S60 Quick Start Guide

FTOS version 8.3.3.1 **July 30, 2010**

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Chapter 1 S60 Overview

This document is intended to aid you with quick installation and set-up of a new S60 system.

- For complete S60 installation information, including illustrations and display details, refer to *Installing the S60 System* (included in the shipping box with the new chassis).
- For complete information regarding the configuration of the S60 and FTOS features, refer to the *FTOS Configuration Guide for the S60* and the *FTOS Command Line Reference Guide for the S60*.

Introduction

The Force10 Networks S60 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 an optional SFP+ module. The front of the S60 contains the Power Supply Units (PSUs), optional module slots and the grounding connectors. As shown in the rear panel of the S60 contains the 44 ethernet ports, optional module ports, the management ports and the displays for alarms and stacking identification.

Equipment

To successfully install the S60, ensure that you have the following:

- S60 chassis
- At least one grounded AC or DC power source per chassis
- Cable to connect the AC or DC power source to the chassis (US AC power cable 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)

Features

The S60 offers the following:

- S60 CPU and switch processor
- Stackable switch features
- 19-inch rack-mountable
- Standard 1U chassis height
- Integrated PSU/Fan module (3 fans per module)
- 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

- Up to four optional SFP+ modules
- 44 fixed 10/100/1000 Mbps auto-sensing and auto MDIX RJ45 ports
- Four ports capable of using 100/1000 Base-T or 1000 Base-X using auto-media detect
- Optional ports supporting one 2-port 24G stacking module or two 1-port 12G stacking modules
- Console port
- USB-A port
- USB-B port

System status

S60 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 S60* and the *FTOS Configuration Guide for the S60*.

Refer to the *S60 Installation Guide* for details regarding the chassis physical displays.

Chapter 2 Hardware Installation

This document is intended to aid you with quick installation and set-up of a new S60 system.

- For complete S60 installation information, including illustrations and display details, refer to *Installing the S60 System* (included in the shipping box with the new chassis).

To install the S60 system, Force10 Networks recommends that you complete the installation procedures in the order presented below.

1 Install the S60 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. Supply power and power up the system

Attention: Always wear an ESD-preventive wrist or heel ground strap when handling the S60 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 S60 chassis in a rack or cabinet

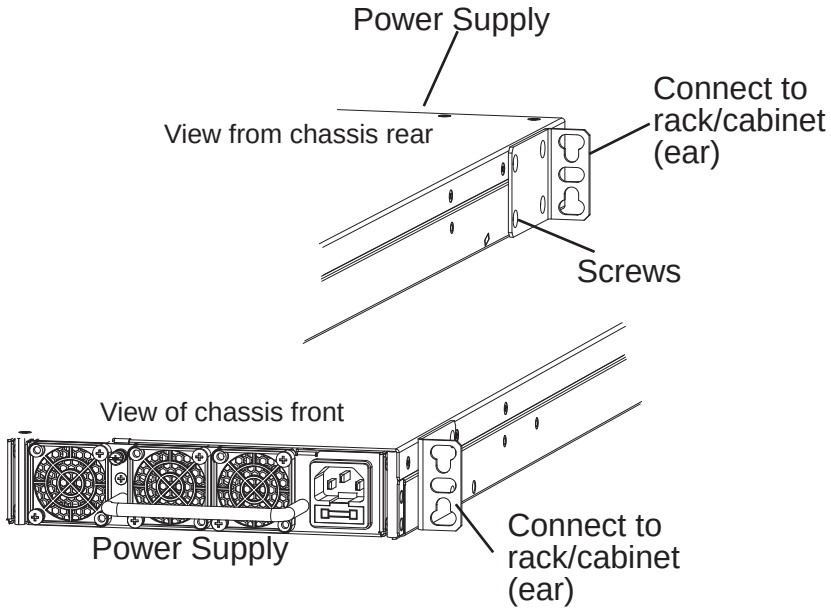
Attach mounting brackets

The S60 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: Force10 recommends attaching the brackets to the front of the chassis, on the PSU side. This provides the greatest weight support for the chassis in the rack or cabinet, and is in compliance with Bellcore Zone 4 earthquake requirements.

