


Installing the Z9000 System



Notes, Cautions, and Warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your computer.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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2014 - 04

Rev. A01




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About this Guide

This guide provides site preparation recommendations, step-by-step procedures for rack mounting and desk mounting, inserting optional modules, and connecting to a power source.





-  **CAUTION:** To avoid electrostatic discharge (ESD) damage, wear grounding wrist straps when handling this equipment.
-  **WARNING:** Only trained and qualified personnel can install this equipment. Read this guide before you install and power up this equipment. This equipment contains two power cords. Disconnect both power cords before servicing.
-  **WARNING:** This equipment contains optical transceivers, which comply with the limits of Class 1 laser radiation.



-  **WARNING:** When no cable is connected, visible and invisible laser radiation may be emitted from the aperture of the optical transceiver ports. Avoid exposure to laser radiation and do not stare into open apertures.

Information Symbols

This book uses the following information symbols:

-  **NOTE:** The Note icon signals important operational information.
-  **CAUTION:** The Caution icon signals information about situations that could result in equipment damage or loss of data.
-  **WARNING:** The Warning icon signals information about hardware handling that could result in injury.
-  **WARNING:** The ESD Warning icon requires that you take electrostatic precautions when handling the device.

Related Documents

For more information about the Z9000 system, refer to the following documents.

- *Dell Networking OS Configuration Guide for the Z9000 System*
- *Dell Networking OS Command Line Reference Guide for the Z9000 System*
- *Dell Networking OS Release Notes for the Z9000 System*



NOTE: For the most recent documentation and software, visit iSupport (registration for access to some sections is required): <http://www.dell.com/support/>

The Z9000 System

The Dell Networking Operating System (OS) Z9000 platform is a next-generation switch/router product designed to meet the requirements for distributed data center cores. It is a two-rack unit (RU) chassis that supports 32 ports of 40GE QSFP+ or 128 ports of 10GE SFP+ (with breakout cables). The Z9000 includes an RS-232 console port and a management port for system access.

As shown in the following figure, the Z9000's Input/Output (I/O) side contains the thirty two 40G QSFP+ auto-sensing ports and management ports.

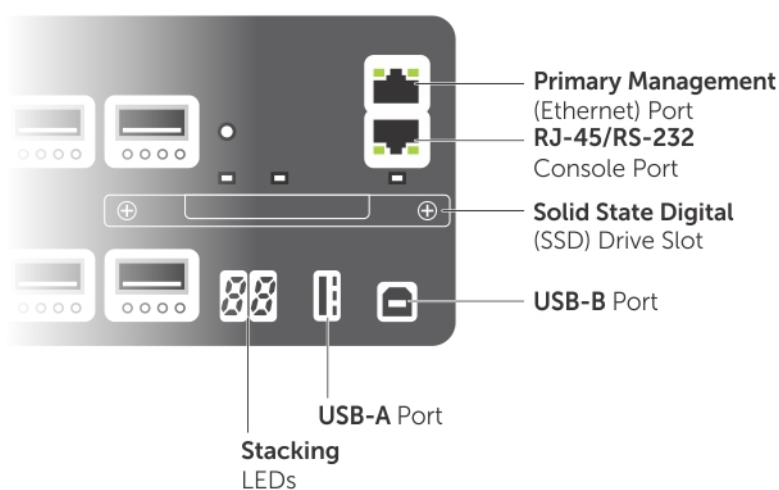


Figure 1. The Z9000 System I/O-Side View

As shown in the following figure, the Z9000's Power Supply Unit (PSU) side contains the power supply units and fan modules.

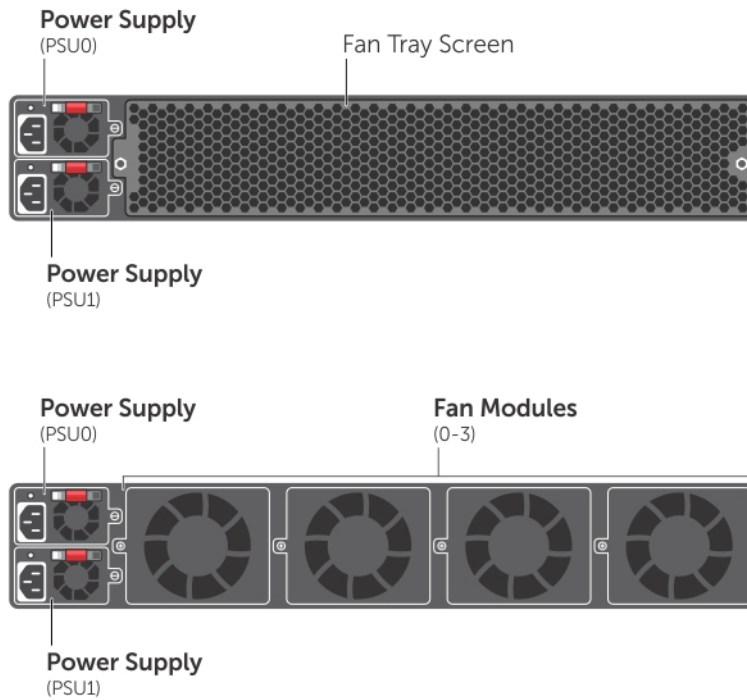


Figure 2. The Z9000 System PSU-Side View

Features

The Z9000 offers the following.

- Z9000 CPU and switch processor
- Hot-swappable redundant power supply
- 19 inch rack-mountable
- Standard 2U chassis height
- Up to 128K MAC address entries supported with hardware assisted aging
- Supports 12K jumbo frames

Ports

The Z9000 offers the following ports.

- External Serial RS-232 port (RJ45 type)
- Remote management port
- 32-port 40G QSFP+ ports
- Universal serial bus (USB)-A port
- USB-B port
- Solid state drive (SSD)

System Status

You can view Z9000 status information in several ways, including light emitting diodes (LEDs) and boot menu options.

You can also view status information through the command line interface (CLI) `show` commands and with simple network management protocol (SNMP) traps. For more information about these options, refer to the *Dell Networking OS Command Line Reference Guide for the Z9000 System* and the *Dell Networking OS Configuration Guide for the Z9000 System*.

LED Displays

The S4810-ON includes LED displays on the I/O side of the chassis (shown in the following illustration).

When the S4810-ON powers up or reloads, the PSU LED is solid green. For additional LED information, refer to your third-party operating software documentation.

The S4810-ON system LEDs are:

- System status (SYS)
- Stack Master indicator (MASTER)
- Fan status (FAN)
- Power status (PSU)

Additionally, the PSUs and fans have LEDs that indicate their individual status:

- PSU status
- Fan tray status
- System

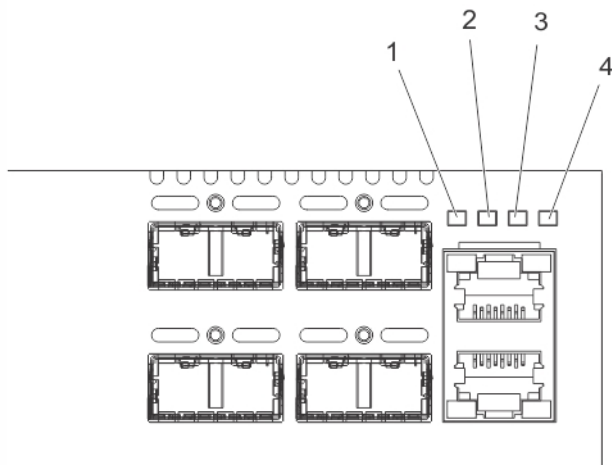


Figure 3. S4810-ON LEDs

1. SYS

2. MASTER
3. FAN
4. PSU


Site Preparations

The Z9000 is suitable for installation as part of a common bond network (CBN).

