

Dell Force10 Z9000 System

Quick Start Guide

Publication Date: October 2012

Regulatory Model: Z9000



Force10

Dell Force10 Z9000 System

Quick Start Guide

Publication Date: October 2012

Regulatory Model: Z9000



Force10

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.

If you purchased a Dell n Series computer, any references in this publication to Microsoft Windows operating systems are not applicable.

Information in this publication is subject to change without notice.

© 2012 Dell Inc. All rights reserved.

Reproduction of these materials in any manner whatsoever without the written permission of Dell Inc. is strictly forbidden.

Trademarks used in this text: Dell™, the DELL logo, Dell Precision™, OptiPlex™, Latitude™, PowerEdge™, PowerVault™, PowerConnect™, OpenManage™, EqualLogic™, KACE™, FlexAddress™ and Vostro™ are trademarks of Dell Inc. Intel®, Pentium®, Xeon®, Core™ and Celeron® are registered trademarks of Intel Corporation in the U.S. and other countries. AMD® is a registered trademark and AMD Opteron™, AMD Phenom™, and AMD Sempron™ are trademarks of Advanced Micro Devices, Inc. Microsoft®, Windows®, Windows Server®, MS-DOS® and Windows Vista® are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Red Hat Enterprise Linux® and Enterprise Linux® are registered trademarks of Red Hat, Inc. in the United States and/or other countries. Novell® is a registered trademark and SUSE™ is a trademark of Novell Inc. in the United States and other countries. Oracle® is a registered trademark of Oracle Corporation and/or its affiliates. Citrix®, Xen®, XenServer® and XenMotion® are either registered trademarks or trademarks of Citrix Systems, Inc. in the United States and/or other countries. VMware®, Virtual SMP®, vMotion®, vCenter®, and vSphere® are registered trademarks or trademarks of VMWare, Inc. in the United States or other countries.

Other trademarks and trade names may be used in this publication to refer to either the entities claiming the marks and names or their products. Dell Inc. disclaims any proprietary interest in trademarks and trade names other than its own.

Regulatory Model: Z9000

2012 - 2 P/N 00G3CM Rev. A01

About this Guide

This document is intended as a Quick Start Guide to get new systems up and running and ready for configuration. For complete installation and configuration information, refer to the documents listed in Table 1-1.

Table 1-1. Z9000 Documents

Information	Documentation
Hardware installation and power-up instructions	<i>Installing the Z9000 System</i>
Software configuration	<i>FTOS Configuration Guide for the Z9000 System</i>
Command line interface	<i>FTOS Command Line Reference Guide for the Z9000 System</i>
Latest updates	<i>FTOS Release Notes for the Z9000 System</i>

Installing the Hardware

Perform all site preparation before installing the Z9000 system.

Installing the Z9000 Chassis in a Rack or Cabinet

To install the Z9000 system, Dell Force10 recommends completing the installation procedures in the order presented in this chapter.

Always handle the system and its components with care. Avoid dropping the Z9000 chassis or its Field Replaceable Units (FRUs).

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

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

△ CAUTION: Take all the necessary safety precautions to prevent injury when installing this system.

Attach the Mounting Brackets

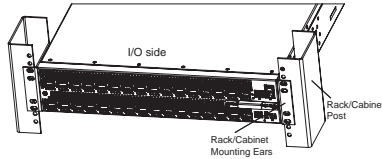
The Z9000 system is shipped with mounting brackets (rack ears) and the required screws for rack or cabinet installation. The brackets are enclosed in a package with the system.

To attach the mounting brackets, follow these steps:

Step	Task
1	Take the brackets and screws out of their packaging.

Step **Task (continued)**


- 2 Attach the brackets to the sides of the chassis on either side using four screws for each bracket.
- Attach the bracket so that the “ear” faces to the outside of the chassis.



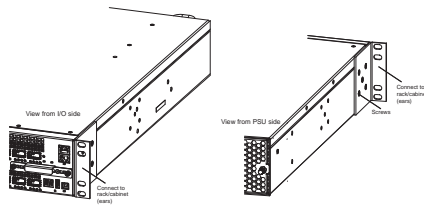
Install a Chassis into the Rack or Cabinet

To install the chassis into a rack or cabinet, follow these steps:

Step **Task**

 **NOTE:** Dell Force10 recommends that one person hold the Z9000 chassis in place while a second person attaches the brackets to the posts.

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



Attach a Ground Cable

Use a single M4x0.7 screw to attach a ground cable to the Z9000 system. The ground cable is not included. To properly ground the system, Dell Force10 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.



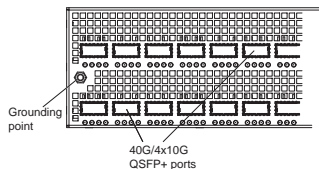
NOTE: Coat the one-hole lug with an anti-oxidant compound prior to crimping. Bring any unplated mating surfaces to a shiny finish and coat with an anti-oxidant prior to mating. Plated mating surfaces must be clean and free from contamination.