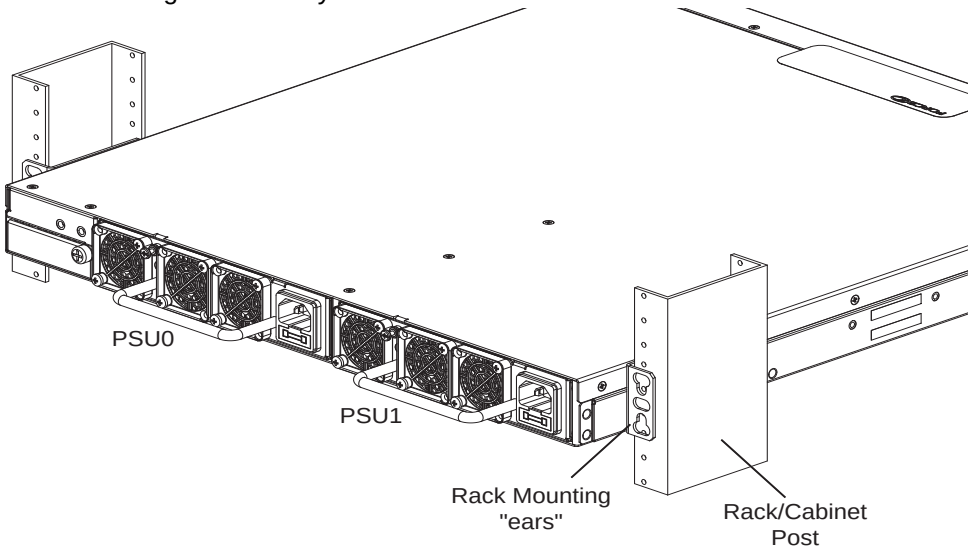
Follow these steps to attach the brackets to the chassis:

Step	Task
1	Take the brackets and screws out of their packaging.
2	Attach the brackets to the rear sides of the chassis, using four screws for each bracket. Attach the bracket so that the “ear” faces to the rear 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. If you are installing two S60 switches side-by-side, position the two chassis at least 5 inches (12.7 cm) apart to permit proper 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	It is recommended that one person hold the S60 chassis in place while another attaches the brackets to the posts.
2	Attach the bracket “ears” to the rack or cabinet posts, using two screws for each bracket. Ensure the screws are tightened firmly. 

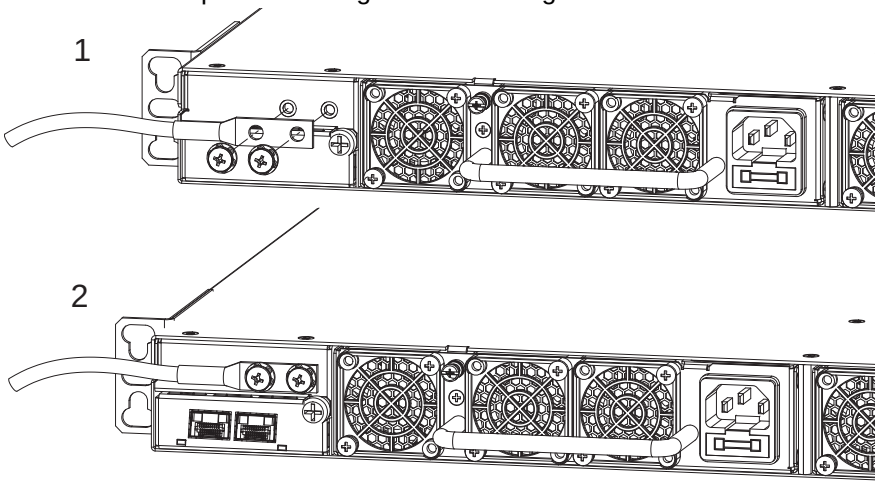
Attach ground cable

The S60 is shipped with 2 10-32 screws for attaching a ground cable to the chassis. The cable itself is not included. Force10 recommends a 6AWG two-hole lug, #10 hole size, .63" spacing (not included in shipping) to properly ground the chassis. The two-hole lug must be a UL recognized, crimp-type lug.

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

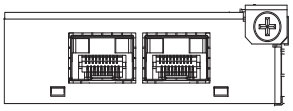
Follow these steps to connect the ground cable to the chassis:

Step	Task
1	Take the (2) 10-32 screws from the package.

Step	Task (Continued)
2	Cut cable to desired length. Cable length must facilitate the proper operation of fault interrupt circuits. Force10 recommends using of the shortest cable route allowable.
3	Attach the two-hole lug to the chassis as shown, using the supplied screws. Any un-plated mating surfaces should be brought to a shiny finish, and apply an anti-oxidant coating to the surfaces prior to mating. Plated mating surfaces must be clean and free from contamination. 
4	Attach the other end of the ground cable to a suitable ground point.

