Dell PowerEdge FTOS
Command Line Reference
Guide for the
M I/O Aggregator

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About this Guide

This book provides information about the Dell Force10 operating software (FTOS) command line interface (CLI) on the Dell PowerEdge M I/O Aggregator. It includes some information about the protocols and features found in FTOS and on the Dell Force10 systems supported by FTOS.

This chapter includes:
- Objectives
- Audience
- Conventions
- Related Documents

Objectives

This document is intended as a reference guide for the FTOS CLI commands, with detailed syntax statements, usage information, and sample output examples.

For details about when to use the commands, refer to the FTOS Configuration Guide. This guide contains an Appendix with a list of the request for comment (RFCs) and management information base files (MIBs) supported.

Audience

This document is intended for system administrators who are responsible for configuring or maintaining networks. This document assumes you are knowledgeable in Layer 2 and Layer 3 networking technologies.

Conventions

This document uses the following conventions to describe command syntax:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>keyword</td>
<td>Keywords are in bold and must be entered in the CLI as listed.</td>
</tr>
<tr>
<td>parameter</td>
<td>Parameters are in italics and require a number or word to be entered in the CLI.</td>
</tr>
<tr>
<td>{X}</td>
<td>Keywords and parameters within braces must be entered in the CLI.</td>
</tr>
<tr>
<td>[X]</td>
<td>Keywords and parameters within brackets are optional.</td>
</tr>
</tbody>
</table>
Related Documents

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

- Dell PowerEdge Configuration Guide for the M I/O Aggregator
- Dell PowerEdge M I/O Aggregator Getting Started Guide
- Release Notes for the M I/O Aggregator
Before You Start

By following the instructions in the Dell PowerEdge M I/O Aggregator Getting Started Guide that is shipped with the product, you install the Aggregator in a Dell PowerEdge M1000e Enclosure.

The Aggregator installs with zero-touch configuration. After you power it on, an Aggregator boots up with default settings and auto-configures with software features enabled. This chapter describes the default settings and software features that are automatically configured at startup. Use the tasks described in the other chapters to reconfigure the Aggregator for customized network operation.

Default Settings

The I/O Aggregator provides zero-touch configuration with the following default configuration settings:

- Default user name (root)
- Password (calvin)
- VLAN (vlan1) and IP address for in-band management (DHCP-assigned)
- IP address for out-of-band (OOB) management (DHCP-assigned)
- Read-only SNMP community name (public)
- Broadcast storm control (enabled)
- Unregistered Multicast Packets flooding (enabled)
- IGMP snooping in all VLANs except the default VLAN (enabled)
- VLAN configuration (all ports belong to all VLANs)

You can change any of these default settings using the CLI. Refer to the appropriate chapter for details.

**Note:** You can also change many of the default settings using the chassis management controller (CMC) interface. For information about how to access the CMC to configure an Aggregator, refer to the Dell PowerEdge M1000e Enclosure Hardware Owner's Manual or Dell Chassis Management Controller (CMC) User's Guide on the Dell Support website at http://support.dell.com/support/edocs/systems/pem/en/index.htm.

Other Auto-Configured Settings

After the Aggregator powers on, it auto-configures and is operational with software features enabled, including:

- VLANs: All ports are configured as members of all (4094) VLANs. All VLANs are up and can send or receive layer 2 traffic. For more information, refer to VLANs.
- Data Center Bridging Capability Exchange Protocol (DCBX)
• Fibre Channel over Ethernet (FCoE) connectivity
• FCoE Initiation Protocol (FIP) snooping
• Hybrid ports: Ports are administratively up and auto-configured to operate as hybrid ports to transmit tagged and untagged VLAN traffic.
• iSCSI optimization
• IGMP snooping
• Jumbo frames: Ports are set to a maximum MTU of 12,000 bytes by default.
• Link aggregation: All uplink ports are configured in a single LAG (LAG 128).
• Link Layer Discovery Protocol (LLDP): Enabled on all ports.
• Link tracking: Enables server-facing links to be brought up only if the uplink port-channel (LAG 128) is up.
• Stacking: Stacking is supported only on the 40GbE ports on the base module. A single stack is limited to two Aggregators in the same chassis. Up to three stacks are supported in an M1000e chassis. To configure a switch stack, you must use the CLI. For more information, refer to Chapter 21, Stacking Commands.

DCB Support

DCB enhancements for data center networks are supported to eliminate packet loss and provision links with required bandwidth.

The Aggregator provides zero-touch configuration for DCB. The Aggregator auto-configures DCBX port roles to match the DCBX configuration in the ToR switches to which it connects through its uplink ports.

The Aggregator supports DCB only in standalone mode and not in the stacking mode.

FCoE Connectivity

Many data centers use Fibre Channel (FC) in storage area networks (SANs). Fibre Channel over Ethernet (FCoE) encapsulates Fibre Channel frames over Ethernet networks.

On an Aggregator, the internal ports support FCoE connectivity and connect to the converged network adapter (CNA) in blade servers. FCoE allows Fibre Channel to use 10-Gigabit Ethernet networks while preserving the Fibre Channel protocol.

The Aggregator also provides zero-touch configuration for FCoE configuration. The Aggregator auto-configures to match the FCoE settings used in the ToR switches to which it connects through its uplink ports.

iSCSI Operation

Support for iSCSI traffic is turned on by default when the Aggregator powers up. No configuration is required.

When the Aggregator powers up, it monitors known TCP ports for iSCSI storage devices on all interfaces. When a session is detected, an entry is created and monitored as long as the session is active.
The Aggregator also detects iSCSI storage devices on all interfaces and auto-configures to optimize performance. Performance optimization operations, such as Jumbo frame size support, STP port-state fast, and disabling of storm control on interfaces connected to an iSCSI storage device, are applied automatically.

CLI configuration is necessary only when the configuration includes iSCSI storage devices that cannot be automatically detected and when non-default QoS handling is required.

**Link Aggregation**

All uplink ports are configured in a single LAG (LAG 128). Server-facing ports are auto-configured as part of link aggregation groups if the corresponding server is configured for LACP-based NIC teaming. Static LAGs are not supported.

**Tip:** The recommended LACP timeout is long-timeout mode.

**Link Tracking**

By default, all server-facing ports are tracked by the operational status of the uplink LAG. If the uplink LAG goes down, the Aggregator loses its connectivity and is no longer operational; all server-facing ports are brought down.

**Tip:** If installed servers do not have connectivity to a ToR switch, check the Link Status LED of uplink ports on the Aggregator. If all LEDs are ON, check the LACP configuration on the ToR switch that is connected to the Aggregator to ensure the LACP is correctly configured.

**VLANs**

By default, all Aggregator ports belong to all 4094 VLANs and are members of untagged VLAN 1. You can use the CLI or CMC interface to configure only the required VLANs on a port.

When you configure VLANs on server-facing interfaces (ports 1 to 32), you can assign VLANs to a port or a range of ports by entering the `vlan tagged` or `vlan untagged` commands in interface configuration mode; for example:

```
FTOS(conf)# interface tengigabitethernet 0/2 - 4
FTOS(conf-if-range-te-0/2-4)# vlan tagged 5,7,10-12
FTOS(conf-if-range-te-0/2-4)# vlan untagged 3
```

**Note:** You can also use the CMC interface to configure VLANs.

**Uplink LAG**

The tagged VLAN membership of the uplink LAG is automatically configured based on the VLAN configuration of all server-facing ports (ports 1 to 32).
The untagged VLAN used for the uplink LAG is always the default VLAN.

**Server-Facing LAGs**

The tagged VLAN membership of a server-facing LAG is automatically configured based on the server-facing ports that are members of the LAG.

The untagged VLAN of a server-facing LAG is configured based on the untagged VLAN to which the lowest numbered server-facing port in the LAG belongs.

**Tip:** Dell Force10 recommends that you configure the same VLAN membership on all LAG member ports.

**Stacking Mode**

When you configure an Aggregator to operate in stacking mode (See “Configuring and Bringing Up a Stack” in the Dell Force10 Configuration Guide for the M I/O Aggregator), VLANs are reconfigured as follows:

If an Aggregator port belonged to all 4094 VLANs in standalone mode (default), all VLAN membership is removed and the port is assigned only to default VLAN 1. You must configure additional VLAN membership as necessary.

If you had manually configured an Aggregator port to belong to one or more VLANs (non-default) in standalone mode, the VLAN configuration is retained in stacking mode only on the master switch.

When you reconfigure an Aggregator from stacking to standalone mode:

Aggregator ports that you manually configured for VLAN membership in stacking mode retain their VLAN configuration in standalone mode.

To restore the default auto-VLAN mode of operation (in which all ports are members of all 4094 VLANs) on a port, enter the auto vlan command; for example:

```
FTOS(conf)# interface tengigabitethernet 0/2
FTOS(conf-if-te-0/2)# auto vlan
```

**Where to Go From Here**

You can customize the Aggregator for use in your data center network as necessary. To perform additional switch configuration, do one of the following:

- For remote out-of-band management, enter the OOB management interface IP address into a Telnet or SSH client and log in to the switch using the user ID and password to access the CLI.
- For local management using the CLI, use the attached console connection.
- For remote in-band management from a network management station, enter the VLAN IP address of the management port and log in to the switch to access the CLI.

If you installed the Aggregator in a stack, you can configure additional settings for switch stacking.
In case of an FTOS upgrade, you can check to see that an Aggregator is running the latest FTOS version by entering the `show version` command. To download an FTOS version, go to [http://support.dell.com](http://support.dell.com).

Refer to the appropriate chapter for detailed information on how to configure specific software settings.
CLI Basics

This chapter describes the command structure and command modes. The Dell Force10 operating software (FTOS) commands are in a text-based interface that allows you to use launch commands, change the command modes, and configure interfaces and protocols.

This chapter includes the following sections:

- Accessing the Command Line
- Multiple Configuration Users
- Navigating the Command Line Interface
- Obtaining Help
- Using the Keyword no
- Filtering show Commands
- Command Modes

Accessing the Command Line

When the system boots successfully, you are positioned on the command line in EXEC mode and not prompted to log in. You can access the commands through a serial console port or a Telnet session. When you Telnet into the switch, you are prompted to enter a login name and password.

Figure 3-1 is an example of a successful Telnet login session.

Figure 3-1. Login Example

telnet 172.31.1.53
Trying 172.31.1.53...
Connected to 172.31.1.53.
Escape character is '^]'.
Login: username
Password:
FTOS>

After you log into the switch, the prompt provides you with current command-level information (Table 3-1).
Multiple Configuration Users

When a user enters CONFIGURATION mode and another user(s) is already in that configuration mode, FTOS generates an alert warning message similar to Figure 3-2:

Figure 3-2. Configuration Mode User Alert

```
FTOS#conf
% Warning: The following users are currently configuring the system:
User "" on line console0
User "admin" on line vty0 (123.12.1.123)
User "admin" on line vty1 (123.12.1.123)
User "Irene" on line vty3 (123.12.1.321)
```

When another user enters CONFIGURATION mode, FTOS sends a message similar to the following, (the user in this case is “admin” on vty2):

```
% Warning: User "admin" on line vty2 "172.16.1.210" is in configuration
```

Navigating the Command Line Interface

The command line interface (CLI) prompt displayed by FTOS is comprised of:

- "hostname"— the initial part of the prompt, “FTOS” by default. You can change it with the `hostname` command, as described in `hostname`.
- The second part of the prompt, reflecting the current CLI mode, is shown in Table 3-1.

The CLI prompt changes as you move up and down the levels of the command structure.

Table 3-1 lists the prompts and their corresponding command levels, called *modes*. Starting with CONFIGURATION mode, the command prompt adds modifiers to further identify the mode. The command modes are explained in **Command Modes**.

<table>
<thead>
<tr>
<th>Prompt</th>
<th>CLI Command Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTOS&gt;</td>
<td>EXEC</td>
</tr>
<tr>
<td>FTOS#</td>
<td>EXEC Privilege</td>
</tr>
<tr>
<td>FTOS(conf)#</td>
<td>CONFIGURATION</td>
</tr>
<tr>
<td>FTOS(conf-if-te-0/0)#</td>
<td>INTERFACE</td>
</tr>
<tr>
<td>FTOS(conf-if-vl-1)#</td>
<td>INTERFACE</td>
</tr>
<tr>
<td>FTOS(conf-if-ma-0/0)#</td>
<td>INTERFACE</td>
</tr>
<tr>
<td>FTOS(conf-if-range)#</td>
<td>INTERFACE</td>
</tr>
<tr>
<td>FTOS(conf-line-console)#</td>
<td>LINE</td>
</tr>
<tr>
<td>FTOS(conf-line-vty)#</td>
<td>LINE</td>
</tr>
<tr>
<td>FTOS(conf-mon-sess)#</td>
<td>MONITOR SESSION</td>
</tr>
</tbody>
</table>
Obtaining Help

As soon as you are in a command mode, there are several ways to access help.

- To obtain a list of keywords at any command mode, do the following:
  - Enter a `?` at the prompt or after a keyword. There must always be a space before the `?`.
- To obtain a list of keywords with a brief functional description, do the following:
  - Enter `help` at the prompt.
- To obtain a list of available options, do the following:
  - Type a keyword followed by a space and a `?`
  - Type a partial keyword followed by a `?`
    - A display of keywords beginning with the partial keyword is listed.

Figure 3-3 shows the results of entering `ip ?` at the prompt.

Figure 3-3. Partial Keyword Example

<table>
<thead>
<tr>
<th>CLI Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>igmp</td>
<td>Internet Group Management Protocol</td>
</tr>
<tr>
<td>route</td>
<td>Establish static routes</td>
</tr>
<tr>
<td>telnet</td>
<td>Specify telnet options</td>
</tr>
</tbody>
</table>

When entering commands, you can take advantage of the following time saving features:

- The commands are not case sensitive.
- You can enter partial (truncated) command keywords. For example, you can enter `int tengig interface` for the `interface tengigabitethernet` command.
- Use the `TAB` key to complete keywords in commands.
- Use the `up arrow` key to display the last enabled command.
- Use either the `Backspace` key or the `Delete` key to erase the previous character.

Use the `left` and `right arrow` keys to navigate left or right in the FTOS command line. Table 3-2 defines the key combinations valid at the FTOS command line.

**Table 3-2. Short-cut Keys and their Actions**

<table>
<thead>
<tr>
<th>Key Combination</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNTL-A</td>
<td>Moves the cursor to the beginning of the command line.</td>
</tr>
<tr>
<td>CNTL-B</td>
<td>Moves the cursor back one character.</td>
</tr>
<tr>
<td>CNTL-D</td>
<td>Deletes character at cursor.</td>
</tr>
<tr>
<td>CNTL-E</td>
<td>Moves the cursor to the end of the line.</td>
</tr>
<tr>
<td>CNTL-F</td>
<td>Moves the cursor forward one character.</td>
</tr>
<tr>
<td>CNTL-I</td>
<td>Completes a keyword.</td>
</tr>
<tr>
<td>CNTL-K</td>
<td>Deletes all characters from the cursor to the end of the command line.</td>
</tr>
<tr>
<td>CNTL-N</td>
<td>Return to more recent commands in the history buffer after recalling commands with Ctrl-P or the up arrow key.</td>
</tr>
<tr>
<td>CNTL-P</td>
<td>Recalls commands, beginning with the last command.</td>
</tr>
<tr>
<td>CNTL-U</td>
<td>Deletes the line.</td>
</tr>
<tr>
<td>CNTL-W</td>
<td>Deletes the previous word.</td>
</tr>
</tbody>
</table>
### Table 3-2. Short-cut Keys and their Actions

<table>
<thead>
<tr>
<th>Key Combination</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNTL-X</td>
<td>Deletes the line.</td>
</tr>
<tr>
<td>CNTL-Z</td>
<td>Comes back to EXEC mode from any CONFIGURATION mode.</td>
</tr>
<tr>
<td>Esc B</td>
<td>Moves the cursor back one word.</td>
</tr>
<tr>
<td>Esc F</td>
<td>Moves the cursor forward one word.</td>
</tr>
<tr>
<td>Esc D</td>
<td>Deletes all characters from the cursor to the end of the word.</td>
</tr>
</tbody>
</table>
Using the Keyword no

To disable, delete, or return to default values, use the no form of the commands. For most commands, if you type the keyword no in front of the command, you will disable that command or delete it from the running configuration. In this document, the no form of the command is described in the “Syntax” portion of the command description.

**Syntax**

```plaintext
no {boot | default | enable | ftp-server | hardware | hostname | ip | line | logging | monitor | service | io-aggregator broadcast storm-control | snmp-server | username}
```

**Defaults**

None

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

---

Filtering show Commands

You can filter the display output of a show command to find specific information, to display certain information only, or to begin the command output at the first instance of a regular expression or phrase.

When you execute a show command, followed by a pipe ( | ) and one of the parameters listed below and a regular expression, the resulting output either excludes or includes those parameters, as defined by the parameter:

- **except** — display only text that does not match the pattern (or regular expression)
- **find** — search for the first occurrence of a pattern
- **grep** — display text that matches a pattern
- **no-more** — do not paginate the display output
- **save** — copy output to a file for future use

**Note:** FTOS accepts a space before or after the pipe, no space before or after the pipe, or any combination. For example:

```
FTOS#command | grep ten_gigabit | except regular-expression | find regular-expression
```

The `grep` command option has an `ignore-case` sub-option that makes the search case-insensitive. For example, the commands:

- `show run | grep Ethernet` returns a search result with instances containing a capitalized “Ethernet,” such as `interface TenGigabitEthernet 0/0`.
- `show run | grep ethernet` does not return the search result above because it only searches for instances containing a non-capitalized “ethernet”.
- `show run | grep Ethernet ignore-case` returns instances containing both “Ethernet” and “ethernet”.

---

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Displaying All Output

To display the output all at once (not one screen at a time), use the no-more command after the pipe. This is similar to the terminal length screen-length command except that the no-more option affects the output of just the specified command. For example:

```
FTOS# show running-config | no-more
```

Filtering Command Output Multiple Times

You can filter a single command output multiple times. To do this, place the save option as the last filter. For example:

```
FTOS# command | grep regular-expression | except regular-expression | grep other-regular-expression | find regular-expression | no-more | save
```

Command Modes

To navigate to various CLI modes, use specific commands to launch each mode. Navigation to these modes is described in the following sections.

**EXEC Mode**

When you initially log in to the switch, by default you are logged into EXEC mode. This mode allows you to view settings and to enter EXEC Privilege mode to configure the device. While you are in EXEC mode, the > prompt is displayed following the “hostname” prompt (which is “FTOS” by default). You can change this using the hostname command. For more information, refer to the hostname command. Each mode prompt is preceded by the hostname.

**EXEC Privilege Mode**

The enable command accesses EXEC Privilege mode. If an administrator has configured an Enable password, you are prompted to enter the password here.

EXEC Privilege mode allows you to access all commands accessible in EXEC mode, plus other commands, such as to clear ARP entries and IP addresses. In addition, you can access CONFIGURATION mode to configure interfaces, routes, and protocols on the switch. While you are logged in to EXEC Privilege mode, the # prompt displays.

**CONFIGURATION Mode**

In EXEC Privilege mode, use the configure command to enter CONFIGURATION mode and configure routing protocols and access interfaces.

To enter CONFIGURATION mode:
1. Verify that you are logged in to EXEC Privilege mode.
2. Enter the configure command. The prompt changes to include (conf).
From this mode, you can enter INTERFACE mode using the interface command.

**INTERFACE Mode**

Use INTERFACE mode to configure interfaces or IP services on those interfaces. An interface can be physical (for example, a TenGigabit Ethernet port) or virtual (for example, the Null interface).

To enter INTERFACE mode:

1. Verify that you are logged into CONFIGURATION mode.
2. Enter the interface command followed by an interface type and interface number that is available on the switch.
3. The prompt changes to include the designated interface and slot/port number (Table 3-3).

**Table 3-3. Interface prompts**

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTOS(conf-if-te-0/0)#</td>
<td>Ten Gigabit Ethernet interface followed by slot/port information</td>
</tr>
<tr>
<td>FTOS(conf-if-vl-1)#</td>
<td>VLAN Interface followed by VLAN number (range 1 to 4094)</td>
</tr>
<tr>
<td>FTOS(conf-if-ma-0/0)#</td>
<td>Management Ethernet interface followed by slot/port information</td>
</tr>
<tr>
<td>FTOS(conf-if-range)#</td>
<td>Designated interface range (used for bulk configuration; refer to group).</td>
</tr>
</tbody>
</table>

**LINE Mode**

Use LINE mode to configure console or virtual terminal parameters.

To enter LINE mode:

1. Verify that you are logged in to CONFIGURATION mode.
2. Enter the line command. You must include the keywords console or vty and their line number available on the switch. The prompt changes to include (config-line-console) or (config-line-vty).

You can exit this mode using the exit command.

**MONITOR SESSION Mode**

While in CONFIGURATION mode, use the monitor session command to enter MONITOR SESSION mode. Use this mode to configure port monitoring.

To enter MONITOR SESSION mode:

1. Verify that you are logged in to CONFIGURATION mode.
2. Use the monitor session command. You must enter the monitor session id. The prompt changes to include (conf-mon-sess).

You can return to CONFIGURATION mode using the exit command.
PROTOCOL LLDP Mode

While in CONFIGURATION mode, use the protocol lldp command to enter PROTOCOL LLDP mode. Use this mode to configure the LLDP protocol.

To enter MONITOR SESSION mode:
1. Verify that you are logged in to CONFIGURATION mode.
2. Use the protocol lldp command. You must enter the monitor session id. The prompt changes to include (conf-lldp).

You can return to CONFIGURATION mode using the exit command.
File Management

Overview

This chapter contains commands needed to manage the configuration files and includes other file management commands found in the Dell Force10 operating software (FTOS).

Basic File Management Commands

The commands included in this chapter are:

- boot system gateway
- boot system stack-unit
- cd
- copy
- copy running-config startup-config
- delete
- dir
- format flash
- logging coredump server
- logging coredump stack-unit
- pwd
- rename
- restore factory-defaults
- show boot system
- show file
- show file-systems
- show os-version
- show running-config
- show version
- upgrade boot
- upgrade system
**boot system gateway**

Specify the IP address of the default next-hop gateway for the management subnet.

**Syntax**

```
boot system gateway ip-address
```

**Parameters**

- `ip-address`: Enter an IP address in dotted decimal format.

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

Saving the address to the startup configuration file preserves the address in NVRAM in case the startup configuration file is deleted.

**boot system stack-unit**

Specify the location of the FTOS image to be used to boot the system.

**Syntax**

```
boot system stack-unit <0-5 | all> {default | primary | secondary}
```

**Parameters**

- `0-5`: Enter the stack member unit identifier of the stack member.
- `all`: Enter this keyword to set the primary, secondary, and default images for the system.
- `default`: Enter this keyword to set the default image path for the system.
- `primary`: Enter this keyword to set the primary image path for the system.
- `secondary`: Enter this keyword to set the secondary image path for the system.

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

The system first attempts to load the image from the primary path. If it fails to boot, the system will try to load the image from the secondary path and if that too fails, the system will load the default image.

**cd**

Change to a different working directory.

**Syntax**

```
cd directory
```

**Parameters**

- `directory`: (OPTIONAL) Enter one of the following:
  - `flash`: (internal Flash) or any sub-directory
  - `usbflash`: (external Flash) or any sub-directory

**Command Modes**

EXEC Privilege
Copy

Copy one file to another location. FTOS supports IPv4 addressing for FTP, TFTP, and SCP (in the hostip field).

Syntax

copy source-file-url destination-file-url

Parameters

- **file-url**: Enter the following location keywords and information:
  - To copy a file from the internal FLASH, enter flash:// followed by the filename.
  - To copy the running configuration, enter the keyword running-config.
  - To copy the startup configuration, enter the keyword startup-config.
  - To copy a file on the external FLASH, enter usbflash:// followed by the filename.

Command Modes

- EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

FTOS supports a maximum of 100 files, at the root directory level, on both the internal and external Flash.

The usbflash commands are supported. For a list of approved USB vendors, refer to the FTOS Release Notes.

When copying a file to a remote location (for example, using Secure Copy [SCP]), enter only the keywords and FTOS prompts you for the rest of the information.

For example, when using SCP, you can enter copy running-config scp:

The running-config is the source, and the target is specified in the ensuing prompts. FTOS prompts you to enter any required information, as needed for the named destination—remote destination, destination filename, user ID and password, etc.

When you use the copy running-config startup-config command to copy the running configuration (the startup configuration file amended by any configuration changes made since the system was started) to the startup configuration file, FTOS creates a backup file on the internal flash of the startup configuration.

FTOS supports copying the running-configuration to a TFTP server or to an FTP server:

copy running-config tftp:

copy running-config ftp:
In this example — copy scp: flash: — specifying SCP in the first position indicates that the target is to be specified in the ensuing prompts. Entering flash: in the second position means that the target is the internal Flash. In this example the source is on a secure server running SSH, so the user is prompted for the UDP port of the SSH server on the remote host.

Related Commands

| cd | Changes the working directory. |

**copy running-config startup-config**

Copy running configuration to the startup configuration.

**Syntax**

copy running-config startup-config {duplicate}

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

This command is useful for quickly making a changed configuration on one chassis available on external flash in order to move it to another chassis.
delete

Delete a file from the flash. Once deleted, files cannot be restored.

Syntax

```
delete flash: ([flash://]filepath) usbflash ([usbflash://] filepath)
```

Parameters

- **flash-url**: Enter the following location and keywords:
  - For a file or directory on the internal Flash, enter flash:// followed by the filename or directory name.
  - For a file or directory on the external Flash, enter usbflash:// followed by the filename or directory name.

- **no-confirm**: (OPTIONAL) Enter the keyword no-confirm to specify that FTOS does not require user input for each file prior to deletion.

Command Modes

- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator

dir

Displays the files in a file system. The default is the current directory.

Syntax

```
dir [filename | directory name:]
```

Parameters

- **filename | directory name**: (OPTIONAL) Enter one of the following:
  - For a file or directory on the internal Flash, enter flash:// followed by the filename or directory name.
  - For a file or directory on the external Flash, enter usbflash:// followed by the filename or directory name.

Command Modes

- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator
Example

Figure 4-3. dir for the Internal Flash Command Example

```
FTOS#dir
Directory of flash:
1 drwx 4096 Jan 01 1980 00:00:00 +00:00 .
2 drwx 4096 Jul 19 2012 10:36:07 +00:00 ..
3 drwx 4096 Apr 03 2012 20:25:02 +00:00 TRACE_LOG_DIR
4 drwx 4096 Apr 03 2012 20:25:02 +00:00 CORE_DUMP_DIR
5 d--- 4096 Apr 03 2012 20:25:02 +00:00 ADMIN_DIR
6 -rw 506724352 Apr 19 2012 23:32:02 +00:00 out3
 7 -rw 715651180 Apr 17 2012 23:17:30 +00:00 out1
 8 -rw 30670080 May 18 2012 04:42:06 +00:00
FTOS-nav_ascii.bin
 9 -rw 76 May 02 2012 05:37:42 +00:00 dhcpBindConflict
10 -rw 1 Jul 06 2012 07:30:44 +00:00 testhttp
11 -rw 56839 May 17 2012 01:05:24 +00:00 writefru
12 -rw 150227 Jun 07 2012 16:57:24 +00:00 aaa
13 -rw 150227 Jun 07 2012 17:31:52 +00:00 bbb
14 -rw 561 Jun 26 2012 06:36:46 +00:00 jumpstartcfg
15 -rw 149553 Jul 04 2012 04:27:48 +00:00
startup-config.bak
16 -rw 4835 Jul 19 2012 10:34:28 +00:00 startup-config
17 -rw 8373 Jul 19 2012 06:44:34 +00:00 startup-config-1
flash: 2143281152 bytes total (836874240 bytes free)
FTOS#
```

Related Commands

**format flash**

Erase all existing files and reformat the filesystem in the internal flash memory. After the filesystem is formatted, files cannot be restored.

**Syntax**

```
format {flash: | usbflash:}
```

**Default**

flash memory

**Command Modes**

EXEC Privilege

**Usage Information**

You must include the colon (:) when entering this command.

⚠️ **Caution:** This command deletes all files, including the startup configuration file. So, after executing this command, consider saving the running config as the startup config (use the `write memory` command or the `copy run start` command).

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>cd</strong></td>
<td>Changes the working directory.</td>
</tr>
<tr>
<td><strong>copy</strong></td>
<td>Copies the current configuration to either the startup-configuration file or the terminal.</td>
</tr>
<tr>
<td><strong>show file</strong></td>
<td>Displays the contents of a text file in the local filesystem.</td>
</tr>
<tr>
<td><strong>show file-systems</strong></td>
<td>Displays information about the file systems on the system.</td>
</tr>
</tbody>
</table>
logging coredump server

Designate a server to upload core dumps.

**Syntax**

```
logging coredump server {ipv4-address} username name password [type] password
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ipv4-address</code></td>
<td>Enter the server IPv4 address (A.B.C.D)</td>
</tr>
<tr>
<td><code>name</code></td>
<td>Enter a username to access the target server.</td>
</tr>
<tr>
<td><code>type</code></td>
<td>Enter the password type:</td>
</tr>
<tr>
<td></td>
<td>• Enter 0 to enter an unencrypted password.</td>
</tr>
<tr>
<td></td>
<td>• Enter 7 to enter a password that has already been encrypted using a Type 7 hashing algorithm.</td>
</tr>
<tr>
<td><code>password</code></td>
<td>Enter a password to access the target server.</td>
</tr>
</tbody>
</table>

**Defaults**

Crash kernel files are uploaded to flash by default.

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

Because flash space may be limited, using this command ensures your entire crash kernel files are uploaded successfully and completely. Only a single coredump server can be configured. Configuration of a new coredump server over-writes any previously configured server.

**Note:** You must disable `logging coredump stack-unit` before you designate a new server destination for your core dumps.

**Related Commands**

- `logging coredump stack-unit` Enable the kernel coredump

logging coredump stack-unit

Enable the coredump.

**Syntax**

```
logging coredump stack-unit all
```

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

The Kernel core dump can be large and may take up to five to 30 minutes to upload. FTOS does not overwrite application core dumps so delete them as necessary to conserve space on the flash; if the flash is out of memory, the coredump is aborted. FTOS completes the coredump process and waits until the upload is complete before rebooting the system.

**Related Commands**

- `logging coredump server` Designates a server to upload kernel core-dumps.
pwd

Displays the current working directory.

**Syntax**

pwd

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

Figure 4-4. pwd Command Example

```
FTOS#pwd
flash:
FTOS#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cd</td>
<td>Changes the working directory.</td>
</tr>
</tbody>
</table>

rename

Rename a file in the local file system.

