/11540/11542, MPX 17550/19550/20550/21550, MPX 22040/22060/22080/22100/22120, MPX 24100/24150, and MPX 25100T/25160T appliances 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, use the LOM credentials to log on to the LOM GUI, and then do the following:
 - 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), and reseal 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 listed below 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 need to scroll down. Green indicates that the hardware component is functioning properly. Red indicates that it has failed. Contact Citrix 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 Citrix 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, so 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 (the serial cable can be connected to a network serial terminal/console server for remote access), or try pinging the NetScaler IP address. 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 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), and reseal 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 listed below 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, as described in Step 1.b, 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 the SFP/SFP+/XFP transceivers are supported by Citrix.

Hardware FAQs

Transceivers

Are transceivers shipped with the MPX 8005/8015/8200/8400/8600/8800 appliance?

No. Transceivers are available for purchase separately. Contact your Citrix sales representative to order transceivers for your appliance.

Are transceivers hot-swappable?

The 1G SFP transceiver is hot-swappable with release 9.3 build 47.5 or later on the following NetScaler appliances, which use the Intel e1k interface:

- MPX 7500/9500
- MPX 8005/8015/8200/8400/8600/8800
- MPX 9700/10500/12500/15500
- MPX 11500/13500/14500/16500/18500/20500
- MPX 11515/11520/11530/11540/11542
- MPX 22040/22060/22080/22100/22120
- MPX 24100/24150

The 10G SFP+ transceiver is hot-swappable with release 9.3 build 57.5 or later on the following NetScaler appliances, which use the ixgbe (ix) interface:

- MPX 8005/8015/8200/8400/8600/8800
- MPX 9700/10500/12500/15500
- MPX 11500/13500/14500/16500/18500/20500
- MPX 17500/19500/21500
- MPX 17550/19550/20550/21550
- MPX 11515/11520/11530/11540/11542
- MPX 22040/22060/22080/22100/22120
- MPX 24100/24150
- MPX 25100T/25160T

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?

The 10G slot supports copper 1G transceivers, which can operate at up to 1 Gbps in a 10 Gbps slot.

Note that you cannot insert a 10G transceiver into a 1G slot.

The following table shows the compatibility matrix of transceivers and ports available on the NetScaler appliance.

Ports	Transceivers		
	10G	1G Fiber	1G Copper
10G	Supported	Not Supported	Supported
1G Fiber	Not Supported	Supported	Not Supported
1G Copper	Not Supported	Not Supported	Supported

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 a NetScaler 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.

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 this cable. The following appliances have at least four 10G SFP+ ports:

- MPX 11500/13500/14500/16500/18500/20500
- MPX 17550/19550/20550/21550
- MPX 11515/11520/11530/11540/11542
- MPX 22040/22060/22080/22100/22120
- MPX 24100/24150
- MPX 25100T/25160T

QSFP-4SFP10G-CU3M breakout cable is supported by NetScaler release 9.3 build 65.8 or later, and release 10.1 build 122.17 or later.

Power Supplies

Is the power supply on the NetScaler MPX 5500 and MPX 5550/5650 appliances field replaceable?
No. The power supply on the NetScaler MPX 5500 and MPX 5550/5650 appliances is fixed.

Does the MPX 8005/8015/8200/8400/8600/8800 appliance ship with two power supplies?
No. The MPX 8005/8015/8200/8400/8600/8800 appliance supports dual power supplies but ships with one power supply. Contact your Citrix sales representative to order a second power supply.

How many power supplies are shipped with each platform?
The following table lists the number of power supplies shipped with each platform:

Platform	Number of Power Supplies shipped
MPX 5500	1
MPX 7500/9500	1 (You can order a second power supply.)
MPX 9700/10500/12500/15500	2
MPX 15000/17000	1 (You can order a second power supply.)
MPX 11500/13500/14500/16500/18500/20500	2
MPX 17500/19500/21500	1 (You can order a second power supply.)
MPX 17550/19550/20550/21550	2

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 should I buy?

The appliance ships with the standard 4-post rail kit that fits racks from 28-38 inches.

The compact 4-post rail kit for racks from 23-33 inches, or the 2-post rail kit for 2-post racks, has to be purchased separately. Contact your Citrix 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 to 38 inches. The length of a shorter outer rack rail is from 23 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 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 MPX and SDX appliances.

Lights Out Management (LOM) Port

Which LOM features are supported on the NetScaler MPX Appliance?

The MPX 8005/8015/8200/8400/8600/8800, MPX 11500/13500/14500/16500/18500/20500, and MPX 17550/19550/20550/21550 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:

- Configuring the LOM port
- Power cycling the appliance
- Performing 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. The latest available LOM package can be found on the Citrix downloads website under [LOM Firmware Upgrade](#).

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?

The following platforms support Pay-As-You-Grow licenses:

- MPX 5550 to MPX 5650
- MPX 7500 to MPX 9500
- MPX 8005 to MPX 8015 to MPX 8200 to MPX 8400 to MPX 8600 to MPX 8800
- MPX 11500 to MPX 13500 to MPX 14500 to MPX 16500 to MPX 18500 to MPX 20500
- MPX 17500 to MPX 19500 to MPX 21500
- MPX 17550 to MPX 19550 to MPX 20550 to MPX 21550
- MPX 22040 to MPX 22060 to MPX 22080 to MPX 22100 to MPX 22120

Do you support direct attach cable (DAC)?

Yes, Citrix NetScaler appliances support a passive DAC in the following releases and builds:

- Release 9.3, build 63.4 and later
- Release 9.3.e, build 60.3007.e and later
- Release 10, build 74.2 and later
- Release 10.1, build 112.15 and later

Which port should I insert the DAC into?

DAC is inserted into the 10G port on the appliance.

Does the 1G port support DAC?

No. The DAC might fit into a 1G port but is not supported.

How can I order a DAC?

Contact your Citrix 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 (LAC)?

No. There must be symmetry between all elements in the same LAC.