Insert Optional Modules

The S60 system has expansion slots at the front left and the rear right of the chassis, that can be used for SFP+ devices.The following table lists the modules that can be installed into these slots. The modules are hot-swappable; you can insert or replace modules without powering down the system

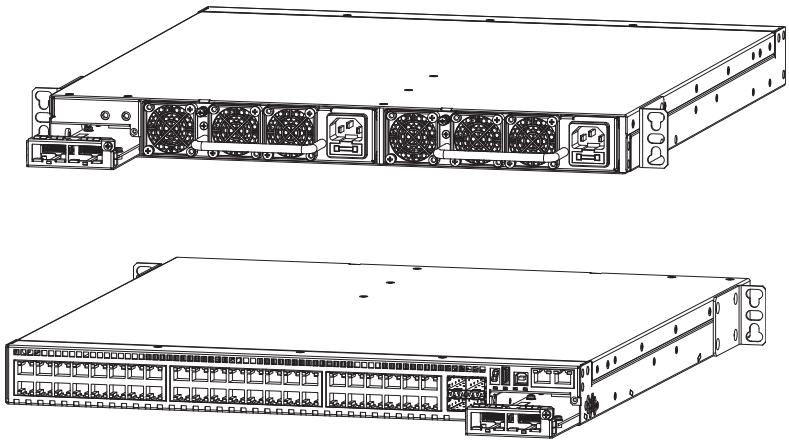
Module Description	Catalog Number	
2-port 10G SFP+ optical module	S60-10GE-2S	

Attention: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S60 and its components.

To install an optional module, follow the steps below:

Step	Task
5	Remove the faceplate covering the module slot located at the rear left or the front right of the S60.

Step	Task
6	Remove the module from its packaging and slide the module into the slot.



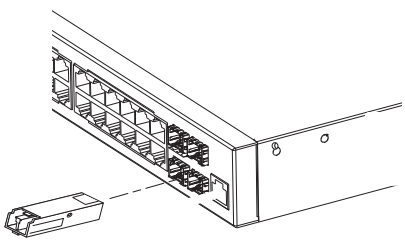
7	Secure the captive screw on the side of the module.

Install the SFP and SFP+ optics

The S60 has 4 SFP optical ports in the front 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:

Attention: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S60 and its components.

Step	Task
1	Position the SFP or SFP+ so it is in the upright 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 Force10 Networks' supported optics, refer to http://www.force10networks.com/products/specifications.asp

Supply power and power up the system

Supply power to the S60 after they are mounted in a rack (or on a table) and the optional modules are 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

Attention: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S60 and its components.

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 S60 and the power source, the chassis is powered-up; there is no on/off switch.

DC power

Connect the cable to the DC receptacle at the rear of the S60, making sure that the power cord is secure. When the cable is secured, turn the power switch on.

Chapter 3 Getting Started

This document is intended to aid you with quick installation and set-up of a new S60 system.

- For complete information regarding the configuration of the S60 and FTOS features, refer to the *FTOS Configuration Guide for the S60* and the *FTOS Command Line Reference Guide for the S60*.

The system then loads FTOS and boot messages scroll up the terminal window during this process. No user interaction is required if the boot process proceeds without interruption.

For details on using the Command Line Interface (CLI), see the Fundamentals chapter in the *FTOS Configuration Guide for the S60*.

Console access

The S60 has 2 management ports available for system access: a serial console port and a USB-B port. The USB-B ports acts exactly as the console port.

By default, the S60 sends system messages to the serial console port. However, only one console connection can be active at a time. When both the serial 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.

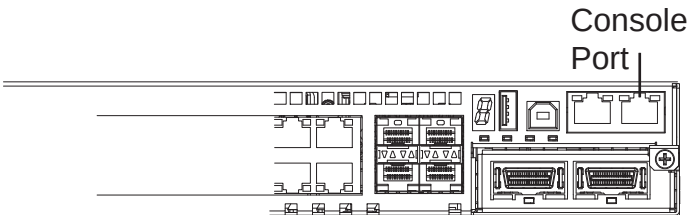
You can switch between console connections by physically connecting or disconnecting the cables. A system message is displayed on the serial console prior to switching to the USB-B console. When the USB-B cable is detached, the system returns to the serial console default.

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 the S60 chassis. It is in the upper right-hand side, as you face the rear of the chassis.

Figure 1 S60 serial console port connector



To access the console port, follow the procedures below. Refer to Table 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 S60 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

Accessing 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 1 lists the pin assignments.

Table 1 Pin Assignments Between the E300 System Console and a DTE Terminal Server

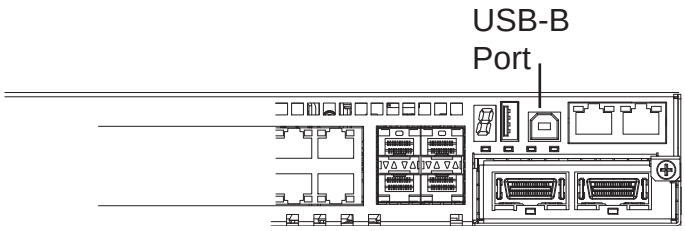
E300 System Console Port	RJ-45 to RJ-45 Rollover Cable		RJ-45 to DB-9 Adapter	Terminal Server Device
Signal	**RJ-45 pinout**	**RJ-45 Pinout**	**DB-9 Pin**	**Signal**
RTS	1	8	8	CTS
NC	2	7	6	DSR
TxD	3	6	2	RxD
GND	4	5	5	GND
GND	5	4	5	GND
RxD	6	3	3	TxD
NC	7	2	4	DTR
CTS	8	1	7	RTS

Access the USB-B console port

The S60 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 S60 sends all messages to the USB-B drive when it is connected.