You can install the system in:

- network telecommunication facilities
- data centers
- other locations where the National Electric Code (NEC) applies

For more information about Z9000 specifications, refer to [Specifications](#).

 **NOTE:** Install the Z9000 system into a rack or cabinet before installing any optional components.

Site Selection

The following section describes where to install Dell Networking equipment.

Install Dell Networking equipment in restricted access areas. A restricted access area is one in which access can only be gained by service personnel by using a special tool, lock, key or other means of security and access is controlled by the authority responsible for the location.

Ensure that the area where you install your Z9000 system meets the following safety requirements:

- Near an adequate power source. Connect the system to the appropriate branch circuit protection as defined by your local electrical codes.
- Environmental temperature between 32° to 104°F (from 0° to 40°C).
- Relative humidity that does not exceed 85% noncondensing.
- In a dry, clean, well-ventilated and temperature-controlled room, away from heat sources such as hot air vents or direct sunlight.
- Away from sources of severe electromagnetic noise.
- Positioned in a rack or cabinet, or on a desktop with adequate space in the front, rear, and sides of the Z9000 for proper ventilation and access.

Cabinet Placement

Install the Z9000 only in indoor cabinets designed for use in a controlled environment.

Do not install the Z9000 in outside plant cabinets. For cabinet placement requirements, refer to [Site Selection](#).

The cabinet must be a minimum cabinet size. Airflow must be according to the Electronic Industries Alliance (EIA) standard. Ensure that there is a minimum of five inches (12.7 cm) between the intake and exhaust vents and the cabinet wall.

Rack Mounting

When you prepare your equipment rack, ensure that the rack is earth ground.

Ground the equipment rack to the same ground point the power service in your area uses. The ground path must be permanent.

Grounding

Use the Z9000 in a common bond network (CBN).

Connect the grounding cables as described in [Install the Z9000](#).

Fans and Airflow


The Z9000 fans support two airflow options.

Be sure to order the fans suitable to support your site's ventilation. Use a single type of airflow fan in your system. Do not mix reverse and normal airflows in a single S4810-ON chassis.

- Normal — airflow is from the I/O panel to the power supply. The grab-handle is labeled Exhaust.
- Reversed — airflow is from the power supply to the I/O panel. The grab-handle is labeled Intake.

For proper ventilation, position the Z9000 in an equipment rack (or cabinet) with a minimum of 5 inches (12.7 cm) of clearance around the exhaust vents. When you install two Z9000 systems near each other, position the two chassis at least 5 inches (12.7 cm) apart to permit proper airflow. The acceptable ambient temperature ranges are listed in [Specifications](#).

The fan speed increases and decreases automatically based on the system's state and temperature. The switch never intentionally turns off the fans. To see the log messages, use the `show logging` command. For more information, refer to the *System Logs* chapter of the *Dell Networking OS Command Line Reference Guide for the Z9000 System* and the *Dell Networking OS Configuration Guide for the Z9000 System*.

 **NOTE:** Power Supplies and Fan Modules are field replaceable units. Dell Networking does not support a mix of power supply types (such as, AC and DC) in the same switch. If a power supply is added or replaced, it **MUST** match the existing type of power supply (such as, AC and AC or DC and DC).


Power

To connect the chassis to the applicable power source, use the appropriate power cord with the Z9000. An AC power cord is included with the system.

When installing AC systems, follow the requirements of the National Electrical Code, ANSI/NFPA 70 where applicable.


The system is powered-up as soon as the power cord is connected between the system and the power source.

 **CAUTION:** Always disconnect the power cable before you service the power supply slots.

 **CAUTION:** Use the power supply cord as the main disconnect device on the AC system. Ensure that the socket-outlet is located/installed near the equipment and is easily accessible.

Storing Components

If you do not install your Z9000 and components immediately, Dell Networking recommends properly storing the system and all optional components until you are ready to install them.

 **WARNING:** Electrostatic discharge (ESD) damage can occur when components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the Z9000 and its accessories. After you remove the original packaging, place the Z9000 and its components on an antistatic surface.

Follow these storage guidelines:

- Storage temperature must remain constant ranging from -4° to 158°F (-20°C to 70°C).
- Store on a dry surface or floor, away from direct sunlight, heat, and air conditioning ducts.
- Store in a dust-free environment.

Install the Z9000

To install the Z9000 system, Dell Networking OS recommends completing the installation procedures in the order presented in this chapter.

Always handle the Z9000 and its components with care. Avoid dropping the system or its field replaceable units (FRUs).

This chapter describes the installation procedures as follows:

1. [Installing the Z9000 System in a Rack or Cabinet](#)
 - a. [Attaching the Mounting Brackets](#)
 - b. [Installing the System into the Rack or Cabinet](#)
2. [Installing the Rear Mounting Brackets](#)
3. [Attaching the Ground Cable](#)
4. [Installing the QSFP+ Optics](#)
5. [Splitting QSFP Ports to SFP+ Ports](#)
6. [Installing the Solid State Drive](#)
7. [Supply Power and Power Up the System](#)



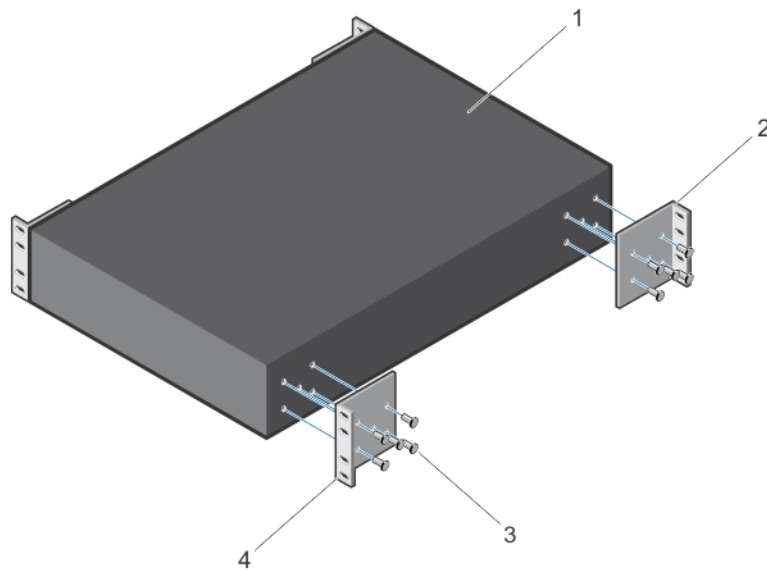
WARNING: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the Z9000 and its components. As with all electrical devices of this type, take all the necessary safety precautions to prevent injury when installing this system.

Installing the Z9000 Chassis in a Rack or Cabinet

The Z9000 is shipped with mounting brackets (rack ears) and the required screws for rack or cabinet installation. The brackets are enclosed in a package with the system.

To attach the brackets to the system, follow these steps:

1. Take the brackets and screws out of their packaging.
2. Attach the brackets to both sides of the system using four screws for each bracket. Attach the bracket so that the "ear" faces to the outside of the system.

