Installing the S55 System

Notes, Cautions, and Warnings

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

CAUTION: A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.

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

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Contents

1 About this Guide

Information symbols and warnings 5
Related publications 6

2 The S55 System

Introduction 7
Orderable S55 systems 8
Features 9
Ports 9
System status 9
LED displays 9

3 Site Preparations

Site selection 13
Cabinet placement 14
Rack mounting 14
Grounding 14
Fans and airflow 14
Power 14
Storing components 15

4 Install the S55

Install the S55 chassis in a rack or cabinet 17
Attach mounting brackets 17
Install chassis into rack or cabinet 18
Attach ground cable 19
Insert optional modules 20
Install the SFP and SFP+ optics 21
Connect stacking ports (optional) 21
Connect two S55s 22
Connect three or more S55s 23
Supply power and power up the system 24
Power up sequence 24
AC power 24
DC power 25
Hot-swap units in a stack 25

5 Power Supplies

Components 27

Install an AC or DC power supply 27
Replace an AC or DC power supply 29

6 Fans

Components 31
Install a fan module 31
Replace a fan module 32

7 Access the console ports

Access the RJ45 console port (RS-232) 33
Access the RJ-45 console port with a DB-9 adapter 34
Access the USB-B console port 34

8 S55 Specifications

Chassis Physical Design 37
Environmental Parameters 37
AC Power Requirements 37
DC Power Requirements 38
IEEE Standards 38
Agency Compliance 38
NEBS (Network Equipment Building Systems) Compliance 38
Safety Standards and Compliance Agency Certifications 41
Electromagnetic Compatibility (EMC) 41
Product Recycling and Disposal 42

9 Technical Support

The iSupport website 45
Accessing iSupport services 45
Contacting the Technical Assistance Center 46
Requesting a hardware replacement 46

1

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.

After you have completed the hardware installation and power-up of the S55, refer to the *FTOS Configuration Guide for the S55* for software configuration information and the *FTOS Command Reference for the S55* for Command Line Interface (CLI) information.

NOTE: The S55 requires FTOS version 8.3.5.0. Refer to the *S55 Release Notes* for information on upgrading the system, if necessary. Contact Dell Force10 Technical Support with any questions regarding FTOS versions and upgrades.

CAUTION: Wear grounding wrist straps when handling this equipment to avoid ESD damage.

WARNING: The installation of this equipment shall be performed by trained and qualified personnel only. Read this guide before installing and powering 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: Visible and invisible laser radiation may be emitted from the aperture of the optical transceiver ports when no cable is connected. Avoid exposure to laser radiation and do not stare into open apertures.

Information symbols and warnings

The following graphic symbols are used in this document to bring attention to hazards that exist when handling the S55 and its components. Please read these alerts and heed their warnings and cautions.

Table describes symbols contained in this guide.

Table 1-1. Information Symbols

Symbol	Warning	Description
	Note	This symbol informs you of important operational information.
	Caution	This symbol informs you that improper handling and installation could result in equipment damage or loss of data.
	Warning	This symbol signals information about hardware handling that could result in injury.

Related publications

For more information about the S55, refer to the following documents:

- FTOS Configuration Guide for the S55 system
- FTOS Command Reference for the S55 system
- *FTOS Release Notes for the S55 system*

NOTE: For the most recent documentation and software, please visit iSupport (registration for access to some sections is required): https://www.force10networks.com/CSPortal20/Main/SupportMain.aspx

2

The S55 System

Introduction

The Dell Force10 S55 is a high performance, high capacity, low cost, stackable, Layer 2 switch/Layer 3 router that supports 44 built-in 10/100/1000 Base-T ports, four SFP (small form-factor pluggable) ports, and two optional module slots, and optional 12G stacking module. The S55's PSU (Power Supply Unit) side (Figure 2-1) contains the Power Supply Units (PSUs), and optional module slots. As shown in Figure 2-2, the S55's I/O (Input/Output) side contains the 44 Ethernet ports, the SFP ports, the management ports and the displays for alarms and stacking identification.

Figure 2-1. The S55 PSU side

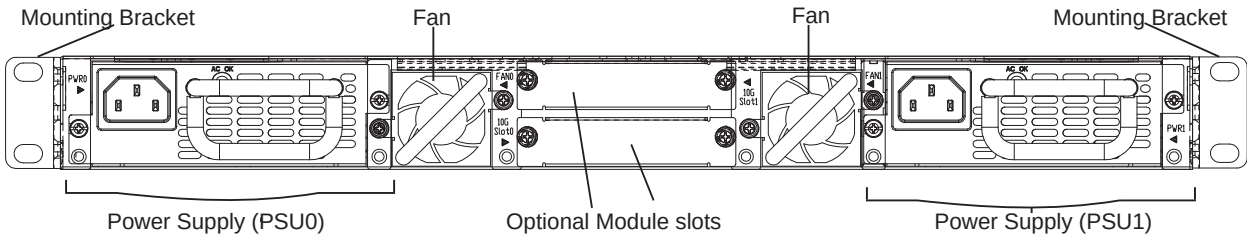
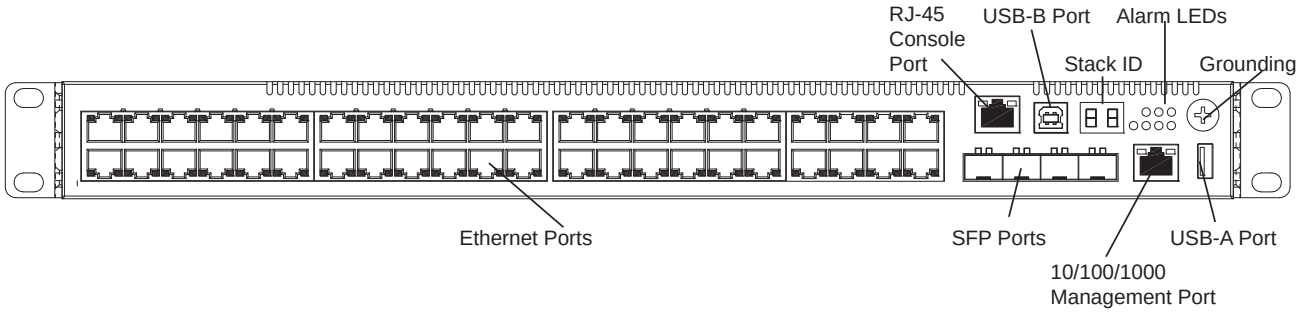


Figure 2-2. The S55 I/O



NOTE: The Ethernet ports are labeled 0-43. When cabling these ports, be sure not to interfere with the airflow from the small vent holes above and below the ports.

Orderable S55 systems

The S55 can be ordered in several different configurations. Optional modules are ordered separately.

Hardware	Catalog Number
44 port 10/100/1000 Base-T with 4 SFP ports and 2 expansion module slots	**S55T**
44 port 10/100/1000 Base-T with 4 SFP ports and 2 expansion module slots, 1 AC power supply and 2 fan units with airflow from I/O panel to utility panel	**S55T-AC**
44 port 10/100/1000 Base-T with 4 SFP ports and 2 expansion module slots, 1 DC power supply and 2 fan units with airflow from I/O panel to utility panel	**S55T-DC**
44 port 10/100/1000 Base-T with 4 SFP ports and 2 expansion module slots, 1 AC power supply and 2 fan units with airflow from utility panel to I/O panel	**S55T-AC-R**
44 port 10/100/1000 Base-T with 4 SFP ports and 2 expansion module slots, 1 DC power supply and 2 fan units with airflow from utility panel to I/O panel	**S55T-DC-R**
S55 Series - Fan with airflow from I/O panel to utility panel	**S55-FAN**
S55 Series - Fan with airflow from utility panel to I/O panel	**S55-FAN-R**
S55 Series - AC Power supply with airflow from I/O panel to utility panel	**S55-PWR-AC**
S55 Series - AC Power supply with airflow from utility panel to I/O panel	**S55-PWR-AC-R**
S55 Series - DC Power supply with airflow from I/O panel to utility panel	**S55-PWR-DC**
S55 Series - DC Power supply with airflow from utility panel to I/O panel	**S55-PWR-DC-R**
S55 Series - 2 port 12 Gigabit stacking module	**S55-12G-2ST**
S55 Series - 2 port 10 GE SFP+ module - SFP+ optics not included	**S55-10GE-2S**

To successfully install the S55, ensure that you have the following:

- S55 chassis (or multiple chassis, if stacking)
- At least one grounded AC or DC power source per chassis
- Cable to connect the AC or DC power source to the chassis (US power cables included)
- Mounting brackets for rack installation (included)
- Screws for rack installation and #1#2 Phillips screwdrivers (not supplied)
- Ground cable (not supplied)
- Ground cable screws (included)
- Copper/fiber cables