The USB-B connector port is labeled on the the S60 chassis. It is to the left of the management ports, as you face the rear of the chassis.

Figure 2 S60 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 Force10 Networks Technical Support for assistance.

Step	Task
1	Power on the PC (XP operating system recommended)
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 S60 (
4	Power on the S60.
5	Install necessary USB device drivers (internet connection required). Contact Force10 Networks Technical Support for assistance if necessary.
6	Open your terminal software emulation program to access the S60.

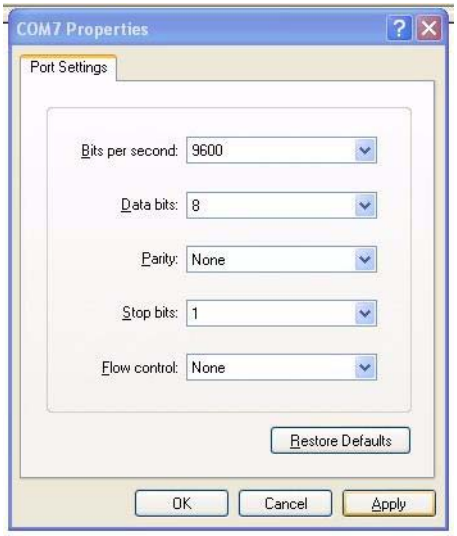
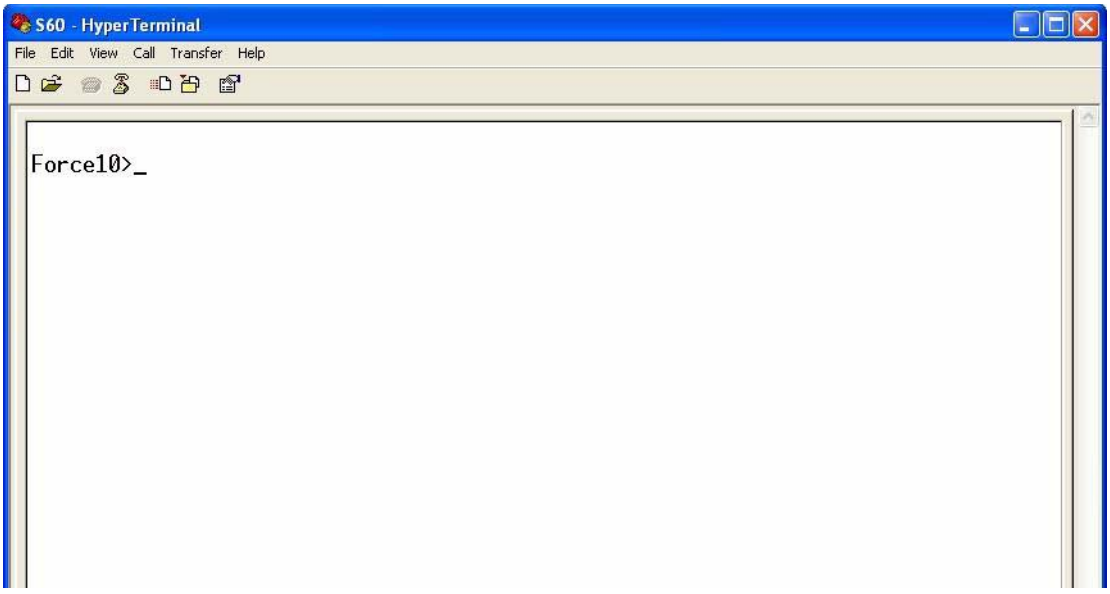
Step	Task (Continued)
7	Using the terminal settings shown here, set the terminal connection settings. • 9600 baud rate, No parity, 8 data bits, 1 stop bit, No flow control 
8	The CLI command prompt appears (shown below) when you are connected to the S60. 