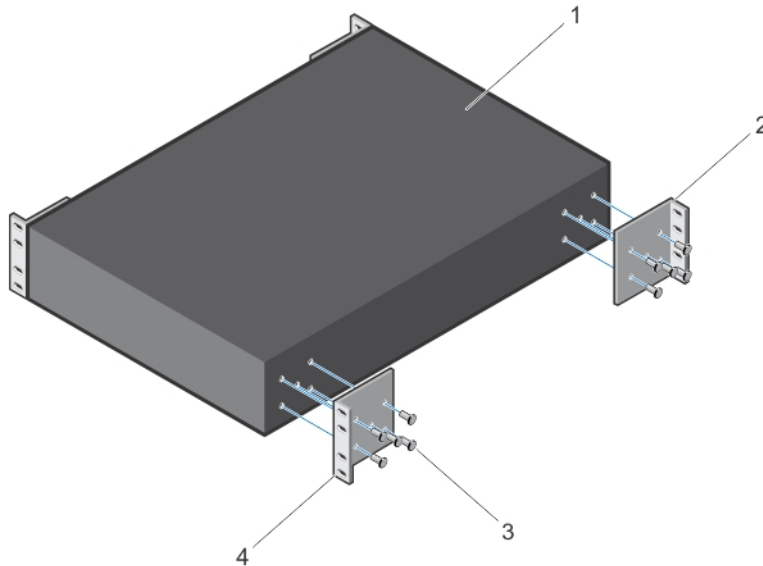


Attaching the Mounting Brackets

The Z9000 ships with mounting brackets (rack ears) and the required screws for rack or cabinet installation. The brackets are enclosed in a package with the system.

Attach the brackets to the system as follows:

1. Take the brackets and screws out of their packaging.
2. Attach the brackets to both sides of the system using four screws for each bracket. Attach the bracket so that the "ear" faces to the outside of the system.




- | | | | |
|----|--------------------------------|----|--------------------------------|
| 1. | View from PSU or I/O side | 3. | Screws |
| 2. | Connect to rack/cabinet (ears) | 4. | Connect to rack/cabinet (ears) |

Installing the System into a Rack or Cabinet

Ensure that there is adequate clearance surrounding the rack or within the cabinet to permit access and airflow.

To install the system into a two-post 19-inch equipment rack using the already attached mounting brackets, follow these steps:


-  **NOTE:** Dell Networking OS recommends using one person to hold the Z9000 chassis in place while another person attaches the brackets to the posts.

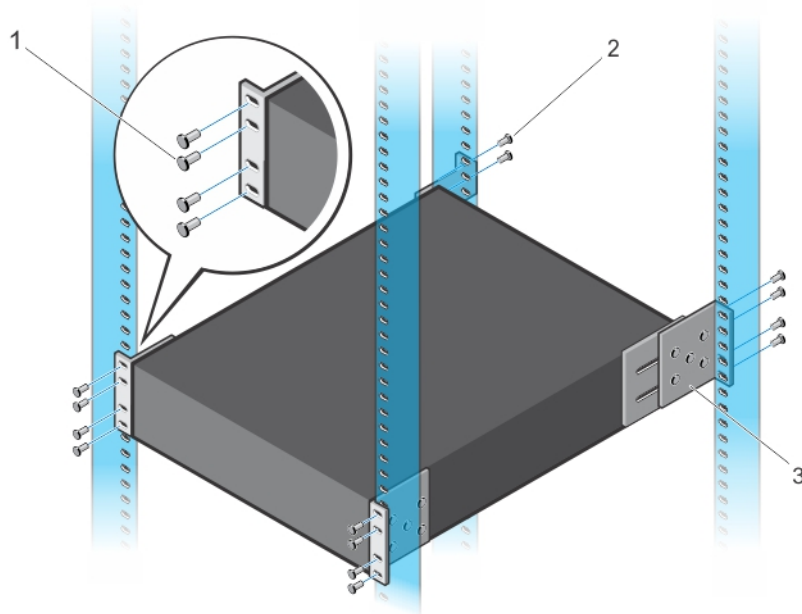
Attach the bracket "ears" to the rack or cabinet posts using the two screws for each bracket. Ensure the screws are tightened firmly. The following figure shows the mounting on the I/O side, but you can use either side.

Installing the Rear Mounting Brackets


To install the rear mounting brackets to the system, follow these steps:

1. Attach a long extension bracket to the side of the back of the switch using five screws (both sides).


-  **NOTE:** Ensure that the bracket bend is facing inwards.



2. Secure the short L-bracket extension to the rack using four screws (both sides).

-  **NOTE:** The screws are not included.


3. Align and secure the short L-bracket extension to the long extension bracket using four screws.


-  **NOTE:** Ensure that the short bracket is attached to the outside of the long bracket.

Attaching the Ground Cable


To attach the ground cable to the chassis, use a single M4x0.7 screw.

The cable itself is not included with the Z9000. To properly ground the chassis, Dell Networking OS recommends using a 6AWG one-hole lug, #10 hole size, 63" spacing (not included in shipping). The one-hole lug must be a UL recognized, crimp-type lug.

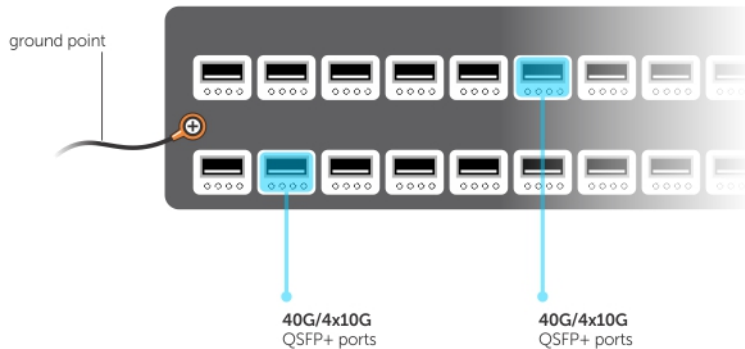
 **NOTE:** The rack installation "ears" are not suitable for grounding.

 **CAUTION:** Grounding conductors *must* be made of copper. Do not use aluminum conductors.

To connect the ground cable to the system, follow these steps.

 **NOTE:** Coat the one-hole lug with an anti-oxidant compound prior to crimping. Also, bring any unplated mating surfaces to a shiny finish and coat with an anti-oxidant prior to mating. Plated mating surfaces must be clean and free from contamination.

1. Take the one M4x0.7 screw from the package.
2. Cut the cable to the desired length. The cable length must facilitate proper operation of the fault interrupt circuits. Dell Networking recommends using the shortest cable route allowable.
3. Attach the one-hole lug to the system using the supplied screw with the captive internal tooth lock washer (shown in the illustration). Torque the screw to 20 in-lbs.




4. Attach the other end of the ground cable to a suitable ground point. The rack installation ears are not a suitable grounding point.

Installing the QSFP+ Optics

The Z9000 has 32 QSFP+ optical ports.

For supported optics, refer to <http://www.dell.com/products/specifications>.

 **WARNING:** ESD damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the Z9000 and its components.

 **WARNING:** When working with optical fibers, follow all warning labels and always wear eye protection. Never look directly into the end of a terminated or unterminated fiber or connector as it may cause eye damage.

To install QSFP+ optics into an open port, follow these steps.

1. Position the optic so it is in the correct position. The optic has a key that prevents it from being inserted incorrectly.
2. Insert the optic into the port until it gently snaps into place.



NOTE: Both rows of QSFP+ ports require that the 40G optics be inserted with the tabs facing up.

Removing the QSFP+ Optics

Remove an optic by pushing the tab on the optic and sliding the optic from the port.

When removing optics with direct attach cables (DACs) from the port, pull the release tab firmly and steadily. Prior to pulling the release tab, you may need to gently push the optic into the port to ensure it is seated properly. Do not jerk or tug repeatedly on the tab.

Splitting QSFP Ports to SFP+ Ports

The Z9000 supports splitting a single 40G QSFP port into four 10G SFP+ ports using one of the supported breakout cables.

For the system to recognize the port type change, enter the `stack-unit portmode` command. For example:

```
stack-unit stack-unit port number portmode quad
```

- *stack-unit*: enter the stack member unit identifier of the stack member to reset. The range is from 0 to 7.
- *number*: enter the port number of the 40G port to be split. The range is from 0 to 124 in increments of 4.