**Syntax**

rename url url

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| url | Enter the following keywords and a filename:  
  - For a file on the internal Flash, enter flash:// followed by the filename.  
  - For a file on the external Flash, enter usbflash:// followed by the filename. |

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

restore factory-defaults

Restore factory defaults.

**Syntax**

restore factory-defaults stack-unit {0-5 | all} {clear-all | nvram}

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>factory-defaults</td>
<td>Return the system to its factory default mode.</td>
</tr>
<tr>
<td>0-5</td>
<td>Enter this keyword to restore only the mentioned stack-unit.</td>
</tr>
<tr>
<td>all</td>
<td>Enter this keyword to restore all units in the stack.</td>
</tr>
<tr>
<td>clear-all</td>
<td>Enter this keyword to reset the NvRAM and the system startup configuration.</td>
</tr>
<tr>
<td>nvram</td>
<td>Enter this keyword to reset the NvRAM only.</td>
</tr>
</tbody>
</table>

**Command Modes**

EXEC Privilege
Restoring factory defaults deletes the existing startup configuration and all persistent settings (stacking, fanout, etc.).

When restoring all units in a stack, all the units in the stack are placed into stand-alone mode.

When restoring a single unit in a stack, that unit placed in stand-alone mode. No other units in the stack are affected.

When restoring units in stand-alone mode, the units remain in stand-alone mode after the restoration.

After the restore is complete, the units power cycle immediately.

**Caution:** There is no undo for this command.

**Example**

**Figure 4-5. restore factory-defaults (all units in a stack) Command Example**

```
FTOS#restore factory-defaults stack-unit all clear-all
***********************************************************************
*  Warning - Restoring factory defaults will delete the existing      *
*  startup-config and all persistent settings (stacking, fanout, etc.)*
*  All the units in the stack will be split into standalone units.    *
*  After restoration the unit(s) will be powercycled immediately.     *
*  Proceed with caution !                                           *
********************************************************************************
Proceed with factory settings? Confirm [yes/no]:yes

-- Restore status --
Unit  Nvram  Config
----------------------
0    Success   Success
1    Success   Success
2    Success   Success
3    Not present
4    Not present
5    Not present

Power-cycling the unit(s).
FTOS#
```

**Figure 4-6. restore factory-defaults (single unit in a stack) Command Example**

```
FTOS#restore factory-defaults stack-unit 0 clear-all
***********************************************************************
*  Warning - Restoring factory defaults will delete the existing      *
*  startup-config and all persistent settings (stacking, fanout, etc.)*
*  After restoration the unit(s) will be powercycled immediately.     *
*  Proceed with caution !                                           *
********************************************************************************
Proceed with factory settings? Confirm [yes/no]:yes

-- Restore status --
Unit  Nvram  Config
----------------------
0    Success   Success
Power-cycling the unit(s).
FTOS#
```
**show boot system**

Displays information about boot images currently configured on the system.

**Syntax**

```
show boot system stack-unit {0-5 | all}
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>Enter this information to display the boot image information of only the entered stack-unit</td>
</tr>
<tr>
<td>all</td>
<td>Enter this keyword to display the boot image information of all the stack-units in the stack</td>
</tr>
</tbody>
</table>
show file

Displays contents of a text file in the local filesystem.

**Syntax**

show file url

**Parameters**

- **url** Enter one of the following:
  - For a file on the internal Flash, enter flash:// followed by the filename.
  - For a file on the external Flash, enter usbflash:// followed by the filename.

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

**Figure 4-10. show file Command Example (Partial)**

```
FTOS#show file flash://startup-config
! Version E8-3-17-38
! boot system stack-unit 1 primary tftp://10.11.9.21/dv-m1000e-2-b2
! boot system stack-unit 1 default system: A:
! boot system gateway 10.11.209.62
! hostname FTOS
--More--
FTOS#
```

**Related Commands**

- format flash Erases all existing files and reformats the filesystem in the internal flash memory.
- show file-systems Displays information about the file systems on the system.
show file-systems

Displays information about the file systems on the system.

**Syntax**

```
show file-systems
```

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

<table>
<thead>
<tr>
<th>Figure 4-11. show file-system Command Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTOS# show file-systems</td>
</tr>
<tr>
<td>Size(b)</td>
</tr>
<tr>
<td>2143281152</td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td>FTOS#</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4-1. show file-systems Command Output Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Size(b)</td>
</tr>
<tr>
<td>Free(b)</td>
</tr>
<tr>
<td>Feature</td>
</tr>
<tr>
<td>Type</td>
</tr>
</tbody>
</table>
| Flags | Displays the access available to the storage location. The following letters indicate the level of access:  
  • r = read access  
  • w = write access |
| Prefixes | Displays the name of the storage location. |

**Related Commands**

- `format flash`: Erases all existing files and reformats the filesystem in the internal flash memory.
- `show file`: Displays the contents of a text file in the local filesystem.

show os-version

Displays the release and software image version information of the image file specified.

**Syntax**

```
show os-version [file-url]
```
Parameters

file-url  (OPTIONAL) Enter the following location keywords and information:
  • For a file on the internal Flash, enter flash:/// followed by the filename.
  • For a file on an FTP server, enter ftp://user:password@hostip/filepath
  • For a file on a TFTP server, enter tftp://hostip/filepath
  • For a file on the external Flash, enter usbflash:/// followed by the filename.

Defaults

none

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0  Supported on M I/O Aggregator

Usage Information

Note: A filepath that contains a dot (.) is not supported.

Example

Figure 4-12. show os-version Command Example

FTOS#show os-version
RELEASE IMAGE INFORMATION :
---------------------------------------------------------------------
Platform          Version        Size           ReleaseTime
IOM-Series:  XL        8-3-17-38    31603078    Jul 19 2012 06:02:28
---------------------------------------------------------------------
TARGET IMAGE INFORMATION :
---------------------------------------------------------------------
Type          Version                   Target    checksum
runtime        8-3-17-38        Control Processor      passed
---------------------------------------------------------------------
CPLD IMAGE INFORMATION :
---------------------------------------------------------------------
Card                      CPLD Name    Version
Stack-unit 1                IOM SYSTEM CPLD          6
---------------------------------------------------------------------
FTOS#

show running-config

Displays the current configuration and changes from the default values.

Syntax

show running-config [entity] [configured] [status]

Parameters

entity  (OPTIONAL) Enter one of the keywords listed below to display that entity’s current (non-default) configuration. Note that, if nothing is configured for that entity, nothing is displayed and the prompt returns:
  • boot for the current boot configuration
  • ftp for the current FTP configuration
  • igmp for the current IGMP configuration
  • interface for the current interface configuration
  • iscsi for the current ISCSI configuration
  • line for the current line configuration
  • lldp for the current LLDP configuration
  • logging for the current logging configuration
### show running-config

- **management-route** for the current Management port forwarding configuration
- **monitor** for the current Monitor configuration
- **snmp** for the current SNMP configuration
- **uplink-state-group** for the uplink state group configuration
- **users** for the current users configuration

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>EXEC Privilege</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command History</td>
<td>Version 8.3.17.0</td>
</tr>
</tbody>
</table>

#### Example

**Figure 4-13. show running-config Command Example (Partial)**

```plaintext
FTOS#show running-config
Current Configuration ...
! Version E8-3-17-38
! Last configuration change at Mon Jul 23 14:34:31 2012 by default
! boot system stack-unit 1 primary tftp://10.11.9.21/dv-m1000e-2-b2
boot system stack-unit 1 default system: A:
boot system gateway 10.11.209.62
!
redundancy auto-synchronize full
!
! service timestamps log datetime
!
hostname FTOS
...
```

**Figure 4-14. show running-config Command Example**

```plaintext
FTOS#show running-config status
running-config bytes 5063, checksum 0xF6F801AC
startup-config bytes 4835, checksum 0x764D3787
FTOS#
```

#### Usage Information

The **status** option allows you to display the size and checksum of the running configuration and the startup configuration.

### show version

Displays the current FTOS version information on the system.

#### Syntax

```
show version
```

#### Command Modes

- EXEC Privilege

#### Command History

| Command History | Version 8.3.17.0 | Supported on M I/O Aggregator |
Example

Figure 4-15. show version Command Example

FTOS#show version
Dell Force10 Real Time Operating System Software
Dell Force10 Operating System Version: 1.0
Dell Force10 Application Software Version: E8-3-17-38
Copyright (c) 1999-2012 by Dell Inc. All Rights Reserved.
Build Time: Thu Jul 19 05:59:59 PDT 2012
Build Path: /sites/sjc/work/awb-systems-appendix-1-2/ravisubramani/ravis-8317/SW/SRC/
Cp_src/Tacacs
FTOS uptime is 4 day(s), 4 hour(s), 3 minute(s)

System image file is "dv-m1000e-2-b2"

System Type: I/O-Aggregator
Control Processor: MIPS RMI XLP with 2147483648 bytes of memory.
256M bytes of boot flash memory.

1 34-port GE/TE (XL)
56 Ten GigabitEthernet/IEEE 802.3 interface(s)

FTOS#

Table 4-2. show version Command Fields

<table>
<thead>
<tr>
<th>Lines beginning with</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dell Force10 Network...</td>
<td>Name of the operating system</td>
</tr>
<tr>
<td>Dell Force10 Operating...</td>
<td>OS version number</td>
</tr>
<tr>
<td>Dell Force10 Application...</td>
<td>Software version</td>
</tr>
<tr>
<td>Copyright (c)...</td>
<td>Copyright information</td>
</tr>
<tr>
<td>Build Time...</td>
<td>Software build’s date stamp</td>
</tr>
<tr>
<td>Build Path...</td>
<td>Location of the software build files loaded on the system</td>
</tr>
<tr>
<td>Dell Force10 uptime is...</td>
<td>Amount of time the system has been up</td>
</tr>
<tr>
<td>System image...</td>
<td>Image file name</td>
</tr>
<tr>
<td>Chassis Type:</td>
<td>System type (M I/O Aggregator)</td>
</tr>
<tr>
<td>Control Processor:...</td>
<td>Control processor information and amount of memory on processor.</td>
</tr>
<tr>
<td>256M bytes...</td>
<td>Amount of boot flash memory on the system</td>
</tr>
<tr>
<td>1 34-Port...</td>
<td>Hardware configuration of the system, including the number and type of physical interfaces available.</td>
</tr>
</tbody>
</table>

upgrade boot

Upgrade the bootflash image or bootselector image.

Syntax

```
upgrade boot {all | bootflash-image | bootselector-image} stack-unit {0-5 | all} {booted | flash: | ftp: | tftp: | usbflash:} {A: | B:}
```

Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Enter this keyword to change both the bootflash and bootselector images.</td>
</tr>
<tr>
<td>bootflash-image</td>
<td>Enter this keyword to change the bootflash image.</td>
</tr>
<tr>
<td>bootselector-image</td>
<td>Enter this keyword to change the bootselector image</td>
</tr>
<tr>
<td>0-5</td>
<td>Enter this keyword to upgrade only the mentioned stack-unit</td>
</tr>
<tr>
<td>Parameters</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>all</td>
<td>Enter this keyword to upgrade all the member stack-units</td>
</tr>
<tr>
<td>booted</td>
<td>Enter this keyword to upgrade from the current image in the M I/O Aggregator.</td>
</tr>
<tr>
<td>ftp</td>
<td>After entering this keyword you can either follow it with the location of the source file in this form: //userid:password@hostip/filepath, or press Enter to launch a prompt sequence.</td>
</tr>
<tr>
<td>tftp</td>
<td>After entering this keyword you can either follow it with the location of the source file in this form: //hostlocation/filepath, or press Enter to launch a prompt sequence.</td>
</tr>
<tr>
<td>flash</td>
<td>After entering this keyword you can either follow it with the location of the source file in this form: //filepath, or press Enter to launch a prompt sequence.</td>
</tr>
<tr>
<td>usbflash</td>
<td>After entering this keyword you can either follow it with the location of the source file in this form: //filepath, or press Enter to launch a prompt sequence.</td>
</tr>
<tr>
<td>A</td>
<td>Enter this keyword to upgrade the bootflash partition A</td>
</tr>
<tr>
<td>B</td>
<td>Enter this keyword to upgrade the bootflash partition B</td>
</tr>
</tbody>
</table>

**Defaults**
none

**Command Modes**
EXEC Privilege

**Command History**
- Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**
You must reload FTOS after executing this command.

**Example**

**Figure 4-16. upgrade boot Command Example**

```
FTOS#upgrade boot ?
all Upgrade both boot flash image and selector image
bootflash-image Upgrade boot flash image
bootselector-image Upgrade boot selector image
FTOS#
```

**upgrade system**

Upgrade the bootflash image or system image.

**Syntax**

```
upgrade system {flash: | ftp: | scp: | tftp: | usbflash: | stack-unit {0-5 | all} {A: | B:}}
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>Enter this keyword to upgrade only the mentioned stack-unit</td>
</tr>
<tr>
<td>all</td>
<td>Enter this keyword to upgrade all the member units of the stack</td>
</tr>
<tr>
<td>ftp</td>
<td>After entering this keyword you can either follow it with the location of the source file in this form: //userid:password@hostip/filepath, or press Enter to launch a prompt sequence.</td>
</tr>
<tr>
<td>scp</td>
<td>After entering this keyword you can either follow it with the location of the source file in this form: //userid:password@hostip/filepath, or press Enter to launch a prompt sequence.</td>
</tr>
<tr>
<td>tftp</td>
<td>After entering this keyword you can either follow it with the location of the source file in this form: //hostlocation/filepath, or press Enter to launch a prompt sequence.</td>
</tr>
</tbody>
</table>
Defaults

none

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0  Supported on M I/O Aggregator

Usage Information

You must reload FTOS after executing this command. Use the command upgrade system stack-unit to copy FTOS from the management unit to one or more stack members.

Example

Figure 4-17. upgrade system Command Example

```
FTOS#upgrade system ?
flash: Copy from flash file system (flash://filepath)
ftp: Copy from remote file system, IPv4 or IPv6, (ftp://userid:password@hostip/filepath)
scp: Copy from remote file system, IPv4 or IPv6, (scp://userid:password@hostip/filepath)
stack-unit Sync image to the stack-unit
tftp: Copy from remote file system, IPv4 or IPv6, (tftp://hostip/filepath)
usbflash: Copy from usbflash file system (usbflash://filepath)
FTOS#
```
Control and Monitoring

This chapter describes control and monitoring for the M I/O Aggregator.

Commands

This chapter includes the following commands:

<table>
<thead>
<tr>
<th>Command</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear alarms</td>
<td>show debugging</td>
</tr>
<tr>
<td>clear command history</td>
<td>show diag</td>
</tr>
<tr>
<td>configure</td>
<td>show environment</td>
</tr>
<tr>
<td>debug cpu-traffic-stats</td>
<td>show inventory</td>
</tr>
<tr>
<td>debug ifm trace-flags</td>
<td>show memory</td>
</tr>
<tr>
<td>disable</td>
<td>show processes cpu</td>
</tr>
<tr>
<td>enable</td>
<td>show processes ipc flow-control</td>
</tr>
<tr>
<td>end</td>
<td>show processes memory</td>
</tr>
<tr>
<td>exit</td>
<td>show server-interfaces</td>
</tr>
<tr>
<td>ftp-server enable</td>
<td>show system</td>
</tr>
<tr>
<td>ftp-server topdir</td>
<td>show revision</td>
</tr>
<tr>
<td>ftp-server username</td>
<td>show tech-support</td>
</tr>
<tr>
<td>hostname</td>
<td>show uplink brief</td>
</tr>
<tr>
<td>ip telnet server enable</td>
<td>show util-threshold cpu</td>
</tr>
<tr>
<td>ip telnet source-interface</td>
<td>show util-threshold memory</td>
</tr>
<tr>
<td>line</td>
<td>ssh-peer-stack-unit</td>
</tr>
<tr>
<td>ping</td>
<td>telnet-peer-stack-unit</td>
</tr>
<tr>
<td>reload</td>
<td>terminal length</td>
</tr>
<tr>
<td>service timestamps</td>
<td>terminal xml</td>
</tr>
<tr>
<td>show alarms</td>
<td>terminal monitor</td>
</tr>
<tr>
<td>show command-history</td>
<td>traceroute</td>
</tr>
<tr>
<td>show configuration lock</td>
<td>undefine all</td>
</tr>
<tr>
<td>show cpu-traffic-stats</td>
<td>write</td>
</tr>
</tbody>
</table>
clear alarms

Clear the alarms on the system.

Syntax

clear alarms

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

This command clears alarms that are no longer active. If an alarm situation is still active, it is seen in the system output.

clear command history

Clear the command history log.

Syntax

clear command history

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Related Commands

show command-history Displays a buffered log of all commands entered by all users along with a time stamp.

configure

Enter the CONFIGURATION mode from EXEC Privilege mode.

Syntax

configure [terminal]

Parameters

terminal (OPTIONAL) Enter the keyword terminal to specify that you are configuring from the terminal.

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 5-1. configure Command Example

FTOS#configure
FTOS(conf)#
debug cpu-traffic-stats

Enable the collection of CPU traffic statistics.

Syntax
debug cpu-traffic-stats

Defaults
Disabled

Command Modes
EXEC Privilege

Command History

Version 8.3.17.0  Supported on M I/O Aggregator

Usage Information
This command enables (and disables) the collection of CPU traffic statistics from the time this command is executed (not from system boot). However, excessive traffic received by a CPU automatically triggers (turns on) the collection of CPU traffic statistics. Use the show configuration lock to view the traffic statistics.

If excessive traffic is received by CPU, traffic is rate controlled

Note: This command must be enabled before the show configuration lock command displays traffic statistics. Dell Force10 recommends disabling debugging (no debug cpu-traffic-stats) after troubleshooting is complete.

Related Commands
show configuration lock  Displays the cpu traffic statistics

debug ifm trace-flags

Turn on the IFM internal trace-flags.

Syntax
debug ifm trace-flags  trace-flags

Disable this command using the no debug ifm trace-flags command.

Parameters

trace-flags  Enter a hexadecimal number representing the trace-flag.

Defaults
None

Command Modes
EXEC Privilege

Command History

Version 8.3.17.0  Supported on M I/O Aggregator

Usage Information
Disable this command using the no debug ifm trace-flags command.

Note: Use this command only when you are working directly with a technical support representative to troubleshoot a problem. Do not use this command unless a technical support representative instructs you to do so.
disable

Return to EXEC mode.

Syntax
disable [level]

Parameters
level (OPTIONAL) Enter a number for a privilege level of the FTOS.
Range: 0 to 15.
Default: 1

Defaults
1

Command Modes
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

enable

Enter the EXEC Privilege mode or any other privilege level configured. After entering this command, you may need to enter a password.

Syntax
enable [level]

Parameters
level (OPTIONAL) Enter a number for a privilege level of FTOS.
Range: 0 to 15.
Default: 15

Defaults
15

Command Modes
EXEC

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information
Users entering EXEC Privilege mode or any other configured privilege level can access configuration commands. To protect against unauthorized access, use the enable password command to configure a password for the enable command at a specific privilege level. If no privilege level is specified, the default is privilege level 15.

Related Commands
enable password Configures a password for the enable command and to access a privilege level.

end

Return to the EXEC Privilege mode from other command modes (for example, CONFIGURATION mode).

Syntax
end
Control and Monitoring

Command Modes

- CONFIGURATION
- LINE
- INTERFACE
- MONITOR SESSION
- PROTOCOL LLDP

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Related Commands

exit
Returns to the lower command mode.

exit
Return to the lower command mode.

Syntax
exit

Command Modes

- EXEC Privilege
- CONFIGURATION
- LINE
- INTERFACE
- PROTOCOL LLDP

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Related Commands

end
Returns to EXEC Privilege command mode.

ftp-server enable

Enable the FTP server functions on the system.

Syntax
ftp-server enable

Defaults
Disabled.

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0 Supported on M I/O Aggregator
Example

**Figure 5-2. Logging on to an FTP Server Example**

```
morpheus% ftp 10.31.1.111
Connected to 10.31.1.111.
220 Dell Force10 (1.0) FTP server ready
Name (10.31.1.111:dch): dch
331 Password required
Password:
230 User logged in
ftp> pwd
257 Current directory is "flash:"
ftp> dir
200 Port set okay
150 Opening ASCII mode data connection
          size    date       time       name
----------   ------     ------    --------
    512  Jul-20-2004 18:15:00   tgtimg
    512  Jul-20-2004 18:15:00   diagnostic
    512  Jul-20-2004 18:15:00   other
    512  Jul-20-2004 18:15:00   tgt
226 Transfer complete
329 bytes received in 0.018 seconds (17.95 Kbytes/s)
ftp>
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ftp-server topdir</code></td>
<td>Sets the directory to be used for incoming FTP connections.</td>
</tr>
<tr>
<td><code>ftp-server username</code></td>
<td>Sets a username and password for incoming FTP connections.</td>
</tr>
</tbody>
</table>

**ftp-server topdir**

Specify the top-level directory to be accessed when an incoming FTP connection request is made.

**Syntax**

```
ftp-server topdir directory
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>directory</code></td>
<td>Enter the directory path.</td>
</tr>
</tbody>
</table>

**Defaults**

The internal flash is the default directory.

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

After you enable FTP server functions with the `ftp-server enable` command, Dell Force10 recommends specifying a top-level directory path. Without a top-level directory path specified, the FTOS directs users to the flash directory when they log in to the FTP server.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ftp-server enable</code></td>
<td>Enables FTP server functions on the M I/O Aggregator.</td>
</tr>
<tr>
<td><code>ftp-server username</code></td>
<td>Sets a username and password for incoming FTP connections to the M I/O Aggregator.</td>
</tr>
</tbody>
</table>
ftp-server username
Create a user name and associated password for incoming FTP server sessions.

**Syntax**

```
ftp-server username username password [encryption-type] password
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>username</td>
<td>Enter a text string up to 40 characters long as the user name.</td>
</tr>
<tr>
<td>password password</td>
<td>Enter the keyword password followed by a string up to 40 characters long as the password. Without specifying an encryption type, the password is unencrypted.</td>
</tr>
<tr>
<td>encryption-type</td>
<td>(OPTIONAL) After the keyword password enter one of the following numbers:</td>
</tr>
<tr>
<td></td>
<td>• 0 (zero) for an unencrypted (clear text) password</td>
</tr>
<tr>
<td></td>
<td>• 7 (seven) for hidden text password</td>
</tr>
</tbody>
</table>

**Defaults**

Not enabled.

**Command Modes**

CONFIGURATION

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td>Supported on M I/O Aggregator</td>
</tr>
</tbody>
</table>

hostname
Set the host name of the system.

**Syntax**

```
hostname name
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Enter a text string, up to 32 characters long.</td>
</tr>
</tbody>
</table>

**Defaults**

FTOS

**Command Modes**

CONFIGURATION

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td>Supported on M I/O Aggregator</td>
</tr>
</tbody>
</table>

ip telnet server enable
Enable the Telnet server on the switch.

**Syntax**

```
ip telnet server enable
```

**Defaults**

Enabled

**Command Modes**

CONFIGURATION

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td>Supported on M I/O Aggregator</td>
</tr>
</tbody>
</table>
ip telnet source-interface

Set an interface’s IP address as the source address in outgoing packets for Telnet sessions.

Syntax

    ip telnet source-interface interface

Parameters

    interface  Enter the following keywords and slot/port or number information:
                 • For a 10-Gigabit Ethernet interface, enter the keyword TenGigabitEthernet followed by
                   the slot/port information.
                 • For VLAN interface, enter the keyword vlan followed by a number from 1 to 4094.

Defaults

    The IP address on the system that is closest to the Telnet address is used in the outgoing packets.

Command Modes

    CONFIGURATION

Command History

    Version 8.3.17.0  Supported on M I/O Aggregator

Related Commands

    telnet  Telnets to another device.

line

Enable and configure console and virtual terminal lines to the system. This command accesses LINE
mode, where you can set the access conditions for the designated line.

Syntax

    line {console 0 | vty number [end-number]}

Parameters

    console 0  Enter the keyword console 0 to configure the console port.
                The console option is <0-0>.

    vty number  Enter the keyword vty followed by a number from 0 to 9 to configure a virtual terminal
                 line for Telnet sessions.
                The system supports 10 Telnet sessions.

    end-number  (OPTIONAL) Enter a number from 1 to 9 as the last virtual terminal line to configure.
                You can configure multiple lines at one time.

Defaults

    Not configured

Command Modes

    CONFIGURATION

Command History

    Version 8.3.17.0  Supported on M I/O Aggregator

Usage Information

    You cannot delete a terminal connection.

Related Commands

    show memory  View current memory usage on the M I/O Aggregator.
ping

Test connectivity between the system and another device by sending echo requests and waiting for replies.

**Syntax**

```
ping [host | ip-address] [count {number | continuous}] [datagram-size] [timeout] [source (ip src-ipv4-address) | interface] [tos] [df-bit (y|n)] [validate-reply(y|n)] [pattern pattern] [sweep-min-size] [sweep-max-size] [sweep-interval] [interface (ip src-ipv4-address) | interface]
```

**Parameter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>host</strong></td>
<td>(OPTIONAL) Enter the host name of the devices to which you are testing connectivity.</td>
</tr>
<tr>
<td><strong>ip-address</strong></td>
<td>(OPTIONAL) Enter the IPv4 address of the device to which you are testing connectivity. The address must be in the dotted decimal format.</td>
</tr>
</tbody>
</table>
| **count** | Enter the number of echo packets to be sent.  
  * number: 1-2147483647  
  * Continuous: transmit echo request continuously  
  Default: 5 |
| **datagram-size** | Enter the ICMP datagram size.  
  Range: 36 - 15360 bytes  
  Default: 100 |
| **timeout** | Enter the interval to wait for an echo reply before timing out.  
  Range: 0-3600 seconds  
  Default: 2 seconds |
| **source** | Enter the IPv4 source ip address or the source interface.  
  - Enter the IP address in A.B.C.D format  
  - For a 10-Gigabit Ethernet interface, enter the keyword TenGigabitEthernet followed by the slot/port information.  
  - For a VLAN interface, enter the keyword vlan followed by a number from 1 to 4094. |
| **tos** | Enter the type of service required.  
  Range: 0-255  
  Default: 0 |
| **df-bit** | Enter Y or N for the don't fragment bit in IPv4 header  
  - N: Do not set the don't fragment bit  
  - Y: Do set don't fragment bit  
  Default is No. |
| **validate-reply** | Enter Y or N for reply validation.  
  - N: Do not validate reply data  
  - Y: Do validate reply data  
  Default is No. |
| **pattern pattern** | Enter the IPv4 data pattern.  
  Range: 0-FFFF  
  Default: 0xABCD |
| **sweep-min-size** | Enter the minimum size of datagram in sweep range.  
  Range: 52-15359 bytes |
| **sweep-max-size** | Enter the maximum size of datagram in sweep range.  
  Range: 53-15359 bytes |
**sweep-interval**
Enter the incremental value for sweep size.
1-15308 seconds

**interface**
Enter the outgoing interface for multicast packets.
- Enter the IP address in A.B.C.D format
- For a 10-Gigabit Ethernet interface, enter the keyword TenGigabitEthernet followed by the slot/port information.
- For a VLAN interface, enter the keyword vlan followed by a number from 1 to 4094.

---

### Defaults
See parameters above.

### Command Modes
- EXEC
- EXEC Privilege

### Command History

**Version 8.3.17.0** Supported on M I/O Aggregator

### Usage Information

When you enter the ping command without specifying an IP address (Extended Ping), you are prompted for a target IP address, a repeat count, a datagram size (up to 1500 bytes), a timeout in seconds, and for Extended Commands. For information on the ICMP message codes that return from a ping command, refer to Chapter 26, Internet Control Message Protocol (ICMP) Message Types.

**Figure 5-3. ping (IPv4) Command Example**

```plaintext
FTOS#ping 172.31.1.255
Type Ctrl-C to abort.
Sending 5, 100-byte ICMP Echos to 172.31.1.255, timeout is 2 seconds:
Reply to request 1 from 172.31.1.208     0 ms
Reply to request 1 from 172.31.1.216     0 ms
Reply to request 1 from 172.31.1.205     16 ms

Reply to request 5 from 172.31.1.209     0 ms
Reply to request 5 from 172.31.1.66      0 ms
Reply to request 5 from 172.31.1.87      0 ms

FTOS#
```

### reload
Reboot FTOS.

**Syntax**

```
reload
```

**Command Modes**
- EXEC Privilege

**Command History**

**Version 8.3.17.0** Supported on M I/O Aggregator

**Usage Information**

If there is a change in the configuration, FTOS prompts you to save the new configuration. Or you can save your running configuration with the copy running-config command.

**Related Commands**
- `reset stack-unit` — Resets any designated stack member except the management unit.
service timestamps

Add time stamps to debug and log messages. This command adds either the uptime or the current time and date.

**Syntax**

```
service timestamps [debug | log] [datetime [localtime] [msec] [show-timezone] | uptime]
```

**Parameters**

- **debug** (OPTIONAL) Enter the keyword `debug` to add timestamps to debug messages.
- **log** (OPTIONAL) Enter the keyword `log` to add timestamps to log messages with severity 0 to 6.
- **datetime** (OPTIONAL) Enter the keyword `datetime` to have the current time and date added to the message.
- **localtime** (OPTIONAL) Enter the keyword `localtime` to include the localtime in the timestamp.
- **msec** (OPTIONAL) Enter the keyword `msec` to include milliseconds in the timestamp.
- **show-timezone** (OPTIONAL) Enter the keyword `show-timezone` to include the time zone information in the timestamp.
- **uptime** (OPTIONAL) Enter the keyword `uptime` to have the timestamp based on time elapsed since system reboot.