Figure 3 Completed Boot Process

```
                                                          .*************.
                                                        .#  ####   #######.
 ########  #######   #########     ######## ########   .#. ###### ############.
 ###     ###     ##  ###    ###  ####       ###      .##. ## ### ####       ###.
 ###    ###      ### ###    ### ###        ###      *#.    ### ###           #*
 ###    ###       ## ###   #### ###        ######## *#    -## ###           #*
 ###### ###       ## #########  ###        ######## *#    ### ##            #*
 ###    ###       ## ###  ####  ###        ###      *#   #### ###           #*
 ###     ###     ### ###   #### ####       ###      *#. ####  ###          ###*
 ###      ###   ###  ###     ### #####   ## ######## .#.#####   ####      #### .
 ###        #####    ###      ###   ######  ########   .######  ############ .
                                                        .#      ######### .
                                                          `*************'

                  Copyright 1999-2006 Force10 Networks, Inc.

 + Force10 Networks, Inc.
 + CPU: DB-MV64460-BP/IBM750Fx (2.3)
 + Version: VxWorks5.5.1
 + Memory Size: 1038876672 bytes.
 + BSP Version: 1.2/1.3.6
 + Creation Date : Jan  2 2007

nvDrvInit: nvDrvErase passed
-> 00:00:10: %RPM0-U:CP %RAM-6-ELECTION_ROLE: RPM0 is transitioning to Primary RPM.
00:00:11: %RPM0-P:CP %CHMGR-2-FAN_BAD: Minor alarm: some fans in fan tray 0 are down
00:00:11: %RPM0-P:CP %CHMGR-5-CARDDETECTED: Line card 1 present

 DSA Card Init
00:00:11: %RPM0-P:CP POEMGR-4-POE_POWER_USAGE_ABOVE_THRESHOLD: Inline power used is exceeded 90% c
available inline power
00:00:12: %RPM0-P:CP %CHMGR-5-CARDDETECTED: Line card 2 present
00:00:12: %RPM0-P:CP %TSM-6-SFM_SWITCHFAB_STATE: Switch Fabric: UP
00:00:12: %RPM0-P:CP %TSM-6-SFM_FULL_PARTIAL_STATE: SW_FAB_UP_1 SFM in the system
00:00:13: %RPM0-P:CP %IFMGR-5-OSTATE_UP: Changed interface state to up: Ma 0/0

00:01:27: %RPM0-P:CP %CHMGR-5-CHECKIN: Checkin from line card 1 (type E48TB, 48 ports)
00:01:27: %RPM0-P:CP %CHMGR-5-CHECKIN: Checkin from line card 2 (type E48TB, 48 ports)
00:01:28: %RPM0-P:CP %CHMGR-5-LINECARDUP: Line card 1 is up
00:01:28: %RPM0-P:CP %CHMGR-5-LINECARDUP: Line card 2 is up
00:01:36: %RPM0-P:CP %RAM-5-RPM_STATE: RPM0 is in Active State.
00:01:36: %RPM0-P:CP %CHMGR-5-CHAS_READY: Chassis ready

00:01:37: %RPM0-P:CP %SEC-5-LOGIN_SUCCESS: Login successful for user  on line console
Force10>
```

Default Configuration

A version of FTOS is pre-loaded onto the chassis, however the system is not configured when you power up for the first time (except for the default hostname, which is Force10). You must configure the system using the CLI, except when using Bare Metal Auto-Configuration. Refer to the Bare Metal Auto-Configuration chapter in the *FTOS COnfiguration Guide for the S60*.

Note: If you are using the Bare Metal Auto-Configuration feature, you do not need to proceed with the following sections.

Configure a Host Name

The host name appears in the prompt. The default host name is **force10**.

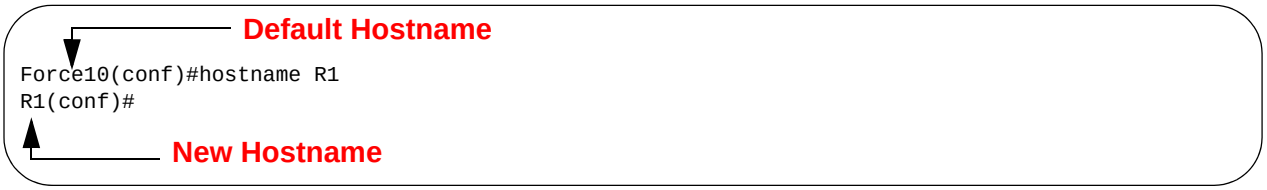
- Host names must start with a letter and end with a letter or digit.
- Characters within the string can be letters, digits, and hyphens.

To configure a host name:

Step	Task	Command Syntax	Command Mode
1	Create a new host name.	**hostname** *name*	CONFIGURATION

Figure 4 illustrates the **hostname** command.

Figure 4 Configuring a Hostname



Access the System Remotely

You can configure the system to access it remotely by Telnet. The method for configuring the C-Series and E-Series for Telnet access is different from S-Series.

- The C-Series and E-Series have a dedicated management port and a management routing table that is separate from the IP routing table.
- The S-Series does not have a dedicated management port, but is managed from any port. It does not have a separate management routing table.

Access the C-Series and E-Series and the S60 Remotely

Configuring the system for Telnet is a three-step process:

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

Configure the Management Port IP Address

Assign IP addresses to the management ports in order to access the system remotely.