Important Points to Know

- The unit number with the split ports must be the default (stack-unit 0). To verify the unit number, use the `show system brief` command. If the unit ID is different than 0, renumber it to 0 before the ports are split by using the `stack-unit id renumber 0` command in EXEC mode.
- The quad port must be in a default configuration before you can split it into four 10G SFP+ ports. The 40G port is lost in the configuration when you split the port, so be sure that the port is also removed from other L2/L3 feature configurations.
- For the split-port change to take effect, reload the system after issuing the command. Save your configuration.

Installing the Solid State Drive

The Z9000 includes a solid state drive (SSD) that acts as another storage device.

The SSD ships installed in the Z9000 system and is located in a slot on the lower-right area on the I/O side (shown in the following illustration).

The SSD is field replaceable but not hot-swappable and supports drives that use 12 Volts and/or 5.0 Volts. Be sure to use only drives that Dell Networking OS supports.

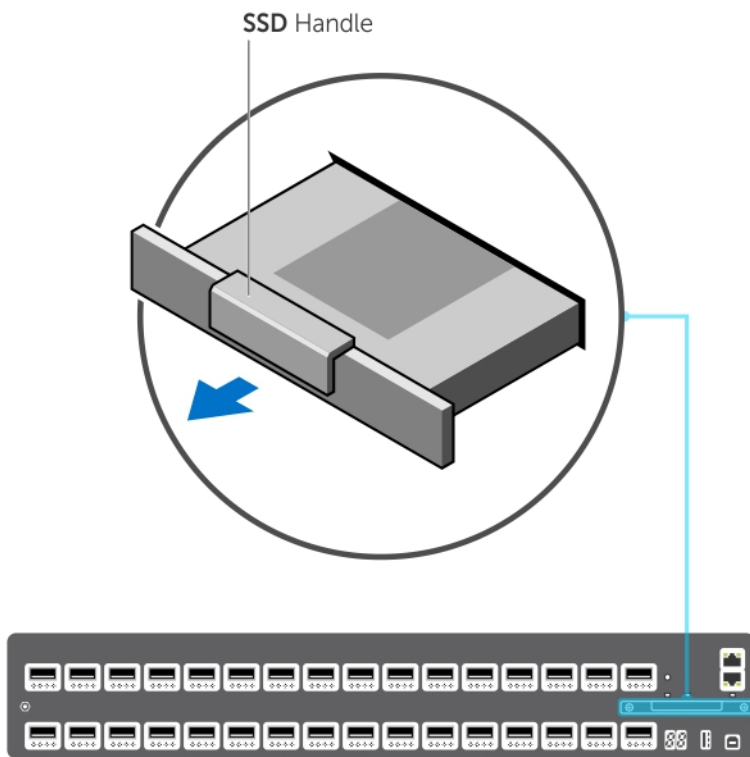


Figure 4. The SSD

Removing the Solid State Drive

To remove and replace an SSD, follow these steps.

1. Shut down the system.
2. Loosen the retaining screws on the SSD.
3. Use the handle to pull the SSD out of the slot.
4. Remove the SSD and set it aside.
5. Use the SSD handle to slide the replacement SSD into the slot and firmly press it in place.
6. Finger tighten the retaining screws.
7. Restart the system.


Supply Power and Power Up the System


Supply power to the Z9000 after it is mounted in a rack or cabinet.

Dell Networking OS recommends re-inspecting your system prior to powering up. Verify that:

- the equipment is properly secured to the rack and properly grounded.
- the equipment rack is properly mounted and grounded.
- the ambient temperature around the unit (which may be higher than the room temperature) is within the limits specified for the Z9000.
- there is sufficient airflow around the unit.

- the input circuits are correctly sized for the loads and that you use sufficient over-current protection devices.
- all protective covers are in place.

 **NOTE:** A US AC power cable is included for powering up an AC power supply. You must order all other power cables separately.

 **NOTE:** ESD damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the Z9000 system and its components.

Power Up Sequence

When the system powers up, the fans immediately come on at high speed. The fan speed slows as the system boots up.

The SYS Light Emitting Diode (LED) does not light up until the boot-up sequence is complete. When the boot-up is complete, the SYS LED is steadily lit green.

AC Power

To add AC power, connect the power cord plug to each AC power connector. Make sure that the power cord is secure.

As soon as the cable is connected between the Z9000 system and the power source, the system is powered-up; there is no on/off switch.

DC Power

To add DC power, follow these steps.


1. Remove the small plastic cover from the DC connectors.
2. Ensure that the power source is turned off. Do not attach the DC cable to the DC connectors while the power source is on.
3. Attach the connectors to the Power Supply Units (PSUs). Make sure that the connections are secure.
4. Replace the plastic cover over the DC connectors.

As soon as the cable is connected between the Z9000 system and the power source, the system is powered-up; there is no on/off switch.


Power Supplies


The Z9000 supports two hot-swappable power supply units (PSUs) with integrated fans that provide cooling for the system.

The Z9000 supports AC and DC power supplies with two air-flow directions (normal and reversed). Two PSUs are required for full redundancy, but the system can operate with a single PSU.

 **NOTE:** If you use a single PSU, install a blank plate in the other PSU slot. Dell Networking recommends using power supply 1 (PSU1) as the blank plate slot.

The PSUs are field replaceable. When operating with full redundancy (two power supplies installed and running), you can remove and replace one PSU while the other PSU is running without disrupting traffic.

 **WARNING: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the Z9000 and its components.**

 **WARNING: To prevent electrical shock, ensure that the Z9000 is grounded properly. If you do not ground your equipment correctly, excessive emissions may result. To ensure that the power cables meet your local electrical requirements, use a qualified electrician.**


Components


The following power supply options are available for the Z9000.


- AC power supply with integrated fan
- AC power supply with integrated reverse flow fan
- DC power supply with integrated fan
- DC power supply with integrated reverse flow fan

The PSUs in the Z9000 are field replaceable. When both power supplies are installed and running, you can remove one power supply without interrupting traffic.

Power Supply 0 (PSU0) is on the top of the Z9000; power supply 1(PSU1) is on the bottom of the Z9000 system.


 **WARNING: Prevent exposure and contact with hazardous voltages. Do not attempt to operate this system with the safety cover removed.**

 **CAUTION: Remove the power cable from the PSU prior to removing the PSU. Also, do not connect the power cable before you insert the PSU in the chassis.**


 **CAUTION: Be sure that the DC power source is turned off before attaching the cables to the DC connectors on the Z9000.**

Installing a Power Supply

To install power supply, follow these steps.

 **NOTE:** The PSU slides into the slot smoothly. Do not force a PSU into a slot as this action may damage the PSU or the Z9000 chassis.

1. Take the PSU out of the shipping box.
2. Use the grab handle to slide the PSU into the power supply bay.
3. Tighten the securing screw on the side of the PSU. Ensure that the PSU is secure.
4. Attach the power cables.

 **NOTE:** The system powers up as soon as the cables are connected between the power supply and the power source.

Installing a New AC Power Supply

To install a new AC power supply, follow these steps.