Other optional components are:

- Additional Power Supply Unit

- Additional Fan module
- Optional modules (if using)
- Stacking cables, if stacking

Features

The S55 offers the following:

- S55 CPU and switch processor
- Up to 8 stacked units
- Stackable switch features
- 19-inch rack-mountable
- Standard 1U chassis height
- Hot Swappable optional modules, power supplies, and fan modules
- Up to 16K MAC address entries supported with hardware assisted aging
- Supports 9K jumbo frames

Ports

- Optional ports supporting two 2-port 10G SFP+ modules, or two 2-port 12G stacking module stacking modules
- 44 fixed 10/100/1000 Mbps auto-sensing and auto MDIX RJ45 ports
- Four fixed ports supporting 100/1000 Base-T or 1000 Base-X using auto-media detection
- Console port (for system access)
- USB-A port (for storage)
- USB-B port (for system connectivity and access)

System status

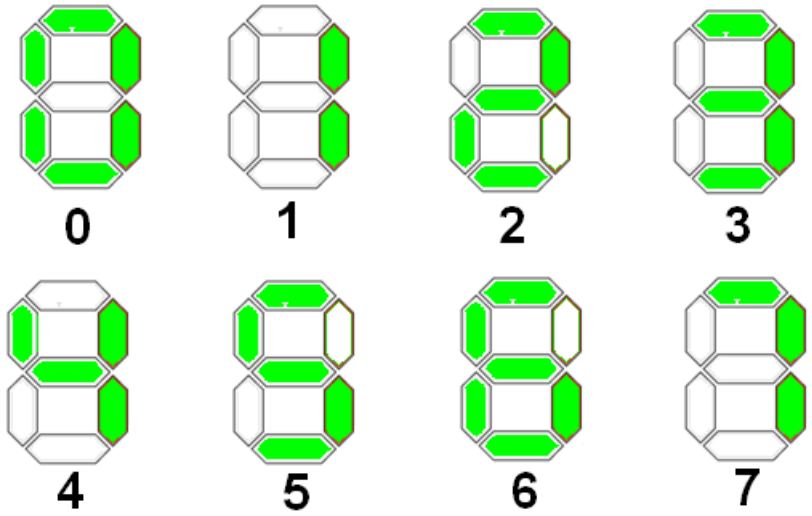
S55 status information is viewed in several ways, including physical displays and boot menu options. Status information is also seen through the CLI `show` commands and with SNMP traps. For details on those options, see the *FTOS Command Reference for the S55* and the *FTOS Configuration Guide for the S55*.

LED displays

As shown in Figure 2-2, the S55 I/O panel contains several sets of LEDs. The Stacking ID LEDs is in the upper half of the chassis, next to the USB-B port. The system LEDs are located to the right of the Stack ID LEDs.

- The Stack ID itself is in decimal format (Figure).

Figure 2-3. Stack ID hexidecimal Display



- The system LEDs are (Figure 2-4):
  - Master (Stack Master status)
  - PSU1 (Power supply 1)
  - FAN1(Fan module 1)
  - ALM (System alarms)
  - SYS (System status)
  - PSU0 (Power supply 0)
  - FAN0 (Fan module 0)

Figure 2-4. System LEDs

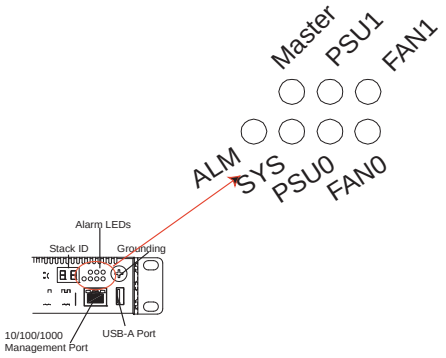


Table 2-1. System LED displays

Label	LED Color/Display	Description
Master	Off	Non-master unit, or stand-alone unit
	Green solid	Stack master unit
Power Supply (PSU1)	Off	Power supply not present
	Green solid	Power supply present and working
	Yellow solid	Power supply present, but failed
Fan Module (FAN1)	Off	Fan tray not present
	Green solid	Fan tray present and working
	Yellow solid	Fan tray present, but failed
System alarms (ALM)	Off	No alarm
	Yellow solid	Minor alarm
	Red solid	Major alarm
System status (SYS)	Off	No alarm
	Yellow solid	Minor alarm
	Red solid	Major alarm
Power Supply (PSU0)	Off	Power supply not present
	Green solid	Power supply present and working
	Yellow solid	Power supply present, but failed
Fan Module (FAN0)	Off	Fan tray not present
	Green solid	Fan tray present and working
	Yellow solid	Fan tray present, but failed

In addition to the system LEDs, each port has status indicator LEDs, described in Table 2-2.

Table 2-2. Port LED Displays

Feature	Description
10/100/1000 Port LEDs	Link LED (left side of each port) Green — 1000M Yellow — 10/100M Off —No link Activity LED (right side of each port) Green — Link up on this port, full traffic Blinking Green — Activity, transmitting or receiving packet at this port. Off —No traffic
SFP+ Port LED	Link/Activity LED Green — Link up on this port, no activity taking place Blinking Green — Activity, transmitting or receiving packet at this port. Off — No Link detected at this port

3

Site Preparations

The S55 is suitable for installation as part of a Common Bond Network (CBN). It can be installed in:

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

This chapter covers the following topics:

- Site selection
- Cabinet placement
- Rack mounting
- Grounding
- Fans and airflow
- Power
- Storing components

For detailed S55 specifications, refer to Chapter 8, S55 Specifications.

NOTE: Install the S55 unit into a rack or cabinet before installing any optional components.

Site selection

Dell Force10 equipment is intended for installation in restricted access areas. A restricted access area is one in which access can only be gained by service personnel through the use of a special tool, lock, key or other means of security and access is controlled by the authority responsible for the location.

Make sure that the area where you install your S55 chassis 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 (0° to 40°C).
- Relative humidity that does not exceed 85% non-condensing.
- 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 unit for proper ventilation, and access.

Cabinet placement

The S55 should be installed only in indoor cabinets designed for use in a controlled environment as described in the Site Selection heading. The S55 should not be installed in outside plant cabinets.

The cabinet must meet the following criteria:

- Minimum cabinet size and airflow are according to the EIA standard.
- Minimum of 5 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. The equipment rack must be grounded to the same ground point used by the power service in your area. The ground path must be permanent.

Grounding

The S55 is for use in a Common Bond Network. You must connect grounding cables as described in Chapter 4, Install the S55.

Fans and airflow

The S55 system fans support with 2 air flow options. Be sure to order the fans suitable to support your site's proper ventilation. Use a single type of fan in your system. Do not mix Reverse and Normal airflows in a single chassis.

- Normal is airflow from I/O panel to power supply
- Reversed is airflow from power supply to I/O panel

For proper ventilation, position the S55 chassis in an equipment rack (or cabinet) with a minimum of five inches (12.7 cm) of clearance around exhaust vents. When two S55 systems are installed 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 Environmental Parameters.

The fan speed increases when the internal temperature reaches 72 degrees C, and decreases to normal speed when the temperature falls to 58 degrees C. The switch never intentionally turns off the fans.

Use the `show logging` command to see the log messages. For details, see the System Logs chapters of the *FTOS Command Reference* and *FTOS Configuration Guide*.

Power

⚠ **WARNING:** Do not mix power supply types. The redundant power supplies must be the same type AC *or* DC.

Use the appropriate power cord with the S55 chassis to connect the chassis to the applicable (AC or DC) power source. Power cords for US AC and DC are 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 the power supply slots are serviced.

CAUTION: The power supply cord is used as the main disconnect device on the AC and the DC system; ensure that the socket-outlet is located/installed near the equipment and is easily accessible.

Storing components

If you do not install your system and components immediately, Dell Force10 recommends that you properly store the S55 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 S55 and its accessories. After you remove the original packaging, place the S55 and its components on an antistatic surface.

Follow these storage guidelines:

- Storage temperature should 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.

4

Install the S55

To install the S55 system, Dell Force10 recommends that you complete the installation procedures in the order presented below.

Always handle the system and its components with care. Avoid dropping the S55 switch or its field replaceable units.

1. Install the S55 chassis in a rack or cabinet
   a. Attach mounting brackets
   b. Install chassis into rack or cabinet
2. Attach ground cable
3. Insert optional modules
4. Connect stacking ports (optional)
5. Supply power and power up the system

WARNING: Always wear an ESD-preventive wrist or heel ground strap when handling the S55 and its components. As with all electrical devices of this type, take all the necessary safety precautions to prevent injury when installing this system. Electrostatic discharge (ESD) damage can occur if components are mishandled.