To configure the management port IP address:

Step	Task	Command Syntax	Command Mode
1	Enter INTERFACE mode for the Management port.	**interface ManagementEthernet** *slot/port* • *slot* range: 0 to 1 • *port* range: 0	CONFIGURATION
2	Assign an IP address to the interface.	**ip address** *ip-address/mask* • *ip-address:* an address in dotted-decimal format (A.B.C.D). • *mask:* a subnet mask in /prefix-length format (/xx).	INTERFACE
3	Enable the interface.	**no shutdown**	INTERFACE

Configure a 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:

Step	Task	Command Syntax	Command Mode
1	Configure a management route to the network from which you are accessing the system.	**management route** *ip-address/mask gateway* • *ip-address:* the network address in dotted-decimal format (A.B.C.D). • *mask:* a subnet mask in /prefix-length format (/xx). • *gateway*: the next hop for network traffic originating from the management port.	CONFIGURATION

Configure a Username and Password

Configure a system username and password to access the system remotely.

To configure a username and password:

Step	Task	Command Syntax	Command Mode
1	Configure a username and password to access the system remotely.	**username** *username* **password** [*encryption-type*] *password* *encryption-type* specifies how you are inputting the password, is 0 by default, and is not required. • 0 is for inputting the password in clear text. • 7 is for inputting a password that is already encrypted using a Type 7 hash. Obtaining the encrypted password from the configuration of another Force10 system.	CONFIGURATION

Access the S-Series Remotely (on a non-management port)

The S-Series does not have a dedicated management port nor a separate management routing table. Configure any port on the S-Series to be the port through which you manage the system and configure an IP route to that gateway.

Note: The S60 system uses management ports and can be configured similar to the C-Series and E-Series systems. Refer to Access the C-Series and E-Series and the S60 Remotely.

Configuring the system for Telnet access is a three-step process:

1. Configure an IP address for the port through which you will manage the system using the command **ip address** from INTERFACE mode, as shown in Figure 5.
2. Configure a IP route with a default gateway using the command **ip route** from CONFIGURATION mode, as shown in Figure 5.
3. Configure a username and password using the command **username** from CONFIGURATION mode, as shown in Figure 5.

Figure 5 Configuring the S-Series for Remote Access

```
R5(conf)#int gig 0/48
R5(conf-if-gi-0/48)#ip address 10.11.131.240
R5(conf-if-gi-0/48)#show config
!
interface GigabitEthernet 0/48
 ip address 10.11.131.240/24
 no shutdown
R5(conf-if-gi-0/48)#exit
R5(conf)#ip route 10.11.32.0/23 10.11.131.254
R5(conf)#username admin pass force10
```

Configure the Enable Password

Access the EXEC Privilege mode using the **enable** command. The 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 DES encryption method.
- **enable secret** is stored in the running/startup configuration in using a stronger, MD5 encryption method.

Force10 recommends using the **enable secret** password.

To configure an enable password:

Task	Command Syntax	Command Mode
Create a password to access EXEC Privilege mode.	**enable** [**password** | **secret**] [**level** *level*] [*encryption-type*] *password* *level* is the privilege level, is 15 by default, and is not required. *encryption-type* specifies how you are inputting the password, is 0 by default, and is not required. • 0 is for inputting the password in clear text. • 7 is for inputting a password that is already encrypted using a DES hash. Obtain the encrypted password from the configuration file of another Force10 system. • 5 is for inputting a password that is already encrypted using an MD5 hash. Obtain the encrypted password from the configuration file of another Force10 system.	CONFIGURATION

Configuration File Management

Files can be stored on and accessed from various storage media. Rename, delete, and copy files on the system from the EXEC Privilege mode.

The E-Series EtherScale platform architecture uses MMC cards for both the internal and external Flash memory. MMC cards support a maximum of 100 files. The E-Series TeraScale and ExaScale platforms architecture use Compact Flash for the internal and external Flash memory. It has a space limitation but does not limit the number of files it can contain.

Note: Using flash memory cards in the system that have not been approved by Force10 can cause unexpected system behavior, including a reboot.

Copy Files to and from the System

The command syntax for copying files is similar to UNIX. The **copy** command uses the format **copy** *source-file-url destination-file-url*.

Note: See the *FTOS Command Reference* for a detailed description of the **copy** command.

- To copy a local file to a remote system, combine the *file-origin* syntax for a local file location with the *file-destination* syntax for a remote file location shown in Table 2.
- To copy a remote file to Force10 system, combine the *file-origin* syntax for a remote file location with the *file-destination* syntax for a local file location shown in Table 2.