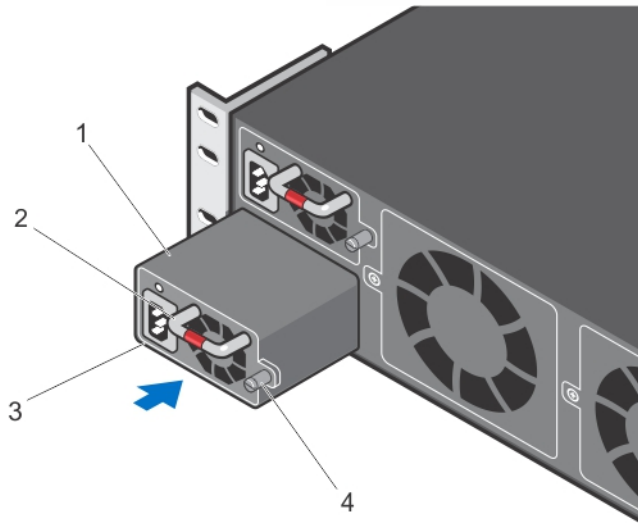



Figure 5. Illustration of installing a new AC power supply

- | | | | |
|----|-----------------|----|----------------|
| 1. | PSU1 | 3. | Grab Handle |
| 2. | Cable Connector | 4. | Securing Screw |

 **NOTE:** The PSU slides into the slots smoothly. Do not force the PSU into a slot as this action may damage the PSU or the chassis.

1. Take the PSU out of the shipping box.
2. Use the grab handle to slide the PSU into the power supply bay.
3. Tighten the securing screw on the side of the PSU. Ensure that the PSU is secure.
4. Attach the power cable.

NOTE: The system powers up as soon as the cables are connected between the power supply and the power source.

Installing a New DC Power Supply

NOTE: The PSU slides into the slot smoothly. Do not force the PSU into a slot as this action may damage the PSU or the chassis.

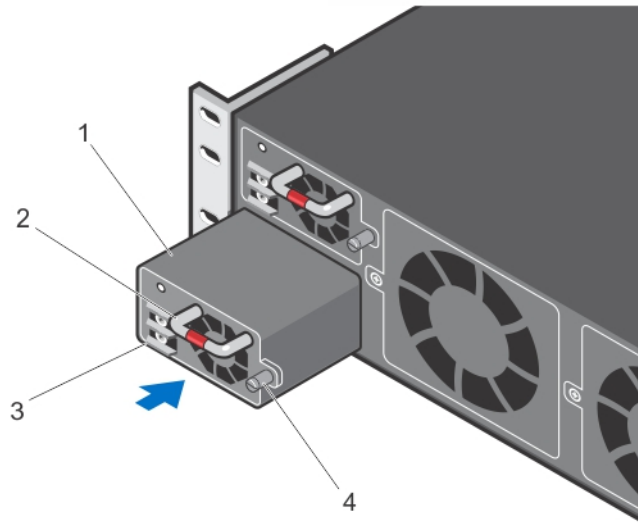


Figure 6. Illustration of installing a new DC Power Supply

- | | | | |
|----|-------------|----|---------------------|
| 1. | PSU1 | 3. | DC Cable Connectors |
| 2. | Grab Handle | 4. | Securing Screw |


To install a new DC power supply, follow these steps.


1. Take the PSU out of the shipping box.
2. Remove the small plastic cover over the DC cable connectors. Do not throw away the cover as you will replace it when you complete the installation.
3. Ensure that the DC power source is turned OFF.
4. Use the grab handle to slide the PSU into the power supply bay.
5. Tighten the securing screw on the side of the PSU. Ensure that the PSU is secure.
6. Attach the power cables.
7. Replace the small plastic cover over the DC cable connectors.
8. Turn the DC power source ON.

Replacing an AC Power Supply


To replace a power supply, follow these steps.

NOTE: The PSU slides into the slot smoothly. Do not force a PSU into a slot as this action may damage the PSU or the Z9000 chassis.

 **NOTE:** If a PSU fails, you must completely replace it. There are no field serviceable components in the PSU. To request a hardware replacement, refer to [Technical Support](#).


 **NOTE:** If you use a single PSU, install a blank plate in the other PSU slot. Dell Networking OS recommends using power supply 1 (PSU1) as the blank plate slot.

1. Disconnect the power cable from the PSU.
2. Use the grab handle to slide the PSU out of the power supply bay.
3. Use the grab handle on the replacement unit to slide it into the power supply bay.
4. Tighten the securing screws on the replacement PSU with a screwdriver. Ensure that the PSU is secure.
5. Attach the power cord to the replacement PSU.

 **NOTE:** The system powers up as soon as the cables are connected between the power supply and the power source.

Replacing a DC Power Supply

To replace a DC power supply, follow these steps.

 **NOTE:** The PSU slides into the slot smoothly. Do not force the PSU into a slot as this action may damage the PSU or the chassis.

1. Turn the DC power source OFF.
2. Remove the small plastic cover over the DC cable connectors. Do not throw away the cover as you will replace it when you complete the installation.
3. Disconnect the power cable from the PSU.
4. Use the grab handle to slide the PSU out of the power supply bay.
5. Use the grab handle on the replacement unit to slide it into the power supply bay.
6. Replace the small plastic cover over the DC cable connectors.
7. Tighten the securing screw on the side of the PSU. Ensure that the PSU is secure.
8. Attach the power cables.
9. Turn the DC power source ON.

Fans


The Z9000 comes from the factory with one power supply unit (PSU) and two fan modules installed in the system.

If two or more fans are installed and running, the fan modules are hot-swappable.

The Z9000 supports two airflow direction options. Do not mix airflow directions; you can use only a single airflow direction in a chassis. If the airflow directions are mismatched, the Z9000 powers down in one minute.

- Normal — airflow is from the I/O panel to the PSU. The grab-handle is labeled Exhaust.
- Reversed — airflow is from the PSU to the I/O panel. The grab-handle is labeled Intake.

Environmental factors can decrease the amount of time required between fan replacements. Check the environmental factors regularly. An increase in temperature and/or particulate matter in the air might affect performance (for example, new equipment installation).

 **CAUTION: If the wrong fan air flow is ordered or if the wrong fans are received with your Z9000, the entire Z9000 must be replaced. Normal fans cannot be swapped with reverse air flow fans; the unit must be replaced.**

 **CAUTION: Check the fans at six-month intervals and replace them as necessary. Regularly monitor the speeds of the cooling fans in order to accurately determine replacement intervals.**

Components


The following are the Z9000 fan components.

- Z9000 Fan module
- Z9000 Fan module - Reverse flow

Installing a Fan Module

The fan modules in the Z9000 are field replaceable.

Module slot 0 is on the left side of the chassis; module slot 1 is on the right side of the chassis.

 **CAUTION: DO NOT mix airflow directions. Both fans must use the same airflow direction (reverse or normal). If the airflows are mismatched, an error message appears and the system shuts down.**

To install a fan module, follow these steps.

1. Twist the latching screws so that the fan screen detaches from the system, as shown in the following illustration.

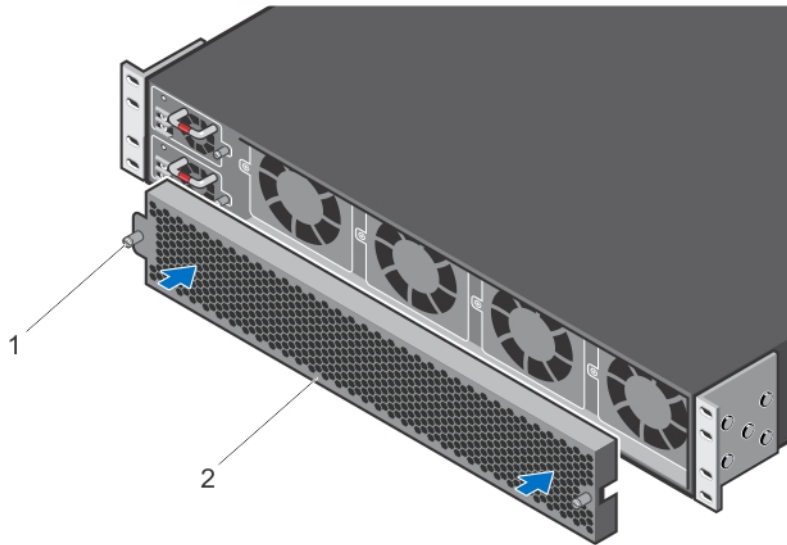


Figure 7. Illustration for installing a fan module

1. Latching Screw
 2. Fan Screen
2. Remove the screen and set it aside.
 3. Take the fan module out of the shipping box.
 4. Use the grab handle to slide the module into the bay.
 5. Tighten the securing screw on the side of the module.
 6. Replace the fan screen.
 7. Twist the latching screws to the fan screen until it is securely attached to the system.