**Defaults**

Not configured.

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

If you do not specify parameters and enter `service timestamps`, it appears as `service timestamps debug uptime` in the running-configuration.

Use the `show running-config` command to view the current options set for the `service timestamps` command.

---

show alarms

Displays the active major and minor alarms on the system.

**Syntax**

```
show alarms
```

**Command Modes**

EXEC

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator
Example Figure 5-4. show alarms Command Example

```
FTOS# show alarms

-- Minor Alarms --
Alarm Type         Duration
-- Major Alarms --
Alarm Type         Duration

FTOS#
```

show command-history
Displays a buffered log of all commands entered by all users along with a time stamp.

**Syntax**

```
show command-history
```

**Defaults**
None.

**Command Mode**
EXEC

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Supported on M I/O Aggregator</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td>M I/O Aggregator</td>
</tr>
</tbody>
</table>

**Usage Information**

One trace log message is generated for each command. No password information is saved to this file.
show configuration lock

Displays the configuration lock status.

**Syntax**

```plaintext
show configuration lock
```

**Defaults**

None

**Command Modes**

EXEC Privilege

**Command History**

- **Version 8.3.17.0**
- Supported on M I/O Aggregator

---

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear command history</td>
<td>Clears the command history log.</td>
</tr>
</tbody>
</table>
The type may be auto, manual, or rollback. When set to auto, FTOS automatically denies access to CONFIGURATION mode to all other users every time the user on the listed VTY line enters CONFIGURATION mode. When set to manual, the user on the listed VTY line must explicitly set the lock each time before entering CONFIGURATION mode. Rollback indicates that FTOS is in a rollback process. The line number shown in the output can be used to send the messages to that session or release a lock on a VTY line.

`show cpu-traffic-stats`
Displays the CPU traffic statistics.

**Syntax**
```
show cpu-traffic-stats [port number | all]
```

**Parameters**
- `port number` (OPTIONAL) Enter the port number to display traffic statistics on that port only.
  
  Range: 1 to 1568
- `all` (OPTIONAL) Enter the keyword all to display traffic statistics on all the interfaces receiving traffic, sorted based on traffic.

**Defaults**
all

**Command Modes**
EXEC

**Command History**
Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**
Traffic statistics are sorted on a per-interface basis; the interface receiving the most traffic is displayed first. All CPU and port information is displayed unless a specific port or CPU is specified. Traffic information is displayed for router ports only; not for management interfaces. The traffic statistics are collected only after the `debug cpu-traffic-stats` command is executed; not from the system bootup.

**Note:** After debugging is complete, use the `no debug cpu-traffic-stats` command to shut off traffic statistics collection.
### show debugging
Displays a list of all enabled debugging processes.

**Syntax**

```
show debugging
```

**Command Mode**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

```
Figure 5-8. show debugging Command Example

FTOS#show debug
Generic IP: (Access List: test)
    IP packet debugging is on for (Access List: test)
    TenGigabitEthernet 0/16
    ICMP packet debugging is on for
    TenGigabitEthernet 0/16
OSPF:1
    OSPF packet debugging is on
DHCP:
    DHCP debug is on
FTOS#
```

### show diag
Displays the diagnostics information.

**Syntax**

```
show diag {information | stack-unit unit-id [detail | summary]} | testcase
```

**Parameters**

- `information` Enter the keyword `information` to view current diagnostics information in the system.
- `stack-unit unit-id` (OPTIONAL) Enter the keyword `stack-unit` followed by the `unit-id` to display information on a specific stack member. Range: 0 to 5.
- `detail` (OPTIONAL) Enter the keyword `detail` to view detailed diagnostics information.
- `summary` (OPTIONAL) Enter the keyword `summary` to view a summary of the diagnostics information.
- `testcase` Enter the keyword `testcase` to view current diagnostics testcases available in the system.

**Defaults**

- Summary

**Command Modes**

EXEC Privilege
show environment

Displays the system component status (for example, temperature, voltage).

Syntax

show environment [all | stack-unit unit-id]

Parameters

- all (OPTIONAL) Enter the keyword all to view all components.
- stack-unit unit-id (OPTIONAL) Enter the keyword stack-unit followed by the unit-id to display information on a specific stack member. Range: 0 to 5.
- thermal sensor (OPTIONAL) Enter the keyword thermal-sensor to view all components.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

**Figure 5-9. show environment all Command Example**

```
FTOS#show environment all
-- Unit Environment Status --
Unit Status Temp Voltage TempStatus
---------------------------------------------------------------------------
* 1 online 66C ok 2
* Management Unit
-- Thermal Sensor Readings (deg C) --
Unit Sensor0 Sensor1 Sensor2 Sensor3 Sensor4 Sensor5 Sensor6 Sensor7 Sensor8 Sensor9
---------------------------------------------------------------------------
1 51 51 63 61 61 61 67 61 64 66
FTOS#
```

**Figure 5-10. show environment stack-unit Command Example**

```
FTOS#show environment stack-unit
-- Unit Environment Status --
Unit Status Temp Voltage TempStatus
---------------------------------------------------------------------------
* 1 online 66C ok 2
* Management Unit
FTOS#
```
show inventory

Displays the switch type, components (including media), FTOS version including hardware identification numbers and configured protocols.

**Syntax**

```
show inventory {[media slot] | [optional-module]}
```

**Parameters**

- **media slot** (OPTIONAL) Enter the keyword `media` followed by the stack ID of the stack member for which you want to display pluggable media inventory.
- **optional-module** (OPTIONAL) Enter the keyword `optional-module` to display optional module information.

**Defaults**

none

**Command Modes**

EXEC

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage**

If there are no fibre ports in the unit, only the header under `show inventory media` is displayed. If there are fibre ports but no optics inserted, the output displays the message “Media not present or accessible.”
Figure 5-12. show inventory for M I/O Aggregator Command Example

FTOS#show inventory
System Type : I/O-Aggregator
System Mode : 1.0
Software Version : E8-3-17-38

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Serial Number</th>
<th>Part Number</th>
<th>Rev</th>
<th>Piece Part ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O-Aggregator</td>
<td>00000000000000 NVH81X01</td>
<td>01-NVH81X-00000-000-0000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* - Management Unit

Software Protocol Configured
- DCBX
- FIP Snooping
- IGMP
- iSCSI
- LLDP
- SNMP

FTOS#

Figure 5-13. show inventory media Command Example

FTOS#show inventory media

<table>
<thead>
<tr>
<th>Slot</th>
<th>Port</th>
<th>Type</th>
<th>Media</th>
<th>Serial Number</th>
<th>F10Qualified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33</td>
<td>Media not present or accessible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>34</td>
<td>Media not present or accessible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>35</td>
<td>Media not present or accessible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>36</td>
<td>Media not present or accessible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>37</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VDU</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>38</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VDU</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>39</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VDU</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>40</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VDU</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>41</td>
<td>Media not present or accessible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>42</td>
<td>SFP</td>
<td>1000BASE-SX</td>
<td>P741L1X</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>43</td>
<td>SFP</td>
<td>100BASE-FX</td>
<td>PCK17RH</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>44</td>
<td>SFP</td>
<td>1000BASE-SX</td>
<td>PLP37J6</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>49</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VJ6</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VJ6</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>51</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VJ6</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>52</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VJ6</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>53</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VMP</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>54</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VMP</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>55</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VMP</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>56</td>
<td>QSFP</td>
<td>40GBASE-CR4-1M</td>
<td>APF11380018VMP</td>
<td>Yes</td>
</tr>
</tbody>
</table>

FTOS#

Figure 5-14. show inventory optional-module Command Example

FTOS#show inventory optional-module

<table>
<thead>
<tr>
<th>Unit</th>
<th>Slot</th>
<th>Expected</th>
<th>Inserted</th>
<th>Next Boot</th>
<th>Status/Power(On/Off)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>SFP+</td>
<td>SFP+</td>
<td>AUTO</td>
<td>Good/On</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>QSFP+</td>
<td>QSFP+</td>
<td>AUTO</td>
<td>Good/On</td>
</tr>
</tbody>
</table>

* - Mismatch

FTOS#
show memory

Displays current memory usage on the M I/O Aggregator.

Syntax

```
show memory [stack-unit 0-5]
```

Parameters

```
stack-unit 0-5  (OPTIONAL) Enter the keyword stack-unit followed by the stack unit ID of the stack member to display memory information on the designated stack member.
```

Command Modes

EXEC

EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

The output for the `show memory` command displays the memory usage of LP part (sysdlp) of the system. The Sysdlp is an aggregate task that handles all the tasks running on the CPU.

Example

```
Figure 5-15. show memory Command Example

FTOS#show memory stack-unit 0
    Statistics On Unit 0 Processor
    -----------------------------
    Total (b)  Used (b)  Free (b)  Lowest (b)  Largest (b)
    268435456  4010354   264425102  264375410   264425102
```

show processes cpu

Displays CPU usage information based on running processes.

Syntax

```
show processes cpu [management-unit 1-99 [details]] [stack-unit 0-5] [summary] [ipc] [memory [stack-unit 0-5]]
```

Parameters

```
management-unit 1-99  [details]  (OPTIONAL) Displays processes running in the control processor. The 1-99 variable sets the number of tasks to be displayed in order of the highest CPU usage in the past five (5) seconds. Add the details keyword to display all running processes (except sysdlp). See Example 3.

stack-unit 0-5  (OPTIONAL) Enter the keyword stack-unit followed by the stack member ID (Range 0 to 5).

As an option of show processes cpu, this option displays CPU usage for the designated stack member. See Example 2.

Or, as an option of memory, this option limits the output of memory statistics to the designated stack member. See Example 5.

summary  (OPTIONAL) Enter the keyword summary to view a summary view of CPU usage for all members of the stack. See Example 1.
```
Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example 1

**Figure 5-16. show processes cpu summary Command Example**

```
FTOS#show processes cpu summary
CPU utilization 5Sec 1Min 5Min
-------------------------
UNIT1 4% 3% 2%
FTOS#
```

Example 2

**Figure 5-17. show processes cpu management-unit Command Example**

```
FTOS#show processes cpu management-unit 5
CPU utilization for five seconds: 4%/0%; one minute: 4%; five minutes: 4%
PID  Runtime(ms)  Invoked  uSecs  5Sec  1Min  5Min  TTY  Process
0x00000000 2120  212  10000  3.77%  3.77%  3.77%  0  system
0x00000112 2472940  247294  10000  0.79%  0.61%  0.65%  0  sysdlp
0x000000e4  495560  49556  10000  0.20%  0.25%  0.24%  0  sysd
0x0000013d  34310  3431  10000  0.00%  0.02%  0.00%  0  lacp
0x00000121  4190  419  10000  0.00%  0.02%  0.00%  0  iscsiOpt
FTOS#
```
FTOS#show process cpu stack-unit 1

<table>
<thead>
<tr>
<th>PID</th>
<th>Runtime(ms)</th>
<th>Invoked</th>
<th>uSecs</th>
<th>5Sec</th>
<th>1Min</th>
<th>5Min</th>
<th>TTY</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x763a3000</td>
<td>17981680</td>
<td>1798168</td>
<td>10000</td>
<td>3.00%</td>
<td>2.67%</td>
<td>2.67%</td>
<td>0</td>
<td>KP</td>
</tr>
<tr>
<td>0x762ba000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0</td>
<td>debugagt</td>
</tr>
<tr>
<td>0x762d9000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0</td>
<td>F10StkMgr</td>
</tr>
<tr>
<td>0x762f8000</td>
<td>214590</td>
<td>21459</td>
<td>10000</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0</td>
<td>lcMgr</td>
</tr>
<tr>
<td>0x76319000</td>
<td>7890</td>
<td>789</td>
<td>10000</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0</td>
<td>dia</td>
</tr>
<tr>
<td>0x76344000</td>
<td>155777</td>
<td>15577</td>
<td>10000</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.02%</td>
<td>0</td>
<td>sysAdmTsk</td>
</tr>
<tr>
<td>0x76363000</td>
<td>583230</td>
<td>58323</td>
<td>10000</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.02%</td>
<td>0</td>
<td>timerMgr</td>
</tr>
<tr>
<td>0x76381000</td>
<td>658850</td>
<td>65885</td>
<td>10000</td>
<td>0.00%</td>
<td>0.17%</td>
<td>0.08%</td>
<td>0</td>
<td>diagagt</td>
</tr>
<tr>
<td>0x76299000</td>
<td>80110</td>
<td>8011</td>
<td>10000</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0</td>
<td>evagt</td>
</tr>
</tbody>
</table>

--More--
Example 4  Figure 5-19.  show processes memory Command Example

```text
FTOS#show process memory

Memory Statistics Of Stack Unit 1 (bytes)
---------------------------------------------
Total:  2147483648, MaxUsed:   499019776, CurrentUsed:  499019776, CurrentFree:  
1648463872

TaskName      TotalAllocated       TotalFreed       MaxHeld    CurrentHolding
f10appioserv          225280              0             0          192512
fcoecntrl          270336              0             0         9277440
f10appioserv          225280              0             0         192512
iscsiOpt          114688              0             0         7380992
dhclient          552960              0             0         1626112
f10appioserv          225280              0             0         192512
ndpm          618496              0             0         7389184
f10appioserv          225280              0             0         192512
vrrp          335872              0             0         7712768
f10appioserv          225280              0             0         192512
frpp          180224              0             0         7192576
f10appioserv          225280              0             0         192512
xstp          2740224              0             0         9445376
f10appioserv          225280              0             0         192512
pim          1007616              0             0         7585792
f10appioserv          225280              0             0         192512
igmp          417792              0             0        14774272
f10appioserv          225280              0             0         192512
mrmt          5496832              0             0        12636160
f10appioserv          225280              0             0         192512
l2mgr          1040384              0             0        42471424
f10appioserv          225280              0             0         192512
l2pm          176128              0             0        24166400
f10appioserv          225280              0             0         192512
frrp          184320              0             0         7127040
f10appioserv          225280              0             0         192512
--More--
FTOS#
```

Example 5  Figure 5-20.  show processes memory stack-unit Command Example

```text
FTOS#show process memory stack-unit 1

Total:  2147483648, MaxUsed:   499019776, CurrentUsed:  499019776, CurrentFree:  
1648463872

TaskName      TotalAllocated       TotalFreed       MaxHeld    CurrentHolding
f10appioserv          225280              0             0          192512
fcoecntrl          270336              0             0         9277440
f10appioserv          225280              0             0         192512
iscsiOpt          114688              0             0         7380992
dhclient          552960              0             0         1626112
f10appioserv          225280              0             0         192512
ndpm          618496              0             0         7389184
f10appioserv          225280              0             0         192512
vrrp          335872              0             0         7712768
f10appioserv          225280              0             0         192512
frpp          180224              0             0         7192576
f10appioserv          225280              0             0         192512
xstp          2740224              0             0         9445376
f10appioserv          225280              0             0         192512
pim          1007616              0             0         7585792
f10appioserv          225280              0             0         192512
igmp          417792              0             0        14774272
f10appioserv          225280              0             0         192512
mrmt          5496832              0             0        12636160
f10appioserv          225280              0             0         192512
l2mgr          1040384              0             0        42471424
f10appioserv          225280              0             0         192512
l2pm          176128              0             0        24166400
f10appioserv          225280              0             0         192512
frrp          184320              0             0         7127040
f10appioserv          225280              0             0         192512
--More--
FTOS#
```

---

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show diag</td>
<td>Displays the data plane or management plane input and output statistics of the designated component of the designated stack member.</td>
</tr>
<tr>
<td>show hardware system-flow</td>
<td>Displays Layer 3 ACL or QoS data for the selected stack member and stack member port-pipe.</td>
</tr>
</tbody>
</table>
**show processes ipc flow-control**

Displays the Single window protocol queue (SWPQ) statistics.

**Syntax**

```
show processes ipc flow-control [cp]
```

**Parameters**

- `cp` *(OPTIONAL)* Enter the keyword `cp` to view the Control Processor’s SWPQ statistics.

**Defaults**

none

**Command Modes**

EXEC

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

---

**Example 1**

**Figure 5-21. show processes ipc flow-control Command Example**

```plaintext
FTOS#show processes ipc flow-control

Q Statistics on CP Processor
TxProcess  RxProcess  Cur  Len  Mark  Time  Retr ies  Msg  Ack  Aval  Max
ACL0       RTM0       0    0    0     0     0      0  10   10
ACL0       DIFFSERV0  0    0    0     0     0      0  10   10
ACL0       IGMP0      0    0    0     0     0      0  10   10
ACL0       PIM0       0    0    0     0     0      0  10   10
LACP0      IFMGR0     0    24   0     0     34     34  25   25
STP0       L2PM0      0    0    0     0     0      0  25   25
L2PM0      STP0       0    1    0     2     2      2  25   25
FRP0       L2PM0      0    0    0     0     0      0  25   25
DHCP0      ACL0       0    0    0     0     0      0  25   25
DHCP0      IFMGR0     0    0    0     0     0      0  25   25
SMUX0      IFMGR0     0    38   0     47     47     60  60   60
SMUX0      LACP0      0    1    0     0      3      3  60   60
--More--
FTOS#
```

---

Table 5-1 lists the definitions of the fields shown in Figure 5-21.

**Table 5-1. Description of the show processes ipc flow-control cp output Command**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source QID /Tx Process</td>
<td>Source Service Identifier</td>
</tr>
<tr>
<td>Destination QID/Rx Process</td>
<td>Destination Service Identifier</td>
</tr>
<tr>
<td>Cur Len</td>
<td>Current number of messages enqueued</td>
</tr>
</tbody>
</table>
The Single window protocol (SWP) provides flow control-based reliable communication between the sending and receiving software tasks.

**Important Points to Remember**
- A sending task enqueues messages into the SWP queue for a receiving task and waits for an acknowledgement.
- If no response is received within a defined period of time, the SWP timeout mechanism resubmits the message at the head of the FIFO queue.
- After retrying a defined number of times, the following timeout message is generated:
  
  SWP-2-NOMORETIMEOUT

- In the display output in Figure 5-21, a retry (Retries) value of zero indicates that the SWP mechanism reached the maximum number of retransmissions without an acknowledgement.

### show processes memory

Displays memory usage information based on processes running in the system.

**Syntax**

```
show processes memory {management-unit | stack unit {0–5 | all | summary}}
```

**Parameters**

- `management-unit` Enter the keyword management-unit for CPU memory usage of the stack management unit.
- `stack unit 0–5` Enter the keyword stack unit followed by a stack unit ID of the member unit for which to display memory usage on the forwarding processor.
- `all` Enter the keyword all for detailed memory usage on all stack members.
- `summary` Enter the keyword summary for a brief summary of memory availability and usage on all stack members.

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

| Version 8.3.17.0 | Supported on M I/O Aggregator |

---

Table 5-1. Description of the show processes ipc flow-control cp output Command

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Mark</td>
<td>Highest number of packets in the queue at any point of time</td>
</tr>
<tr>
<td>#of to / Timeout</td>
<td>Timeout count</td>
</tr>
<tr>
<td>#of Retr /Retries</td>
<td>Number of retransmissions</td>
</tr>
<tr>
<td>#msg Sent/Msg Sent/</td>
<td>Number of messages sent</td>
</tr>
<tr>
<td>#msg Ackd/Ack Rcvd</td>
<td>Number of messages acknowledged</td>
</tr>
<tr>
<td>Retr /Available Retr</td>
<td>Number of retries left</td>
</tr>
<tr>
<td>Total/ Max Retra</td>
<td>Number of retries allowed</td>
</tr>
</tbody>
</table>
The output for the `show process memory` command displays the memory usage statistics running on CP part (sysd) of the system. The Sysd is an aggregate task that handles all the tasks running on M I/O Aggregator’s CP.

The output of `show memory` and this command will differ based on which FTOS processes are counted.

- In the `show memory` display output, the memory size is equal to the size of the application processes.
- In the output of this command, the memory size is equal to the size of the application processes plus the size of the system processes.

**Example**

**Figure 5-22. show processes memory Command Example**

```
FTOS#show process memory stack-unit 1
Total:  2147483648, MaxUsed:  499040256, CurrentUsed:  499040256, CurrentFree: 164843392

TaskName       TotalAllocated       TotalFreed       MaxHeld       CurrentHolding
f10appioserv   225280              0               0            192512
f10appioserv   225280              0               0            192512
fcoecntrl      114688              0               0            7380992
dhclient       552960              0               0            1626112
f10appioserv   225280              0               0            192512
ndpm           618496              0               0            7389184
f10appioserv   225280              0               0            192512
vrrp           335872              0               0            7712768
f10appioserv   225280              0               0            192512
frp            180224              0               0            792569
f10appioserv   225280              0               0            192512
xstp           2740224             0               0            9445376
f10appioserv   225280              0               0            192512
pim            1007616             0               0            7585792
f10appioserv   225280              0               0            192512
igmp           477792              0               0            14774272
f10appioserv   225280              0               0            192512
mrtm           5496832             0               0            12636160
```

**Example**

**Figure 5-23. show processes memory management-unit Command Example**

```
FTOS#show processes memory management-unit
Total : 2147483648, MaxUsed : 499040256, CurrentUsed : 499040256, CurrentFree : 164843392

CurrentFree : 164843392

CurrentFree : 164843392

PID Process    ResSize    Size    Allocs    Frees    Max
Current        
633 fcoecntrl  9277440   270336   1380528   132512   1281144
1248016        
289 iscsiOpt   7380992   114688   23262    16564    23262
6698 dhclient   1626112   552960   0        0        0
0               
521 ndpm       7389184   618496   4848     0        4848
4848            
160 vrrp       7712768   335872   880      0        880
880             
318 frp        7192576   180224   71086    66256    21394
4830            
218 xstp       9445376   2740224  21858    0        21858
21858           
277 pim        7585792   1007616  60168    0        62168
62168           
```
Table 5-2 defines the fields that appear in the `show processes memory` output.

### Table 5-2. Descriptions of show processes memory output

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td>Total system memory available</td>
</tr>
<tr>
<td>MaxUsed:</td>
<td>Total maximum memory used ever (history indicated with time stamp)</td>
</tr>
<tr>
<td>CurrentUsed:</td>
<td>Total memory currently in use</td>
</tr>
<tr>
<td>CurrentFree:</td>
<td>Total system memory available</td>
</tr>
<tr>
<td>SharedUsed:</td>
<td>Total used shared memory</td>
</tr>
<tr>
<td>SharedFree:</td>
<td>Total free shared memory</td>
</tr>
<tr>
<td>PID</td>
<td>Process ID</td>
</tr>
<tr>
<td>Process</td>
<td>Process Name</td>
</tr>
<tr>
<td>ResSize</td>
<td>Actual resident size of the process in memory</td>
</tr>
<tr>
<td>Size</td>
<td>Process test, stack, and data size</td>
</tr>
<tr>
<td>Allocs</td>
<td>Total dynamic memory allocated</td>
</tr>
<tr>
<td>Frees</td>
<td>Total dynamic memory freed</td>
</tr>
<tr>
<td>Max</td>
<td>Maximum dynamic memory allocated</td>
</tr>
<tr>
<td>Current</td>
<td>Current dynamic memory in use</td>
</tr>
</tbody>
</table>

### show server-interfaces

Displays server port information.

**Syntax**

```
show server-interfaces {brief | detail}
```

**Command Modes**

EXEC Privilege

**Command History**

- Version 8.3.17.0
- Supported on M I/O Aggregator
**Example**

**Figure 5-24. show server-interfaces brief Command Example**

```
FTOS#show server-interfaces brief
---------------- show server ports brief ---------------------
Interface                OK  Status     Protocol    Description
TenGigabitEthernet 1/1   NO  up         down        
TenGigabitEthernet 1/2   NO  up         down        
TenGigabitEthernet 1/3   NO  up         down        
TenGigabitEthernet 1/4   NO  up         down        
TenGigabitEthernet 1/5   YES up         up          
TenGigabitEthernet 1/6   NO  up         down        
TenGigabitEthernet 1/7   NO  up         down        
TenGigabitEthernet 1/8   NO  up         down        
TenGigabitEthernet 1/9   NO  up         down        
TenGigabitEthernet 1/10  NO  up         down        
TenGigabitEthernet 1/11  NO  up         down        
TenGigabitEthernet 1/12  NO  up         down        
TenGigabitEthernet 1/13  YES up         up          
TenGigabitEthernet 1/14  NO  up         down        
TenGigabitEthernet 1/15  NO  up         down        
TenGigabitEthernet 1/16  YES up         up          
--More--
FTOS#
```
show system

Displays the current status of all stack members or a specific stack member.

**Syntax**

```plaintext
show system [brief | stack-unit unit-id]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>brief</td>
<td>(OPTIONAL) Enter the keyword <code>brief</code> to view an abbreviated list of system information.</td>
</tr>
<tr>
<td>stack-unit unit-id</td>
<td>(OPTIONAL) Enter the keyword <code>stack-unit</code> followed by the stack member ID for information on that stack member. Range: 0 to 5.</td>
</tr>
</tbody>
</table>

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage**

Figure 5-26 shows the output from the `show system brief` command.

Figure 5-27 shows the output from the `show system stack-unit` command.

**Example**

**Figure 5-26. show system brief Command Example**

```plaintext
FTOS#show system brief
Stack MAC: 00:01:e8:00:ab:03

-- Stack Info --
Unit UnitType    Status          ReqTyp          CurTyp          Version     Ports
-----------------------------------------------------------------------------------------------
0   Member       not present
1   Management   online         I/O-Aggregator  I/O-Aggregator  8-3-17-38   56
2   Member       not present
3   Member       not present
4   Member       not present
5   Member       not present

FTOS#
```
Example Figure 5-27. show system stack-unit Command Example

FTOS#show system stack-unit 1

--  Unit 1 --
Unit Type       : Management Unit
Status          : online
Next Boot       : online
Required Type   : I/O-Aggregator - 34-port GE/TE (XL)
Current Type    : I/O-Aggregator - 34-port GE/TE (XL)
Master priority : 0
Hardware Rev    : 01
Num Ports       : 56
Up Time         : 4 day, 7 hr, 9 min
FTOS Version    : 8-3-17-38
Jumbo Capable   : yes
POE Capable     : no
Boot Flash      : A: 4.0.1.0bt (booted)  B: 4.0.1.0bt1
Boot Selector   : 4.0.0.0bt
Memory Size     : 2147483648 bytes
Temperature     : 67C
Voltage         : ok
Switch Power    : GOOD
Product Name    : I/O Aggregator
Mfg By          : DELL
Mfg Date        :
Serial Number   : 00000000000000
Part Number     : NVH81X01
Piece Part ID   : 00-NVH81X-00000-000-000
PPID Revision   : 01
Service Tag     : N/A
Expr Svc Code   : N/A
PSCC FW Rev     : 0xb
ICT Test Date   : 0-0-0
ICT Test Info   : 0x0
Max Power Req   : 31488
Fabric Type     : 0x3
Fabric Maj Ver  : 0x1
Fabric Min Ver  : 0x0
SW Manageability: 0x4
HW Manageability: 0x1
Max Boot Time   : 3 minutes
Link Tuning     : unsupported
Auto Reboot     : enabled
Burned In MAC   : 00:01:e8:00:ab:03
No Of MACs      : 3

FTOS#

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show version</td>
<td>Displays the FTOS version.</td>
</tr>
<tr>
<td>show processes memory</td>
<td>Displays the memory usage based on the running processes.</td>
</tr>
<tr>
<td>show system stack-ports</td>
<td>Displays information about the stack ports on all switches in the stack.</td>
</tr>
<tr>
<td>show diag</td>
<td>Displays the data plane and management plane input and output statistics of a particular stack member.</td>
</tr>
</tbody>
</table>

show revision

Displays the revision numbers of all stack-units.

Syntax

show revision

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0  Supported on M I/O Aggregator
show tech-support

Displays a collection of data from other show commands, necessary for Dell Force10 technical support to perform troubleshooting on M I/O Aggregators.

Syntax

```
show tech-support [stack-unit unit-id | page]
```

Parameters

- **stack-unit** (OPTIONAL) Enter the keyword stack-unit to view CPU memory usage for the stack member designated by unit-id. Range: 0 to 5
- **page** (OPTIONAL) Enter the keyword page to view 24 lines of text at a time. Press the SPACE BAR to view the next 24 lines. Press the ENTER key to view the next line of text.
- **save** Enter the save keyword to save the command output.
  - flash: Save to local flash drive (flash://filename (max 20 chars))

Command Modes

EXEC Privilege

Command History

- **Version 8.3.17.0** Supported on M I/O Aggregator
Examples Figure 5-29. show tech-support save Command Example (Partial)

```
FTOS#show tech-support ?
page            Page through output
stack-unit      Unit Number
                Pipe through a command
<cr>
FTOS#show tech-support stack-unit 1 ?
page            Page through output
<cr>
FTOS#show tech-support stack-unit 1 | ?
except          Show only text that does not match a pattern
find            Search for the first occurrence of a pattern
grep            Show only text that matches a pattern
no-more          Don't paginate output
save            Save output to a file

FTOS#show tech-support stack-unit 1 | save ?
flash:          Save to local file system (flash://filename (max 20 chars) )
usbflash:       Save to local file system (usbflash://filename (max 20 chars) )

FTOS#show tech-support stack-unit 1 | save flash://LauraSave
Start saving show command report .......
FTOS#

FTOS#dir
Directory of flash:

Directory of flash:

1 drwx 4096 Jan 01 1980 01:00:00 +01:00 .
2 drwx 2048 May 16 2012 10:49:01 +01:00 ..
3 drwx 4096 Jan 24 2012 19:38:32 +01:00 TRACE_LOG_DIR
4 drwx 4096 Jan 24 2012 19:38:32 +01:00 CORE_DUMP_DIR
5 d--- 4096 Jan 24 2012 19:38:34 +01:00 ADMIN_DIR
6 -rwx 10303 Mar 15 2012 18:37:20 +01:00 startup-config.bak
7 -rwx 7366 Apr 20 2012 10:57:02 +01:00 startup-config
8 -rwx 4 Feb 19 2012 07:05:02 +01:00 dhcpBindConflict
9 -rwx 12829 Feb 18 2012 02:24:14 +01:00 startup-config.backup
10 drwx 4096 Mar 08 2012 22:58:54 +01:00 WJ_running-config
11 -rwx 7680 Feb 21 2012 04:45:40 +01:00 stbkup

flash: 2143281152 bytes total (2131476480 bytes free)