Table 2 Forming a copy Command

	source-file-url **Syntax**	*destination-file-url* **Syntax**
Local File Location		
Internal flash:		
primary RPM	**copy flash://***filename*	**flash://***filename*
standby RPM	**copy rpm{0|1}flash://***filename*	**rpm{0|1}flash://***filename*
External flash:		
primary RPM	**copy rpm{0|1}slot0://***filename*	**rpm{0|1}slot0://***filename*
standby RPM	**copy rpm{0|1}slot0://***filename*	**rpm{0|1}slot0://***filename*
USB Drive (		
USB drive on RPM0	**copy rpm0usbflash://***filepath*	**rpm0usbflash://***filename*
External USB drive	**copy usbflash://***filepath*	**usbflash://***filename*
Remote File Location		
FTP server	**copy ftp://***username*:*password*@{*hostip* | *hostname*}/*filepath*/*filename*	**ftp://***username*:*password*@{*hostip* | *hostname*}/*filepath*/*filename*
TFTP server	**copy tftp://**{*hostip* | *hostname*}/*filepath*/*filename*	**tftp://**{*hostip* | *hostname*}/*filepath*/*filename*
SCP server	**copy scp://**{*hostip* | *hostname*}/*filepath*/*filename*	**scp://**{*hostip* | *hostname*}/*filepath*/*filename*

Important Points to Remember

- You may not copy a file from one remote system to another.
- You may not copy a file from one location to the same location.
- The internal flash memories on the RPMs are synchronized whenever there is a change, but only if both RPMs are running the same version of FTOS.
- When copying to a server, a hostname can only be used if a DNS server is configured.
- The **usbflash** and **rpm0usbflash** commands are supported on E-Series ExaScale platform only. Refer to the FTOS Release Notes for a list of approved USB vendors.

Figure 6 shows an example of using the **copy** command to save a file to an FTP server.

Figure 6 Saving a file to a Remote System

Local Location

Remote Location

```
Force10#copy flash://FTOS-SB-8.3.3.1.bin ftp://myusername:mypassword@10.10.10.10//FTOS/FTOS-SB-8.3.3.1
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
27952672 bytes successfully copied
```

Figure 7 shows an example of using the **copy** command to import a file to the Force10 system from an FTP server.

Figure 7 Saving a file to a Remote System

Remote Location

Local Location

```
Force10#$//copy ftp://myusername:mypassword@10.10.10.10//FTOS/FTOS-SB-8.3.3.1.bin flash://
Destination file name [FTOS-EF-8.3.3.1.bin.bin]:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
26292881 bytes successfully copied
```

Save the Running-configuration

The running-configuration contains the current system configuration. Force10 recommends that you copy your running-configuration to the startup-configuration. The system uses the startup-configuration during boot-up to configure the system. The startup-configuration is stored in the internal flash on the primary RPM by default, but it can be saved onto an external flash (on an RPM) or a remote server.

To save the running-configuration:

Note: The commands in this section follow the same format as those in Copy Files to and from the System on page 18 but use the filenames *startup-configuration* and *running-configuration*. These commands assume that current directory is the internal flash, which is the system default.

Task	Command Syntax	Command Mode
Save the running-configuration to:		
the startup-configuration on the internal flash of the primary RPM	**copy running-config startup-config**	EXEC Privilege
the internal flash on an RPM	**copy running-config rpm**{**0**|**1**}**flash://***filename*	
Note: The internal flash memories on the RPMs are synchronized whenever there is a change, but only if the RPMs are running the same version of FTOS.		
the external flash of an RPM	**copy running-config rpm**{**0**|**1**}**slot0://***filename*	
an FTP server	**copy running-config ftp://** *username*:*password*@{*hostip* | *hostname*}/*filepath*/*filename*	
a TFTP server	**copy running-config tftp://**{*hostip* | *hostname*}/*filepath*/*filename*	
an SCP server	**copy running-config scp://**{*hostip* | *hostname*}/*filepath*/*filename*	
Note: When copying to a server, a hostname can only be used if a DNS server is configured.		
Save the running-configuration to the startup-configuration on the internal flash of the primary RPM. Then copy the new startup-config file to the external flash of the primary RPM.	**copy running-config startup-config duplicate**	EXEC Privilege

View Files

File information and content can only be viewed on local file systems.

To view a list of files on the internal or external Flash:

Step	Task	Command Syntax	Command Mode
1	View a list of files on:		
	the internal flash of an RPM	**dir flash:**	EXEC Privilege
	the external flash of an RPM	**dir slot:**	

The output of the command **dir** also shows the read/write privileges, size (in bytes), and date of modification for each file, as shown in Figure 8.