Install the S55 chassis in a rack or cabinet

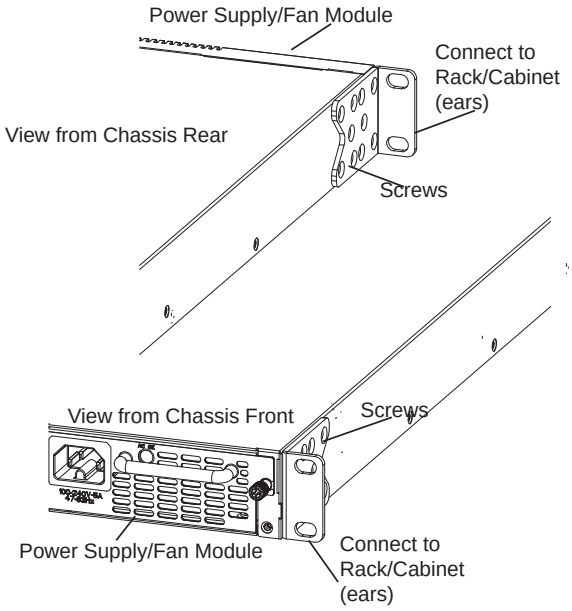
Attach mounting brackets

The S55 is shipped with mounting brackets (rack ears) and required screws for rack or cabinet installation. The brackets are enclosed in a package with the chassis.

NOTE: Dell Force10 recommends attaching the brackets at the PSU side. This provides the greatest weight support for the chassis in the rack or cabinet.

Follow these steps to attach the brackets to the chassis:

Step	Task
1	Take the brackets and screws out of their packaging.
2	Attach the brackets to the sides of the chassis at the PSU end, using four screws for each bracket. Attach the bracket so that the “ear” faces to the PSU and the outside of the chassis.

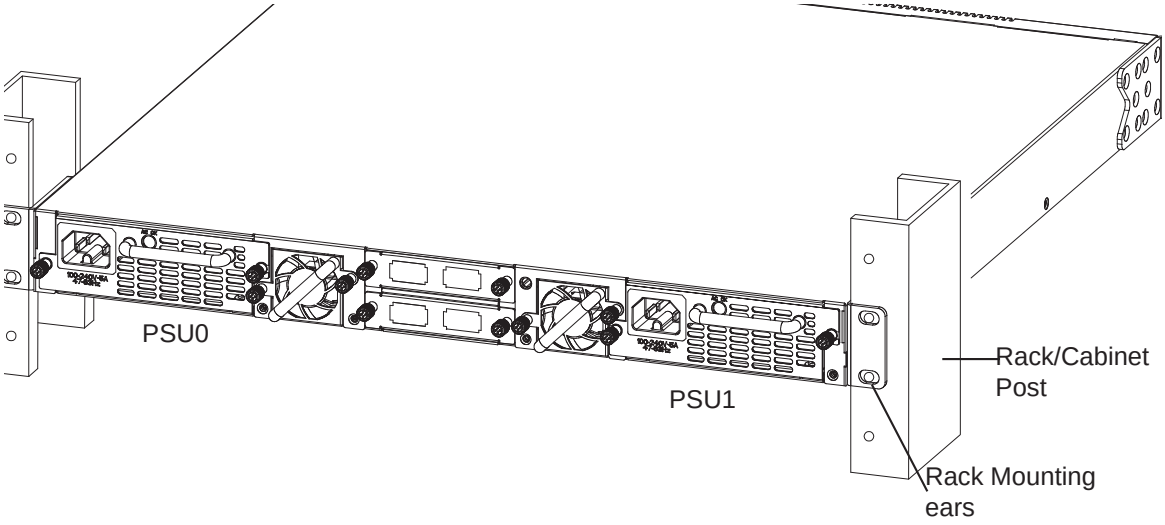


Install chassis into rack or cabinet

Ensure that there is adequate clearance surrounding the rack or within the cabinet to permit access and airflow. Follow the steps below to install a switch into a two-post 19-inch equipment rack, using the already attached mounting brackets.

Step	Task
1	Dell Force10 recommends that one person hold the S55 chassis in place while another attaches the brackets to the posts.

Step	Task *(continued)*
2	Attach the bracket “ears” to the rack or cabinet posts, using two screws for each bracket. Ensure the screws are tightened firmly.



Attach ground cable

The S55 is shipped with 1 10-32 screws for attaching a ground cable to the chassis. The cable itself is not included. Dell Force10 recommends a 6AWG one-hole lug, #10 hole size, 63" spacing (not included in shipping) to properly ground the chassis. The one-hole lug must be a UL recognized, crimp-type lug.

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

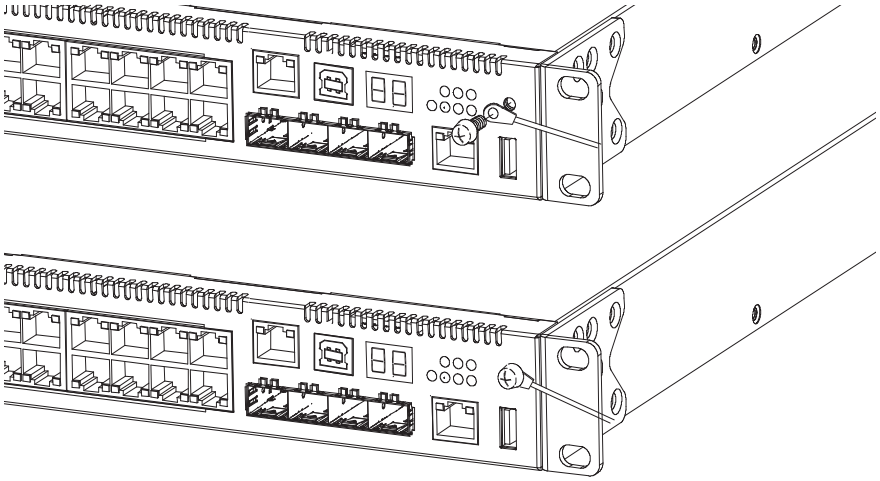
CAUTION: Grounding conductors *must* be made of copper. Do not use aluminum conductors.

Follow these steps to connect the ground cable to the chassis.

NOTE: Coat the one-hole lug with an anti-oxidant compound prior to crimping.
Bring any un-plated 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.

Step	Task
1	Take the (1) 10-32 screw from the package.
2	Cut cable to desired length. Cable length must facilitate the proper operation of fault interrupt circuits. Dell Force10 recommends using of the shortest cable route allowable.

Step	Task *(continued)*
3	Attach the one-hole lug to the chassis as shown, using the supplied 10-32 screw with captive internal tooth lock washer. The screw should be torqued to 20 in-lbs.

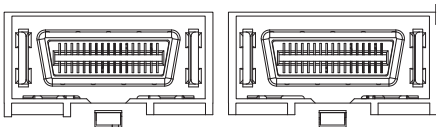
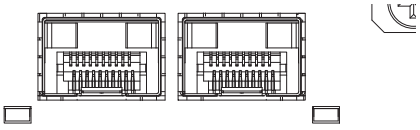


4	Attach the other end of the ground cable to a suitable ground point. The rack installation ears are not a suitable grounding point.

Insert optional modules

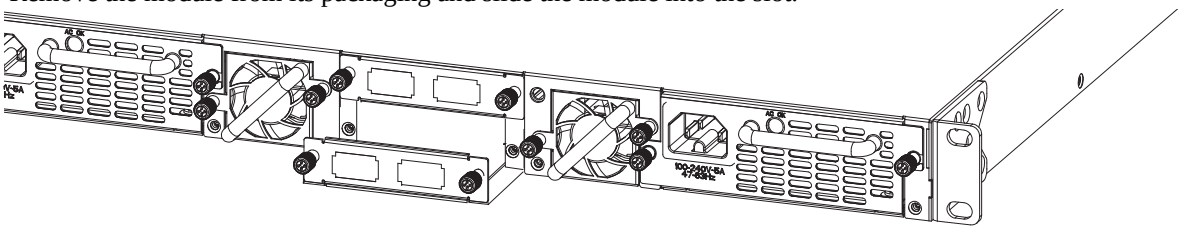
The S55 system has expansion slots, that can be used for stacking modules or for SFP+ devices.The SFP+ module can be inserted in either optional slot; the stacking module can only be inserted in the lower slot (OPT0). The modules are hot-swappable; you can insert or replace modules without powering down the system.

CAUTION: Stacking modules can only be inserted into the lower optional module slot.