FTOS#
```
without the page or stack-unit option, the command output is continuous, use Ctrl-z to interrupt the command output.

The save option works with other filtering commands. This allows you to save specific information of a show command. The save entry must always be the last option.

For example: FTOS#show tech-support |grep regular-expression |except regular-expression | find regular-expression | save flash://result

This display output is an accumulation of the same information that is displayed when you execute one of the following show commands:

- show cam
- show clock
- show environment
- show file
- show interfaces
- show inventory
- show processes cpu
- show processes memory
- show running-conf
- show version

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show version</td>
<td>Displays the FTOS version.</td>
</tr>
<tr>
<td>show system</td>
<td>Displays the current switch status.</td>
</tr>
<tr>
<td>show environment</td>
<td>Displays system component status.</td>
</tr>
<tr>
<td>show processes memory</td>
<td>Displays memory usage based on the running processes.</td>
</tr>
</tbody>
</table>

### show uplink brief

Displays the uplink port information.

**Syntax:**

```
show uplink {brief | detail}
```

**Parameters:**

- `brief`  
  - Enter the keyword `brief` to display a brief summary of the uplink port information.
- `detail`  
  - Enter the keyword `detail` to display uplink port information with description.

**Command Modes:** EXEC Privilege

**Command History:**

- Version 8.3.17.0  
  - Supported on M I/O Aggregator

**Example 1**

**Figure 5-31. show uplink brief Command Example**

```
FTOS#show uplink brief
---------------- show uplink brief ----------------
Interface                OK  Status     Protocol    Description
TenGigabitEthernet 0/41  NO  up         down
TenGigabitEthernet 0/42  NO  up         down
TenGigabitEthernet 0/43  NO  up         down
TenGigabitEthernet 0/44  NO  up         down
TenGigabitEthernet 0/45  NO  up         down
TenGigabitEthernet 0/46  NO  up         down
TenGigabitEthernet 0/47  NO  up         down
TenGigabitEthernet 0/48  NO  up         down
TenGigabitEthernet 0/49  NO  up         down
TenGigabitEthernet 0/50  NO  up         down
TenGigabitEthernet 0/51  NO  up         down
TenGigabitEthernet 0/52  NO  up         down
TenGigabitEthernet 0/53  NO  up         down
TenGigabitEthernet 0/54  NO  up         down
TenGigabitEthernet 0/55  NO  up         down
TenGigabitEthernet 0/56  NO  up         down
TenGigabitEthernet 1/41  NO  up         down
TenGigabitEthernet 1/42  NO  up         down
TenGigabitEthernet 1/43  NO  up         down
--More--
4 www.force10networks.com (10.11.84.18) 000.000 ms 000.000 ms 000.000 ms
FTOS#
```
Example 2

Figure 5-32. show uplink detail Command Example

```
FTOS#show uplink detail
---------------- show uplink detail ---------------------
TenGigabitEthernet 0/41 is up, line protocol is down
Hardware is DellForce10Eth, address is 00:1e:c9:f1:00:99
Current address is 00:1e:c9:f1:00:99
Port is not present
Pluggable media not present
Interface index is 44634881
Internet address is not set
Mode of IP Address Assignment : NONE
DHCP Client-ID : tenG170001ec9f10099
MTU 12000 bytes, IP MTU 11982 bytes
LineSpeed auto
Flowcontrol rx on tx off
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interface" counters 2d19h53m
Queueing strategy: fifo
Input Statistics:
  0 packets, 0 bytes
  0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
  0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts
  0 Multicasts, 0 Broadcasts
--More--
```

show util-threshold cpu

Displays the set CPU utilization threshold values.

Syntax

```
show util-threshold cpu
```

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

This command displays all CPU utilization thresholds of the management, standby, and stack-units.

show util-threshold memory

Displays the set memory utilization threshold values.

Syntax

```
show util-threshold memory
```

Command Modes

EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

This command displays all memory utilization thresholds of the management, standby, and stack-units.
ssh-peer-stack-unit
Open an SSH connection to the peer stack-unit.

Syntax
ssh-peer-stack-unit [-l username]

Parameters
- `-l username` (OPTIONAL) Enter the keyword -l followed by your username.
  Default: The username associated with the terminal.

Defaults
Not configured.

Command Modes
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

---

telnet
Connect through Telnet to a server. The Telnet client and server in FTOS supports IPv4 connections.
You can establish a Telnet session directly to the router, or a connection can be initiated from the router.

Syntax
telnet {host | ip-address} [/source-interface]

Parameters
- `host` Enter the name of a server.
- `ip-address` Enter the IPv4 address in dotted decimal format of the server.
- `/source-interface` (OPTIONAL) Enter the keywords /source-interface followed by the interface information to include the interface’s IP address.
  Enter the following keywords and slot/port or number information:
  - For a 10-Gigabit Ethernet interface, enter the keyword TenGigabitEthernet followed by the slot/port information.
  - For a VLAN interface, enter the keyword vlan followed by a number from 1 to 4094.

Defaults
Not configured.

Command Modes
EXEC
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information
Telnet to link-local addresses is not supported.
telnet-peer-stack-unit
Open a telnet connection to the peer stack-unit.

Syntax
telnet-peer-stack-unit

Defaults Not Configured

Command Modes EXEC
EXEC Privilege

Command History

| Version 8.3.17.0 | Supported on M I/O Aggregator |

terminal length
Configure the number of lines displayed on the terminal screen.

Syntax
terminal length screen-length
To return to the default values, use the no terminal length command.

Parameters

<table>
<thead>
<tr>
<th>screen-length</th>
<th>Enter a number of lines. Entering zero will cause the terminal to display without pausing.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range: 0 to 512.</td>
</tr>
<tr>
<td></td>
<td>Default: 24 lines.</td>
</tr>
</tbody>
</table>

Defaults 24 lines

Command Modes EXEC
EXEC Privilege

Command History

| Version 8.3.17.0 | Supported on M I/O Aggregator |

terminal xml
Enable XML mode in Telnet and SSH client sessions.

Syntax
terminal xml
To exit the XML mode, use the no terminal xml command.

Defaults Disabled

Command Modes EXEC
EXEC Privilege
This command enables XML input mode where you can either cut and paste XML requests or enter the XML requests line-by-line.

**terminal monitor**

Configure the FTOS to display messages on the monitor/terminal.

**Syntax**

```plaintext
terminal monitor
```

To return to default settings, use the `no terminal monitor` command.

**Defaults**

Disabled.

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**traceroute**

View the packet path to a specific device.

**Syntax**

```plaintext
traceroute {host | ip-address}
```

**Parameters**

- `host`
  - Enter the name of device.

- `ip-address`
  - Enter the IP address of the device in dotted decimal format.

**Defaults**

Timeout = 5 seconds; Probe count = 3; 30 hops max; 40 byte packet size; UDP port = 33434

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

When you enter the `traceroute` command without specifying an IP address (Extended Traceroute), you are prompted for a target and source IP address, timeout in seconds (default is 5), a probe count (default is 3), minimum TTL (default is 1), maximum TTL (default is 30), and port number (default is 33434). To keep the default setting for those parameters, press the ENTER key.
Example

Figure 5-33. traceroute (IPv4) Command Example

```
FTOS#traceroute www.force10networks.com
Translating "www.force10networks.com"...domain server (10.11.0.1) [OK]
Type Ctrl-C to abort.
---------------------------------------------------------------------------------
TTL Hostname            Probe1      Probe2      Probe3
1 10.11.199.190        001.000 ms  001.000 ms  002.000 ms
2 gwegress-sjc-02.force10networks.com (10.11.30.126) 005.000 ms  001.000 ms  001.000 ms
3 fw-sjc-01.force10networks.com (10.11.127.254) 000.000 ms  000.000 ms  000.000 ms
4 www.force10networks.com (10.11.84.18) 000.000 ms  000.000 ms  000.000 ms
FTOS#
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ping</td>
<td>Tests the connectivity to a device.</td>
</tr>
</tbody>
</table>

**undebug all**

Disable all debug operations on the system.

**Syntax**

```
undebug all
```

**Defaults**

```
none
```

**Command Modes**

```
EXEC Privilege
```

**Command History**

```
Version 8.3.17.0   Supported on M I/O Aggregator
```

**write**

Copy the current configuration to either the startup-configuration file or the terminal.

**Syntax**

```
write {memory | terminal}
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>memory</td>
<td>Enter the keyword memory to copy the current running configuration to the startup configuration file. This command is similar to the copy running-config startup-config command.</td>
</tr>
<tr>
<td>terminal</td>
<td>Enter the keyword terminal to copy the current running configuration to the terminal. This command is similar to the show running-config command.</td>
</tr>
</tbody>
</table>

**Command Modes**

```
EXEC Privilege
```
| Command History | Version 8.3.17.0 | Supported on M I/O Aggregator |

**Usage Information**

The `write memory` command saves the running-configuration to the file labeled `startup-configuration`. When using a LOCAL CONFIG FILE other than the `startup-config` not named “startup-configuration”, the running-config is not saved to that file; use the `copy` command to save any running-configuration changes to that local file.
u-Boot

Overview

All commands in this chapter are in u-Boot mode. These commands are supported on the Dell Force10 Aggregator only.

To access this mode, hit any key when the following line appears on the console during a system boot:

Hit any key to stop autoboot:

You enter u-Boot immediately, as indicated by the **BOOT_USER#** prompt.

**Note:** Only the most frequently used commands available in uBoot mode are described in this chapter.

In uBoot mode, you cannot use the Tab key for command completion.

Commands

- boot change
- boot selection
- boot show net config retries
- boot write net config retries
- boot zero
- default gateway
- enable
- help
- ignore enable password
- ignore startup-config
- interface management ethernet ip address
- no default gateway
- no interface management ethernet ip address
- reload
- show boot blc
- show boot selection
- show bootflash
- show bootvar
- show default gateway
- show interface management ethernet
• show interface management port config
• syntax help

>Note: You cannot use the Tab key to complete commands in this mode.

**boot change**

Change the operating system boot parameters.

**Syntax**

```
boot change [primary | secondary | default]
```

**Command Modes**

uBoot

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**boot selection**

Change the ROM bootstrap bootflash partition.

**Syntax**

```
boot selection [a | b]
```

**Command Modes**

uBoot

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**boot show net config retries**

Show the number of retries for network boot configuration failure.

**Syntax**

```
boot show net config retries
```

**Command Modes**

uBoot

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

*Figure 6-1. boot show net config retries Command Example*

```
BOOT_USER# boot show net config retries
Number of Network Boot Config Retries is : 0
BOOT_USER 
```
boot write net config retries
Set the number of retries for network boot configuration failure.

**Syntax**
`boot write net config retries <int>`

**Command Modes**
uBoot

**Command History**
Version 8.3.17.0 Supported on M I/O Aggregator

**Example**
*Figure 6-2. boot write net config retries Command Example*

```plaintext
BOOT_USER # boot write net config retries 2
Updated number of Network Boot Config retries to 2.
BOOT_USER #
```

boot zero
Clears the primary, secondary, or default boot parameters.

**Syntax**
`boot zero [primary | secondary | default]`

**Command Modes**
uBoot

**Command History**
Version 8.3.17.0 Supported on M I/O Aggregator

default gateway
Set the default gateway IP address.

**Syntax**
`default-gateway <ip-address>`

**Command Modes**
uBoot

**Command History**
Version 8.3.17.0 Supported on M I/O Aggregator

enable
Change the access privilege level.

**Syntax**
`enable [user | admin]`

**Command Modes**
uBoot

**Command History**
Version 8.3.17.0 Supported on M I/O Aggregator
help

Displays the help menu.

Syntax
help

Command Modes
uBoot

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

Example Figure 6-3. help Command Example

```bash
BOOT_USER # help
***** Dell Force10 Boot Interface Help Information *****
Current access level: USER LEVEL
Use "syntax help" for more information on syntax.
Available command list (22 commands total):
  boot change [primary|secondary|default]
  change operating system boot parameters
  boot selection [a|b]
  change the rom bootstrap bootflash partition
  boot show net config retries
  show number of retries for network boot config failure
  boot write net config retries <int>
  write number of retries for network boot config failure
  boot zero [primary|secondary|default]
  zero operating system boot parameters
  default-gateway <ip-address>
  default-gateway - set the default gateway ip address
  enable [user|admin]
  change access privilege level
  help
  display help menu
-(36%)=Use <CR> to continue, q to stop:
BOOT_USER #
```

ignore enable password

Ignore the enabled password.

Syntax
ignore enable-password

Command Modes
uBoot

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

ignore startup-config

Ignore the system startup configuration.

Syntax
ignore startup-config

Command Modes
uBoot
interface management ethernet ip address
Set the management port IP address and mask.

Syntax
interface management ethernet ip address <ip/mask>

Command Modes
uBoot

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

no default gateway
Clear the default gateway IP address.

Syntax
no default-gateway

Command Modes
uBoot

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

no interface management ethernet ip address
Clear the management port IP address and mask.

Syntax
no interface management ethernet ip address

Command Modes
uBoot

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

reload
Reload the M I/O Aggregator.

Syntax
reload

Command Modes
uBoot

Command History
Version 8.3.17.0 Supported on M I/O Aggregator
**show boot blc**

Show the boot loop counter value.

**Syntax**

`show boot blc`

**Command Modes**

uBoot

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Supported on M I/O Aggregator</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td></td>
</tr>
</tbody>
</table>

**Example**

Figure 6-4. show boot blc Command Example

```
BOOT_USER # show boot blc ?
Total 1 possible command found.
Possible command list: 
   show boot blc
   show the boot loop counter value
BOOT_USER # show boot blc
Boot Loop Counter : 10
BOOT_USER #
```

**show boot selection**

Displays the ROM bootstrap bootflash partition.

**Syntax**

`show boot selection`

**Command Modes**

uBoot

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Supported on M I/O Aggregator</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td></td>
</tr>
</tbody>
</table>

**Example**

Figure 6-5. show boot selection Command Example

```
BOOT_USER # show boot selection
ROM BOOTSTRAP SELECTOR PARMETERS: 
-----------------------------------
Next ROM bootstrap set to occur from Bootflash partition A.
Last ROM bootstrap occurred from Bootflash partition B.
BOOT_USER #
```

**show bootflash**

Show the summary of boot flash information.

**Syntax**

`show bootflash`

**Command Modes**

uBoot
show bootvar

Show the summary of operating system boot parameters.

**Syntax**

```
show bootvar
```

**Command Modes**

uBoot
show default gateway
Displays the default gateway IP address.

Syntax  
show default-gateway

Command Modes  
uBoot

Command History
Version 8.3.17.0  
Supported on M I/O Aggregator

Example  

Example Figure 6-8.  show default-gateway Command Example


display default gateway
Gateway IP address: 15.0.0.1

show interface management ethernet
Show the management port IP address and mask.

Syntax  
show interface management ethernet

Command Modes  
uBoot
**show interface management port config**

Show the management port boot characteristics.

**Syntax**

`show interface management port config`

**Command Modes**

uBoot

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

**Figure 6-10. show interface management port config Command Example**

```
BOOT_USER # show interface management port config
Management ethernet Port Configuration: no Auto Negotiate
Management ethernet Port Configuration: 100M
Management ethernet Port Configuration: full duplex
BOOT_USER #
```
Data Center Bridging

Overview

Data center bridging (DCB) refers to a set of IEEE Ethernet enhancements that provide data centers with a single, robust, converged network to support multiple traffic types, including LAN, server, and storage traffic. Data center bridging (DCB) features are auto-configured in standalone mode and supported in stacking mode.

The Dell Force10 operating software (FTOS) commands for data center bridging features include 802.1Qbb priority-based flow control (PFC), 802.1Qaz enhanced transmission selection (ETS), and the Data Center Bridging Exchange (DCBX) protocol.

CLI commands for individual DCB features are as follows:

**DCB Command**

- `dcb enable auto-detect on-next-reload`

**PFC Commands**

- `clear pfc counters`
- `show interface pfc`
- `show interface pfc statistics`
- `show stack-unit stack-ports pfc detail`

**ETS Commands**

- `clear ets counters`
- `show interface ets`
- `show stack-unit stack-ports ets detail`

**DCBX Commands**

- `dcbx version`
- `show dcb`
- `show interface dcbx detail`
clear ets counters
Clear ETS TLV counters.

Syntax
`clear ets counters [tengigabitethernet slot/port]`

Parameters
- `slot/port` Enter the slot/port number.

Defaults
None

Command Modes
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

---

clear pfc counters
Clear PFC TLV counters.

Syntax
`clear pfc counters [stack-unit unit-number | tengigabitethernet slot/port]`

Parameters
- `unit number` Number of the member stack unit. Valid values: 0 to 5. Default: 0
- `slot/port` Enter the slot/port number.

Defaults
None

Command Modes
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

---

dcb enable auto-detect on-next-reload
Enables or disables global DCB on a subsequent reload. This command also internally configures PFC buffers based on DCB enable/disable. Save and reload is mandatory for the configurations to take effect. Auto-detect keyword can be used to re-enable IOA with port wise DCB auto detect feature.

Syntax
`dcb enable {on-next-reload | auto-detect on-next-reload}`

Parameters
- `auto-detect` Enter this key word to re-enable the Aggregator with port wise DCB auto detect feature.

Defaults
DCB is globally enabled with auto-detect feature.

Command Modes
CONFIGURATION
Example 1  **Figure 7-1. Disable DCB Command Example**

```
FTOS#show dcb stack-unit 0 port-set 0
stack-unit 0 port-set 0
   DCB Status : Enabled
   PFC Port Count : 56 (current), 0 (configured)
   PFC Queue Count : 2 (current), 0 (configured)
FTOS#
FTOS(conf)#dcb enable?
    on-next-reload          Apply DCB configs on subsequent reload
FTOS(conf)#no dcb enable on-next-reload
FTOS(conf)#00:03:11: %STKUNIT0-M:CP %DIFFSERV-6-DCB_DISABLE_CFG_ON_RELOAD: Global DCB will be disabled on subsequent reload. All reserved PFC buffers will be deleted from each stack unit. For the pfc-buffering change to take effect, please save the config and reload the system.
FTOS(conf)#end
FTOS#00:03:23: %STKUNIT0-M:CP %SYS-5-CONFIG_I: Configured from console
FTOS#write memory
00:03:28: %STKUNIT0-M:CP %FILEMGR-5-FILESAVED: Copied running-config to startup-config in flash by default
FTOS#reload
Proceed with reload [confirm yes/no]: yes
00:04:13: %STKUNIT0-M:CP %CHMGR-5-RELOAD: User request to reload the chassis
syncing disks... done
unmounting file systems...
unmounting /f10/flash (/dev/ld0e)...
unmounting /usr (mfs:31)...
unmounting /lib (mfs:23)...
unmounting /f10 (mfs:20)...
unmounting /tmp (mfs:15)...
unmounting /kern (kernfs)...
unmounting / (/dev/md0a) ... done
rebooting...
FTOS#
FTOS#show dcb stack-unit 0 port-set 0
stack-unit 0 port-set 0
   DCB Status : Disabled
   PFC Port Count : 0 (current), 0 (configured)
   PFC Queue Count : 0 (current), 0 (configured)
FTOS#
```
Example 2

**Figure 7-2. Enable DCB Command Example**

FTOS#show dcb stack-unit 0 port-set 0

```
stack-unit 0 port-set 0
  DCB Status : Disabled
  PFC Port Count : 0 (current), 0 (configured)
  PFC Queue Count : 0 (current), 0 (configured)
FTOS#
```

FTOS#conf

FTOS(conf)#dcb enable on-next-reload

```
FTOS(conf)#00:02:35: %STKUNIT0-M:CP %DIFFSERV-6-DCB_ENABLE_CFG_ON_RELOAD: Global DCB will be enabled on subsequent reload, PFC buffers will be reserved for all PFC ports and max lossless queues supported for each stack unit. PFC buffering change to take effect, please save the config and reload the system.

FTOS(conf)#end
```

```
FTOS#00:02:38: %STKUNIT0-M:CP %SYS-5-CONFIG_I: Configured from  console
```

```
FTOS#write memory
```

```
00:02:41: %STKUNIT0-M:CP %FILEMGR-5-FILESAVED: Copied running-config to startup-config in flash by default
```

```
FTOS#reload
```

Proceed with reload [confirm yes/no]: yes

```
syncing disks... done
unmounting file systems...
unmounting /f10/flash (/dev/ld0e)...
unmounting /usr (mfs:31)...
unmounting /lib (mfs:23)...
unmounting /f10 (mfs:20)...
unmounting /tmp (mfs:15)...
unmounting /kern (kernfs)...
unmounting / (/dev/md0a)... done
rebooting...
```

```
FTOS#show dcb stack-unit 0 port-set 0
```

```
stack-unit 0 port-set 0
  DCB Status : Enabled
  PFC Port Count : 56 (current), 56 (configured)
  PFC Queue Count : 2 (current), 2 (configured)
FTOS#
```
Example 3  

Figure 7-3.  Enable DCB with Auto-Detect Command Example 3

```
FTOS#show dcb stack-unit 0 port-set 0

stack-unit 0 port-set 0
  DCB Status : Disabled
  PFC Port Count : 0 (current), 0 (configured)
  PFC Queue Count : 0 (current), 0 (configured)

FTOS#

FTOS#conf
FTOS(conf)#dcb enable auto-detect on-next-reload
FTOS(conf)#end

FTOS#show dcb stack-unit 0 port-set 0

stack-unit 0 port-set 0
  DCB Status : Enabled
  PFC Port Count : 56 (current), 56 (configured)
  PFC Queue Count : 2 (current), 2 (configured)

FTOS#
```
**dcbx version**

Configure the DCBX version used on the interface.

**Syntax**

dcbx version {auto | cee | cin | ieee-v2.5}

To remove the DCBX version, use the no dcbx version {auto | cee | cin | ieee-v2.5} command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto</td>
<td>Enter the DCBX version type used on the interface, where:</td>
</tr>
<tr>
<td>cee</td>
<td>• auto: configures the port to operate using the DCBX version received from a peer.</td>
</tr>
<tr>
<td>cin</td>
<td>• cee: configures the port to use CEE (Intel 1.01).</td>
</tr>
<tr>
<td>ieee-v2.5</td>
<td>• cin: configures the port to use Cisco-Intel-Nuova (DCBX 1.0).</td>
</tr>
<tr>
<td>ieee-v2.5</td>
<td>• ieee-v2.5: configures the port to use IEEE 802.1az (Draft 2.5).</td>
</tr>
</tbody>
</table>

**Defaults**

Auto

**Command Modes**

PROTOCOL LLDP

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

DCBX requires that you enable LLDP to advertise DCBX TLVs to peers.

Configure DCBX operation at the INTERFACE level on a switch or globally on the switch. To verify the DCBX configuration on a port, use the show interface dcbx detail command.
show dcb

Displays the data center bridging status, the number of PFC-enabled ports, and the number of PFC-enabled queues.

Syntax

show dcb [stack-unit unit-number]

Parameters

unit number Enter the DCB unit number.
The valid values are 0 to 5.

Command Mode

EXEC PRIVILEGE

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 7-4. show dcb Command Example

FTOS# show dcb
stack-unit 0 port-set 0
  DCB Status : Enabled
  PFC Port Count : 56 (current), 56 (configured)
  PFC Queue Count : 2 (current), 2 (configured)

Usage Information

Specify a stack-unit number on the Master switch in a stack.

show interface dcbx detail

Displays the DCBX configuration on an interface.

Syntax

show interface port-type slot/port dcbx detail

Parameters

port-type Enter the port type.
slot/port Enter the slot/port number.

Command Mode

EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator
Table 7-1 lists the show interface dcbx detail field descriptions.

Table 7-1. show interface dcbx detail Command Example Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Interface type with chassis slot and port number.</td>
</tr>
<tr>
<td>Port-Role</td>
<td>Configured the DCBX port role: auto-upstream or auto-downstream.</td>
</tr>
<tr>
<td>DCBX Operational Status</td>
<td>Operational status (enabled or disabled) used to elect a configuration source and internally propagate a DCB configuration. The DCBX operational status is the combination of PFC and ETS operational status.</td>
</tr>
<tr>
<td>Configuration Source</td>
<td>Specifies whether the port serves as the DCBX configuration source on the switch: true (yes) or false (no).</td>
</tr>
<tr>
<td>Local DCBX Compatibility mode</td>
<td>DCBX version accepted in a DCB configuration as compatible. In auto-detection mode, a port can only operate on a DCBX version supported on the remote peer.</td>
</tr>
<tr>
<td>Local DCBX Configured mode</td>
<td>DCBX version configured on the port: CEE, CIN, IEEE v2.5, or Auto (port auto-configures to use the DCBX version received from a peer).</td>
</tr>
<tr>
<td>Peer Operating version</td>
<td>DCBX version that the peer uses to exchange DCB parameters.</td>
</tr>
<tr>
<td>Local DCBX TLVs Transmitted</td>
<td>Transmission status (enabled or disabled) of advertised DCB TLVs (see TLV code at the top of the show command output).</td>
</tr>
<tr>
<td>Local DCBX Status: DCBX Operational Version</td>
<td>DCBX version advertised in Control TLVs.</td>
</tr>
<tr>
<td>Local DCBX Status: DCBX Max Version Supported</td>
<td>Highest DCBX version supported in Control TLVs.</td>
</tr>
<tr>
<td>Local DCBX Status: Sequence Number</td>
<td>Sequence number transmitted in Control TLVs.</td>
</tr>
<tr>
<td>Local DCBX Status: Acknowledgment Number</td>
<td>Acknowledgement number transmitted in Control TLVs.</td>
</tr>
</tbody>
</table>
Table 7-1.  show interface dcbx detail Command Example Fields (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local DCBX Status: Protocol</td>
<td>Current operational state of the DCBX protocol: Waiting for ACK or IN-SYNC.</td>
</tr>
<tr>
<td>Peer DCBX Status: DCBX</td>
<td>DCBX version advertised in Control TLVs received from the peer device.</td>
</tr>
<tr>
<td>Peer DCBX Status: DCBX Max</td>
<td>Highest DCBX version supported in Control TLVs received from the peer device.</td>
</tr>
<tr>
<td>Peer DCBX Status: Sequence</td>
<td>Sequence number transmitted in Control TLVs received from the peer device.</td>
</tr>
<tr>
<td>Peer DCBX Status: Ack</td>
<td>Acknowledgement number transmitted in Control TLVs received from the peer</td>
</tr>
<tr>
<td>Peer DCBX Status: Ack</td>
<td>Number</td>
</tr>
<tr>
<td>Total DCBX Frames transmitted</td>
<td>Number of DCBX frames sent from the local port.</td>
</tr>
<tr>
<td>Total DCBX Frames received</td>
<td>Number of DCBX frames received from the remote peer port.</td>
</tr>
<tr>
<td>Total DCBX Frame errors</td>
<td>Number of DCBX frames with errors received.</td>
</tr>
<tr>
<td>Total DCBX Frames unrecognized</td>
<td>Number of unrecognizable DCBX frames received.</td>
</tr>
</tbody>
</table>

**show interface ets**

Displays the ETS configuration applied to egress traffic on an interface, including priority groups with priorities and bandwidth allocation.

**Syntax**

```
show interface port-type slot/port ets {summary | detail}
```

**Parameters**

- `port-type slot/port`: Enter the port-type slot and port ETS information.
- `{summary | detail}`: Enter the keyword `summary` for a summary list of results or enter the keyword `detail` for a full list of results.

**Command Mode**

EXEC Privilege

**Command History**

- Version 8.3.17.0: Supported on M I/O Aggregator
Example

**Figure 7-6. show interfaces ets summary Command Example**

```
FTOS#show interface tengigabitethernet 1/1 ets summary

Interface TenGigabitEthernet 1/1
Max Supported TC Groups is 4
Number of Traffic Classes is 8
Admin mode is on

Admin Parameters:
-------------------
Admin is enabled

<table>
<thead>
<tr>
<th>TC-grp</th>
<th>Priority#</th>
<th>Bandwidth</th>
<th>TSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0,1,2,3,4,5,6,7</td>
<td>100%</td>
<td>ETS</td>
</tr>
<tr>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Remote Parameters:
-------------------
Remote is disabled

Local Parameters:
------------------
Local is enabled

<table>
<thead>
<tr>
<th>TC-grp</th>
<th>Priority#</th>
<th>Bandwidth</th>
<th>TSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0,1,2,3,4,5,6,7</td>
<td>100%</td>
<td>ETS</td>
</tr>
<tr>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Oper status is internally propagated
ETS DCBX Oper status is Down
State Machine Type is Asymmetric
Conf TLV Tx Status is enabled
Reco TLV Tx Status is enabled