Replacing a Fan Module

To replace a fan module, follow these steps.

1. Twist the latching screws so that the fan screen detaches from the system.

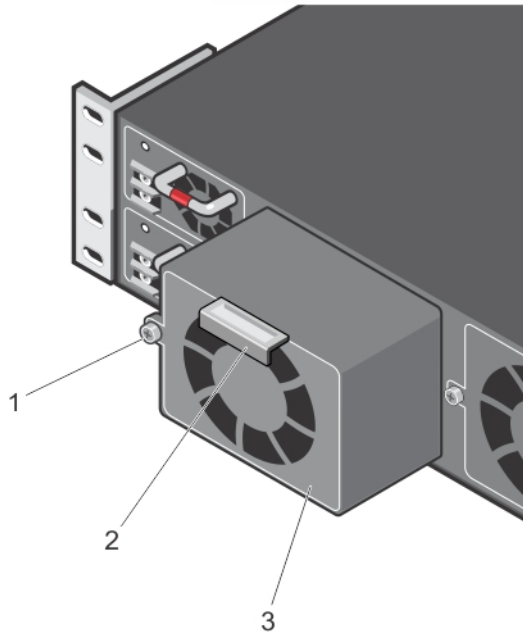


Figure 8. Illustration for replacing a Fan module

1. Screw
 2. Grab Handle
 3. Fan Module
2. Remove the fan screen and set it aside.
 3. Loosen the securing screw on the side of the module.
⚠ CAUTION: You must complete steps 4 and 5 within one minute or the system powers down.
 4. Use the grab handle on the module to slide it out of the bay.
 5. Use the grab handle on the replacement module to slide it into the bay.
 6. Tighten the captive screws on the module with a screwdriver. Ensure that the module is secure.
 7. Replace the fan screen.
 8. Twist the latches to the fan screen until it is securely attached to the system.

Console Ports

The Z9000 has two management ports available for system access—a console port and a Universal serial bus (USB)-B port.

The USB-B ports act exactly the same as the console port. The terminal settings are the same for both access ports.

Accessing the RJ-45 Console Port (RS-232)

The RS-232/RJ-45 console port is labeled on the upper right side of the Z9000 chassis (the I/O side) (as shown in the following illustration).

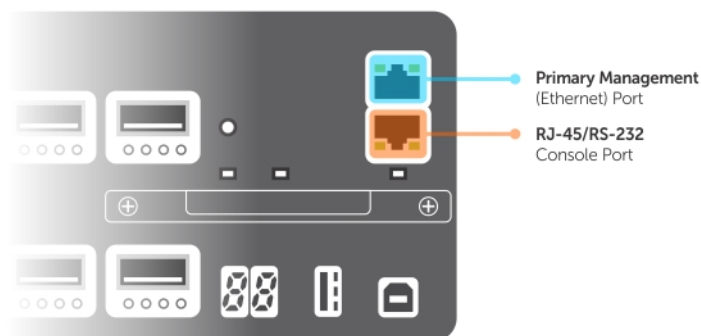


Figure 9. RJ-45/RS-232 Console Port Connector

To access the RJ-45/RS-232 console port, follow these steps.

1. Install an RJ-45 copper cable into the console port. Use a rollover cable to connect the Z9000 console port to a terminal server.
2. Connect the other end of the cable to the dumb terminal emulator (DTE) serial port on the PC or terminal server.
3. Keep the default terminal settings on the console as follows:
 - 9600 baud rate
 - No parity
 - 8 data bits
 - 1 stop bit
 - No flow control

Access the RJ-45 Console Port with a DB-9 Adapter

If the DTE has a DB-9 interface, you can connect to the console using an RJ-45 to DB-9 adapter along with the RJ-45 rollover cable.

The following table lists the pin assignments.

Table 1. Pin Assignments Between the Console and a DTE Terminal Server

Console Port	RJ-45 to RJ-45 Rollover Cable	RJ-45 to RJ-45 Rollover Cable	RJ-45 to DB-9 Adapter	Terminal Server Device
Signal	RJ-45 Pinout	RJ-45 Pinout	DB-9 Pin	Signal
RTS	1	8	8	CTS
NC	2	7	6	DSR
TxD	3	6	2	RxD
GND	4	5	5	GND
GND	5	4	5	GND
RxD	6	3	3	TxD
NC	7	2	4	DTR
CTS	8	1	7	RTS

Accessing the USB-B Console Port

The terminal settings are the same for the USB-B port and the console port:

- 9600 baud rate
- No parity
- 8 data bits
- 1 stop bit
- No flow control

When you connect the USB-B port, it becomes the primary connection and, when the system is connected, it sends all messages to the USB-B drive.

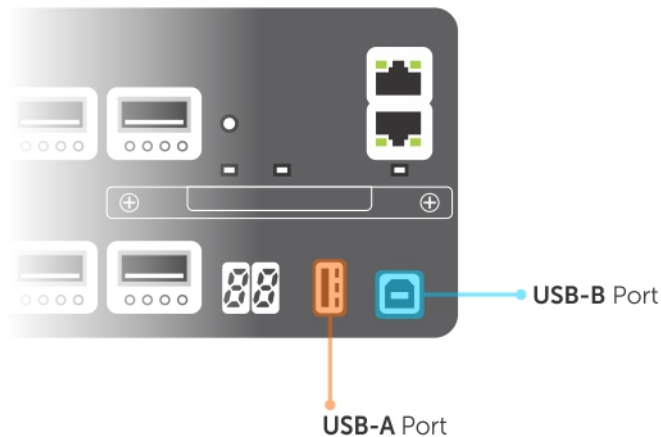


Figure 10. USB-B Console Port Connector

NOTE: Before starting this procedure, be sure you have a terminal emulation program already installed on your PC. You will also need the appropriate drivers for the USB device you use. For assistance, contact Dell Networking Technical Support.

To access the USB-B console port, follow these steps.

1. Power on the PC (Dell Networking recommends using the XP operating system).
2. Connect the USB-A end of cable into an available USB port on the PC.
3. Connect the USB-B end of cable into the USB-B console port on the Z9000.
4. Power on the system.
5. Install the necessary USB device drivers (you will need an internet connection). For assistance, contact Dell Networking Technical Support.
6. Open your terminal software emulation program to access the Z9000.
7. Set the terminal connection settings. Use these settings: 9600-baud rate, No parity, 8 data bits, 1 stop bit, No flow control.

The command line interface (CLI) prompt appears (`Dell>_`) when you are connected to the Z9000.

Accessing the Solid State Drive

The Z9000 ships with a 32GB SSD.

You can also order the SSD separately. The SSD acts as an external flash and is accessed as **slot0**: on the system. You view and manage the SSD contents through the CLI, similar to the flash drives.

The SSD is field replaceable and supports drives that use 12 Volts and/or 5.0 Volts. Be sure to use only drives that Dell Networking supports.

NOTE: You **cannot** hot-swap the SSD. You must reboot the Z9000 to recognize a new or reseated SSD.