Figure 8 Viewing a List of Files in the Internal Flash

```
Force10#dir
Directory of flash:

  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
  6  drw-       8192   Mar 30 1919 10:31:04  CORE_DUMP_DIR
  7  d---       8192   Mar 30 1919 10:31:04  ADMIN_DIR
  8  -rw-   33059550   Jul 11 2007 17:49:46  FTOS-EF-7.4.2.0.bin
  9  -rw-   27674906   Jul 06 2007 00:20:24  FTOS-EF-4.7.4.302.bin
 10  -rw-   27674906   Jul 06 2007 19:54:52  boot-image-FILE
 11  drw-       8192   Jan 01 1980 00:18:28  diag
 12  -rw-       7276   Jul 20 2007 01:52:40  startup-config.bak
 13  -rw-       7341   Jul 20 2007 15:34:46  startup-config
 14  -rw-   27674906   Jul 06 2007 19:52:22  boot-image
 15  -rw-   27674906   Jul 06 2007 02:23:22  boot-flash
--More--
```

To view the contents of a file:

Step	Task	Command Syntax	Command Mode
1	View the:		
	contents of a file in the internal flash of an RPM	**show file rpm{0|1}flash://***filename*	EXEC Privilege
	contents of a file in the external flash of an RPM	**show file rpm{0|1}slot0://***filename*	
	running-configuration	**show running-config**	
	startup-configuration	**show startup-config**	

View Configuration Files

Configuration files have three commented lines at the beginning of the file, as shown in Figure 9, to help you track the last time any user made a change to the file, which user made the changes, and when the file was last saved to the startup-configuration.

In the running-configuration file, if there is a difference between the timestamp on the “Last configuration change,” and “Startup-config last updated,” then you have made changes that have not been saved and will not be preserved upon a system reboot.

Figure 9 Tracking Changes with Configuration Comments

```
Force10#show running-config
Current Configuration ...
! Version 8.2.1.0
! Last configuration change at Thu Apr 3 23:06:28 2008 by admin
! Startup-config last updated at Thu Apr 3 23:06:55 2008 by admin
!
boot system rpm0 primary flash://FTOS-EF-8.2.1.0.bin
boot system rpm0 secondary flash://FTOS-EF-7.8.1.0.bin
boot system rpm0 default flash://FTOS-EF-7.7.1.1.bin
boot system rpm1 primary flash://FTOS-EF-7.8.1.0.bin
boot system gateway 10.10.10.100
--More--
```

File System Management

The Force10 system can use the internal Flash, external Flash, or remote devices to store files. It stores files on the internal Flash by default but can be configured to store files elsewhere.

To view file system information:

Task	Command Syntax	Command Mode
View information about each file system.	**show file-systems**	EXEC Privilege

The output of the command **show file-systems** (Figure 10) shows the total capacity, amount of free memory, file structure, media type, read/write privileges for each storage device in use.

Figure 10 show file-systems Command Example

```
Force10#show file-systems
Size(b)     Free(b)      Feature      Type   Flags  Prefixes
    520962048   213778432     dosFs2.0 USERFLASH      rw  flash:
    127772672    21936128     dosFs2.0 USERFLASH      rw  slot0:
            -           -            -   network      rw  ftp:
            -           -            -   network      rw  tftp:
            -           -            -   network      rw  scp:
```

You can change the default file system so that file management commands apply to a particular device or memory.

To change the default storage location:

Task	Command Syntax	Command Mode
Change the default directory.	**cd** *directory*	EXEC Privilege

In Figure 11, the default storage location is changed to the external Flash of the primary RPM. File management commands then apply to the external Flash rather than the internal Flash.

Figure 11 Alternative Storage Location

```
Force10#cd slot0:
Force10#copy running-config test
Force10#copy run test                          <-- No File System Specified
!
7419 bytes successfully copied
Force10#dir
Directory of slot0:

  1  drw-      32768   Jan 01 1980 00:00:00  .
  2  drwx        512   Jul 23 2007 00:38:44  ..
  3  ----          0   Jan 01 1970 00:00:00  DCIM
  4  -rw-       7419   Jul 23 2007 20:44:40  test   <-- File Saved to External Flash
  5  ----          0   Jan 01 1970 00:00:00  BT
  6  ----          0   Jan 01 1970 00:00:00  200702~1VSN
  7  ----          0   Jan 01 1970 00:00:00  G
  8  ----          0   Jan 01 1970 00:00:00  F
  9  ----          0   Jan 01 1970 00:00:00  F

slot0: 127772672 bytes total (21927936 bytes free)
```

View command history

The command-history trace feature captures all commands entered by all users of the system with a time stamp and writes these messages to a dedicated trace log buffer. The system generates a trace message for each executed command. No password information is saved to the file.

To view the command-history trace, use the **show command-history** command, as shown in Figure 487.

Figure 12 Command Example **show command-history**

```
Force10#show command-history
[12/5 10:57:8]: CMD-(CLI):service password-encryption
[12/5 10:57:12]: CMD-(CLI):hostname Force10
[12/5 10:57:12]: CMD-(CLI):ip telnet server enable
[12/5 10:57:12]: CMD-(CLI):line console 0
[12/5 10:57:12]: CMD-(CLI):line vty 0 9
[12/5 10:57:13]: CMD-(CLI):boot system rpm0 primary flash://FTOS-CB-1.1.1.2E2.bin
```

Upgrading and Downgrading FTOS

Note: To upgrade or downgrade FTOS, see the release notes for the version you want to load on the system.