FTOS#
```
Example

Figure 7-7.  show interfaces ets detail Command Example

FTOS#show interface tengigabitethernet 1/1 ets detail

Interface TenGigabitEthernet 1/1
Max Supported TC Groups is 4
Number of Traffic Classes is 8
Admin mode is on

Admin Parameters:
-------------------
Admin is enabled

<table>
<thead>
<tr>
<th>TC-grp</th>
<th>Priority#</th>
<th>Bandwidth</th>
<th>TSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0,1,2,3,4,5,6,7</td>
<td>100%</td>
<td>ETS</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remote Parameters:
-------------------
Remote is disabled

Local Parameters:
------------------
Local is enabled

<table>
<thead>
<tr>
<th>TC-grp</th>
<th>Priority#</th>
<th>Bandwidth</th>
<th>TSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0,1,2,3,4,5,6,7</td>
<td>100%</td>
<td>ETS</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Oper status is internally propagated
ETS DCBX Oper status is Down
State Machine Type is Asymmetric
Conf TLV Tx Status is enabled
Reco TLV Tx Status is enabled

0 Input Conf TLV Pkts, 0 Output Conf TLV Pkts, 0 Error Conf TLV Pkts
0 Input Reco TLV Pkts, 0 Output Reco TLV Pkts, 0 Error Reco TLV Pkts

FTOS#
Table 7-2 lists the show interface ets summary field descriptions.

### Table 7-2. show interfaces ets detail Command Example Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Interface type with stack-unit and port number.</td>
</tr>
<tr>
<td>Max Supported TC Group</td>
<td>Maximum number of priority groups supported.</td>
</tr>
<tr>
<td>Number of Traffic Classes</td>
<td>Number of 802.1p priorities currently configured.</td>
</tr>
<tr>
<td>Admin mode</td>
<td>ETS mode: on or off. When on, the scheduling and bandwidth allocation configured in an ETS output policy or received in a DCBX TLV from a peer can take effect on an interface.</td>
</tr>
<tr>
<td>Admin Parameters</td>
<td>ETS configuration on local port, including priority groups, assigned dot1p priorities, and bandwidth allocation.</td>
</tr>
<tr>
<td>Remote Parameters</td>
<td>ETS configuration on remote peer port, including admin mode (enabled if a valid TLV was received or disabled), priority groups, assigned dot1p priorities, and bandwidth allocation. If ETS admin mode is enabled on the remote port for DCBX exchange, the Willing bit received in ETS TLVs from the remote peer is included.</td>
</tr>
<tr>
<td>Local Parameters</td>
<td>ETS configuration on local port, including admin mode (enabled when a valid TLV is received from a peer), priority groups, assigned dot1p priorities, and bandwidth allocation.</td>
</tr>
<tr>
<td>Operational status (local port)</td>
<td>Port state for current operational ETS configuration:</td>
</tr>
<tr>
<td></td>
<td>• Init: Local ETS configuration parameters were exchanged with the peer.</td>
</tr>
<tr>
<td></td>
<td>• Recommend: Remote ETS configuration parameters were received from the peer.</td>
</tr>
<tr>
<td></td>
<td>• Internally propagated: ETS configuration parameters were received from the configuration source.</td>
</tr>
<tr>
<td>ETS DCBX Oper status</td>
<td>Operational status of the ETS configuration on the local port: match or mismatch.</td>
</tr>
<tr>
<td>State Machine Type</td>
<td>Type of state machine used for DCBX exchanges of ETS parameters: Feature - for legacy DCBX versions; Asymmetric - for an IEEE version.</td>
</tr>
<tr>
<td>Conf TLV Tx Status</td>
<td>Status of ETS Configuration TLV advertisements: enabled or disabled.</td>
</tr>
<tr>
<td>Reco TLV Tx Status</td>
<td>Status of ETS Recommendation TLV advertisements: enabled or disabled.</td>
</tr>
<tr>
<td>ETS TLV Statistic: Input Conf TLV pkts</td>
<td>Number of ETS Configuration TLVs received.</td>
</tr>
<tr>
<td>ETS TLV Statistic: Output Conf TLV pkts</td>
<td>Number of ETS Configuration TLVs transmitted.</td>
</tr>
<tr>
<td>ETS TLV Statistic: Error Conf TLV pkts</td>
<td>Number of ETS Error Configuration TLVs received.</td>
</tr>
<tr>
<td>ETS Reco TLV Statistic: Input Reco TLV pkts</td>
<td>Number of ETS Recommendation TLVs received.</td>
</tr>
<tr>
<td>ETS Reco TLV Statistic: Output Reco TLV pkts</td>
<td>Number of ETS Recommendation TLVs transmitted.</td>
</tr>
<tr>
<td>ETS Reco TLV Statistic: Error Reco TLV pkts</td>
<td>Number of ETS Error Recommendation TLVs received.</td>
</tr>
</tbody>
</table>
show interface pfc

Displays the PFC configuration applied to ingress traffic on an interface, including priorities and link delay.

Syntax

```
show interface port-type slot/port pfc {summary | detail}
```

Parameters

- `port-type slot/port pfc` Enter the port-type slot and port PFC information.
- `{summary | detail}` Enter the keyword `summary` for a summary list of results or enter the keyword `detail` for a full list of results.

Command Mode

EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator

Example

```
Figure 7-8. show interface pfc summary Command Example

FTOS# show interfaces tengigabitethernet 0/49 pfc summary
Interface TenGigabitEthernet 0/49
  Admin mode is on
  Admin is enabled
  Remote is enabled, Priority list is 4
  Remote Willing Status is enabled
  Local is enabled
  Oper status is Recommended
  PFC DCBX Oper status is Up
  State Machine Type is Feature
  TLV Tx Status is enabled
  PFC Link Delay 45556 pause quantams
  Application Priority TLV Parameters:
    FCOE TLV Tx Status is disabled
    ISCSI TLV Tx Status is disabled
    Local FCOE PriorityMap is 0x8
    Local ISCSI PriorityMap is 0x10
    Remote FCOE PriorityMap is 0x8
    Remote ISCSI PriorityMap is 0x8

FTOS#
```
Figure 7-9. show interface pfc detail Command Example

Usage Information

Table 7-3 lists the show interface pfc summary field descriptions.

Table 7-3. show interfaces pfc summary Command Example Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Interface type with stack-unit and port number.</td>
</tr>
<tr>
<td>Admin mode is on</td>
<td>PFC mode: on or off.</td>
</tr>
<tr>
<td>Admin is enabled</td>
<td>Priority list: list of the configured PFC priorities (if any).</td>
</tr>
<tr>
<td></td>
<td>When the PFC admin mode is on, PFC advertisements are enabled to be sent and</td>
</tr>
<tr>
<td></td>
<td>received from peers.</td>
</tr>
<tr>
<td>Remote is enabled,</td>
<td>Remote Admin mode: (enabled if a valid TLV was received or disabled)</td>
</tr>
<tr>
<td>Priority list,</td>
<td>Priority list: list of the configured PFC priorities (if any).</td>
</tr>
<tr>
<td>Remote Willing Status is</td>
<td>Remote Willing Status: Willing bit received in PFC TLVs from the remote peer.</td>
</tr>
<tr>
<td>enabled</td>
<td></td>
</tr>
<tr>
<td>Local is enabled</td>
<td>Local PFC configuration including the mode and the list of PFC priorities</td>
</tr>
<tr>
<td></td>
<td>configured.</td>
</tr>
<tr>
<td>Operational status (local</td>
<td>Port state for current operational PFC configuration:</td>
</tr>
<tr>
<td>port)</td>
<td>• Init: Local PFC configuration parameters were exchanged with the peer.</td>
</tr>
<tr>
<td></td>
<td>• Recommend: Remote PFC configuration parameters were received from the peer.</td>
</tr>
<tr>
<td></td>
<td>• Internally propagated: PFC configuration parameters were received from the</td>
</tr>
<tr>
<td></td>
<td>configuration source.</td>
</tr>
<tr>
<td>PFC DCBX Oper status</td>
<td>Operational status for the exchange of the PFC configuration on the local port:</td>
</tr>
<tr>
<td></td>
<td>match (up) or mismatch (down).</td>
</tr>
<tr>
<td>State Machine Type</td>
<td>Type of state machine used for DCBX exchanges of the PFC parameters:</td>
</tr>
<tr>
<td></td>
<td>Feature - for legacy DCBX versions; Symmetric - for an IEEE version.</td>
</tr>
<tr>
<td>TLV Tx Status</td>
<td>Status of the PFC TLV advertisements: enabled or disabled.</td>
</tr>
</tbody>
</table>
Table 7-3. show interfaces pfc summary Command Example Fields (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFC Link Delay</td>
<td>Link delay (in quanta) used to pause specified priority traffic.</td>
</tr>
<tr>
<td>Application Priority TLV:</td>
<td></td>
</tr>
<tr>
<td>FCOE TLV Tx Status</td>
<td>Status of FCoE advertisements in application priority TLVs from the local DSBX port. enabled or disabled.</td>
</tr>
<tr>
<td>Application Priority TLV:</td>
<td></td>
</tr>
<tr>
<td>SCSI TLV Tx Status</td>
<td>Status of ISCSI advertisements in application priority TLVs from the local DSBX port. enabled or disabled.</td>
</tr>
<tr>
<td>Application Priority TLV:</td>
<td></td>
</tr>
<tr>
<td>Local FCOE Priority Map</td>
<td>Priority bitmap used by the local DSBX port in FCoE advertisements in application priority TLVs.</td>
</tr>
<tr>
<td>Application Priority TLV:</td>
<td></td>
</tr>
<tr>
<td>Local ISCSI Priority Map</td>
<td>Priority bitmap used by the local DSBX port in ISCSI advertisements in application priority TLVs.</td>
</tr>
<tr>
<td>Application Priority TLV:</td>
<td></td>
</tr>
<tr>
<td>Remote FCOE Priority Map</td>
<td>Priority bitmap received from the remote DSBX port in FCoE advertisements in application priority TLVs.</td>
</tr>
<tr>
<td>Application Priority TLV:</td>
<td></td>
</tr>
<tr>
<td>Remote ISCSI Priority Map</td>
<td>Priority bitmap received from the remote DSBX port in ISCSI advertisements in application priority TLVs.</td>
</tr>
<tr>
<td>PFC TLV Statistics:</td>
<td></td>
</tr>
<tr>
<td>Input TLV pkts</td>
<td>Number of PFC TLVs received.</td>
</tr>
<tr>
<td>PFC TLV Statistics:</td>
<td></td>
</tr>
<tr>
<td>Output TLV pkts</td>
<td>Number of PFC TLVs transmitted.</td>
</tr>
<tr>
<td>PFC TLV Statistics:</td>
<td></td>
</tr>
<tr>
<td>Error pkts</td>
<td>Number of PFC error packets received.</td>
</tr>
<tr>
<td>PFC TLV Statistics:</td>
<td></td>
</tr>
<tr>
<td>Pause Tx pkts</td>
<td>Number of PFC pause frames transmitted.</td>
</tr>
<tr>
<td>PFC TLV Statistics:</td>
<td></td>
</tr>
<tr>
<td>Pause Rx pkts</td>
<td>Number of PFC pause frames received.</td>
</tr>
</tbody>
</table>

show interface pfc statistics

Displays counters for the PFC frames received and transmitted (by dot1p priority class) on an interface.

**Syntax**

show interface *port-type* *slot/port* pfc statistics

**Parameters**

<table>
<thead>
<tr>
<th>port-type</th>
<th>Enter the port type.</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/port</td>
<td>Enter the slot/port number.</td>
</tr>
</tbody>
</table>

**Command Mode**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator
show stack-unit stack-ports ets detail

Displays the ETS configuration applied to egress traffic on stacked ports, including ETS operational mode on each unit and the configured priority groups with dot1p priorities, bandwidth allocation, and scheduler type.

Syntax
show stack-unit {all | stack-unit} stack-ports {all | port-number} ets detail

Parameters
- **stack-unit**: Enter the stack unit identification.
- **port-number**: Enter the port number.

Command Mode
EXEC Privilege

Command History
- Version 8.3.17.0: Supported on M I/O Aggregator
Example

Figure 7-11. show stack-unit stack-ports ets detail Command Example

```
FTOS#show stack-unit all stack-ports all ets details

Stack unit 1 stack port all
Max Supported TC Groups is 4
Number of Traffic Classes is 1
Admin mode is on

Admin Parameters:
-------------------------------------
Admin is enabled
TC-grp     Priority#         Bandwidth       TSA
-------------------------------------
0          0,1,2,3,4,5,6,7   100%            ETS
1                            -               -
2                            -               -
3                            -               -
4                            -               -
5                            -               -
6                            -               -
7                            -               -
8                            -               -

FTOS#
```

show stack-unit stack-ports pfc detail

Displays the PFC configuration applied to ingress traffic on stacked ports, including PFC operational mode on each unit with the configured priorities, link delay, and number of pause packets sent and received.

Syntax
```
show stack-unit {all | stack-unit} stack-ports {all | port-number} pfc detail
```

Parameters
- `stack-unit` Enter the stack unit.
- `port-number` Enter the port number.

Command Mode
CONFIGURATION

Command History
- Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 7-12. show stack-unit all stack-ports all pfc details Command Example

```
FTOS#show stack-unit all stack-ports all pfc details

stack unit 1 stack-port all
    Admin mode is On
    Admin is enabled
    Local is enabled
    Link Delay 45556 pause quantum
    0 Pause Tx pkts, 0 Pause Rx pkts

FTOS#
```
Dynamic Host Configuration Protocol (DHCP)

Overview

Dynamic host configuration protocol (DHCP) is an application layer protocol that dynamically assigns IP addresses and other configuration parameters to network end-stations (hosts) based on configuration policies determined by network administrators.

An Aggregator can operate as a DHCP client. As a DHCP client, the Aggregator requests an IP address from a DHCP server.

The following types of DHCP commands are described in this chapter:

- DHCP Client Commands
- Other Commands supported by DHCP Client

DHCP Client Commands

- ip address dhcp
- release dhcp interface
- renew dhcp interface
- show ip dhcp client statistics
- show ip dhcp lease

Other Commands supported by DHCP Client

- debug ip dhcp client events
- debug ip dhcp clients packets
ip address dhcp

Acquire an IP address dynamically on an interface from the DHCP server.

Syntax

ip address dhcp

To disable DHCP Client on an interface, use the no ip address dhcp command.

Command Mode

INTERFACE

Default

Enabled

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

In the M I/O Aggregator, the DHCP client is enabled only on the default vlan and management interface 0/0. Use the ip address command to assign a static ip address that overwrites the dynamically assigned IP address.

clear ip dhcp client statistics

Displays DHCP client statistics, including the number of DHCP messages sent and received on an interface.

Syntax

clear ip dhcp client statistics {all | interface type slot/port}

Parameters

- **all**: Clear DHCP client statistics on all DHCP client-enabled interfaces on the switch.
- **interface type slot/port**: Clear DHCP client statistics on the specified interface.
  - For the management interface on the stack-unit, enter the keyword managementethernet followed by slot/port information. The slot and port range is 0.
  - For a VLAN, enter the keyword vlan followed by a number from 1 to 4094.

Command Mode

EXEC Privilege

Default

None.

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

debug ip dhcp client events

Enable the display of log messages for the following events on DHCP client interfaces:

- IP address acquisition
- IP address release
- Renewal of IP address and lease time
- Release of an IP address

Syntax

debug ip dhcp client events [interface type slot/port]
Parameters

**debug ip dhcp clients packets**

Enable the display of log messages for all DHCP packets sent and received on DHCP client interfaces.

**Syntax**

debit ip dhcp client packets [interface type slot/port]

**Parameters**

- **interface type slot/port**: Display log messages for DHCP packets sent and received on the specified interface.
  - For the management interface on the stack-unit, enter the keyword *managementethernet* followed by slot/port information. The slot and port range is 0.
  - For a VLAN, enter the keyword *vlan* followed by a number from 1 to 4094.

**Command Mode**

EXEC Privilege

**Default**

None

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**release dhcp interface**

Release the dynamically-acquired IP address on an Ethernet interface while retaining the DHCP client configuration on the interface.

**Syntax**

release dhcp interface type slot/port

**Parameters**

- **interface type slot/port**: For the management interface on the stack-unit, enter the keyword *managementethernet* followed by slot/port information. The slot and port range is 0.
  - For a VLAN, enter the keyword *vlan* followed by a number from 1 to 4094.

**Command Mode**

EXEC Privilege

**Default**

None.
When you enter the `release dhcp` command, although the IP address that was dynamically-acquired from a DHCP server is released from an interface, the ability to acquire a new DHCP server-assigned address remains in the running configuration for the interface. To acquire a new IP address, enter either the `renew dhcp` command at the EXEC privilege level or the `ip address dhcp` command at the interface configuration level.

### renew dhcp interface

Re-acquire a dynamic IP address on an Ethernet interface enabled as a DHCP client.

**Syntax**

```plaintext
renew dhcp interface type slot/port
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| interface type slot/port | Enter any of the following keywords and slot/port or number to clear counters from a specified interface:  
  - For the management interface on the stack-unit, enter the keyword `managementethernet` followed by slot/port information. The slot and port range is 0.  
  - For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094. |

**Command Mode**

EXEC Privilege

**Default**

None.

**Usage Information**

The `renew dhcp` command is used to renew the lease of IP address obtained through dhcp.

To display the currently configure dynamic IP address and lease time, enter the `show ip dhcp lease` command.

### show ip dhcp client statistics

Displays DHCP client statistics, including the number of DHCP messages sent and received on an interface.

**Syntax**

```plaintext
show ip dhcp client statistics {all | interface type slot/port}
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Display DHCP client statistics on all DHCP client-enabled interfaces on the switch.</td>
</tr>
</tbody>
</table>
| interface type slot/port | Display DHCP client statistics on the specified interface.  
  - For the management interface on the stack-unit, enter the keyword `managementethernet` followed by slot/port information. The slot and port range is 0.  
  - For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094. |

**Command Mode**

EXEC Privilege

**Default**

None.
show ip dhcp lease

Displays lease information about the dynamic IP address currently assigned to a DHCP client-enabled interface.

**Syntax**

```text
show ip dhcp lease [interface type slot/port]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface type slot/port</td>
<td>Display DHCP lease information on the specified interface.</td>
</tr>
<tr>
<td>• For the management interface on the stack-unit, enter the keyword <code>managementethernet</code> followed by slot/port information. The slot and port range is 0.</td>
<td></td>
</tr>
<tr>
<td>• For a VLAN, enter the keyword <code>vlan</code> followed by a number from 1 to 4094.</td>
<td></td>
</tr>
</tbody>
</table>

**Command Mode**

EXEC Privilege

**Default**

Display DHCP lease information on all DHCP client-enabled interfaces on the switch.

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator
FIP Snooping

Overview

In a converged Ethernet network, an Aggregator can operate as an intermediate Ethernet bridge to snoop on Fibre Channel over Ethernet Initialization Protocol (FIP) packets during the login process on Fibre Channel over Ethernet (FCoE) forwarders (FCFs). Acting as a transit FIP snooping bridge, the switch uses dynamically-created ACLs to permit only authorized FCoE traffic to be transmitted between an FCoE end-device and an FCF.

FIP Snooping Commands

The following Dell Force10 operating software (FTOS) commands are used to configure and verify the FIP snooping feature:

- clear fip-snooping statistics
- debug fip-snooping
- show fip-snooping config
- show fip-snooping enode
- show fip-snooping fcf
- show fip-snooping sessions
- show fip-snooping statistics
- show fip-snooping system

clear fip-snooping statistics

Clear the statistics on the FIP packets snooped on all VLANs, a specified VLAN, or a specified port interface.

**Syntax**

clear fip-snooping statistics [interface vlan vlan-id | interface port-type port/slot | interface port-channel port-channel-number]

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vlan-id</td>
<td>Enter the VLAN ID of the FIP packet statistics to be cleared.</td>
</tr>
<tr>
<td>port-type port/slot</td>
<td>Enter the port-type and slot number of the FIP packet statistics to be cleared.</td>
</tr>
<tr>
<td>port-channel-number</td>
<td>Enter the port channel number of the FIP packet statistics to be cleared.</td>
</tr>
</tbody>
</table>

**Command Modes**

EXEC Privilege
debug fip-snooping

Enable the debug FIP protocol specific messages.

**Syntax**

depend fip-snooping [all | acl | error | ifm | info | ipc | rx]

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Enable all the debug options.</td>
</tr>
<tr>
<td>acl</td>
<td>Enable for ACL specific debugs.</td>
</tr>
<tr>
<td>error</td>
<td>Enable for Error specific debugs.</td>
</tr>
<tr>
<td>ifm</td>
<td>Enable for IFM specific debugs.</td>
</tr>
<tr>
<td>info</td>
<td>Enable for Information specific debugs.</td>
</tr>
<tr>
<td>ipc</td>
<td>Enable for IPC specific debugs.</td>
</tr>
<tr>
<td>rx</td>
<td>Enable for packet receive specific debugs.</td>
</tr>
</tbody>
</table>

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

show fip-snooping config

Displays the FIP snooping status and configured FC-MAP values.

**Syntax**

show fip-snooping config

**Command Mode**

- EXEC
- EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

Figure 9-1. show fip-snooping config Command Example

```
FTOS#show fip-snooping config
FIP Snooping Feature enabled Status: Enabled
FIP Snooping Global enabled Status: Enabled
Global FC-MAP Value: 0X0EFC00
FTOS#
```
show fip-snooping enode

Displays information on the ENodes in FIP-snooped sessions, including the ENode interface and MAC address, FCF MAC address, VLAN ID, and FC-ID.

Syntax

show fip-snooping enode [enode-mac-address]

Parameters

enode-mac-address
Enter the MAC address of the ENodes to be displayed.

Command Mode

• EXEC
• EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 9-2.  show fip-snooping enode Command Example

<table>
<thead>
<tr>
<th>Enode MAC</th>
<th>Enode Interface</th>
<th>FCF MAC</th>
<th>VLAN</th>
<th>FC-ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>d4:ae:52:1b:e3:cd</td>
<td>Te 0/11</td>
<td>54:7f:ee:37:34:40</td>
<td>100</td>
<td>62:00:11</td>
</tr>
</tbody>
</table>

Table 9-1.  show fip-snooping enode Command Field Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENode MAC</td>
<td>MAC address of the ENode</td>
</tr>
<tr>
<td>ENode Interface</td>
<td>Slot/ port number of the interface connected to the ENode.</td>
</tr>
<tr>
<td>FCF MAC</td>
<td>MAC address of the FCF</td>
</tr>
<tr>
<td>VLAN</td>
<td>VLAN ID number used by the session</td>
</tr>
<tr>
<td>FC-ID</td>
<td>Fibre Channel session ID assigned by the FCF.</td>
</tr>
</tbody>
</table>

show fip-snooping fcf

Displays information on the FCFs in FIP-snooped sessions, including the FCF interface and MAC address, FCF interface, VLAN ID, FC-MAP value, FKA advertisement period, and number of ENodes connected.

Syntax

show fip-snooping fcf [fcf-mac-address]

Parameters

| fcf-mac-address | Enter the MAC address of the FCF to be displayed. |

Command Mode

• EXEC
• EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator
Table 9-2 lists the `show fip-snooping fcf` command field descriptions.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCF MAC</td>
<td>MAC address of the FCF</td>
</tr>
<tr>
<td>FCF Interface</td>
<td>Slot/port number of the interface to which the FCF is connected.</td>
</tr>
<tr>
<td>VLAN</td>
<td>VLAN ID number used by the session</td>
</tr>
<tr>
<td>FC-MAP</td>
<td>FC-Map value advertised by the FCF.</td>
</tr>
<tr>
<td>FKA_ADV_PERIOD</td>
<td>Period of time (in milliseconds) during which FIP keep-alive advertisements are transmitted.</td>
</tr>
<tr>
<td>No of ENodes</td>
<td>Number of ENodes connected to the FCF</td>
</tr>
</tbody>
</table>

show fip-snooping sessions

Displays information on FIP-snooped sessions on all VLANs or a specified VLAN, including the ENode interface and MAC address, the FCF interface and MAC address, VLAN ID, FCoE MAC address and FCoE session ID number (FC-ID), worldwide node name (WWNN) and the worldwide port name (WWPN).

Syntax

```
show fip-snooping sessions [interface vlan vlan-id]
```

Parameters

- `vlan-id` Enter the vlan-id of the specified VLAN to be displayed.

Command Mode

- EXEC
- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator
Example

Figure 9-4. show fip-snooping sessions Command Example

<table>
<thead>
<tr>
<th>ENode MAC</th>
<th>Enode Intf</th>
<th>FCF MAC</th>
<th>FCF Intf</th>
<th>VLAN</th>
<th>FCoE MAC</th>
<th>FC-ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:0e:1e:0c:54:a6</td>
<td>Te 0/14</td>
<td>00:05:73:ff:4f:ae</td>
<td>Po128 100 0e:fe:00:5a:00:27 9a:00:27 20:01:00:0e:1e:0c:54:a6</td>
<td>00:0e:1e:0e:01:5e</td>
<td>Te 0/16</td>
<td>00:05:73:ff:4f:4f:ae</td>
</tr>
</tbody>
</table>

Port WWNN
20:00:00:0e:1e:0c:54:a6
20:00:00:0e:1e:0c:54:a6

Table 9-3 lists the show fip-snooping sessions command field descriptions.

Table 9-3. show fip-snooping sessions Command Field Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENode MAC</td>
<td>MAC address of the ENode.</td>
</tr>
<tr>
<td>ENode Interface</td>
<td>Slot/ port number of the interface connected to the ENode.</td>
</tr>
<tr>
<td>FCF MAC</td>
<td>MAC address of the FCF.</td>
</tr>
<tr>
<td>FCF Interface</td>
<td>Slot/ port number of the interface to which the FCF is connected.</td>
</tr>
<tr>
<td>VLAN</td>
<td>VLAN ID number used by the session.</td>
</tr>
<tr>
<td>FCoE MAC</td>
<td>MAC address of the FCoE session assigned by the FCF.</td>
</tr>
<tr>
<td>FC-ID</td>
<td>Fibre Channel ID assigned by the FCF.</td>
</tr>
<tr>
<td>Port WWPN</td>
<td>Worldwide port name of the CNA port.</td>
</tr>
<tr>
<td>Port WWNN</td>
<td>Worldwide node name of the CNA port.</td>
</tr>
</tbody>
</table>

show fip-snooping statistics

Displays statistics on the FIP packets snooped on all interfaces, including VLANs, physical ports, and port channels.

Syntax

`show fip-snooping statistics [interface vlan vlan-id | interface port-type port/slot | interface port-channel port-channel-number]`

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vlan-id</td>
<td>Enter the VLAN ID of the FIP packet statistics to be displayed.</td>
</tr>
<tr>
<td>port-type port/slot</td>
<td>Enter the port-type and slot number of the FIP packet statistics to be displayed.</td>
</tr>
<tr>
<td>port-channel-number</td>
<td>Enter the port channel number of the FIP packet statistics to be displayed.</td>
</tr>
</tbody>
</table>

Command Mode

- EXEC
- EXEC Privilege
**Figure 9-5. show fip-snooping statistics Command Example**

FTOS# show fip-snooping statistics interface vlan 100
Number of Vlan Requests :0
Number of Vlan Notifications :0
Number of Multicast Discovery Solicits :2
Number of Unicast Discovery Solicits :0
Number of FLOGI :2
Number of FDISC :16
Number of FLOGO :0
Number of Enode Keep Alive :9021
Number of VN Port Keep Alive :3349
Number of Multicast Discovery Advertisement :4437
Number of Unicast Discovery Advertisement :2
Number of FLOGI Accepts :2
Number of FLOGI Rejects :0
Number of FDISC Accepts :16
Number of FDISC Rejects :0
Number of FLOGO Accepts :0
Number of FLOGO Rejects :0
Number of CVL :0
Number of FCF Discovery Timeouts :0
Number of VN Port Session Timeouts :0
Number of Session failures due to Hardware Config :0
FTOS(conf)#

FTOS# show fip-snooping statistics int tengigabitethernet 0/11
Number of Vlan Requests :1
Number of Vlan Notifications :0
Number of Multicast Discovery Solicits :1
Number of Unicast Discovery Solicits :0
Number of FLOGI :1
Number of FDISC :16
Number of FLOGO :0
Number of Enode Keep Alive :4416
Number of VN Port Keep Alive :3136
Number of Multicast Discovery Advertisement :0
Number of Unicast Discovery Advertisement :0
Number of FLOGI Accepts :0
Number of FLOGI Rejects :0
Number of FDISC Accepts :0
Number of FDISC Rejects :0
Number of FLOGO Accepts :0
Number of FLOGO Rejects :0
Number of CVL :0
Number of FCF Discovery Timeouts :0
Number of VN Port Session Timeouts :0
Number of Session failures due to Hardware Config :0
Table 9-4 lists the show fip-snooping statistics command field descriptions.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Vlan Requests</td>
<td>Number of FIP-snooped VLAN request frames received on the interface</td>
</tr>
<tr>
<td>Number of VLAN Notifications</td>
<td>Number of FIP-snooped VLAN notification frames received on the interface</td>
</tr>
<tr>
<td>Number of Multicast Discovery Solicits</td>
<td>Number of FIP-snooped multicast discovery solicit frames received on the interface</td>
</tr>
<tr>
<td>Number of Unicast Discovery Solicits</td>
<td>Number of FIP-snooped unicast discovery solicit frames received on the interface</td>
</tr>
<tr>
<td>Number of FLOGI</td>
<td>Number of FIP-snooped FLOGI request frames received on the interface</td>
</tr>
<tr>
<td>Number of FDISC</td>
<td>Number of FIP-snooped FDISC request frames received on the interface</td>
</tr>
<tr>
<td>Number of FLOGO</td>
<td>Number of FIP-snooped FLOGO frames received on the interface</td>
</tr>
<tr>
<td>Number of ENode Keep Alives</td>
<td>Number of FIP-snooped ENode keep-alive frames received on the interface</td>
</tr>
<tr>
<td>Number of VN Port Keep Alives</td>
<td>Number of FIP-snooped VN port keep-alive frames received on the interface</td>
</tr>
<tr>
<td>Number of Multicast Discovery Advertisements</td>
<td>Number of FIP-snooped multicast discovery advertisements received on the interface</td>
</tr>
<tr>
<td>Number of Unicast Discovery Advertisements</td>
<td>Number of FIP-snooped unicast discovery advertisements received on the interface</td>
</tr>
</tbody>
</table>
show fip-snooping system

Displays information on the status of FIP snooping on the switch (enabled or disabled), including the number of FCoE VLANs, FCFs, ENodes, and currently active sessions.

Syntax

show fip-snooping system

Command Mode

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 9-7. show fip-snooping system Command Example

```bash
FTOS# show fip-snooping system
Global Mode                    : Enabled
FCOE VLAN List (Operational)   : 1, 100
FCFs                           : 1
ENodes                         : 2
Sessions                       : 17
```
Internet Group Management Protocol (IGMP)

IGMP Commands

The Dell Force10 operating software (FTOS) supports internet group management protocol (IGMP) snooping version 2 and 3 on all Dell Force10 systems:

- clear ip igmp groups
- debug ip igmp
- ip igmp snooping flood
- show ip igmp groups
- show ip igmp interface
- show ip igmp snooping mrouter

Important Points to Remember

- FTOS supports version 1, version 2, and version 3 hosts.
- FTOS IGMP snooping implementation is based on IP multicast address (not based on Layer 2 multicast mac-address) and the IGMP snooping entries are in Layer 3 flow table not in Layer 2 forwarding information base (FIB).
- FTOS IGMP snooping implementation is based on draft-ietf-magma-snoop-10.
- IGMP snooping is supported on all M I/O Aggregator stack members.
- IGMP snooping is enabled by default on the switch.
- A maximum of 8k groups and 4k virtual local area networks (VLAN) are supported.
- IGMP snooping is not supported on default VLAN interface.
- Flooding of unregistered multicast traffic is enabled by default.
- Queries are not accepted from the server side ports and are only accepted from the uplink LAG.
- Reports and Leaves are flooded by default to the uplink LAG irrespective of whether it is an mrouter port or not.
clear ip igmp groups
Clear entries from the group cache table.