Module Description	Catalog Number	
2-port 12G stacking module	S55-12G-2ST	
2-port 10G SFP+ optical module	S55-10GE-2S	

WARNING: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S55 and its components.

To install an optional module, follow the steps below:

Step	Task
1	Remove the faceplate covering the module slot on PSU side of the S55.
2	Remove the module from its packaging and slide the module into the slot. 
3	Secure the captive screws on the sides of the module.

Install the SFP and SFP+ optics

The S55 has 4 SFP optical ports in the PSU side of the chassis in addition to the optional SFP+ optical modules. To install SFP or SFP+ optics into an open port, follow the steps below:

WARNING: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S55 and its components.

WARNING: Follow all warning labels when working with optical fibers. Always wear eye protection when working with optical fibers. Never look directly into the end of a terminated or unterminated fiber or connector as it may cause eye damage.

Step	Task
1	Position the SFP or SFP+ 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: For details on Dell Force10 supported optics, refer to http://www.force10networks.com/products/specifications.asp

Connect stacking ports (optional)

Rack-mount the switches or insert them into a cabinet before you make your stacking port connections. Insert one end of the stacking cable into a stacking port, and insert the other end into a stacking port of the adjacent switch. Hand-tighten all captive screws to ensure that the cable is secure in the connector.

Dell Force10 supports stacking connections for up to 12 S55 switches, to configure as a unified system.

CAUTION: The S55 system does not stack with other S-Series systems.

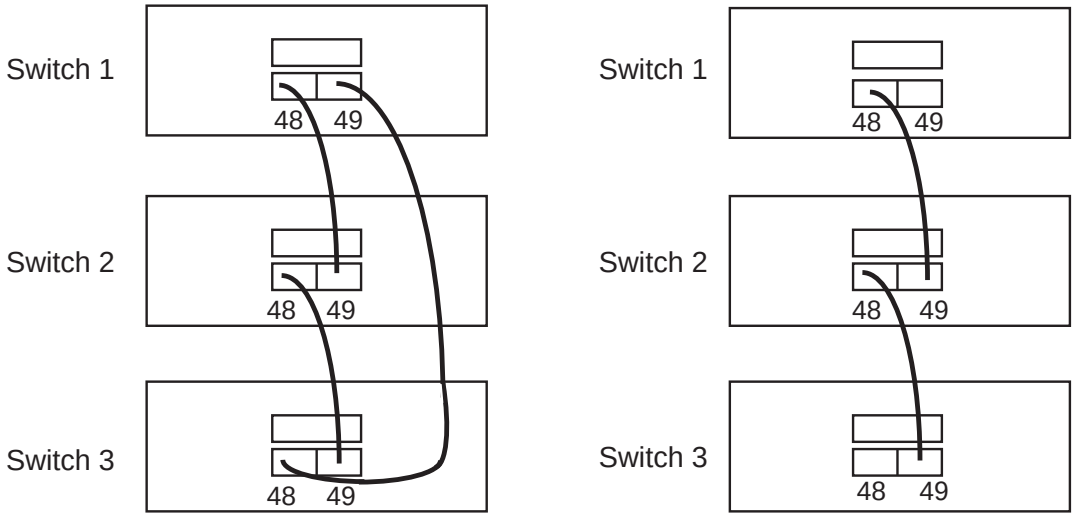
You can connect the switches while they are powered down or up. Both ring topology and cascade topology connections are supported (Figure 4-1). Stacking ports are bi-directional.

When using the 2-port 12G stacking module, the stacking ports are labeled 48-49 on the PSU side.

NOTE: Use only the supported stacking cables for connecting the switches.

The S55 supports stacking in either a ring or cascade topology. Dell Force10 recommends the ring topology when stacking S55 switches, to provide redundant connectivity.

Figure 4-1. S55 stacking topology with 2-port 12G stacking module



While the diagram shows A-to-B connections, the ports are bi-directional, so you can connect A-to-A or B-to-B, as shown below in examples of two-switch (Figure 4-2 or Figure 4-3). Rack-mount the switches or insert them into a cabinet before you make your stacking port connections. Insert one end of the stacking cable into a stacking port, and insert the other end into a stacking port of the adjacent switch. Hand-tighten all captive screws to ensure that the cable is secure in the connector.

Connect two S55s

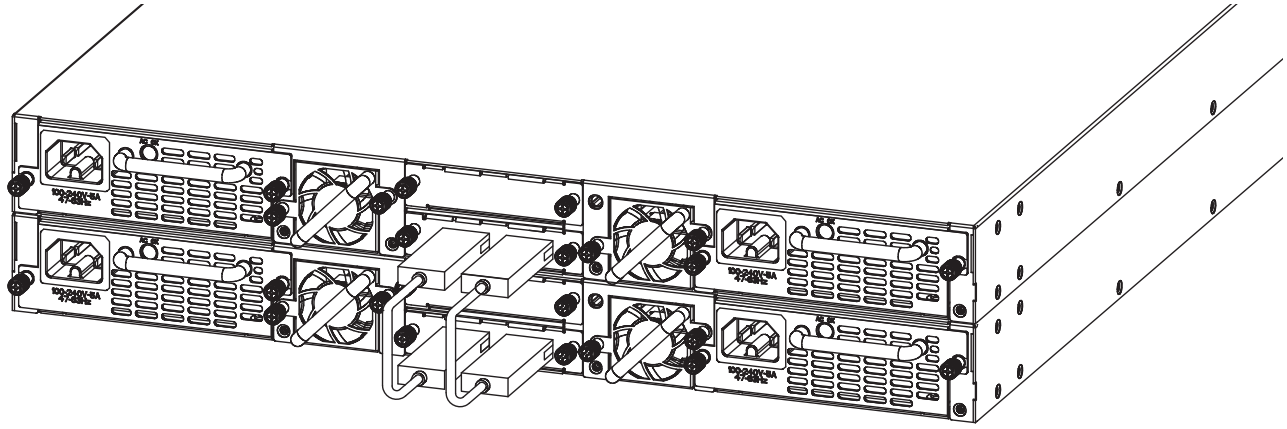
2-port 12G stacking modules

As an option, when using the 2-port 12G stacking modules, insert a second cable into the other open stack ports, as shown in Figure 4-2. The second cable provides both backup connectivity and increased data transfer between the units.

Starting with the S55 at the bottom of the stack:

- Insert one end of the first cable into Stack Port 48 (or 49).
- Insert the other end of the cable into Stack Port 48 (or 49) of the top.
- Insert a second cable into Stack Port 49 (or 48) of the bottom and top S55s.

Figure 4-2. 2 S55s with 2-port 12G stacking modules



Connect three or more S55s

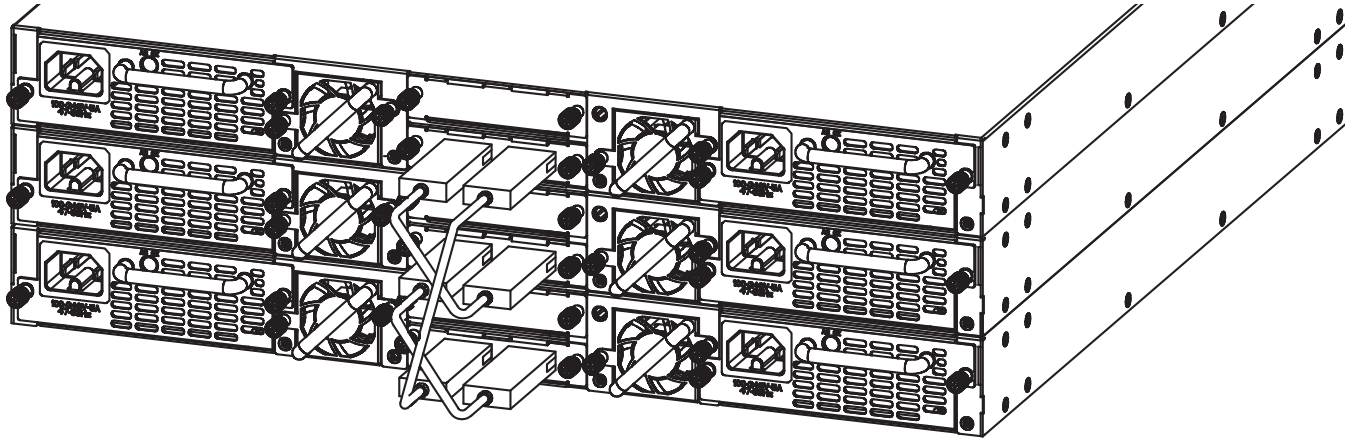
2-port 12G stacking modules

As an option, when using the 2-port 12G stacking modules, insert a second cable into the other open stack ports, as shown in Figure 4-3. The second cable provides both backup connectivity and increased data transfer between the units.