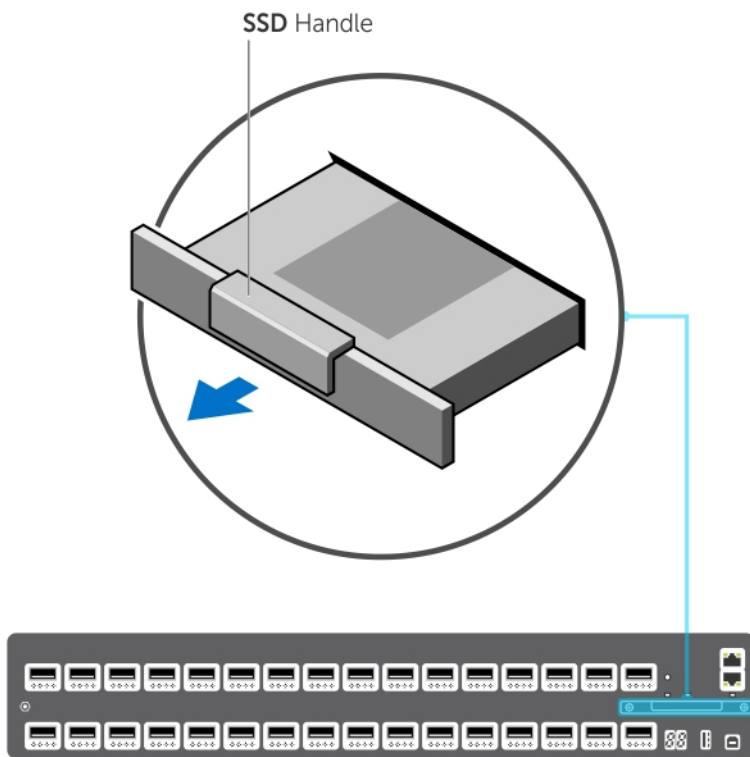


Figure 11. SSD Drive

Components

The following SSD option is available:

- Z9000 Solid State Drive

Installing an SSD

To install an SSD, follow these steps.

1. Shut down the system. You cannot hot-swap the SSD; you must reboot the system to recognize a new or reseated SSD.
2. Take the SSD out of the shipping box.
3. Use the grab handle to slide the SSD into the slot.
4. Restart the system.

Included here are some key commands supported by the SSD. For a complete description of the commands supported by the SSD, refer to the *Dell Networking Command Line Reference Guide for the Z9000 System*.

Viewing Files on the SSD

To view files on the SSD, use the `dir slot0:` command.

For example:

```
Dell#dir slot0:
Directory of slot0:
 1 drw- 32768 Jan 01 1980 00:00:00 .
 2 drwx 512 Jul 23 2007 00:38:44 ..
 3 drw- 8192 Mar 30 1919 10:31:04 TRACE_LOG_DIR
 4 drw- 8192 Mar 30 1919 10:31:04 CRASH_LOG_DIR
 5 drw- 8192 Mar 30 1919 10:31:04 NVTRACE_LOG_DIR
Step Task
 1 Shut down the system. You cannot hot-swap the SSD; you must reboot the system
to recognize a new or reseated
SSD.
 1 Take the SSD out of the shipping box.
 2 Use the grab handle to slide the SSD into the slot.
 3 Restart the system.
SSD
Handle
Access Ports | 39
 6 drw- 8192 Mar 30 1919 10:31:04 CORE_DUMP_DIR
 7 d--- 8192 Mar 30 1919 10:31:04 ADMIN_DIR
--More--
```

Copying Files To and From the SSD

To copy files to or from the SSD, use the `copy` command, as shown in the following examples.

Copy from an FTP site to the SSD:

```
Dell#copy ftp://myusername:mypassword@10.10.10.10//FTOS/FTOS-ZB-8.3.11.0.bin
slot0:/
/
Destination file name [FTOS-ZB-8.3.11.0.bin.bin]:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
26292881 bytes successfully copied
```

Copy from the internal flash to the SSD.

```
Dell#copy flash: slot0:boot-image Destination file name [FTOS-
ZB-8.3.11.0.bin.bin]: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!! 26292881 bytes successfully copied
```

Removing Files From the SSD

To remove files from the SSD, use the `delete` command.

For example:

```
Dell#delete slot0://[filepath]
```


Specifications

This chapter lists the Z9000 specifications.

Chassis Physical Design

Table 2. Chassis Physical Design

Parameter	Specifications
Height	3.48 inches (8.8 cm)
Width	17.32 inches (44.0 cm)
Depth	24.00 inches (61.00 cm)
Chassis weight	50.3 lbs (approx.) (22.8 kg)
Rack clearance required	Front: 5-inches (12.7 cm) Rear: 5-inches (12.7 cm)
Thermal dissipation	2692 BTU/h (789 W)

Table 3. Environmental Parameters

Parameter	Specifications
Temperature	32° to 104°F (0° to 40°C) -40° to 158°F (-20° to 70°C)
Maximum altitude	No performance degradation to 10,000 feet (3,048 meters)
Relative humidity	10 to 85% non-condensing

Table 4. AC Power Requirements

Parameter	Specifications
Nominal input voltage	100 to 240 VAC, 50/60 Hz
Maximum AC power supply input current	8.00 A @ 100/120VAC 4.00 A @ 200/240 VAC
Maximum system power input	789 W

Table 5. DC Power Requirements

Parameter	Specifications
Nominal input voltage	-40 to -60 VDC
Maximum power supply input current	16.5 A @ -48 VDC
Maximum system power input	789 W

IEEE Standards

The Z9000 complies with the following IEEE standards.

- 802.3ae 10 Gigabit Ethernet
- 802.3ab 1000Base-T
- 802.1p L2 Prioritization
- 802.1Q VLAN Tagging, Double VLAN Tagging (Q in Q), GVRP
- 802.1s Multiple Spanning Tree Protocol
- 802.1w Rapid Spanning Tree Protocol
- 802.3ad Link Aggregation with LACP
- 802.1D Bridging, STP
- 802.3x Flow Control
- 802.1ac Frame Extension for VLAN Tagging
- 802.1x Port Based Network Access Control

Agency Compliance

The Z9000 is designed to comply with the following safety and agency requirements.

USA Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designated to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance to the instructions, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures necessary to correct the interference at their own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Dell Networking is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications in the equipment. Unauthorized changes or modification could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Figure 12. Canadian Department of Communication Statement

European Union EMC Directive Conformance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Dell Networking can not accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of this product, including the fitting of non-Dell Networking option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.



WARNING: This is a Class A product. In a domestic environment, this device may cause radio interference, in which case, you may be required to take adequate measures.

European Community Contact

Dell Networking, EMEA - Central

Dahlienweg 19

66265 Heusweiler

Germany

<http://www.force10networks.com/german/>

Tel: +49 172 6802630

Email: EMEA Central Sales

Japan: VCCI Compliance for Class A Equipment

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

⚠ WARNING: Use the AC power cords with Dell Networking equipment only. Do not use Dell Networking AC power cords with any unauthorized hardware.