Syntax
clear ip igmp groups [group-address | interface]

Parameters
- **group-address** (OPTIONAL) Enter the IP multicast group address in dotted decimal format.
- **interface** (OPTIONAL) Enter the interface type and slot/port information:
  For a VLAN interface enter the keyword vlan followed by a number from 1 to 4094.

Command Modes
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

debug ip igmp
Enable debugging of IGMP packets.

Syntax
debug ip igmp [group address | interface]
To disable IGMP debugging, enter the no ip igmp command. To disable all debugging, enter the undebug all command.

Defaults
Disabled

Parameters
- **group-address** (OPTIONAL) Enter the IP multicast group address in dotted decimal format.
- **interface** (OPTIONAL) Enter the interface type and slot/port information:
  For a VLAN interface enter the keyword vlan followed by a number from 1 to 4094.

Command Modes
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

ip igmp snooping flood
This command controls the flooding behavior of unregistered multicast data packets. When flooding is disabled, unregistered multicast data traffic is forwarded to only multicast router ports in a VLAN. If there is no multicast router port in a VLAN, unregistered multicast data traffic is dropped.

Syntax
ip igmp snooping flood

Defaults
Enabled

Command Modes
CONFIGURATION

Command History
Version 8.3.17.0 Supported on M I/O Aggregator
show ip igmp groups

View the IGMP groups.

Syntax

```
show ip igmp groups [group-address [detail] | detail | interface [group-address [detail]]]
```

Parameters

- `group-address` (OPTIONAL) Enter the group address in dotted decimal format to view information on that group only.
- `interface` (OPTIONAL) Enter the interface type and slot/port information:
  - For a VLAN interface enter the keyword vlan followed by a number from 1 to 4094.
- `detail` (OPTIONAL) Enter the keyword detail to display the IGMPv3 source information.

Command Modes

- EXEC
- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator

Example

```
FTOS#show ip igmp groups
Total Number of Groups: 5
IGMP Connected Group Membership
Group Address    Interface                Mode          Uptime
Expires          Last Reporter
225.0.0.0        Vlan 100                 IGMPv2        00:00:05
00:02:04  3.0.0.51
Member Ports: Po 2
225.0.0.1        Vlan 100                 IGMPv2        00:00:05
00:02:04  3.0.0.51
Member Ports: Po 2
225.0.0.2        Vlan 100                 IGMPv2        00:00:05
00:02:04  3.0.0.51
Member Ports: Po 2
225.0.0.3        Vlan 100                 IGMPv2        00:00:05
00:02:04  3.0.0.51
Member Ports: Po 2
225.0.0.4        Vlan 100                 IGMPv2        00:00:05
00:02:04  3.0.0.51
Member Ports: Po 2
```

Table 10-1. show ip igmp groups Command Example Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Address</td>
<td>Lists the multicast address for the IGMP group.</td>
</tr>
<tr>
<td>Interface</td>
<td>Lists the interface type, slot and port number.</td>
</tr>
<tr>
<td>Mode</td>
<td>Displays the IGMP version used.</td>
</tr>
<tr>
<td>Uptime</td>
<td>Displays the amount of time the group has been operational.</td>
</tr>
<tr>
<td>Expires</td>
<td>Displays the amount of time until the entry expires.</td>
</tr>
<tr>
<td>Last Reporter</td>
<td>Displays the IP address of the last host to be a member of the IGMP group.</td>
</tr>
<tr>
<td>Member Ports</td>
<td>Indicates the member ports of the port channel. If the port channel is VLT, an asterisk (*) after the port channel number indicates the port channel is locally down and that a remote VLT port is up.</td>
</tr>
</tbody>
</table>
show ip igmp interface
View information on the interfaces participating in IGMP.

Syntax
show ip igmp interface [interface]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| interface | (OPTIONAL) Enter any of the following keywords and slot/port or number to clear counters from a specified interface:  
  - For a Port Channel interface, enter the keyword port-channel followed by a number. Range: 1-128  
  - For a 10-Gigabit Ethernet interface, enter the keyword TenGigabitEthernet followed by the slot/port information.  
  - For a VLAN, enter the keyword vlan followed by a number from 1 to 4094. |

Command Modes
EXEC
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 10-2. show ip igmp snooping mrouter Command Example

```
FTOS#show ip igmp interface
Vlan 2 is up, line protocol is down
   Inbound IGMP access group is not set
   Interface IGMP group join rate limit is not set
   IGMP snooping is enabled on interface
   IGMP Snooping query interval is 60 seconds
   IGMP Snooping querier timeout is 125 seconds
   IGMP Snooping last member query response interval is 1000 ms
   IGMP snooping fast-leave is disabled on this interface
   IGMP snooping querier is disabled on this interface
Vlan 3 is up, line protocol is down
   Inbound IGMP access group is not set
   Interface IGMP group join rate limit is not set
   IGMP snooping is enabled on interface
   IGMP Snooping query interval is 60 seconds
   IGMP Snooping querier timeout is 125 seconds
   IGMP Snooping last member query response interval is 1000 ms
   IGMP snooping fast-leave is disabled on this interface
   IGMP snooping querier is disabled on this interface
--More--
```
<table>
<thead>
<tr>
<th>Command Modes</th>
<th>EXEC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EXEC Privilege</td>
</tr>
</tbody>
</table>

| Command History | Version 8.3.17.0 | Supported on M I/O Aggregator |

**Example**

**Figure 10-3. show ip igmp snooping mrouter Command Example**

```
FTOS#show ip igmp snooping mrouter vlan 2
Interface Router Ports
  Vlan 2   Po 128
FTOS#
```

| Related Commands | show ip igmp groups | Use this IGMP command to view groups. |
Interfaces

Overview

This chapter defines interface commands and is divided into the following sections:

- Port Interface Commands
- Port Channel Commands
- Time Domain Reflectometer (TDR) Commands

Port Interface Commands

The following commands are for physical, loopback, and null interfaces:

- clear counters
- clear mac-address-table dynamic
- interface range
- interface range macro (define)
- interface range macro name
- interface vlan
- keepalive
- monitor interface
- name
- show config (INTERFACE mode)
- show config (from INTERFACE RANGE mode)
- show config (from INTERFACE VLAN mode)
- show interfaces configured
- show interfaces description
- show interfaces stack-unit
- show interfaces port-channel
- show interfaces status
- show interfaces switchport
- show range
- show vlan
- shutdown
- speed (for 1000/10000/auto interfaces)
Port Channel Commands

A link aggregation group (LAG) is a group of links that appear to a MAC client as if they were a single link according to IEEE 802.3ad. In FTOS, a LAG is referred to as a Port Channel.

Table 11-1. Port Channel Limits

<table>
<thead>
<tr>
<th>Platform</th>
<th>Maximum Port Channel IDs</th>
<th>Maximum Members per Port Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>M I/O Aggregator</td>
<td>128</td>
<td>16</td>
</tr>
</tbody>
</table>

Because each port can be assigned to only one Port Channel, and each Port Channel must have at least one port, some of those nominally available Port Channels might have no function because they could have no members if there are not enough ports installed. In the M I/O Aggregator, those ports could be provided by stack members.

The commands in this section are specific to Port Channel interfaces:

- `auto vlan`
- `group`
- `monitor interface`
- `show config (from INTERFACE RANGE mode)`
- `show interfaces port-channel`

**Note:** The FTOS implementation of LAG or Port Channel requires that you configure a LAG on both switches manually. For information on FTOS Link Aggregation Control Protocol (LACP) for dynamic LAGs, refer to Chapter 14, Link Aggregation Control Protocol (LACP).

For more information on configuring and using Port Channels, refer to the Dell PowerEdge Configuration Guide for the M I/O Aggregator.

Time Domain Reflectometer (TDR) Commands

Time domain reflectometer (TDR) is useful for troubleshooting an interface that is not establishing a link; either it is flapping or not coming up at all. TDR detects open or short conditions of copper cables on 100/1000/10GBase-T modules.

- `tdr-cable-test`
- `show tdr`

**Important Points to Remember**

- The interface and port must be enabled (configured—see the `interface` command) before running TDR. An error message is generated if you have not enabled the interface.
- The interface on the far-end device must be shut down before running TDR.
- Because TDR is an intrusive test on an interface that is not establishing a link, do not run TDR on an interface that is passing traffic.
- When testing between two devices, do not run the test on both ends of the cable.
Virtual LAN (VLAN) Commands

The following commands configure and monitor virtual local area networks (VLANs). VLANs are a virtual interface and use many of the same commands as physical interfaces.

You can configure an IP address and Layer 3 protocols on a VLAN called Inter-VLAN routing. FTP, TFTP, ACLs, and SNMP are not supported on a VLAN.

Occasionally, while sending broadcast traffic over multiple Layer 3 VLANs, the virtual router redundancy protocol (VRRP) state of a VLAN interface may continually switch between Master and Backup.

- auto vlan
- default vlan-id
- name
- show config (from INTERFACE VLAN mode)
- show vlan
- vlan tagged
- vlan untagged

auto vlan

Change the port to auto or admin vlan mode (enable or disable all auto VLANs).

**Syntax**

```
auto vlan <cr>
```

To remove membership from 4K VLAN, use the **no auto vlan** command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>Enter a text string description to identify the VLAN (80 characters maximum).</td>
</tr>
</tbody>
</table>

**Defaults**

none

**Command Modes**

INTERFACE

**Usage Information**

The auto vlan command adds the port as untagged to default vlan and tagged to all other 4K-1 VLAN.

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Supported on</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td>M I/O Aggregator</td>
</tr>
</tbody>
</table>

clear counters

Clear the counters used in the **show interfaces** commands for all VRRP groups, VLANs, and physical interfaces, or selected ones.

**Syntax**

```
clear counters interface
```
clear counters

Clear all interface counters.

Syntax

```
clear counters
```

Parameters

- `interface` (OPTIONAL) Enter any of the following keywords and slot/port or number to clear counters from a specified interface:
  - For the management interface on the stack-unit, enter the keyword `managementethernet` followed by slot/port information. The slot and port range is 0.
  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
  - For a Port Channel interface, enter the keyword `port-channel` followed by a number. Range: 1-128

Defaults

Without a specific interface specified, the command clears all interface counters.

Command Modes

- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator

Example

```
FTOS#clear counters
Clear counters on all interfaces [confirm]
```

clear mac-address-table dynamic

Clear the MAC address table of all MAC addresses learned dynamically.

Syntax

```
clear mac-address-table dynamic [interface tengigabitethernet slot/port-id]
```

Parameters

- `interface` Enter the keyword `interface range` and one of the interfaces — slot/port, port-channel or VLAN number. Select the range of interfaces for bulk configuration. You can enter up to six comma separated ranges—spaces are not required between the commas. Comma-separated ranges can include VLANs, port-channels and physical interfaces.

  Slot/Port information must contain a space before and after the dash. For example, `interface range tengigabitethernet 0/1 - 5` is valid; `interface range tengigabitethernet 0/1-5` is not valid.

  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.

Command Modes

- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator
default vlan-id

Set the default VLAN-id.

Syntax

default vlan-id <vlan-id>

To set the default VLAN-id, use the no default vlan-id command.

Defaults

none

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Related Commands

show vlan Displays VLAN configuration.

description

Assign a descriptive text string to the interface.

Syntax

description desc_text

To delete a description, enter no description.

Parameters

| desc_text | Enter a text string up to 240 characters long.

Defaults

No description is defined.

Command Modes

INTERFACE

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

- Spaces between characters are not preserved after entering this command unless you enclose the entire description in quotation marks ("desc_text").
- Entering a text string after the default vlan-id command overwrites any previous text string configured as the description.
- The show tdr and default vlan-id commands are the only commands that you can configure on an interface that is a member of a port-channel.
- Use the show interfaces description command to display descriptions configured for each interface.

Related Commands

show interfaces description Displays the description field of interfaces.
group

Group two LAGs in a supergroup ("fate-sharing group" or "failover group").

**Syntax**

```
group group_number port-channel number port-channel number
```

To remove an existing LAG supergroup, use the `no group group_number` command.

**Parameters**

- **group_number**: Enter an integer from 1 to 32 that will uniquely identify this LAG fate-sharing group.
- **port-channel number**: Enter the keyword `port-channel` followed by an existing LAG number. Enter this keyword/variable combination twice, identifying the two LAGs to be paired.

**Defaults**

none

**Command Modes**

PORT-CHANNEL FAILOVER-GROUP (conf-po-failover-grp)

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

```
Figure 11-2. group Command Example

FTOS(conf)#port-channel failover-group
FTOS(conf-po-failover-grp)#group 1 port-channel 1 port-channel 2
FTOS(conf-po-failover-grp)#
```

**Related Commands**

- `show interfaces port-channel`: Displays information on configured Port Channel groups.

interface range

This command permits configuration of a range of interfaces to which subsequent commands are applied (bulk configuration). Using the `interface range` command, you can enter identical commands for a range of interfaces.

**Syntax**

```
interface range interface, interface,....
```

**Parameters**

- **interface, interface,....**: Enter the keyword `interface range` and one of the interfaces — slot/port, port-channel or VLAN number. Select the range of interfaces for bulk configuration. You can enter up to six comma separated ranges—spaces are not required between the commas. Comma-separated ranges can include VLANs, port-channels and physical interfaces.

  Slot/Port information must contain a space before and after the dash. For example, `interface range tengigabitethernet 0/1 - 5` is valid; `interface range tengigabitethernet 0/1-5` is not valid.

  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
  - For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.

**Defaults**

none

**Command Modes**

CONFIGURATION
When creating an interface range, interfaces appear in the order they are entered; they are not sorted. The command verifies that interfaces are present (physical) or configured (logical). Important things to remember:

- Bulk configuration is created if at least one interface is valid.
- Non-existing interfaces are excluded from the bulk configuration with a warning message.
- The interface range prompt includes interface types with slot/port information for valid interfaces. The prompt allows for a maximum of 32 characters. If the bulk configuration exceeds 32 characters, it is represented by an ellipsis (...).
- When the interface range prompt has multiple port ranges, the smaller port range is excluded from the prompt.
- If overlapping port ranges are specified, the port range is extended to the smallest start port and the biggest end port.

**Example**

**Figure 11-3. Bulk Configuration Warning Message**

```
FTOS(conf)#interface range tengig 2/0 - 1 , tengig 10/0 , tengig 3/0 , fa 0/0
% Warning: Non-existing ports (not configured) are ignored by interface-range
```

**Example**

**Figure 11-4. Interface Range prompt with Multiple Ports**

```
FTOS(conf)#interface range tengig 2/0 - 23 , tengig 2/1 - 10
FTOS(conf-if-range-tengig-2/0-23#)
```

**Example**

**Figure 11-5. Interface Range prompt Overlapping Port Ranges**

```
FTOS(conf)#interface range tengig 2/1 - 11 , tengig 2/1 - 23
FTOS(conf-if-range-tengig-2/1-23#)
```

Only VLAN and port-channel interfaces created using the `interface vlan` and `vlan tagged` commands can be used in the `interface range` command.

Use the `show running-config` command to display the VLAN and port-channel interfaces. VLAN or port-channel interfaces that are not displayed in the `show running-config` command cannot be used with the bulk configuration feature of the `interface range` command. You cannot create virtual interfaces (VLAN, Port-channel) using the `interface range` command.

**Note:** If a range has VLAN, physical, and port-channel interfaces, only commands related to physical interfaces can be bulk configured. To configure commands specific to VLAN or port-channel, only those respective interfaces should be configured in a particular range.
Figure 11-6 is an example of a single range bulk configuration.

Example  
**Figure 11-6. Single Range Bulk Configuration**

```
FTOS(conf)# interface range tengigabitethernet 5/1 - 23
FTOS(conf-if-range)# no shutdown
FTOS(conf-if-range)#
```

Figure 11-7 shows how to use commas to add different interface types to the range enabling all Ten Gigabit Ethernet interfaces in the range 5/1 to 5/23 and both Ten Gigabit Ethernet interfaces 1/1 and 1/2.

Example  
**Figure 11-7. Multiple Range Bulk Configuration Gigabit Ethernet and Ten Gigabit Ethernet**

```
FTOS(conf-if)# interface range tengigabitethernet 5/1 - 23, tengigabitethernet 1/1 - 2
FTOS(conf-if-range)# no shutdown
FTOS(conf-if-range)#
```

Figure 11-8 shows how to use commas to add VLAN and port-channel interfaces to the range.

Example  
**Figure 11-8. Multiple Range Bulk Configuration with VLAN and port channel**

```
FTOS(conf-if)# interface range tengigabitethernet 5/1 - 23, tengigabitethernet 1/1 - 2, Vlan 2 – 100 , Port 1 – 25
FTOS(conf-if-range)# no shutdown
FTOS(conf-if-range)#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show config (from INTERFACE RANGE mode)</td>
<td>Shows the bulk configuration interfaces.</td>
</tr>
<tr>
<td>show interfaces status</td>
<td>Displays a summary of interface information.</td>
</tr>
<tr>
<td>interface range macro (define)</td>
<td>Defines a macro for an interface-range.</td>
</tr>
</tbody>
</table>

**interface range macro (define)**

Defines a macro for an interface range and then saves the macro in the running configuration.

**Syntax**

define interface range macro name interface , interface , ...

**Parameters**

- `name`  
Enter up to 16 characters for the macro name.

- `interface , interface , ...`  
Enter the `interface` keyword (see below) and one of the interfaces slot/port, port-channel or VLAN numbers. Select the range of interfaces for bulk configuration. You can enter up to six comma separated ranges—spaces are not required between the commas. Comma-separated ranges can include VLANs, port-channels and physical interfaces.

  Slot/Port information must contain a space before and after the dash. For example, `interface range tengigabitethernet 0/1 - 5` is valid; `interface range tengigigabitethernet 0/1-5` is not valid.

  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
  - For a VLAN, enter the keyword `Vlan` followed by a number from 1 to 4094.
interface range macro name

Run the interface-range macro to automatically configure the pre-defined range of interfaces.

Syntax

interface range macro name

Parameters

name

Enter the name of an existing macro.

Defaults

none

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

Figure 11-10 runs the macro named test that was defined earlier.

Example

Figure 11-10. interface-range macro Command Example

FTOS(conf)#interface range macro test
FTOS(conf-if-range-te-0/0-3,tengig-5/0-47,tengig-13/0-89)#

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>group</td>
<td>Configures a range of command (bulk configuration)</td>
</tr>
<tr>
<td>interface range macro name</td>
<td>Runs an interface range macro.</td>
</tr>
</tbody>
</table>
interface vlan

Configure the default VLAN to enable Static or DCHP IP configuration

**Syntax**

interface vlan vlan-id

To delete a VLAN, use the no interface vlanvlan-id command.

**Parameters**

- `vlan-id` Enter 1 for the default VLAN.

**Defaults**

Not configured

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

For more information about VLANs and the commands to configure them, refer to Virtual LAN (VLAN) Commands.

**Example**

Figure 11-11. interface vlan Command Example

```
FTOS(conf)#int vlan 3
FTOS(conf-if-vl-3)#
```

**Related Commands**

- `show vlan` Displays the current VLAN configuration on the switch.
- `vlan tagged` Adds a Layer 2 interface to a VLAN as a tagged interface.
- `vlan untagged` Adds a Layer 2 interface to a VLAN as an untagged interface.

keepalive

Keep the interface alive when it is not transmitting data.

**Syntax**

keepalive

**Defaults**

Enabled

**Command Modes**

INTERFACE

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

When you configure keepalive, the system keeps the link is up even if the link is not active at the time.
monitor interface

Monitor counters on a single interface or all interfaces on a stack unit. The screen is refreshed every 5 seconds and the CLI prompt disappears.

**Syntax**

```plaintext
monitor interface [interface]
```

To disable monitoring and return to the CLI prompt, press the q key.

**Parameters**

- **interface** (OPTIONAL) Enter the following keywords and slot/port or number information:
  - For the management port, enter the keyword `managementethernet` followed by the slot (0-1) and the port (0).
  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
  - For a Port Channel interface, enter the keyword `port-channel` followed by a number. Range: 1-128

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

The delta column displays changes since the last screen refresh.

**Example**

Figure 11-12. monitor Command Example of a Single Interface

```
systest-3 Monitor time: 00:00:06 Refresh Intvl.: 2s Time: 03:26:26
Interface: tengig 0/3, Enabled, Link is Up, Linespeed is 1000 Mbit

Traffic statistics: Current Rate Delta
Input bytes: 9069828 43 Bps 86
Output bytes: 606915800 43 Bps 86
Input packets: 54001 0 pps 1
Output packets: 9401589 0 pps 1
64B packets: 67 0 pps 0
Over 64B packets: 49166 0 pps 1
Over 127B packets: 350 0 pps 0
Over 255B packets: 1351 0 pps 0
Over 511B packets: 286 0 pps 0
Over 1023B packets: 2781 0 pps 0

Error statistics:
Input underruns: 0 0 pps 0
Input giants: 0 0 pps 0
Input throttles: 0 0 pps 0
Input CRC: 0 0 pps 0
Input IP checksum: 0 0 pps 0
Input overrun: 0 0 pps 0
Output underruns: 0 0 pps 0
Output throttles: 0 0 pps 0

m - Change mode c - Clear screen
l - Page up a - Page down
T - Increase refresh interval t - Decrease refresh interval
q - Quit
```

**Table 11-2. monitor Command Menu Options**

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>systest-3</td>
<td>Displays the host name assigned to the system.</td>
</tr>
<tr>
<td>monitor time</td>
<td>Displays the amount of time since the monitor interface command was entered.</td>
</tr>
<tr>
<td>time</td>
<td>Displays the amount of time the chassis is up (since last reboot).</td>
</tr>
</tbody>
</table>
name

Assign a name to the Default VLAN.

**Syntax**

```plaintext
name vlan-name
```

To remove the name from the VLAN, use the no name command.

**Parameters**

- **vlan-name**: Enter up to 32 characters as the name of the VLAN.

**Defaults**

Not configured.

**Command Modes**

INTERFACE VLAN

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

This CLI applies only to the Default VLAN.

To display information about a named VLAN, enter the `show vlan` command with the name parameter or the `show interfaces description` command.

**Related Commands**

- `default vlan-id` Assigns a descriptive text-id to the interface.
- `interface vlan` Configures a VLAN.
- `show vlan` Displays the current VLAN configurations on the switch.

---

### Table 11-2.  monitor Command Menu Options

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>m</td>
<td>Change the view from a single interface to all interfaces on the stack unit or visa-versa.</td>
</tr>
<tr>
<td>c</td>
<td>Refresh the view.</td>
</tr>
<tr>
<td>b</td>
<td>Change the counters displayed from Packets on the interface to Bytes.</td>
</tr>
<tr>
<td>r</td>
<td>Change the [delta] column from change in the number of packets/bytes in the last interval to rate per second.</td>
</tr>
<tr>
<td>l</td>
<td>Change the view to next interface on the stack unit, or if in the stack unit mode, the next stack unit in the chassis.</td>
</tr>
<tr>
<td>a</td>
<td>Change the view to the previous interface on the stack unit, or if the stack unit mode, the previous stack unit in the chassis.</td>
</tr>
<tr>
<td>T</td>
<td>Increase the screen refresh rate.</td>
</tr>
<tr>
<td>t</td>
<td>Decrease the screen refresh rate.</td>
</tr>
<tr>
<td>q</td>
<td>Return to the CLI prompt.</td>
</tr>
</tbody>
</table>
**negotiation auto**
Enable auto-negotiation on an interface.

**Syntax**
negotiation auto

To disable auto-negotiation, enter `no negotiation auto`.

**Defaults**
Enabled

**Command Modes**
INTERFACE

**Command History**

**Usage Information**
The `no negotiation auto` command is only available if you first manually set the speed of a port to 10Mbits or 100Mbits.

The `negotiation auto` command provides a `mode` option for configuring an individual port to forced-master/forced slave once auto-negotiation is enabled.

**Figure 11-13. negotiation auto Master/Slave Example**

```
FTOS(conf)# int tengig 0/0
FTOS(conf-if)#neg auto
FTOS(conf-if-autoneg)#?
  end                     Exit from configuration mode
  exit                    Exit from autoneg configuration mode
  mode                    Specify autoneg mode
  no                      Negate a command or set its defaults
  show                    Show autoneg configuration information
  FTOS(conf-if-autoneg)#mode ?
  forced-master           Force port to master mode
  forced-slave            Force port to slave mode
FTOS(conf-if-autoneg)#
```

If the `mode` option is not used, the default setting is slave. If you do not configure `forced-master` or `forced slave` on a port, the port negotiates to either a master or a slave state. Port status is one of the following:

- Forced-master
- Force-slave
- Master
- Slave
- Auto-neg Error—typically indicates that both ends of the node are configured with forced-master or forced-slave.

**Caution:** Ensure that one end of your node is configured as forced-master and one is configured as forced-slave. If both are configured the same (that is forced-master or forced-slave), the `show interfaces` command will flap between an auto-neg-error and forced-master/slave states.

You can display master/slave settings with the `show interfaces` command.
Both sides of the link must have auto-negotiation enabled or disabled for the link to come up.

The following table details the possible speed and auto-negotiation combinations for a line between two 100/1000/10GB Base-T Ethernet interfaces.

### Table 11-3. Auto-negotiation and Link Speed Combinations

<table>
<thead>
<tr>
<th>Port 0</th>
<th>Port 1</th>
<th>Link Status between Port 1 and Port 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto-negotiation enabled* speed 1000 or auto</td>
<td>auto-negotiation enabled* speed 1000 or auto</td>
<td>Up at 1000 Mb/s</td>
</tr>
<tr>
<td>auto-negotiation enabled speed 100</td>
<td>auto-negotiation enabled speed 100</td>
<td>Up at 100 Mb/s</td>
</tr>
<tr>
<td>auto-negotiation disabled speed 100</td>
<td>auto-negotiation disabled speed 100</td>
<td>Up at 100 Mb/s</td>
</tr>
<tr>
<td>auto-negotiation disabled speed 100</td>
<td>auto-negotiation disabled speed 100</td>
<td>Down</td>
</tr>
<tr>
<td>auto-negotiation enabled* speed 1000 or auto</td>
<td>auto-negotiation disabled speed 100</td>
<td>Down</td>
</tr>
</tbody>
</table>

* You cannot disable auto-negotiation when the speed is set to 1000 or auto.

### Related Commands

- `speed (for 1000/10000/auto interfaces)`
  - Set the link speed to 1000, 10000, or auto-negotiate the speed.

### show config (INTERFACE mode)

Displays the interface configuration.

**Syntax**

```
show config
```

**Command Modes**

INTERFACE

**Command History**

- **Version 8.3.17.0**
  - Supported on M I/O Aggregator
**Example**

**Figure 11-15. show config Command Example for the INTERFACE Mode**

```
FTOS(conf-if)#show conf
!
interface TenGigabitEthernet 1/1
no ip address
switchport
no shutdown
FTOS(conf-if)#
```

**show config (from INTERFACE RANGE mode)**

Displays the bulk configured interfaces (group).

**Syntax**

```
show config
```

**Command Modes**

- CONFIGURATION INTERFACE (conf-if-range)

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

**Figure 11-16. show config (Bulk Configuration) Command Example**

```
FTOS(conf)#interface range tengigabitethernet 1/1 - 2
FTOS(conf-if-range-tengig-1/1-2)#show config
!
interface TenGigabitEthernet 1/1
no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/2
no ip address
switchport
no shutdown
FTOS(conf-if-range-tengig-1/1-2)#
```

**show config (from INTERFACE VLAN mode)**

Displays the current configuration of the Default VLAN.

**Syntax**

```
show config
```

**Command Modes**

- INTERFACE VLAN

**Example**

**Figure 11-17. show config Command Example for the Default VLAN**

```
FTOS(conf-if-vl-1)#show config
!
interface Vlan 1
description a
no ip address
mtu 2500
shutdown
FTOS(conf-if-vl-1)#
```

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator
show config (from PROTOCOL LLDP mode)
Displays the LLDP configuration.

Syntax
show config

Command Modes
PROTOCOL LLDP

Example
Figure 11-18. show config Command Example for a Selected VLAN

```
FTOS(conf-lldp)#show conf
!
protocol lldp
FTOS(conf-lldp)#
```
**Note:** After the counters are cleared, the line-rate continues to increase until it reaches the maximum line rate. When the maximum line rate is reached, there will be no change in the line-rate.

**Example Figure 11-19. show interfaces Command Example for 10G Port**