Starting with the S55 at the bottom of the stack:

- Insert one end of the first cable into Stack Port 48 (or 49).
- Insert the other end of the cable into Stack Port 48 (or 49) of the middle S55.
- Insert the second cable into Stack Port 49 (or 49) of the middle and top S55s.
- Use the remaining cable to connect the top and bottom S55s by inserting one end of the cable into the open Stack Port 49 (or 48) of the bottom S55 and the other end of the cable into Stack Port 48 (or 49) of the top S55.

Figure 4-3. 3 S55s with 2-port 12G stacking modules



Supply power and power up the system

Supply power to the S55 after they are mounted in a rack (or on a table) and the optional modules are installed.

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 unit (which may be higher than the room temperature) is within the limits specified for the S55.
- there is sufficient airflow around the unit.
- the input circuits are correctly sized for the loads and that sufficient over-current protection devices are used.
- all protective covers are in place.
- blank panels are installed if optional modules are not installed.
- blank panels are installed if redundant power supplies are not installed.

NOTE: A US AC power cable is included in the shipping container for powering up an AC power supply. All other power cables must be ordered separately.

WARNING: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S55 and its components.

Power up sequence

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

The PWR LED blinks until the boot-up sequence is complete. When the boot up is complete the PWD LED is steadily lit.

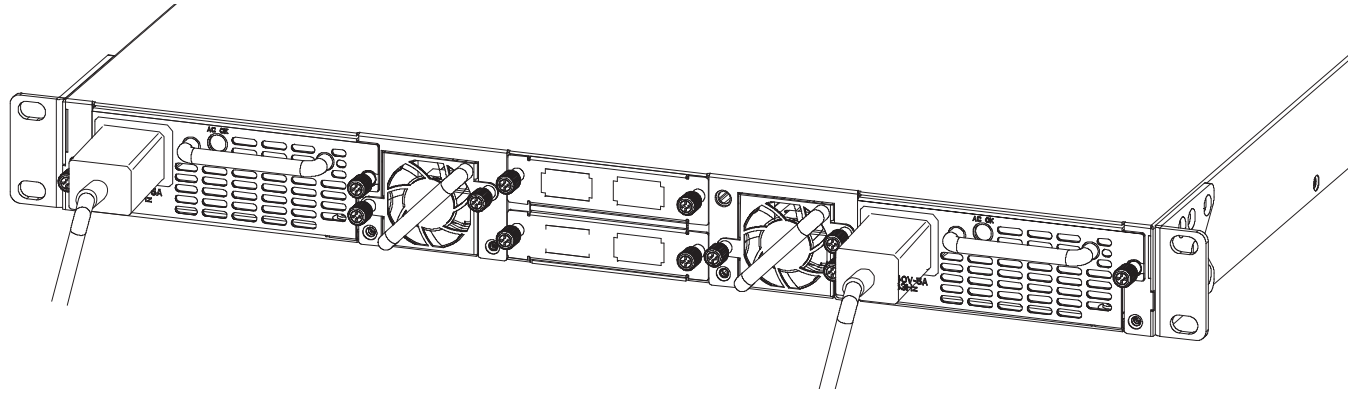
The Stack ID LED displays a digit to show the position of the unit in a stacking chain. For a single chassis, a 0 displays.

AC power

Connect the plug to each AC receptacle, making sure that the power cord is secure.

As soon as the cable is connected between the S55 and the power source, the chassis is powered-up; there is no on/off switch.

Figure 4-4. AC power connection

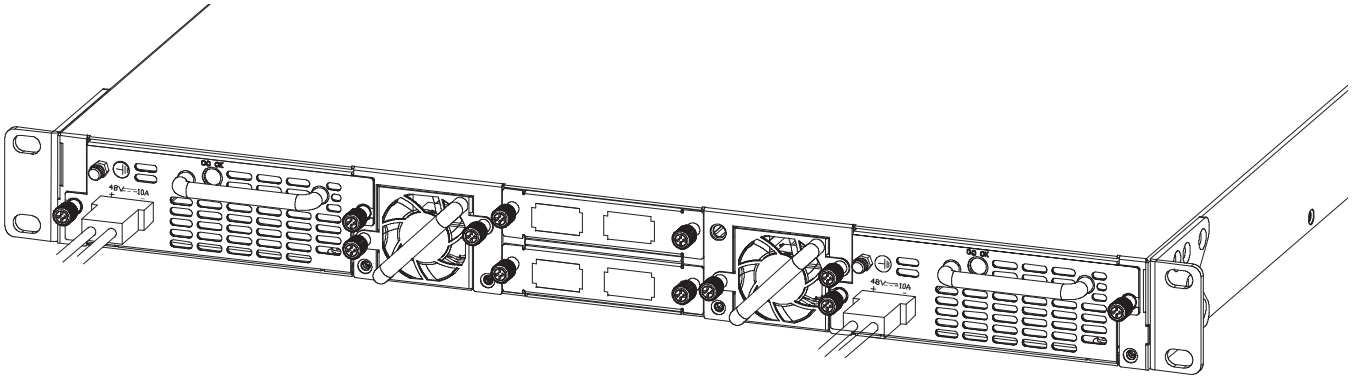


DC power

Connect the plug to each DC receptacle, making sure that the power cord is secure.

As soon as the cable is connected between the S55 and the power source, the chassis is powered-up; there is no on/off switch.

Figure 4-5. DC power connection



Hot-swap units in a stack

You can add, remove, or swap units in an existing stack. The units in the stack and the new units can be already powered up or they can be powered down.

All units in a stack must run the same version of the operating system. If you attempt to attach a unit with a different version of the operating system to an existing stack, the CLI will display an error, and the unit will not be added until you install compatible software.

The order in which the units come on-line or are added to or removed from the stack can affect how the stack identifies them, and how the units identify themselves, influencing unit numbers, management addresses, and other elements of the configuration file.

How units are identified within the stack is determined by the selected identification algorithm. The default algorithm has the units self-identify as Unit 0 through Unit [last] based on the order in which they come on-line. So, when setting up a new set of switches in a stack, you should have no trouble forcing the identification of the management unit and unit IDs by methodically supplying power to the units in your preferred sequence.

Similarly, when you add a brand new unit to the stack, the unit will be gracefully added as Unit [last] (the lowest unused number) with the current configuration. Attaching the unit causes each unit in the stack to reload, and the subsequent configuration file in each unit includes the awareness of the new unit.

If you have a pre-configured unit that you want to add to the stack, but you want to make sure that the configuration does not override the configuration of the stack, it is best to add the unit while it is powered down, in order to avoid stack management conflicts.

You can use the CLI to make stack identification changes on the fly, such as renumbering units (switch renumber), assigning a new management unit (movemanagement command), or removing a unit from stack membership (no member). You can also use commands such as switch priority and member that override the default unit identification algorithms.

Use the show switch command to see the current assignment of the management unit.
Use the show switch *unit* command to see the serial number of the designated unit.

For details on removing a unit from a stack and other stacking commands, see the Stacking chapter in the *FTOS Configuration Guide* and the Stacking Commands chapter in the *FTOS Command Reference.*

5

Power Supplies

The S55 is designed to support two hot-swappable power supplies with integrated fans that provide the cooling for the chassis. There are two types of power supplies (AC or DC) and there are two air-flow directions (Normal and Reversed). Two power supplies are required for full redundancy, but the system will operate with a single power supply. A blank panel must be attached is redundant power supplies are not installed.

Refer to Chapter 6, Fans for the procedure to replace only a fan module.

The S55 is orderable as an empty chassis (S55T) or with either AC or DC power. The S55T-AC/S55T-AC-R system comes from the factory with 1 AC power supply and 2 fan modules installed in the chassis. The S55T-DC/S55T-DC-R system comes from the factory with 1 DC power supply and 2 fan modules installed in the chassis. Both power supply types are field replaceable. When running with full redundancy (2 power supplies installed and running) a power supply unit can be removed an replaced while the other is running without disrupting traffic.

⚠ **WARNING:** To prevent electrical shock, make sure the S55 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:** Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S55 and its components.

Components

The following power supply options are available for the S55:

- AC power supply with integrated fan (Catalog# S55-PWR-AC)
- AC power supply with integrated reverse flow fan (Catalog# S55-PWR-AC-R)
- DC power supply with integrated fan (Catalog# S55-PWR-DC)
- DC power supply with integrated reverse flow fan (Catalog# S55-PWR-DC-R)

Install an AC or DC power supply

The power supply units in the S55 are field replaceable. When both power supplies are up and running, one power supply can be removed without interrupting traffic. To remove and replace a power supply unit, use the following procedure.