This is Class A product based on the standard of the Voluntary Control Council For Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

本製品に同梱いたしております電源コードセットは、本製品専用です。本電源コードセットは、本製品以外の製品ならびに他の用途でご使用いただくことは出来ません。製品本体には同梱された電源コードセットを使用し、他製品の電源コードセットを使用しないで下さい。

Korean Certification of Compliance

A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
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Korean Package Label

	 [equipment type]
품명(Product Name)	Ethernet Switch
모델명(Model)	[model number]
신청인(Applicant)	Force10 Networks, Inc.
제조사(Manufacturer)	Delta Networks, (Dongguan) Ltd.
제조년월(Manufacturing Date)	[date]
제조국(Country of Origin)	China

Safety Standards and Compliance Agency Certifications

- CUS UL 60950-1, 2nd Edition
- CSA 60950-1-03, 2nd Edition
- EN 60950-1, 2nd Edition
- EN 60825-1, 1st Edition
- EN 60825-1 Safety of Laser Products—Part 1: Equipment Classification Requirements and User’s Guide

- EN 60825-2 Safety of Laser Products—Part 2: Safety of Optical Fibre Communication Systems
- FDA Regulation 21CFR 1040.10 and 1040.11
- IEC 60950-1, 2nd Ed, including all National Deviations and Group Differences

Electromagnetic Compatibility (EMC)

Emissions

- International: CISPR 22: 2006, Class A
- Australia/New Zealand: AS/NZS CISPR 22:2009, Class A
- Canada: ICES-003, Issue-4, Class A
- Europe: EN55022 2006 (CISPR 22: 2006), Class A
- Japan: VCCI V-3/2011.04 Class A
- USA: FCC CFR47 Part 15, Subpart B, Class A

Immunity

- EN 300 386 v1.5.1:2010 EMC for Network Equipment
- EN55022 2006, Class A
- EN 55024 1998 + A1: 2001 + A2: 2003
- EN 61000-3-2 Harmonic Current Emissions
- EN 61000-3-3 Voltage Fluctuations and Flicker
- EN 61000-4-2 ESD
- EN 61000-4-3 Radiated Immunity
- EN 61000-4-4 EFT
- EN 61000-4-5 Surge
- EN 61000-4-6 Low Frequency Conducted Immunity

Product Recycling and Disposal

You must recycle or discard this system according to applicable local and national regulations. Dell Networking encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. Dell Networking offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products.

Waste Electrical and Electronic Equipment (WEEE) Directive for Recovery, Recycle and Reuse of IT and Telecommunications Products

Dell Networking switches are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.



Figure 13. The European WEEE Symbol

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE.

Dell Networking products, which fall within the scope of the WEEE, are labeled with the crossed-out wheeled-bin symbol, as shown above, as required by WEEE.

For information on Dell Networking product recycling offerings, see the WEEE Recycling instructions on iSupport at: <https://www.force10networks.com/CSPortal20/Support/WEEEandRecycling.pdf>. For more information, contact the Dell Networking Technical Assistance Center (TAC) (refer to [Contacting the Technical Assistance Center](#)).

Removing the SD Card

To support high security environments, you can remove and re-install the SD card. Dell Networking recommends removing the SD card only when necessary. Only authorized personnel should remove the SD card.

⚠ CAUTION: Only remove the SD card to support high security operations and after discussions with Dell Networking Technical Support or your Dell Networking representative.

To open the case and remove the SD card, follow these steps.

1. Remove the small phillips screws that connect the top of the SD card to the body. The screws are located on the top and the sides of the chassis.
2. Slide the top backwards until its front flange slides free of the faceplate then lift it off.
3. Gently push the SD card to release it from the slot.

4. Remove the card.

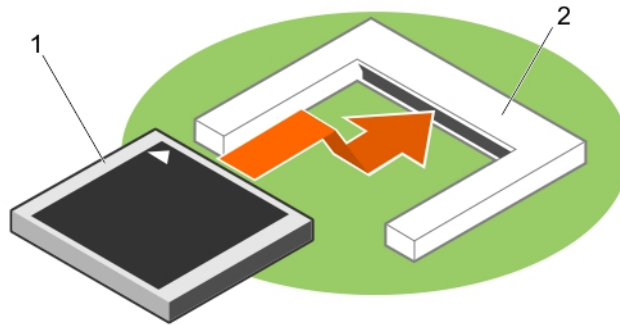


Figure 14. Illustration of removing the SD Card

Replacing the Battery

The lithium battery is *not field replaceable*.

Only authorized personal should remove and replace the battery. If the battery requires replacement, contact Dell Networking Technical Support.

⚠ WARNING: ESD damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S4810-ON and its components. As with all electrical devices of this type, take all the necessary safety precautions to prevent injury when installing this system.

To open the case, follow these steps.

1. Remove the small Phillips screws that connect the top of the case to the body. There are three screws evenly spaced across the rear and three screws evenly spaced along each side of the case.
2. Slide the top backwards until its front flange slides free of the faceplate then lift it off.
3. Insert a small, flat screw-driver blade under the battery and in one of the slots of the plastic retainer underneath the battery.

4. Lever the battery up against the coin cell clip (the hold-down lead on top of the battery) far enough to provide room for the battery to be lifted above the edge of its retainer.

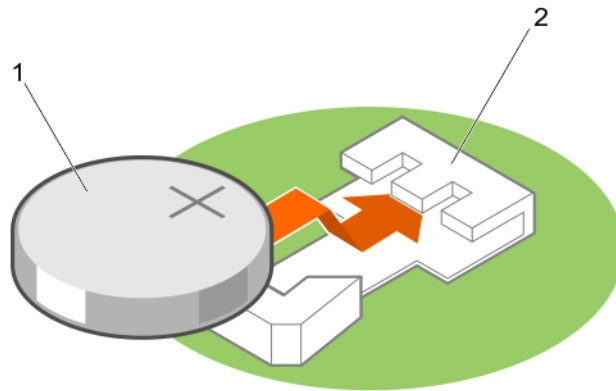


Figure 15. Illustration of the battery removal

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling and treatment of batteries and accumulators.

Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local Dell Networking representative.



Figure 16. The European WEEE Symbol

For California:

- Perchlorate Material — Special handling may apply.

- Refer to <http://www.dtsc.ca.gov/hazardouswaste/perchlorate>

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials.

Technical Support

This chapter contains the following sections:

- [The iSupport Website](#)
- [Contacting the Technical Assistance Center](#)
- [Requesting a Hardware Replacement](#)

The iSupport Website

iSupport provides a range of documents and tools to assist you with effectively using Dell Networking equipment and mitigating the impact of network outages.

Through iSupport you can obtain technical information regarding Dell Networking products, access to software upgrades and patches, and open and manage your Technical Assistance Center (TAC) cases. Dell Networking iSupport provides integrated, secure access to these services.

Accessing iSupport Services

The URL for iSupport is <http://www.dell.com/support>. You must have a userid and password to access iSupport services. If you do not have a userid and password, you can request these at the website.

To request a userid, password, and iSupport services, follow these steps.

1. On the Dell Networking Support page, click the **Account Request** link.
2. Fill out the User Account Request form and click **Send**. You will receive your userid and password by email.
3. To access iSupport services, click the **LOGIN** link and enter your userid and password.

Contacting the Technical Assistance Center

How to
Contact Dell
Networking
TAC

Log in to iSupport at <http://www.dell.com/support>.

Information to
Submit When
Opening a
Support Case

- Your name, company name, phone number, and E-mail address
- Preferred method of contact
- Model number
- Software version number
- Symptom description

Managing Your Case	Log in to iSupport and select the Service Request tab to view all open cases and Return Materials Authorizations (RMAs).
Technical Documentation	Log in to iSupport and select the Documents tab. You can access this page without logging in using the Documentation link on the iSupport page.
Contact Information	E-mail: Dell-Force10_Technical_Support@Dell.com Web: http://www.dell.com/support Telephone: <ul style="list-style-type: none"> • US and Canada: 1.866.965.5800 • International: +1.408.965.5800

Requesting a Hardware Replacement

To request replacement hardware, follow these steps.

1. Determine the part number and serial number of the component.
2. Request an RMA number from TAC by opening a support case. Open a support case by:
 - Using the Create Service Request form on the iSupport page (refer to [Contacting the Technical Assistance Center](#)).
 - Contacting Dell Networking directly by email or by phone (refer to [Contacting the Technical Assistance Center](#)). Provide the following information when using email or phone:
 - Part number, description, and serial number of the component.
 - Your name, organization name, telephone number, fax number, and email address.
 - Shipping address for the replacement component, including a contact name, phone number, and email address.
 - A description of the failure, including log messages.