```
FTOS#show interfaces tengigabitethernet 2/0
TenGigabitEthernet 2/0 is up, line protocol is up
Hardware is Dell Force10Eth, address is 00:01:e8:05:f7:3a
Interface index is 100990998
Internet address is 213.121.22.45/28
MTU 1554 bytes, IP MTU 1500 bytes
LineSpeed 10000 Mbit
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interfaces" counters 02:31:45
Queueing strategy: fifo
Input Statistics:
  0 packets, 0 bytes
  Input 0 IP Packets, 0 Vlans 0 MPLS
  0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
  0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts
  0 symbol errors, 0 runts, 0 giants, 0 throttles
  0 CRC, 0 IP Checksum, 0 overrun, 0 discarded
Output Statistics:
  1 packets, 64 bytes, 0 underruns
  0 Multicasts, 2 Broadcasts, 0 Unicasts
  0 IP Packets, 0 Vlans, 0 MPLS
  0 throttles, 0 discarded
Rate info (interval 299 seconds):
  Input 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
  Output 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
Time since last interface status change: 00:00:27
```

**Table 11-4. Lines in show interfaces Command Example**

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TenGigabitEthernet 2/0...</td>
<td>Displays the interface’s type, slot/port, and administrative and line protocol status.</td>
</tr>
<tr>
<td>Hardware is...</td>
<td>Displays the interface’s hardware information and its assigned MAC address.</td>
</tr>
<tr>
<td>Interface index...</td>
<td>Displays the interface index number used by SNMP to identify the interface.</td>
</tr>
<tr>
<td>Internet address...</td>
<td>States whether an IP address is assigned to the interface. If one is, that address is displayed.</td>
</tr>
<tr>
<td>MTU 1554...</td>
<td>Displays link and IP MTU information. If the chassis is in Jumbo mode, this number can range from 576 to 9252.</td>
</tr>
<tr>
<td>LineSpeed</td>
<td>Displays the interface’s line speed.</td>
</tr>
<tr>
<td>ARP type:...</td>
<td>Displays the ARP type and the ARP timeout value for the interface.</td>
</tr>
<tr>
<td>Last clearing...</td>
<td>Displays the time when the show interfaces counters were cleared.</td>
</tr>
<tr>
<td>Queuing strategy...</td>
<td>States the packet queuing strategy. FIFO means first in first out.</td>
</tr>
</tbody>
</table>
### Table 11-4. Lines in show interfaces Command Example

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
</tr>
</thead>
</table>
| Input Statistics: | Displays all the input statistics including:  
  - Number of packets and bytes into the interface  
  - Number of packets with IP headers and VLAN tagged headers.  
  **Note:** The sum of the number of packets may not be as expected since a VLAN tagged IP packet counts as both a VLAN packet and an IP packet.  
  - Packet size and the number of those packets inbound to the interface  
  - Number of symbol errors, runts, giants, and throttles packets:  
    - symbol errors = number packets containing bad data. That is, the port MAC detected a physical coding error in the packet.  
    - runts = number of packets that are less than 64B  
    - giants = packets that are greater than the MTU size  
    - throttles = packets containing PAUSE frames  
  - Number of CRC, IP Checksum, overrun, and discarded packets:  
    - CRC = packets with CRC/FCS errors  
    - IP Checksum = packets with IP Checksum errors  
    - overrun = number of packets discarded due to FIFO overrun conditions  
    - discarded = the sum of input symbol errors, runts, giants, CRC, IP Checksum, and overrun packets discarded without any processing |
| Output Statistics: | Displays output statistics sent out of the interface including:  
  - Number of packets, bytes and underruns out of the interface  
    - packets = total number of packets  
    - bytes = total number of bytes  
    - underruns = number of packets with FIFO underrun conditions  
  - Number of Multicast, Broadcast and Unicast packets:  
    - Multicasts = number of MAC multicast packets  
    - Broadcasts = number of MAC broadcast packets  
    - Unicasts = number of MAC unicast packets  
  - Number of throttles and discards packets:  
    - throttles = packets containing PAUSE frames  
    - discarded = number of packets discarded without any processing |
| Rate information... | Estimate of the input and output traffic rate over a designated interval (30 to 299 seconds).  
  Traffic rate is displayed in bits, packets per second, and percent of line rate. |
| Time since... | Elapsed time since the last interface status change (hh:mm:ss format). |
The interface counter “over 1023-byte pkts” does not increment for packets in the range 9216 > x < 1023.

The Management port is enabled by default (no show tdr). If necessary, use the ip address command to assign an IP address to the Management port.

<table>
<thead>
<tr>
<th>Related Commands</th>
</tr>
</thead>
<tbody>
<tr>
<td>show interfaces configured</td>
</tr>
<tr>
<td>show interfaces port-channel</td>
</tr>
<tr>
<td>show interfaces switchport</td>
</tr>
<tr>
<td>show inventory</td>
</tr>
<tr>
<td>show ip interface</td>
</tr>
<tr>
<td>show memory</td>
</tr>
<tr>
<td>show interfaces status</td>
</tr>
</tbody>
</table>

**show interfaces configured**

Displays any interface with a non-default configuration.

**Syntax**

show interfaces configured

**Command Modes**

EXEC

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

Figure 11-20. show interfaces ManagementEthernet Command Example

FTOS#show interface managementethernet ?
0/0 Management Ethernet interface number
FTOS#show interface managementethernet 0/0
ManagementEthernet 0/0 is up, line protocol is up
    Hardware is DellForce10Eth, address is 00:1e:c9:f1:00:05
    Current address is 00:1e:c9:f1:00:05
    Pluggable media not present
    Interface index is 235159752
    Internet address is 10.11.209.87/16
    Mode of IP Address Assignment : MANUAL
    DHCP Client-ID: mgmt001ec9f10005
    Virtual-IP is not set
    Virtual-IP IPv6 address is not set
    MTU 1554 bytes, IP MTU 1500 bytes
    LineSpeed 100 Mbit, Mode full duplex
    ARP type: ARPA, ARP Timeout 04:00:00
    Last clearing of "show interface" counters 5d4h57m
    Queueing strategy: fifo
    Input 3448753 packets, 950008323 bytes, 3442163 multicast
    Received 0 errors, 0 discarded
    Output 4627 packets, 814226 bytes, 0 multicast
    Output 0 errors, 0 invalid protocol
Figure 11-21. show interfaces configured Command Example

```
FTOS#show interfaces configured
TenGigabitEthernet 1/1 is up, line protocol is down(error-disabled[UFD])
Hardware is DellForce10Eth, address is 00:01:e8:00:ab:01
Current address is 00:01:e8:00:ab:01
Server Port AdminState is Down
Pluggable media not present
Interface index is 6703553
Internet address is not set
Mode of IP Address Assignment : NONE
DHCP Client-ID :tenG2580001e800ab01
MTU 12000 bytes, IP MTU 11982 bytes
LineSpeed auto
Flowcontrol rx off tx off
ARP type: ARPA, ARP Timeout 04:00:00
Last clearing of "show interface" counters 05:15:07
Queueing strategy: fifo
Input Statistics:
  0 packets, 0 bytes
  0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
  0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts
  0 Multicasts, 0 Broadcasts
  0 runts, 0 giants, 0 throttles
  0 CRC, 0 overrun, 0 discarded
Output Statistics:
  0 packets, 0 bytes, 0 underruns
  0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
  0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts
  0 Multicasts, 0 Broadcasts, 0 Unicasts
  0 throttles, 0 discarded, 0 collisions, 0 wred drops
Rate info (interval 299 seconds):
  Input 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
  Output 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
Time since last interface status change: 05:14:12

TenGigabitEthernet 1/2 is up, line protocol is down(error-disabled[UFD])
FTOS#
```

**show interfaces description**

Displays the descriptions configured on the interface.

**Syntax**

```
show interfaces [interface] description
```

**Parameters**

- **interface**
  - Enter one of the following keywords and slot/port or number information:
    - For the management interface on the stack unit enter the keyword **ManagementEthernet** followed by the slot/port information. The slot range is 0-0 and the port range is 0.
    - For a 10-Gigabit Ethernet interface, enter the keyword **TenGigabitEthernet** followed by the slot/port information.
    - For VLAN interfaces, enter the keyword **vlan** followed by a number from 1 to 4094.

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

- **Version 8.3.17.0** Supported on M I/O Aggregator
Example

Figure 11-22.  show interfaces description Command Example

```
FTOS#show interface description
Interface          OK  Status     Protocol    Description
TenGigabitEthernet 0/1   NO  admin down down
TenGigabitEthernet 0/2   NO  admin down down
TenGigabitEthernet 0/3   NO  admin down down
TenGigabitEthernet 0/4   NO  admin down down
TenGigabitEthernet 0/5   NO  admin down down
TenGigabitEthernet 0/6   NO  admin down down
TenGigabitEthernet 0/7   NO  up        down
TenGigabitEthernet 0/8   YES up     up
TenGigabitEthernet 0/9   NO  admin down down
TenGigabitEthernet 0/10  NO  admin down down
TenGigabitEthernet 0/11  NO  admin down down
TenGigabitEthernet 0/12  NO  admin down down
TenGigabitEthernet 0/13  NO  admin down down
TenGigabitEthernet 0/14  NO  admin down down
TenGigabitEthernet 0/15  NO  admin down down
TenGigabitEthernet 0/16  YES up     up
TenGigabitEthernet 0/17  NO  admin down down
TenGigabitEthernet 0/18  NO  admin down down
TenGigabitEthernet 0/19  NO  admin down down
TenGigabitEthernet 0/20  NO  admin down down
TenGigabitEthernet 0/21  NO  admin down down
```

Table 11-5. show interfaces description Command Example Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Displays type of interface and associated slot and port number.</td>
</tr>
<tr>
<td>OK?</td>
<td>Indicates if the hardware is functioning properly.</td>
</tr>
<tr>
<td>Status</td>
<td>States whether the interface is enabled (up) or disabled (administratively down).</td>
</tr>
<tr>
<td>Protocol</td>
<td>States whether IP is enabled (up) or disabled (down) on the interface.</td>
</tr>
<tr>
<td>Description</td>
<td>Displays the description (if any) manually configured for the interface.</td>
</tr>
</tbody>
</table>

show interfaces port-channel

Displays information on configured Port Channel groups.

Syntax

show interfaces port-channel [channel-number] [brief | description]

Parameters

- **channel-number**: For a Port Channel interface, enter the keyword port-channel followed by a number:
  Range: 1-128

- **brief**: (OPTIONAL) Enter the keyword brief to display only the port channel number, the state of the port channel, and the number of interfaces in the port channel.

- **description**: (OPTIONAL) Enter the keyword description to display interface information with description.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0  Supported on M I/O Aggregator
**Example**  

**Figure 11-23. show interfaces port-channel Command Example (EtherScale)**

```plaintext
FTOS#show interfaces port-channel  
Port-channel 1 is down, line protocol is down  
Hardware address is 00:1e:c9:f1:00:05, Current address is 00:1e:c9:f1:00:05  
Interface index is 1107755009  
Minimum number of links to bring Port-channel up is 1  
Internet address is not set  
Mode of IP Address Assignment : NONE  
DHCP Client-ID :lag1001ec9f10005  
MTU 1554 bytes, IP MTU 1500 bytes  
LineSpeed auto  
Members in this channel:  
ARP type: ARPA, ARP Timeout 04:00:00  
Last clearing of "show interface" counters 03:28:00  
Queueing strategy: fifo  
Input Statistics:  
  0 packets, 0 bytes  
  0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts  
  0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts  
  0 Multicasts, 0 Broadcasts  
  0 runts, 0 giants, 0 throttles  
  0 CRC, 0 overrun, 0 discarded  
Output Statistics:  
  0 packets, 0 bytes, 0 underruns  
  0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts  
  0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts  
  0 Multicasts, 0 Broadcasts, 0 Unicasts  
  0 throttles, 0 discarded, 0 collisions
```

**Table 11-6. show interfaces port-channel Command Example Fields**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port-Channel 1...</td>
<td>Displays the LAG’s status. In the example, the status of the LAG’s LAG fate-sharing group (“Failover-group”) is listed.</td>
</tr>
<tr>
<td>Hardware is...</td>
<td>Displays the interface’s hardware information and its assigned MAC address.</td>
</tr>
<tr>
<td>Port-channel is part...</td>
<td>Indicates whether the LAG is part of a LAG fate-sharing group (“Failover-group”).</td>
</tr>
<tr>
<td>Internet address...</td>
<td>States whether an IP address is assigned to the interface. If one is, that address is displayed.</td>
</tr>
<tr>
<td>MTU 1554...</td>
<td>Displays link and IP MTU.</td>
</tr>
<tr>
<td>LineSpeed</td>
<td>Displays the interface’s line speed. For a port channel interface, it is the line speed of the interfaces in the port channel.</td>
</tr>
<tr>
<td>Members in this...</td>
<td>Displays the interfaces belonging to this port channel.</td>
</tr>
<tr>
<td>ARP type...</td>
<td>Displays the ARP type and the ARP timeout value for the interface.</td>
</tr>
<tr>
<td>Last clearing...</td>
<td>Displays the time when the show interfaces counters were cleared.</td>
</tr>
<tr>
<td>Queueing strategy...</td>
<td>States the packet queuing strategy. FIFO means first in first out.</td>
</tr>
<tr>
<td>packets input...</td>
<td>Displays the number of packets and bytes into the interface.</td>
</tr>
<tr>
<td>Input 0 IP packets...</td>
<td>Displays the number of packets with IP headers, VLAN tagged headers and MPLS headers. The number of packets may not add correctly because a VLAN tagged IP packet counts as both a VLAN packet and an IP packet.</td>
</tr>
<tr>
<td>0 64-byte...</td>
<td>Displays the size of packets and the number of those packets entering that interface. This information is displayed over two lines.</td>
</tr>
<tr>
<td>Received 0...</td>
<td>Displays the type and number of errors or other specific packets received. This information is displayed over three lines.</td>
</tr>
</tbody>
</table>
Table 11-6. show interfaces port-channel Command Example Fields (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output 0...</td>
<td>Displays the type and number of packets sent out the interface. This information is displayed over three lines.</td>
</tr>
<tr>
<td>Rate information...</td>
<td>Displays the traffic rate information into and out of the interface. Traffic rate is displayed in bits and packets per second.</td>
</tr>
<tr>
<td>Time since...</td>
<td>Displays the time since the last change in the configuration of this interface.</td>
</tr>
</tbody>
</table>

Figure 11-24. show interfaces port-channel brief Command Example

```
FTOS# show interfaces port-channel 1 brief
Codes: L = LACP Port-channel
LAG  Mode  Status       Uptime      Ports
   1    L3    down         00:00:00    Te 0/16    (Down)
FTOS#
```

Table 11-7. show interfaces port-channel brief Command Example Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAG</td>
<td>Lists the port channel number.</td>
</tr>
<tr>
<td>Mode</td>
<td>Lists the mode:</td>
</tr>
<tr>
<td></td>
<td>• L3 - for Layer 3</td>
</tr>
<tr>
<td></td>
<td>• L2 - for Layer 2</td>
</tr>
<tr>
<td>Status</td>
<td>Displays the status of the port channel.</td>
</tr>
<tr>
<td></td>
<td>• down - if the port channel is disabled (shutdown)</td>
</tr>
<tr>
<td></td>
<td>• up - if the port channel is enabled (no shutdown)</td>
</tr>
<tr>
<td>Uptime</td>
<td>Displays the age of the port channel in hours:minutes:seconds.</td>
</tr>
<tr>
<td>Ports</td>
<td>Lists the interfaces assigned to this port channel.</td>
</tr>
<tr>
<td>(untitled)</td>
<td>Displays the status of the physical interfaces (up or down).</td>
</tr>
<tr>
<td></td>
<td>In Layer 2 port channels, an * (asterisk) indicates which interface is the primary port of the port channel. The primary port sends out interface PDU.</td>
</tr>
<tr>
<td></td>
<td>In Layer 3 port channels, the primary port is not indicated.</td>
</tr>
</tbody>
</table>

Related Commands

- show lacp Displays the LACP matrix.

show interfaces stack-unit

Displays information on all interfaces on a specific M I/O Aggregator stack member.

Syntax

```
show interfaces stack-unit unit-number
```

Parameters

- `unit-number` Enter the stack member number (0 to 5).
show interfaces status

Displays a summary of interface information or specify a stack unit and interface to display status information for that specific interface only.

**Syntax**

```
show interfaces [interface | stack-unit unit-number] status
```

**Parameters**

- `interface` (OPTIONAL) Enter one of the following keywords and slot/port or number information:
  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.

**Defaults**

none

**Command Modes**

- EXEC
- EXEC Privilege

**Example**

```
FTOS#show interfaces stack-unit 0
TenGigabitEthernet 0/1 is down, line protocol is down
Hardware is DellForce10Eth, address is 00:1e:c9:f1:00:05
  Current address is 00:1e:c9:f1:00:05
  Server Port AdminState is Down
  Pluggable media not present
  Interface index is 34148609
  Internet address is not set
  Mode of IP Address Assignment : NONE
  DHCP Client-ID :tenG130001ec9f10005
  MTU 1554 bytes, IP MTU 1500 bytes
  LineSpeed auto
  Flowcontrol rx off tx off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last clearing of "show interface" counters 5d5h24m
  Queuing strategy: fifo
  Input Statistics:
    0 packets, 0 bytes
    0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
    0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts
    0 Multicasts, 0 Broadcasts
    0 runts, 0 giants, 0 throttles
    0 CRC, 0 overrun, 0 discarded
  Output Statistics:
    0 packets, 0 bytes, 0 underruns
    0 64-byte pkts, 0 over 64-byte pkts, 0 over 127-byte pkts
    0 over 255-byte pkts, 0 over 511-byte pkts, 0 over 1023-byte pkts
    0 Multicasts, 0 Broadcasts, 0 Unicasts
    0 throttles, 0 discarded, 0 collisions
  Rate info (interval 299 seconds):
    Input 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
    Output 00.00 Mbits/sec, 0 packets/sec, 0.00% of line-rate
  Time since last interface status change: 5d5h24m
  !----------------output truncated ----------------!
```

**Related Commands**

- `show diag` Displays data plane and management plane input/output statistics.
show interfaces switchport

Displays only virtual and physical interfaces in Layer 2 mode. This command displays the Layer 2 mode interfaces’ IEEE 802.1Q tag status and VLAN membership.

**Syntax**

`show interfaces switchport [interface | stack-unit unit-id ]`

**Parameters**

- `interface`
  - Enter one of the following keywords and slot/port or number information:
    - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
    - Enter the keyword `backup` to view the backup interface for this interface.

- `stack-unit unit-id`
  - (OPTIONAL) Enter the keyword `stack-unit` followed by the stack member number. Range: 0 to 5

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator
Example

Figure 11-27. show interfaces switchport Command Example

```
FTOS#show interfaces switchport
Codes:  U - Untagged, T - Tagged
       X - Dot1x untagged, x - Dot1x tagged
       G - GVRP tagged, M - Trunk, H - VSN tagged
       i - Internal untagged, I - Internal tagged, v - VLT untagged, V - VLT tagged
Name: TenGigabitEthernet 1/1
802.1QTagged: Hybrid
IO-AGG port mode: Auto VLANs enabled
Vlan membership:
  Q     Vlans
    U     1
    T     2-4094
Native VlanId:    1.

Name: TenGigabitEthernet 1/2
802.1QTagged: Hybrid
IO-AGG port mode: Auto VLANs enabled
Vlan membership:
  Q     Vlans
    U     1
    T     2-4094
Native VlanId:    1.
--More--
```

Table 11-8. Items in show interfaces switchport Command Example

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Displays the interface’s type, slot and port number.</td>
</tr>
<tr>
<td>802.1QTagged</td>
<td>Displays whether if the VLAN tagged (“True”), untagged (“False”), or hybrid</td>
</tr>
<tr>
<td>Vlan membership</td>
<td>(“Hybrid”), which supports both untagged and tagged VLANs by port 13/0.</td>
</tr>
<tr>
<td></td>
<td>Lists the VLANs to which the interface is a member. Starting with FTOS 7.6.1,</td>
</tr>
<tr>
<td></td>
<td>this field can display native VLAN membership by port 13/0.</td>
</tr>
</tbody>
</table>

Related Commands

| show ip interface | Displays Layer 3 information about the interfaces.                           |

show range

Displays all interfaces configured using the group command.

Syntax

```
show range
```

Command Mode

INTERFACE RANGE (config-if-range)

Command History

Version 8.3.17.0 Supported on M I/O Aggregator
show tdr

Displays the TDR test results.

Syntax

```
show tdr interface
```

Parameters

- `interface`: Enter the keyword `TenGigabitEthernet` followed by the slot/port information for the 100/1000/10GbaseT Ethernet interface.

Defaults

none

Command Modes

EXEC

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

```
Figure 11-29. show tdr tengigabitethernet Command Example

FTOS#show tdr tengigabitethernet 1/1
Time since last test: 00:00:02
   Pair A, Length: OK Status: Terminated
   Pair B, Length: 92 (+/- 1) meters, Status: Shorted
   Pair C, Length: 93 (+/- 1) meters, Status: Open
   Pair D, Length: 0 (+/- 1) meters, Status: Impedance Mismatch
```

Table 11-9. TDR Test Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OK Status: Terminated</strong></td>
<td>TDR test is complete, no fault is detected on the cable, and the test is terminated</td>
</tr>
<tr>
<td>Length: 92 (+/- 1) meters, Status: Shorted</td>
<td>A short is detected on the cable. The location, in this example is 92 meters, of the short is accurate to plus or minus one meter.</td>
</tr>
<tr>
<td>Length: 93 (+/- 1) meters, Status: Open</td>
<td>An opening is detected on the cable. The location, in this example is 93 meters, of the open is accurate to plus or minus one meter.</td>
</tr>
<tr>
<td>Status: Impedance Mismatch</td>
<td>There is an impedance mismatch in the cables.</td>
</tr>
</tbody>
</table>

Usage Information

- If the TDR test has not been run, an error message is generated:
  ```
  %Error: Please run the TDR test first
  ```
  Note that TDR test is supported only on 10GbaseT interfaces.
show vlan

Displays the current VLAN configurations on the switch.

Syntax

```
show vlan [brief | id vlan-id | name vlan-name]
```

Parameters

- **brief** (OPTIONAL) Enter the keyword **brief** to display the following information:
  - VLAN ID
  - VLAN name (left blank if none is configured.)
  - Spanning Tree Group ID
  - MAC address aging time
  - IP address

- **id vlan-id** (OPTIONAL) Enter the keyword **id** followed by a number from 1 to 4094. Only information on the VLAN specified is displayed.

- **name vlan-name** (OPTIONAL) Enter the keyword **name** followed by the name configured for the VLAN. Only information on the VLAN named is displayed.

Command Modes

- EXEC
- EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

```
Figure 11-30. show vlan Command Example

FTOS#show vlan
Codes: * - Default VLAN, G - GVRP VLANs, R - Remote Port Mirroring VLANs, P - Primary, C - Community, I - Isolated
Q: U - Untagged, T - Tagged
x - Dot1x untagged, X - Dot1x tagged
G - GVRP tagged, M - Vlan-stack, H - VSN tagged
i - Internal untagged, I - Internal tagged, v - VLT untagged, V - VLT tagged

NUM Status Description Q Ports
1 Inactive a
2 Inactive
* 20 Active U Te 0/3,5,13,53-56
1002 Active T Te 0/3,13,55-56

FTOS#
```

Table 11-10. show vlan Command Information

<table>
<thead>
<tr>
<th>Column Heading</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Column 1 — no heading)</td>
<td>asterisk symbol (*) = Default VLAN</td>
</tr>
<tr>
<td></td>
<td>G = GVRP VLAN</td>
</tr>
<tr>
<td></td>
<td>P = primary VLAN</td>
</tr>
<tr>
<td></td>
<td>C = community VLAN</td>
</tr>
<tr>
<td></td>
<td>I = isolated VLAN</td>
</tr>
<tr>
<td>NUM</td>
<td>Displays existing VLAN IDs.</td>
</tr>
</tbody>
</table>
Table 11-10. show vlan Command Information

<table>
<thead>
<tr>
<th>Column Heading</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Displays the word <strong>Inactive</strong> for inactive VLANs and the word <strong>Active</strong> for active VLANs.</td>
</tr>
<tr>
<td>Q</td>
<td>Displays G for GVRP tagged, M for member of a VLAN-Stack VLAN, T for tagged interface, U (for untagged interface), x (uncapitalized x) for Dot1x untagged, or X (capitalized X) for Dot1x tagged.</td>
</tr>
<tr>
<td>Ports</td>
<td>Displays the type, slot, and port information. For the type, Po = port channel, Fo = fortygigabit ethernet, and Te = ten gigabit ethernet.</td>
</tr>
</tbody>
</table>

Figure 11-31. show vlan id Command Example

```
FTOS# show vlan id 40
Codes: * - Default VLAN, G - GVRP VLANs, R - Remote Port Mirroring VLANs, P - Primary, C - Community, I - Isolated
Q: U - Untagged, T - Tagged
x - Dot1x untagged, X - Dot1x tagged
G - GVRP tagged, M - Vlan-stack, H - VSN tagged
i - Internal untagged, I - Internal tagged, v - VLT untagged, V - VLT tagged

NUM    Status    Description                     Q Ports
1      Inactive  a                             
FTOS#
```

Figure 11-32. show vlan brief Command Example

```
FTOS#show vlan brief
VLAN Name                        STG   MAC Aging IP Address
---- -------------------------------- ---- --------- ------------------
1      unassigned                0     0         unassigned
2      unassigned                0     0         unassigned
20     unassigned                0     0         unassigned
1002   unassigned                0     0         unassigned
FTOS#
```

Figure 11-33. Using a VLAN Name Example

```
FTOSconf)#interface vlan 222
FTOS(conf-if-vl-222)#name test
FTOS(conf-if-vl-222)#do show vlan name test
Codes: * - Default VLAN, G - GVRP VLANs
Q: U - Untagged, T - Tagged
x - Dot1x untagged, X - Dot1x tagged
G - GVRP tagged, M - Vlan-stack
i - Internal untagged, I - Internal tagged, v - VLT untagged, V - VLT tagged

NUM    Status    Description                     Q Ports
222    Inactive                                  U TenGig 1/22
FTOS(conf-if-vl-222)#
FTOS#
```

**Related Commands**

**interface vlan** Configures a VLAN.
**shutdown**

Disable an interface.

**Syntax**

```
shutdown
```

To activate an interface, enter `no shutdown`.

**Defaults**

The interface is disabled.

**Command Modes**

INTERFACE

**Command History**

| Version 8.3.17.0 | Supported on M I/O Aggregator |

**Usage Information**

The `show tdr` command marks a physical interface as unavailable for traffic. To discover if an interface is disabled, use the `show ip interface` command. Disabled interfaces are listed as down.

Disabling a VLAN or a port channel causes different behavior. When a VLAN is disabled, the Layer 3 functions within that VLAN are disabled. Layer 2 traffic continues to flow. Entering the `show tdr` command on a port channel disables all traffic on the port channel and the individual interfaces within the port channel. To enable a port channel, you must enter `no show tdr` on the port channel interface and at least one interface within that port channel.

The `show tdr` and `description` commands are the only commands that you can configure on an interface that is a member of a port channel.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vlan tagged</code></td>
<td>Test the condition of copper cables on 100/1000/10G Base-T modules.</td>
</tr>
<tr>
<td><code>interface vlan</code></td>
<td>Creates a VLAN.</td>
</tr>
<tr>
<td><code>show ip interface</code></td>
<td>Displays the interface routing status. Add the keyword <code>brief</code> to display a table of interfaces and their status.</td>
</tr>
</tbody>
</table>

**speed (for 1000/10000/auto interfaces)**

Set the speed for 1000/10000 Base-T Ethernet interfaces. Both sides of a link must be set to the same speed (1000/10000) or to auto or the link may not come up.

**Syntax**

```
speed {1000 | 10000 | auto}
```

To return to the default setting, use the `no speed {1000 | 10000 | auto}` command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>Enter the keyword <code>1000</code> to set the interface’s speed to 1000 Mb/s.</td>
</tr>
<tr>
<td>10000</td>
<td>Enter the keyword <code>10000</code> to set the interface’s speed to 10000 Mb/s. (Auto-negotiation is enabled. See <code>name</code> for more information)</td>
</tr>
<tr>
<td>auto</td>
<td>Enter the keyword <code>auto</code> to set the interface to auto-negotiate its speed. (Auto-negotiation is enabled. See <code>name</code> for more information)</td>
</tr>
</tbody>
</table>

**Defaults**

auto
Command Modes

INTERFACE

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

This command is found on the 1000/10000 Base-T Ethernet interfaces.

When you enable auto, the system performs and automatic discovery to determine the optics installed and configure the appropriate speed.

When you configure a speed for the 1000/10000 interface, you should confirm name command setting. Both sides of the link should have auto-negotiation either enabled or disabled. For speed settings of 1000 or auto, the software sets the link to auto-negotiation and you cannot change that setting.

In FTOS, the command speed 1000 is an exact equivalent of speed auto 1000 in IOS.

Related Commands

name Enables or disables auto-negotiation on an interface.

tdr-cable-test

Test the condition of copper cables on 100/1000/10GBase-T modules.

Syntax tdr-cable-test interface

Parameters

interface Enter the keyword TenGigabitEthernet followed by the slot/port information for the 100/1000/10GBase-T Ethernet interface.

Defaults none

Command Modes EXEC

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

The interface must be enabled to run the test or an error message is generated:

FTOS#tdr-cable-test tengigabitethernet 5/2

%Error: Interface is disabled TenGIG 5/2

Related Commands

show tdr Displays the results of the TDR test.
Add a Layer 2 interface to a VLAN as a tagged interface.

**Syntax**

```plaintext
tagged interface
```

To remove a tagged interface from a VLAN, use the `no tagged interface` command.

**Parameters**

- `interface`:
  - Enter the following keywords and slot/port or number information:
    - `TenGigabitEthernet` for a 10-Gigabit Ethernet interface
  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.

**Defaults**

All interfaces in Layer 2 mode are untagged.

**Command Modes**

`INTERFACE VLAN`

**Command History**

- **Version 8.3.17.0** Supported on M I/O Aggregator

**Usage Information**

When you use the `no tagged` command, the interface is automatically placed in the default VLAN as an untagged interface unless the interface is a member of another VLAN. If the interface belongs to several VLANs, you must remove it from all VLANs to change it to an untagged interface.

Tagged interfaces can belong to multiple VLANs, while untagged interfaces can only belong to one VLAN at a time.

When two or more ports configured for VLANs form a LAG, the resulting LAG is a tagged member of all the configured VLANs and an untagged member of the VLAN to which the port with the lowest port ID belongs.

For example, if port 0/33 is an untagged member of VLAN 2 and port 0/41 is an untagged member of VLAN 3, the resulting LAG consisting of the two ports is an untagged member of VLAN 2 and a tagged member of VLANs 2 and 3.

**Example**

**Figure 11-34. VLAN Tagged Command Example**