The power supply units are in a single piece with fans. You can replace the fan individually, but replacing a power supply also replaces the fans attached to that power supply. Refer to Chapter 6, Fans for the procedure to replace only the fan.

⚠ **CAUTION:** Remove the power cable from the modules prior to removing the module itself. Power must not be connected prior to insertion in the chassis.

NOTE: For a NEBS compliant installation, the AC power connections must use a surge protection device (SPD) to protect the AC power supplies from damage to excessive power line surges.

NOTE: To comply with the GR-1089 Lightning Criteria for Equipment Interfacing with AC Power Ports, an external surge protection device (SPD) is intended to be used at the AC input of the router.

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

CAUTION: The DC power supply comes with a 6-8inch cord with a snap-in plug that attaches to the DC power supply and screw terminals that attach to the main power. Dell Force10 recommends using a longer cable, to ensure sufficient room.

CAUTION: Note is that the power supply is marked **+ 48V -** . Connect the **+** (plus sign) to the red cable on the 6-8 inch cord; the **-** (minus sign) connects to the black cable. BE SURE TO to connect the RED to RETURN and connect the BLACK to -48V.

Power Supply 0 (PSU0) is on the left; Power Supply 1(PSU1) is on the right.

Figure 5-1. DC Power Supply

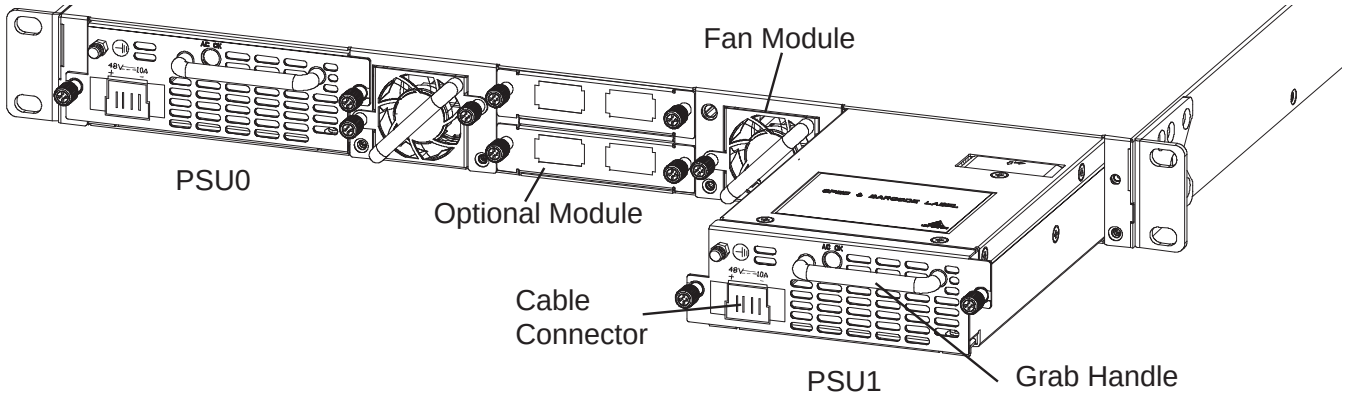
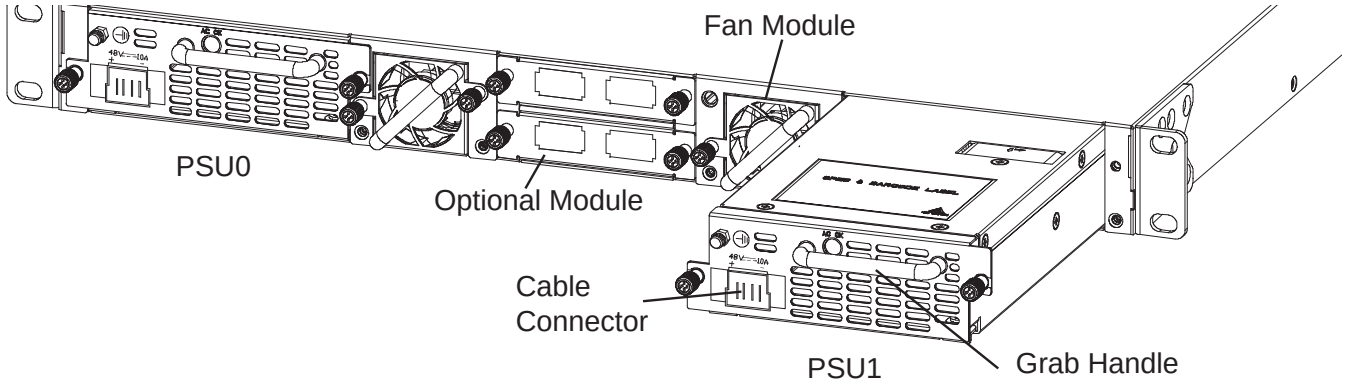


Figure 5-2. AC Power Supply



To install a new power supply, follow the steps below:

The power supply modules should slide into the slots smoothly. Do not force a module into a slot. This may damage the power supply or the S55 chassis.

Step	Task
1	Take the power supply unit out of the shipping box.

Step	Task
2	Using the grab handle, slide the unit in to the power supply bay.
3	Tighten the securing screw at the top of the unit.
4	Attach power cables.
5	The system powers up as soon as the cables are connected between the power supply and the power source.

Replace an AC or DC power supply

NOTE: If a power supply fails, it must be completely replaced. There are no field servicable components in the module itself. Refer to Chapter 9, Technical Support to request a hardware replacement.

To replace a power supply, follow the steps below:

Step	Task
1	Disconnect the power cable from the power supply.
2	Use the grab handle to slide the unit out of the power supply bay. **NOTE:** If the power supply is not going to be replaced, attach a blank panel to the power supply slot.
3	Using the grab handle on the replacement unit, slide it into the power supply bay.
4	Tighten the securing screws on the module with a screwdriver. Ensure that the module is secure.
5	Attach power cord to the new module.
6	The system powers up as soon as the cables are connected between the power supply and the power source.

6

Fans

The S55 comes from the factory with 1 power supply and 2 fan modules installed in the chassis. Both the fan module and the integrated fan-power supply are hot-swappable if a second (redundant) power supply is installed and running. With redundant power supplies, traffic will not be interrupted if a fan module is removed.

NOTE: Both slots must have operating fan units to run the system. If a module is not installed in each slot the system will shut down in 1 minute.

In addition to the integrated fan/power supply modules, fan modules can be ordered separately and additional modules can be inserted in the chassis.

The S55 supports two airflow direction options. Only a single direction can be used in a chassis; do not mix fan flow types in a chassis. The system will shutdown in 1 minute, if the airflow directions are mismatched.

- Normal is airflow from I/O panel to power supply
- Reversed is airflow from power supply to I/O panel

There are environmental factors that could decrease the amount of time required between fan replacements. Check these environmental factors regularly. Any unusual environmental circumstance at the site that causes an increase in temperature and/or particulate matter in the air might affect performance (for example, new equipment installation).

CAUTION: Fans should be checked at six-month intervals and replaced as necessary. Regularly monitor the speeds of the cooling fans in order to accurately determine replacement intervals.

CAUTION: For NEBS compliance, use the NEBS approved filters. These filters are colored green, and are installed exactly the same as the non-NEBS filters.

Components

CAUTION: Fans should be checked at six-month intervals and replaced as necessary. Regularly monitor the speeds of the cooling fans in order to accurately determine replacement intervals.

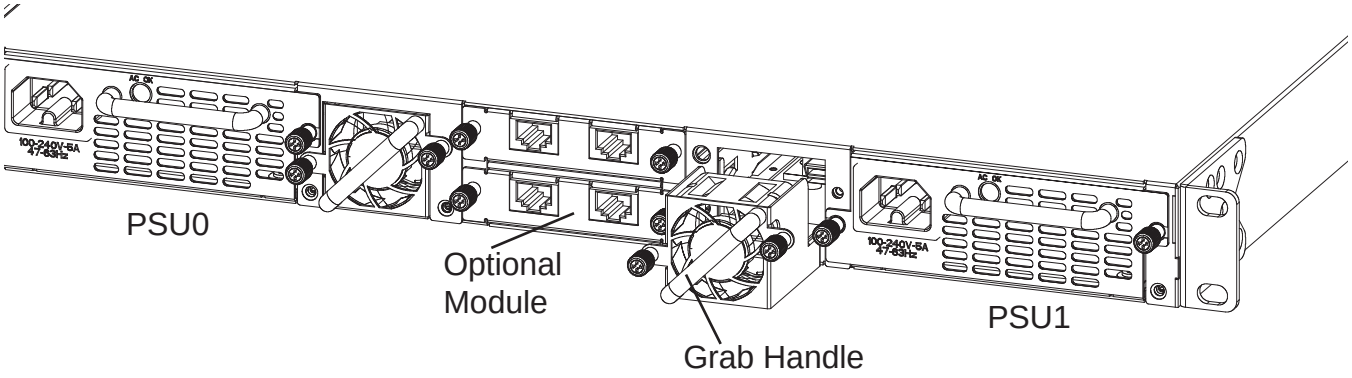
- S55 Fan module (Catalog# S55-FAN)
- S55 Fan module - Reverse flow (Catalog# S55-FAN-R)

Install a fan module

The fan modules in the S55 are field replaceable. The power supply units are in a single piece with fans, but individual fans are available. Refer to Chapter 5, Power Supplies for the procedure to replace the entire power supply.