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

To attach the ground cable, follow these steps:

Step	Task
1	Take the one M4x0.7 screw from the package.
2	Cut the cable to the desired length. The cable length must facilitate the proper operation of the fault interrupt circuits. Dell Force10 recommends using the shortest cable route allowable.
3	Attach the one-hole lug to the chassis using the supplied screw with the captive internal tooth lock washer. 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.
---	---

Install the QSFP+ Optics


The Z9000 has 32 Quad Small Form-Factor Pluggable Plus (QSFP+) optical ports. For supported optics, refer to

<http://www.force10networks.com/products/specifications.asp>.

 **CAUTION: ESD damage can occur if the 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 the warning labels and always wear eye protection. Never look directly into the end of a terminated or un-terminated fiber or connector as this may cause eye damage.**

To install the QSFP+ optics, follow these steps:

Step	Task
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.

Splitting QSFP+ Ports to SFP+ Ports

The Z9000 system supports splitting a single 40G QSFP+ port into four 10G Small Form-Factor Pluggable Plus (SFP+) ports using one of the supported breakout cables.

For the system to recognize the port type change, you must 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. Range: 0 to 7
- *number*: Enter the port number of the 40G port to be split. Range: 0 to 124

Important Points to Know

- The unit number with the split ports must be the default (stack-unit 0). You can verify the unit number by using the **show system brief** command. If the unit ID is different than 0, you must renumber it to 0 before the ports are split by using EXEC mode: **stackunit *id* renumber 0**.

- The 40G QSFP+ port must be in a default configuration before you can split it into four 10G SFP+ ports. When you split the port, the 40G QSFP+ port is lost in the running configuration. Be sure to remove the port from other L2/L3 feature configurations.
- For the change to take effect, you must reload the system after issuing the Command Line Interface (CLI) change commands.

Install the Solid State Drive

The Z9000 includes a Solid State Drive (SSD) that acts as another storage device. The SSD is shipped installed with the Z9000 system and is located in a slot on the lower-right portion of the Input/Output (I/O) side of the chassis.

Power Up Sequence

Supply Power and Power Up the System

Dell Force10 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 system (which may be higher than the room temperature) is within the limits specified for the Z9000.
- There is sufficient airflow around the system.
- The input circuits are correctly sized for the loads and that you use sufficient over-current protection devices.
- All the protective covers are in place.



NOTE: For powering up an AC Power Supply Unit (PSU), a US AC power cable is included in the shipping container. You must order all other power cables separately.



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

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

The SYS 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

Connect the plug to each AC power connector. Make sure the power cord is secure.

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

DC Power

To connect the DC power connector, follow these steps:

Step	Task
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 PSUs. Make sure the connections are secure.
4	Replace the plastic cover over the DC connectors.

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

Fans

The Z9000 system comes from the factory with one PSU and four fan modules installed in the chassis. If two or more fans are installed and running, the fan modules are hot-swappable.

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.

Z9000 Specifications

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)

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

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

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

Power Supplies

The Z9000 is designed to support two hot-swappable PSUs.



NOTE: If you use a single PSU, you must install a blank plate in the other PSU slot. Dell Force10 recommends using power supply 1 (PSU1) as the blank plate slot.



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



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

Installing the Software

Navigating CLI Modes

The Dell Force10 Operating Software (FTOS) prompt changes to indicate the Command Line Interface (CLI) mode. You must move linearly through the command modes, with the exception of the **end** command which takes you directly to EXEC Privilege mode and the **exit** command which moves you up one command mode level.

Console Access



NOTE: You must have a password configured on a virtual terminal line before you can Telnet into the Z9000 system. Therefore, you must use a console connection when connecting to the system for the first time.

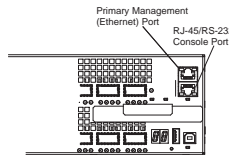
Serial Console

The RJ-45/RS-232 console port is labeled on the upper right-hand side as you face the Input/Output (I/O) side of the Z9000 system.

To access the console port, follow these steps:

Step	Task
------	------

- | | |
|---|--|
| 1 | Install an RJ-45 copper cable into the console port. |
|---|--|



- | | |
|---|--|
| 2 | Connect the other end of the cable to the DTE terminal server. |
|---|--|

Step	Task (<i>continued</i>)
3	Keep the terminal settings on the console port as follows: <ul style="list-style-type: none"> • 9600 baud rate • No parity • 8 data bits • 1 stop bit • No flow control

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

You can connect to the console using an RJ-45 to RJ-45 rollover cable and an RJ-45 to DB-9 female DTE adapter to a terminal server (for example, a PC). Table 2-1 lists the pin assignments.

Table 2-1. Pin Assignments Between the Console and a DTE Terminal Server

Z-Series Console Port	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

Default Configuration

A version of the FTOS is pre-loaded onto the Z9000 system; however, the system is not configured when you power up for the first time (except for the default hostname, FTOS). You must configure the system using the CLI.

Configure Layer 2 (Data Link) Mode

To enable Layer 2 data transmissions through an individual interface, use the **switchport** command in INTERFACE mode. You cannot configure switching or Layer 2 protocols such as Spanning Tree Protocol (STP) on an interface unless the interface has been set to Layer 2 mode.