Module Slot 0 is on the left; Module Slot 1 is on the right.

Figure 6-1. Replacing the fan module



To install a new fan module, follow the steps below:

Step	Task
1	Take the fan module out of the shipping box.
2	Using the grab handle, slide the module in to the bay.
3	Tighten the securing screw at the top of the module.

Replace a fan module

To replace a fan module, follow the steps below.

Step	Task
1	Loosen the securing screw at the top of the unit. ⚠ **CAUTION:** Steps 2-3 must be completed in within 1 minute, or the chassis will power down.
2	Use the grab handle to slide the module out of the bay.
3	Using the grab handle on the replacement module, slide it into the bay.
4	Tighten the captive screws on the module with a screwdriver. Ensure that the module is secure.

7

Access the console ports

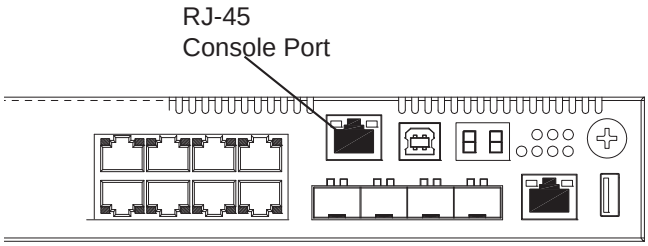
The S55 system can be accessed directly through the console port at I/O side of the switch.

Access the RJ45 console port (RS-232)

NOTE: Before starting this procedure, be sure you have a terminal emulation program already installed on your PC.

The RS-232 console port is labeled on the S55 chassis. It is in the upper right-hand side, as you face the I/O side of the chassis.

Figure 7-1. S55 serial console port connector



To access the console port, follow the procedures below. Refer to Table 7-1 for the console port pinout.

Step	Task
1	Install an RJ-45 copper cable into the console port. Use a rollover cable to connect the S55 console port to a terminal server.
2	Connect the other end of the cable to the DTE terminal server.
3	Default terminal settings on the console are set 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

You can connect to the console using an RJ-45 to DB-9 adapter along with the RJ-45 rollover cable if the DTE has a DB-9 interface. Table 7-1 lists the pin assignments.

Table 7-1. Pin Assignments Between the S55 Console and a DTE Terminal Server

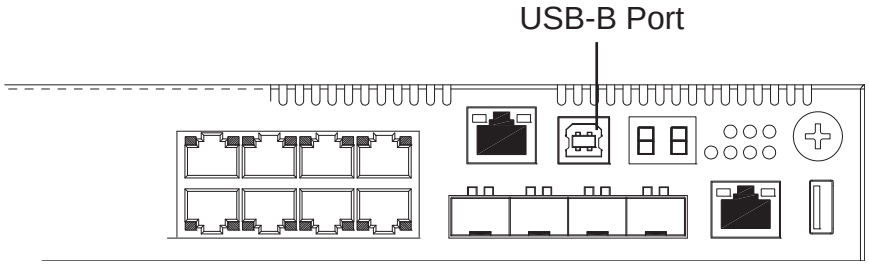
E300 System Console Port	RJ-45 to RJ-45 Rollover Cable		RJ-45 to DB-9 Adapter	Terminal Server Device
Signal	**RJ-45 pinout**	**RJ-45 Pinout**	**DB-9 Pin**	**Signal**
RTS	1	8	8	CTS
NC	2	7	6	DSR
TxD	3	6	2	RxD
GND	4	5	5	GND
GND	5	4	5	GND
RxD	6	3	3	TxD
NC	7	2	4	DTR
CTS	8	1	7	RTS

Access the USB-B console port

The S55 has 2 management ports available for system access: a console port and a USB-B port. The USB-B ports acts exactly as the console port. The terminal settings are the same, and the S55 sends all messages to the USB-B drive when it is connected.

The USB-B connector port is labeled on the S55 chassis. It is to the left of the management ports, as you face the I/O side of the chassis.

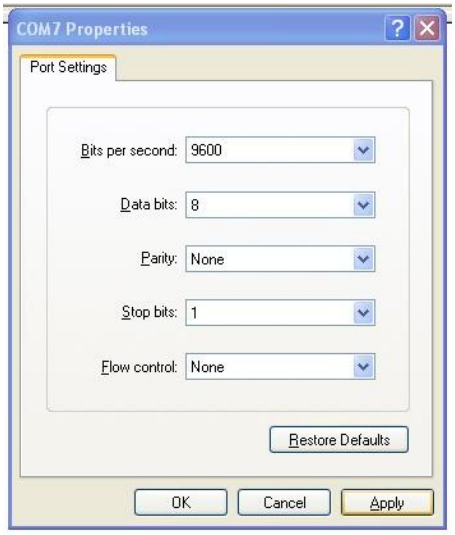
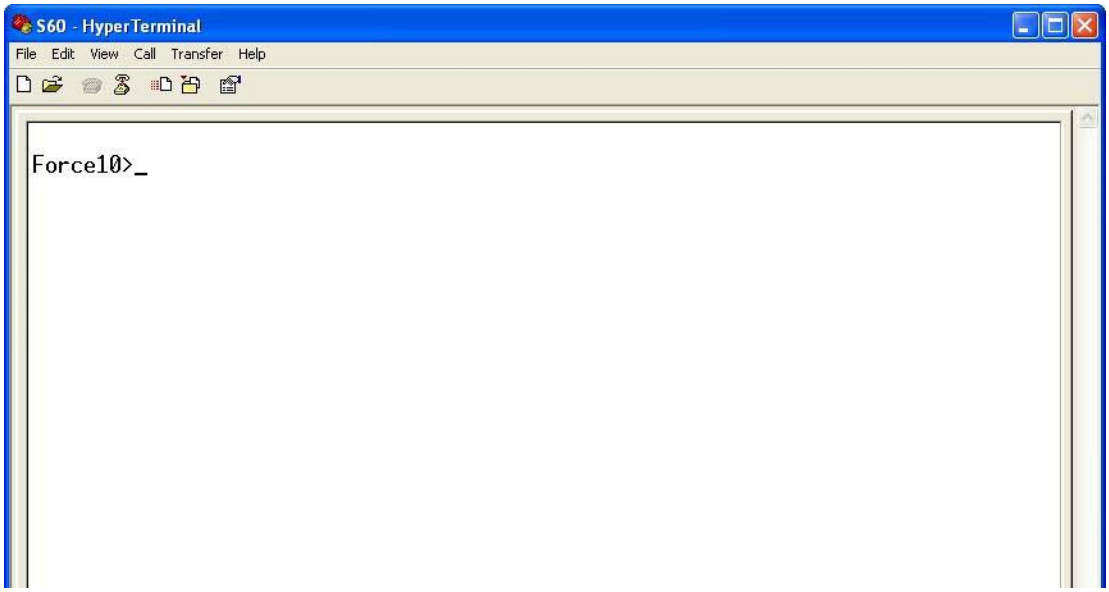
Figure 7-2. S55 USB-B port connector



When both the console port and the USB-B port are connected, the system defaults to the USB-B port. The console connection is considered inactive if the USB-B port is also connected.

NOTE: Before starting this procedure, be sure you have a terminal emulation program already installed on your PC. You will also require appropriate drivers for the USB device in use. Contact Dell Force10 Networks Technical Support for assistance.

Step	Task
1	Power on the PC (XP operating system recommended)

Step	Task *(continued)*
2	Connect the USB-A end of cable (supplied) into an available USB port on the PC
3	Connect the USB-B end of cable into the USB-B console port on the S55 (
4	Power on the S55.
5	Install necessary USB device drivers (internet connection required). Contact Dell Force10 Networks Technical Support for assistance if necessary.
6	Open your terminal software emulation program to access the S55.
7	Using the terminal settings shown here, set the terminal connection settings. • 9600 baud rate, No parity, 8 data bits, 1 stop bit, No flow control 
8	The CLI command prompt appears (shown below) when you are connected to the S55. 

8

S55 Specifications

This chapter contains these major sections:

- Chassis Physical Design
- Agency Compliance

Chassis Physical Design

Parameter	Specifications
Height	1.73 inches (4.4 cm)
Width	17.32 inches (44.0 cm)
Depth	18.74 inches (47.6cm)
Chassis weight with factory-installed components	14.41 pounds (approx.) (6.54 kg)
Rack clearance required	Front: 5-inches (12.7 cm) Rear: 5-inches (12.7 cm)
Thermal Dissipation	461 BTU/hr (135W)
Power Consumption	115 Watts (nominal) 135 Watts (maximum)

Environmental Parameters

Parameter	Specifications
Temperature	32° to 104°F (0° to 40°C) -40° to 158°F (-40° to 70°C)
Maximum altitude	No performance degradation to 10,000 feet (3,048 meters)
Relative humidity	10 to 85% non-condensing
Shock	MIL-STD-810

AC Power Requirements

Parameter	Specifications
Nominal Input Voltage	100 to 240 VAC, 47-63 Hz
Maximum AC Power Supply Input Current	5 A
Maximum System Power Input	135 W

DC Power Requirements

Parameter	Specifications
Nominal Input Voltage	-43 to -72 VDC at startup -36 to -72 VDC during normal operation
Maximum Power Supply Input Current	10 A
Maximum System Power Input	135 W

IEEE Standards

The S55 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, GARP, GMRP
- 802.3x Flow Control
- 802.1ac Frame Extension for VLAN tagging
- 802.1x Port based Network Access Control

Agency Compliance

The S55 is designed to comply with the following safety and agency requirements.

NEBS (Network Equipment Building Systems) Compliance

- Shielded cables must be used for ports 0 - 43.The shields must be grounded at both ends.
- Only reverse air flow configurations may be used in a NEBS compliant installation. Use only AC supply S55-PWR-AC-R, DC supply S55-PWR-DC-R and Fan Only S55-FAN-R, Systems S55-44T-AC-R and S55-44T-DC-R.
- Power supplies and fan modules must be fitted with the S55-PWR-FLTR kits. Fan filters must be replaced on a regular basis.
- This equipment is intended to be used with an external second-level 6kV lightning SPD (Surge Protective Device) at the AC input of the building.
- For the NEBS compliant installation, AC power connections shall use a SPD (surge protection device) in order to protect the AC power supplies from damage to excessive power line surges.

- In order to comply with the GR-1089 Lightning Criteria for Equipment Interfacing with AC Power Ports, an External Surge Protective Device (SPD) is intended to be used at the AC input of the router.

⚠ **WARNING:** Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S55 and its components.

⚠ **CAUTION:** The intra-building port(s) of the equipment or sub-assembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or sub-assembly MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 5) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

Figure 8-1. 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 Force10 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.

Figure 8-2. Canadian Department of Communication Statement

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 8-3. 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 Force10 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 Force10 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, the user may be required to take adequate measures.

Figure 8-4. European Community Contact

Dell Force10, EMEA - Central

Dahlienweg 19

66265 Heusweiler

Germany

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

Tel: +49 172 6802630

Email: EMEA Central Sales

Figure 8-5. 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。

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.

⚠ **WARNING:** AC Power cords are for use with Dell Force10 equipment only. Do not use Dell Force10 AC power cords with any unauthorized hardware.

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。

Figure 8-6. Korea Information

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

Figure 8-7. Korea Compliance

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

Safety Standards and Compliance Agency Certifications

- CUS UL 60950-1, 1st 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: 2006, Class A
- Canada: ICES-003, Issue-4, Class A
- Europe: EN55022 2006 (CISPR 22: 2006), Class A
- Japan: VCCI V3/ 2007.04 Class A
- USA: FCC CFR47 Part 15, Subpart B, Class A

Immunity

- EN 300 386 v1.3.3: 2005 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

This switch must be recycled or discarded according to applicable local and national regulations. Dell Force10 encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. Dell Force10 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 Force10 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 8-8. 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 Force10 products, which fall within the scope of the WEEE, are labeled with the crossed-out wheelie-bin symbol, as shown above, as required by WEEE.

For information on Dell Force10 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 Force10 Technical Assistance Center (TAC).

SD card removal

The SD card can be removed and re-installed, to support high security environments. Dell Force10 recommends the card be removed only when necessary. It should only be removed and replaced by authorized personnel.

⚠ **CAUTION:** The SD card should only be removed to support high security operations and after discussions with Dell Force10 Technical Support or your Dell Force10 representative.

To open the case:

1. Remove the small phillips screws that connect the top to the body. There are three screws evenly spaced across the rear and three screws evenly spaced along each side.
2. Slide the top backwards until its front flange slides free of the faceplate, then lift it off.
3. Remove the small screw at the top of the SD card slot.
4. Gently push the SD card to release it from the slot.
5. Remove the card.

Battery replacement

The lithium battery is not field replaceable. It should only be removed and replaced by authorized personnel. Contact Dell Force10 Technical Support for assistance if the battery requires replacement.

⚠ **WARNING:** Always wear an ESD-preventive wrist or heel ground strap when handling the S55 and its components. As with all electrical devices of this type, take all the necessary safety precautions to prevent injury when installing this system. Electrostatic discharge (ESD) damage can occur if components are mishandled.

To open the case:

1. Remove the small phillips screws that connect the top to the body. There are three screws evenly spaced across the rear and three screws evenly spaced along each side.

2 Slide the top backwards until its front flange slides free of the faceplate, then lift it off.

3 Gently lift the battery from the board.

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 Force10 representative.

Figure 8-9. The European WEEE Symbol

For California:

Perchlorate Material — Special handling may apply.
See: 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.

9

Technical Support

This appendix contains these major 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 Force10 equipment and mitigating the impact of network outages. Through iSupport you can obtain technical information regarding Dell Force10 products, access to software upgrades and patches, and open and manage your Technical Assistance Center (TAC) cases. Dell Force10 iSupport provides integrated, secure access to these services.

Accessing iSupport services

The URL for iSupport is http://www.force10networks.com/support/. You must have a userid and password to access iSupport services. If you do not have one, you can request one at the website:

- On the Dell Force10 Support page, click the **Account Request** link.
  - Fill out the User Account Request form, and click **Send**. You will receive your userid and password by E-Mail.
  - To access iSupport services, click the **LOGIN** link, and enter your userid and password.

Contacting the Technical Assistance Center

How to Contact Dell Force10 TAC	Log in to iSupport at http://www.force10networks.com/support/ and select the **Service Request** tab.
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 • Screen shots illustrating the symptom, including any error messages. These can include: • Output from the `show tech-support [non-paged]` command (This report is very long, so the storage buffer in your terminal program should be set high.) • Output from the `show logging eventlog` [*unit*] command, where *unit* is the stack ID of the member unit that experienced the failure (This report is included as a section in the output of `show tech-support`.) • Console captures showing the error messages • Console captures showing the troubleshooting steps taken • Saved messages to a syslog server, if one is used
Managing Your Case	Log in to iSupport, and select the **Service Request** tab to view all open cases and RMAs.
Downloading Software Updates	Log in to iSupport, and select the **Software Center** tab.
Technical Documentation	Log in to iSupport, and select the **Documents** tab. This page can be accessed without logging in via the **Documentation** link on the iSupport page.
Contact Information	E-mail: support@force10networks.com Web: http://www.force10networks.com/support/. Telephone: US and Canada: 866.965.5800 International: 408.965.5800

Requesting a hardware replacement

To request replacement hardware, follow these steps:

Step	Task
1	Determine the part number and serial number of the component. To list the numbers for all components installed in the chassis, use the `show hardware` command.

Step	Task
2	Request a Return Materials Authorization (RMA) number from TAC by opening a support case. Open a support case by: • Using the Create Service Request form on the iSupport page (see Contacting the Technical Assistance Center). • Contacting Dell Force10 directly by E-mail or by phone (see Contacting the Technical Assistance Center). Provide the following information when using E-mail or phone: • Part number, description, and serial number of the component. • Your name, organization name, telephone number, fax number, and e-mail address. • Shipping address for the replacement component, including a contact name, phone number, and e-mail address. • A description of the failure, including log messages. This generally includes: • Output from the `show tech-support [non-paged]` command (This report is very long, so the storage buffer in your terminal program should be set high.) • Output from the `show logging eventlog` [*unit*] command, where *unit* is the stack ID of the member unit that experienced the failure (This report is included as a section in the output of `show tech-support`.) • Console captures showing the error messages • Console captures showing the troubleshooting steps taken • Saved messages to a syslog server, if one is used

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