To enable an interface in Layer 2 mode, follow these steps:

Step	Task	Command Syntax	Command Mode
1	Enable the interface.	no shutdown	INTERFACE
2	Place the interface in Layer 2 (switching) mode.	switchport	INTERFACE

To view interfaces in Layer 2 mode, use the **show interfaces switchport** command in EXEC mode.

Configure a Host Name

The host name appears in the prompt. The default host name is FTOS. Host names must start with a letter, end with a letter or digit, and have letters, digits, and hyphens within the string.

To configure a host name, follow this step:

Task	Command Syntax	Command Mode
Create a new host name.	hostname <i>name</i>	CONFIGURATION

Access the System Remotely

You can configure the system to be accessed remotely by Telnet. The Z9000 system has a dedicated management port and a management routing table that is separate from the IP routing table.

To access the system remotely, follow these steps:

Step	Task
1	Configure an IP address for the management port (Configure the Management Port IP Address).
2	Configure a management route with a default gateway (Configure the Management Route).
3	Configure a username and password (Configure the Username and Password).

Configure the Management Port IP Address

In order to access the system remotely, assign IP addresses to the management ports.

To configure the management port IP address, follow these steps:

Step	Task	Command Syntax	Command Mode
1	Enter INTERFACE mode for the Management port.	interface ManagementEthernet <i>slot/port</i>	CONFIGURATION
2	Assign an IP address to the interface.	ip address <i>ip-address/mask</i>	INTERFACE
3	Enable the interface.	no shutdown	INTERFACE

Configure the Management Route

Define a path from the system to the network from which you are accessing the system remotely. Management routes are separate from IP routes and are only used to manage the system through the management port.

To configure a management route, follow this step:

Task	Command Syntax	Command Mode
Configure a management route to the network from which you are accessing the system.	management route <i>ip-address/mask</i> <i>gateway</i>	CONFIGURATION

Configure the Username and Password

To access the system remotely, configure a system username and password.

To configure the username and password, follow this step:

Task	Command Syntax	Command Mode
Configure a username and password to access the system remotely.	username <i>username</i> password <i>[encryption-type]</i>	CONFIGURATION

Configure the Enable Password

EXEC Privilege mode is unrestricted by default. Configure a password as a basic security measure. There are two types of enable passwords:

- enable password—stores the password in the running/startup configuration using a Data Encryption Standard (DES)-encryption method.
- enable secret—stores the password in the running/startup configuration using a stronger, MD5 encryption method.

Dell Force10 recommends using the enable secret password.

To configure the enable secret password, follow this step:

Task	Command Syntax	Command Mode
Create a password to access EXEC Privilege mode.	enable [password secret] [level level] [encryption-type] password	CONFIGURATION

Create a Port-based VLAN

The Default VLAN (VLAN 1) is part of the system startup configuration and does not require configuration. To configure a port-based VLAN, you must create the VLAN and then add physical interfaces or port channel (LAG) interfaces to the VLAN.

To configure a port-based VLAN, follow this step:

Task	Command Syntax	Command Mode
Configure a port-based VLAN.	interface vlan <i>vlan-id</i>	CONFIGURATION



NOTE: After you create a VLAN, activate the VLAN by assigning the interfaces in Layer 2 mode to the VLAN.

To view the configured VLANs, use the **show vlan** command in EXEC privilege mode.

Assign Interfaces to a VLAN

To view just the interfaces that are in Layer 2 mode, enter the **show interfaces switchport** command in EXEC privilege mode or EXEC mode.

To tag frames leaving an interface in Layer 2 mode, assign that interface to a port-based VLAN to tag it with that VLAN ID.

To tag interfaces, follow these steps:

Step	Task	Command Syntax	Command Mode
1	Access the INTERFACE VLAN mode of the VLAN to which you want to assign the interface.	interface vlan <i>vlan-id</i>	CONFIGURATION
2	Enable an interface to include the IEEE 802.1Q tag header.	tagged <i>interface</i>	INTERFACE

To move untagged interfaces from the Default VLAN to another VLAN, use the **untagged** command.

To move untagged interfaces, follow these steps:

Step	Task	Command Syntax	Command Mode
1	Access the INTERFACE VLAN mode of the VLAN to which you want to assign the interface.	interface vlan <i>vlan-id</i>	CONFIGURATION
2	Configure an interface as untagged. This command is available only in VLAN interfaces.	untagged <i>interface</i>	INTERFACE

Assign an IP Address to a VLAN



NOTE: An IP address cannot be assigned to the Default VLAN, which, by default, is VLAN 1. To assign another VLAN ID to the Default VLAN, use the default **vlan-id** *vlan-id* command.

To assign an IP address to a VLAN, follow this step:

Task	Command Syntax	Command Mode
Configure an IP address and mask on the interface.	ip address <i>ip-address mask</i> [<i>secondary</i>]	INTERFACE

Connecting the Z9000 to the Network

After you have completed the hardware installation and software configuration, you can connect to your company network by following your company's cabling requirements.



Printed in the U.S.A.

www.dell.com | support.dell.com



000G3CMA01