```
FTOS(conf-if-te-0/2)#vlan tagged 2,3-4
FTOS(conf-if-te-0/2)#show config

interface TenGigabitEthernet 0/2
  mtu 12000
  vlan tagged 2-4
  port-channel-protocol LACP
  port-channel 1 mode active
  protocol lldp
  advertise management-tlv system-name
  dcbx port-role auto-downstream
  no shutdown

FTOS(conf-if-te-0/2)#
```

**Related Commands**

- `interface vlan` Configures a VLAN.
- `vlan untagged` Specifies which interfaces in a VLAN are untagged.
**vlan untagged**

Add a Layer 2 interface to a VLAN as an untagged interface.

**Syntax**

untagged interface

To remove an untagged interface from a VLAN, use the no untagged interface command.

**Parameters**

- **interface**
  - Enter the following keywords and slot/port or number information:
  - For a 10-Gigabit Ethernet interface, enter the keyword TenGigabitEthernet followed by the slot/port information.

**Defaults**

All interfaces in Layer 2 mode are untagged.

**Command Modes**

INTERFACE VLAN

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

Untagged interfaces can only belong to one VLAN.

In the default VLAN, you cannot use the no untagged interface command. To remove an untagged interface from all VLANs, including the default VLAN, enter INTERFACE mode and use the no vlan tagged command.

When two or more ports configured for VLANs form a LAG, the resulting LAG is a tagged member of all the configured VLANs and an untagged member of the VLAN to which the port with the lowest port ID belongs.

For example, if port 0/33 is an untagged member of VLAN 2 and port 0/41 is an untagged member of VLAN 3, the resulting LAG consisting of the two ports is an untagged member of VLAN 2 and a tagged member of VLANs 2 and 3.

**Example**

**Figure 11-35. VLAN Untagged Command Example**

```
FTOS(conf-if-te-0/2)#vlan untagged ?
<1-4094> Untagged VLAN id
FTOS(conf-if-te-0/2)#
FTOS(conf-if-te-0/2)#vlan untagged 4094
FTOS(conf-if-te-0/2)#show config
!
interface TenGigabitEthernet 0/2
  mtu 12000
  vlan untagged 4094
  !
  port-channel-protocol LACP
  port-channel 1 mode active
  !
  protocol lldp
  advertise management-tlv system-name
dcbx port-role auto-downstream
  no shutdown
FTOS(conf-if-te-0/2)#
```

**Related Commands**

- interface vlan  Configures a VLAN.
- vlan tagged  Specifies which interfaces in a VLAN are tagged.
IPv4 Routing

IP Commands

This chapter describes the IPv4-related commands. They are:

- clear tcp statistics
- debug ip dhcp
- debug ip icmp
- ip route
- management route
- show arp
- show hosts
- show ip management-route
- show ip multicast-cam stack-unit
- show ip interface
- show ip route
- show ip route summary
- show ip management-route

**clear tcp statistics**

Clear the TCP counters.

**Syntax**

clear tcp statistics

**Command Modes**

EXEC Privilege

**Command History**

| Version 8.3.17.0 | Supported on M I/O Aggregator |

**debug ip dhcp**

Enable debug information for DHCP relay transactions and display the information on the console.

**Syntax**

deploy ip dhcp

To disable debug, use the no debug ip dhcp command.
debug ip icmp

View information on the internal control message protocol (ICMP).

Syntax

depend ip icmp [interface] [count value]

To disable debugging, use the no debug ip icmp command.

Parameters

<table>
<thead>
<tr>
<th>parameter</th>
<th>description</th>
</tr>
</thead>
</table>
| interface | (OPTIONAL) Enter the following keywords and slot/port or number information:  
  - For the Management interface, enter the keyword ManagementEthernet followed by the slot/port information. The slot range is 0 and the port range is 0.  
  - For a 10-Gigabit Ethernet interface, enter the keyword TenGigabitEthernet followed by the slot/port information.  
  - For VLAN, enter the keyword vlan followed by a number from 1 to 4094. |
| count value | (OPTIONAL) Enter the keyword count followed by the count value.  
  Range: 1 to 65534  
  Default: Infinity |

Command Modes  
EXEC Privilege

Command History  
Version 8.3.17.0  
Supported on M I/O Aggregator
**IPv4 Routing**

**Example**

**Figure 12-2.  debug ip icmp Command Example (Partial)**

```
ICMP: echo request rcvd from src 40.40.40.40
ICMP: src 40.40.40.40, dst 40.40.40.40, echo reply
ICMP: src 40.40.40.40, dst 40.40.40.40, echo reply
ICMP: echo request rcvd from src 40.40.40.40
ICMP: src 40.40.40.40, dst 40.40.40.40, echo reply
ICMP: src 40.40.40.40, dst 40.40.40.40, echo reply
ICMP: echo request sent to dst 40.40.40.40
```

**Usage Information**

Use the `count` option to stop packets from flooding the user terminal when debugging is turned on.

**ip route**

Assign a static route to the switch.

**Syntax**

```
ip route destination mask {ip-address | interface [ip-address]} [distance] [permanent] [tag tag-value]
```

To delete a specific static route, use the `no ip route destination mask {address | interface [ip-address]}` command.

To delete all routes matching a certain route, use the `no ip route destination mask command`.

**Parameters**

- `destination` Enter the IP address in dotted decimal format of the destination device.
- `mask` Enter the mask in slash prefix formation (/x) of the destination device’s IP address.
- `ip-address` Enter the IP address in dotted decimal format of the forwarding router.
- `interface` Enter the following keywords and slot/port or number information:
  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
  - For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.
- `distance` (OPTIONAL) Enter a number as the distance metric assigned to the route.
  Range: 1 to 255
- `permanent` (OPTIONAL) Enter the keyword `permanent` to specify the route is not removed, even if the interface assigned to that route goes down. The route must be up initially to install it in the routing table.
  If you disable the interface with an IP address associated with the keyword `permanent`, the route disappears from the routing table.
- `tag tag-value` (OPTIONAL) Enter the keyword `tag` followed by a number to assign to the route.
  Range: 1 to 4294967295

**Defaults**

Not configured.

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0  Supported on M I/O Aggregator
Using the following example of a static route:
```
ip route 33.33.33.0 /24 tengigabitethernet 0/0 172.31.5.43
```
- The software installs a next hop that is not on the directly connected subnet but which recursively resolves to a next hop on the interface’s configured subnet. In the example, if gig 0/0 has ip address on subnet 2.2.2.0 and if 172.31.5.43 recursively resolves to 2.2.2.0, FTOS installs the static route.
- When the interface goes down, FTOS withdraws the route.
- When the interface comes up, FTOS re-installs the route.
- When recursive resolution is “broken,” FTOS withdraws the route.
- When recursive resolution is satisfied, FTOS re-installs the route.

**show ip route**
Views the switch routing table.

### management route
Configure a static route that points to the Management interface or a forwarding router.

**Syntax**
```
management route {ipv4-address}/mask {forwarding-router-address | managementethernet}
```

**Parameters**
- `ipv4-address`: Enter an IPv4 address (A.B.C.D).
- `mask`: Enter the prefix-length for the IP address of the management interface.
- `forwarding-router-address`: Enter an IPv4 address of a forwarding router.
- `managementethernet`: Enter the keyword `managementethernet` for the Management interface.

**Defaults**
Not configured.

**Command Modes**
Configuration

**Command History**
Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**
When a static route (or a protocol route) overlaps with Management static route, the static route (or a protocol route) is preferred over the Management Static route. Also, Management static routes and the Management Connected prefix are not reflected in the hardware routing tables. Separate routing tables are maintained for IPv4 management routes. This command manages both tables.

### show hosts
View the host table and DNS configuration.

**Syntax**
```
show hosts
```

**Command Modes**
- EXEC
- EXEC Privilege

**Command History**
Version 8.3.17.0 Supported on M I/O Aggregator
Example

Figure 12-3. show hosts Command Example

<table>
<thead>
<tr>
<th>Host</th>
<th>Flags</th>
<th>TTL</th>
<th>Type</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>ks</td>
<td>(perm, OK)</td>
<td>-</td>
<td>IP</td>
<td>2.2.2.2</td>
</tr>
<tr>
<td>4200-1</td>
<td>(perm, OK)</td>
<td>-</td>
<td>IP</td>
<td>192.68.69.2</td>
</tr>
<tr>
<td>1230-3</td>
<td>(perm, OK)</td>
<td>-</td>
<td>IP</td>
<td>192.68.99.2</td>
</tr>
<tr>
<td>ZZr</td>
<td>(perm, OK)</td>
<td>-</td>
<td>IP</td>
<td>192.71.18.2</td>
</tr>
<tr>
<td>Z10-3</td>
<td>(perm, OK)</td>
<td>-</td>
<td>IP</td>
<td>192.71.23.1</td>
</tr>
</tbody>
</table>

Table 12-1. show hosts Command Example Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default domain...</td>
<td>Displays the domain name (if configured).</td>
</tr>
<tr>
<td>Name/address lookup</td>
<td>States if DNS is enabled on the system. If DNS is enabled, the Name/Address lookup is domain service. If DNS is not enabled, the Name/Address lookup is static mapping.</td>
</tr>
<tr>
<td>Name servers are...</td>
<td>Lists the name servers, if configured.</td>
</tr>
<tr>
<td>Host</td>
<td>Displays the host name assigned to the IP address.</td>
</tr>
<tr>
<td>Flags</td>
<td>Classifies the entry as one of the following:</td>
</tr>
<tr>
<td></td>
<td>• perm - the entry was manually configured and will not time out</td>
</tr>
<tr>
<td></td>
<td>• temp - the entry was learned and will time out after 72 hours of inactivity</td>
</tr>
<tr>
<td></td>
<td>Also included in the flag is an indication of the validity of the route:</td>
</tr>
<tr>
<td></td>
<td>• ok - the entry is valid.</td>
</tr>
<tr>
<td></td>
<td>• ex - the entry expired.</td>
</tr>
<tr>
<td></td>
<td>• ?? - the entry is suspect.</td>
</tr>
<tr>
<td>TTL</td>
<td>Displays the amount of time until the entry ages out of the cache. For dynamically learnt entries only.</td>
</tr>
<tr>
<td>Type</td>
<td>Displays IP as the type of entry.</td>
</tr>
<tr>
<td>Address</td>
<td>Displays the IP address(es) assigned to the host.</td>
</tr>
</tbody>
</table>

show arp

Displays the ARP table.

Syntax

```
show arp [interface interface | ip ip-address [mask] | macaddress mac-address [mac-address mask]] [static | dynamic] [summary]
```
Parameters

- **interface interface** (OPTIONAL) Enter the following keywords and slot/port or number information:
  - For the Management interface, enter the keyword `managementethernet` followed by the slot/port information.
  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
  - For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.

- **ip ip-address mask** (OPTIONAL) Enter the keyword `ip` followed by an IP address in the dotted decimal format. Enter the optional IP address mask in the slash prefix format (/x).


- **static** (OPTIONAL) Enter the keyword `static` to view entries entered manually.

- **dynamic** (OPTIONAL) Enter the keyword `dynamic` to view dynamic entries.

- **summary** (OPTIONAL) Enter the keyword `summary` to view a summary of ARP entries.

- **retries** (OPTIONAL) Enter the keyword `retries` to view the number of ARP retries before a 20 sec back off.

- **inspection** (OPTIONAL) Enter the keyword `inspection` to view dynamic ARP Inspection details.

Command Modes

- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator

Example

**Figure 12-4. show arp Command Example (Partial)**

```plaintext
FTOS>show arp
Protocol Address Age(min) Hardware Address Interface VLAN CPU
---------------------------------------------------------------------------------
Internet 10.11.8.6 167 00:01:e9:45:00:03 Ma 0/0 - CP
Internet 10.11.68.14 124 00:01:e9:45:00:03 Ma 0/0 - CP
Internet 10.11.209.254 0 00:01:e9:45:00:03 Ma 0/0 - CP
```
Figure 12-5. show arp Command Example with Private VLAN data

FTOS#show arp

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Address</th>
<th>Age(min)</th>
<th>Hardware Address</th>
<th>Interface</th>
<th>VLAN</th>
<th>CPU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet</td>
<td>5.5.5.1</td>
<td>-</td>
<td>00:01:e8:43:96:5e</td>
<td>Vl 10 pv 200</td>
<td>CP</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>5.5.5.10</td>
<td>-</td>
<td>00:01:e8:44:99:55</td>
<td>Vl 10</td>
<td>CP</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>10.1.2.4</td>
<td>1</td>
<td>00:01:e8:d5:9e:e2</td>
<td>Ma 0/0</td>
<td>CP</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>10.10.10.4</td>
<td>1</td>
<td>00:01:e8:d5:9e:e2</td>
<td>Ma 0/0</td>
<td>CP</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>10.16.127.53</td>
<td>1</td>
<td>00:01:e8:d5:9e:e2</td>
<td>Ma 0/0</td>
<td>CP</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>10.16.134.254</td>
<td>20</td>
<td>00:01:e8:d5:9e:e2</td>
<td>Ma 0/0</td>
<td>CP</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>133.33.33.4</td>
<td>1</td>
<td>00:01:e8:d5:9e:e2</td>
<td>Ma 0/0</td>
<td>CP</td>
<td></td>
</tr>
</tbody>
</table>

Line 1 shows community VLAN 200 (in primary VLAN 10) in a PVLAN.
Line 2 shows primary VLAN 10.

Table 12-2. show arp Command Example Fields

<table>
<thead>
<tr>
<th>Row Heading</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>Displays the protocol type.</td>
</tr>
<tr>
<td>Address</td>
<td>Displays the IP address of the ARP entry.</td>
</tr>
<tr>
<td>Age(min)</td>
<td>Displays the age in minutes of the ARP entry.</td>
</tr>
<tr>
<td>Hardware Address</td>
<td>Displays the MAC address associated with the ARP entry.</td>
</tr>
<tr>
<td>Interface</td>
<td>Displays the first two letters of the interfaces type and the slot/port</td>
</tr>
<tr>
<td>VLAN</td>
<td>Displays the VLAN ID, if any, associated with the ARP entry.</td>
</tr>
<tr>
<td>CPU</td>
<td>Lists which CPU the entries are stored on.</td>
</tr>
</tbody>
</table>

Figure 12-6. show arp summary Command Example

FTOS#show arp summary

<table>
<thead>
<tr>
<th>Total Entries</th>
<th>Static Entries</th>
<th>Dynamic Entries</th>
<th>CPU</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>3</td>
<td>CP</td>
</tr>
</tbody>
</table>

FTOS#

Table 12-3. show arp summary Command Example Fields

<table>
<thead>
<tr>
<th>Row Heading</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Entries</td>
<td>Lists the total number of ARP entries in the ARP table.</td>
</tr>
<tr>
<td>Static Entries</td>
<td>Lists the total number of configured or static ARP entries.</td>
</tr>
<tr>
<td>Dynamic Entries</td>
<td>Lists the total number of learned or dynamic ARP entries.</td>
</tr>
<tr>
<td>CPU</td>
<td>Lists which CPU the entries are stored on.</td>
</tr>
</tbody>
</table>
show ip management-route
View the IP addresses assigned to the Management interface.

Syntax
show ip management-route [all | connected | summary | static]

Parameters
- **all** (OPTIONAL) Enter the keyword all to view all IP addresses assigned to all Management interfaces on the switch.
- **connected** (OPTIONAL) Enter the keyword connected to view only routes directly connected to the Management interface.
- **summary** (OPTIONAL) Enter the keyword summary to view a table listing the number of active and non-active routes and their sources.
- **static** (OPTIONAL) Enter the keyword static to view non-active routes also.

Command Modes
- EXEC
- EXEC Privilege

Command History
- Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 12-7. show ip management route Command Example

```
FTOS#show ip management-route
Destination        Gateway                       State
-----------        -------                       -----  
10.1.2.0/24        ManagementEthernet 0/0        Connected
172.16.1.0/24      10.1.2.4                      Active
FTOS#
```

show ip multicast-cam stack-unit
Displays content-addressable memory (CAM) entries.

Syntax
show ip multicast-cam stack-unit 0-5 port-set pipe-number [ip-address mask [longer-prefixes] | detail | member-info | summary]

Parameters
- **0-5** Enter the stack-unit ID, from 0 to 5.
- **pipe-number** Enter the number of the Port-Pipe number. Range: 0 to 0
- **ip-address mask** (OPTIONAL) Enter the IP address and mask of a route to CAM entries for that route only.
- **[longer-prefixes]** Enter the keyword longer-prefixes to view routes with a common prefix.
- **detail** Enter the keyword detail to display the group index ID used by the ecmp routes in the CAM.
show ip interface

View IP-related information on all interfaces.

Syntax  show ip interface [interface | brief] [configuration]
**Parameter**

*interface* *(OPTIONAL)* Enter the following keywords and slot/port or number information:

- For the Management interface, enter the keyword `ManagementEthernet` followed by zero (0).
- For a Port Channel interface, enter the keyword `port-channel` followed by a number:
  Range: 1 to 128
- For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
- For a VLAN, enter the keyword `vlan` followed by a number from 1 to 4094.

*brief* *(OPTIONAL)* Enter the keyword `brief` to view a brief summary of the interfaces and whether an IP address is assigned.

*configuration* *(OPTIONAL)* Enter the keyword `configuration` to display the physical interfaces with non-default configurations only.

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

**Figure 12-9. show ip interface Command Example**

```
FTOS#show ip int te 0/0
TenGigabitEthernet 0/0 is down, line protocol is down
Internet address is not set
IP MTU is 1500 bytes
Inbound access list is not set
Proxy ARP is enabled
Split Horizon is enabled
Poison Reverse is disabled
ICMP redirects are not sent
ICMP unreachables are not sent
FTOS#
```

**Table 12-5. show ip interface Command Example Items**

<table>
<thead>
<tr>
<th>Lines</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TenGigabitEthernet 0/0...</td>
<td>Displays the interface’s type, slot/port and physical and line protocol status.</td>
</tr>
<tr>
<td>Internet address...</td>
<td>States whether an IP address is assigned to the interface. If one is, that address is displayed.</td>
</tr>
<tr>
<td>IP MTU is...</td>
<td>Displays IP MTU value.</td>
</tr>
<tr>
<td>Inbound access...</td>
<td>Displays the name of the any configured incoming access list. If none is configured, the phrase “not set” is displayed.</td>
</tr>
<tr>
<td>Proxy ARP...</td>
<td>States whether proxy ARP is enabled on the interface.</td>
</tr>
<tr>
<td>Split horizon...</td>
<td>States whether split horizon for RIP is enabled on the interface.</td>
</tr>
<tr>
<td>Poison Reverse...</td>
<td>States whether poison for RIP is enabled on the interface.</td>
</tr>
<tr>
<td>ICMP redirects...</td>
<td>States if ICMP redirects are sent.</td>
</tr>
<tr>
<td>ICMP unreachables...</td>
<td>States if ICMP unreachable messages are sent.</td>
</tr>
</tbody>
</table>
show ip route

View information, including how they were learned, about the IP routes on the switch.

Syntax

```
show ip route [hostname] [ip-address] [mask] [longer-prefixes] [list prefix-list [process-id]] [connected | static | summary]
```

Parameter

- **ip-address**: (OPTIONAL) Specify a name of a device or the IP address of the device to view more detailed information about the route.
- **mask**: (OPTIONAL) Specify the network mask of the route. Use this parameter with the IP address parameter.
- **longer-prefixes**: (OPTIONAL) Enter the keyword longer-prefixes to view all routes with a common prefix.
- **list prefix-list**: (OPTIONAL) Enter the keyword list and the name of a configured prefix list.
- **process-id**: (OPTIONAL) Specify that only OSPF routes with a certain process ID must be displayed.
- **connected**: (OPTIONAL) Enter the keyword connected to view only the directly connected routes.
- **static**: (OPTIONAL) Enter the keyword static to view only routes configured by the `ip route` command.
- **summary**: (OPTIONAL) Enter the keyword summary. See `show ip route summary`.

Table 12-6. show ip interface brief Column Headings

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Displays type of interface and the associated slot and port number.</td>
</tr>
<tr>
<td>IP-Address</td>
<td>Displays the IP address for the interface, if configured.</td>
</tr>
<tr>
<td>Ok?</td>
<td>Indicates if the hardware is functioning properly.</td>
</tr>
<tr>
<td>Method</td>
<td>Displays Manual if the configuration is read from the saved configuration.</td>
</tr>
<tr>
<td>Status</td>
<td>States whether the interface is enabled (up) or disabled (administratively down).</td>
</tr>
<tr>
<td>Protocol</td>
<td>States whether IP is enabled (up) or disabled (down) on the interface.</td>
</tr>
</tbody>
</table>

Figure 12-10. show ip interface brief Command Example (Partial)
**Command Modes**

EXEC

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

**Figure 12-11. show ip route summary and show ip route static Command Examples**

```
FTOS#show ip route summary
Route Source      Active Routes  Non-active Routes
connected         2              0
static            1              0
Total             3              0
Total 3 active route(s) using 612 bytes
FTOS#show ip route static ?
| Pipe through a command <cr>
```

```
FTOS#show ip route static
   Destination Gateway                                      Dist/Metric Last Change
       *S 0.0.0.0/0 via 10.10.91.9, Te 1/2                    1/0 3d2h
FTOS#
```

**Table 12-7. show ip route all Command Example Fields**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(undefined)</td>
<td>Identifies the type of route:</td>
</tr>
<tr>
<td></td>
<td>• C = connected</td>
</tr>
<tr>
<td></td>
<td>• S = static</td>
</tr>
<tr>
<td></td>
<td>• R = RIP</td>
</tr>
<tr>
<td></td>
<td>• B = BGP</td>
</tr>
<tr>
<td></td>
<td>• IN = internal BGP</td>
</tr>
<tr>
<td></td>
<td>• EX = external BGP</td>
</tr>
<tr>
<td></td>
<td>• LO = Locally Originated</td>
</tr>
<tr>
<td></td>
<td>• O = OSPF</td>
</tr>
<tr>
<td></td>
<td>• IA = OSPF inter area</td>
</tr>
<tr>
<td></td>
<td>• N1 = OSPF NSSA external type 1</td>
</tr>
<tr>
<td></td>
<td>• N2 = OSPF NSSA external type 2</td>
</tr>
<tr>
<td></td>
<td>• E1 = OSPF external type 1</td>
</tr>
<tr>
<td></td>
<td>• E2 = OSPF external type 2</td>
</tr>
<tr>
<td></td>
<td>• i = IS-IS</td>
</tr>
<tr>
<td></td>
<td>• L1 = IS-IS level-1</td>
</tr>
<tr>
<td></td>
<td>• L2 = IS-IS level-2</td>
</tr>
<tr>
<td></td>
<td>• IA = IS-IS inter-area</td>
</tr>
<tr>
<td></td>
<td>• * = candidate default</td>
</tr>
<tr>
<td></td>
<td>• &gt; = non-active route</td>
</tr>
<tr>
<td></td>
<td>• + = summary routes</td>
</tr>
<tr>
<td>Destination</td>
<td>Identifies the route’s destination IP address.</td>
</tr>
<tr>
<td>Gateway</td>
<td>Identifies whether the route is directly connected and on which interface the route is configured.</td>
</tr>
<tr>
<td>Dist/Metric</td>
<td>Identifies if the route has a specified distance or metric.</td>
</tr>
<tr>
<td>Last Change</td>
<td>Identifies when the route was last changed or configured.</td>
</tr>
</tbody>
</table>
show ip route summary

View a table summarizing the IP routes in the switch.

Syntax

```
show ip route summary
```

Command Modes

- EXEC
- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator

Example

**Figure 12-12. show ip route summary Command Example**

```
FTOS>show ip route summary
Route Source    Active Routes   Non-active Routes
connected       17              0
static          3               0
ospf 100        1368            2
    Intra-area: 762 Inter-area: 1 External-1: 600 External-2: 5
    Total 1388
Total 1388 active route(s) using 222440 bytes
Total 2 non-active route(s) using 128 bytes
FTOS>
```

<table>
<thead>
<tr>
<th>Column Heading</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route Source</td>
<td>Identifies how the route is configured in FTOS.</td>
</tr>
<tr>
<td>Active Routes</td>
<td>Identifies the best route if a route is learned from two protocol sources.</td>
</tr>
<tr>
<td>Non-active Routes</td>
<td>Identifies the back-up routes when a route is learned by two different protocols. If the best route or active route goes down, the non-active route will become the best route.</td>
</tr>
<tr>
<td>ospf 100</td>
<td>If routing protocols (OSPF, RIP) are configured and routes are advertised, then information on those routes is displayed.</td>
</tr>
<tr>
<td>Total 1388 active...</td>
<td>Displays the number of active and non-active routes and the memory usage of those routes. If there are no routes configured in the FTOS, this line does not appear.</td>
</tr>
</tbody>
</table>

Related Commands

- `show ip route` Displays information about the routes found in switch.

show tcp statistics

View information on TCP traffic through the switch.

Syntax

```
show tcp statistics
```

Command Modes

- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator
Table 12-9. show tcp statistics cp Command Example Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rcvd:</td>
<td>Displays the number and types of TCP packets received by the switch.</td>
</tr>
<tr>
<td></td>
<td>• Total = total packets received</td>
</tr>
<tr>
<td></td>
<td>• no port = number of packets received with no designated port.</td>
</tr>
<tr>
<td>0 checksum error...</td>
<td>Displays the number of packets received with the following:</td>
</tr>
<tr>
<td></td>
<td>• checksum errors</td>
</tr>
<tr>
<td></td>
<td>• bad offset to data</td>
</tr>
<tr>
<td></td>
<td>• too short</td>
</tr>
<tr>
<td>329 packets...</td>
<td>Displays the number of packets and bytes received in sequence.</td>
</tr>
<tr>
<td>17 dup...</td>
<td>Displays the number of duplicate packets and bytes received.</td>
</tr>
<tr>
<td>0 partially...</td>
<td>Displays the number of partially duplicated packets and bytes received.</td>
</tr>
<tr>
<td>7 out-of-order...</td>
<td>Displays the number of packets and bytes received out of order.</td>
</tr>
<tr>
<td>0 packets with data after window</td>
<td>Displays the number of packets and bytes received that exceed the switch’s window size.</td>
</tr>
<tr>
<td>0 packets after close</td>
<td>Displays the number of packet received after the TCP connection was closed.</td>
</tr>
<tr>
<td>0 window probe packets...</td>
<td>Displays the number of window probe and update packets received.</td>
</tr>
<tr>
<td>41 dup ack...</td>
<td>Displays the number of duplicate acknowledgement packets and acknowledgement packets with data received.</td>
</tr>
<tr>
<td>10184 ack...</td>
<td>Displays the number of acknowledgement packets and bytes received.</td>
</tr>
<tr>
<td>Sent:</td>
<td>Displays the total number of TCP packets sent and the number of urgent packets sent.</td>
</tr>
<tr>
<td>25 control packets...</td>
<td>Displays the number of control packets sent and the number retransmitted.</td>
</tr>
<tr>
<td>11603 data packets...</td>
<td>Displays the number of data packets sent.</td>
</tr>
<tr>
<td>24 data packets retransmitted</td>
<td>Displays the number of data packets resent.</td>
</tr>
</tbody>
</table>
### Table 12-9. show tcp statistics cp Command Example Fields (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>355 ack...</td>
<td>Displays the number of acknowledgement packets sent and the number of packet delayed.</td>
</tr>
<tr>
<td>0 window probe..</td>
<td>Displays the number of window probe and update packets sent.</td>
</tr>
<tr>
<td>7 Connections initiated...</td>
<td>Displays the number of TCP connections initiated, accepted, and established.</td>
</tr>
<tr>
<td>14 Connections closed...</td>
<td>Displays the number of TCP connections closed, dropped.</td>
</tr>
<tr>
<td>20 Total rxmt...</td>
<td>Displays the number of times the switch tried to re-send data and the number of connections dropped during the TCP retransmit timeout period.</td>
</tr>
<tr>
<td>0 Keepalive....</td>
<td>Lists the number of keepalive packets in timeout, the number keepalive probes and the number of TCP connections dropped during keepalive.</td>
</tr>
</tbody>
</table>
iSCSI Optimization

Overview

Internet small computer system interface (iSCSI) optimization enables quality-of-service (QoS) treatment for iSCSI storage traffic on an Aggregator.

Note: When iSCSI storage devices are detected on the server-ports, storm-control is disabled on those ports. When the iSCSI devices are off the ports, storm-control is enabled again.

iSCSI Commands

The following FTOS commands are used to verify the iSCSI Optimization feature:

- `show iscsi`
- `show iscsi sessions`
- `show iscsi sessions detailed`

show iscsi

Displays the currently configured iSCSI settings.

Syntax

`show iscsi`

Command Mode

EXEC

EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator
show iscsi sessions

Displays information on active iSCSI sessions on the switch.

**Syntax**

show iscsi sessions

**Command Mode**

EXEC

EXEC Privilege

**Example**

Figure 13-2. show iscsi sessions Command Example

FTOS# show iscsi sessions
Session 0:
Target: iqn.2001-05.com.equallogic:0-8a0906-0e70c2002-10a0018426a48c94-iom010
Initiator: iqn.1991-05.com.microsoft:win-x9l8v27yajg
ISID: 400001370000

Session 1:
Target: iqn.2001-05.com.equallogic:0-8a0906-0f60c2002-0360018426d48c94-iom011
Initiator: iqn.1991-05.com.microsoft:win-x9l8v27yajg
ISID: 400001370000.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show iscsi sessions</td>
<td>Displays information on active iSCSI sessions on the switch.</td>
</tr>
<tr>
<td>show iscsi sessions detailed</td>
<td>Displays detailed information on active iSCSI sessions on the switch.</td>
</tr>
</tbody>
</table>
show iscsi sessions detailed

Displays detailed information on active iSCSI sessions on the switch.

**Syntax**

```
show iscsi sessions detailed [session isid]
```

**Parameters**

- **isid**: Enter the session’s iSCSI ID to display detailed information on specified iSCSI session.

**Command Mode**

- EXEC
- EXEC Privilege

**Command History**

- **Version 8.3.17.0**: Supported on M I/O Aggregator

**Example**

**Figure 13-3. show iscsi sessions detailed Command Example**

```
FTOS# show iscsi sessions detailed
Session 0 :
------------------------------------------------------------------------------------------
Up Time:00:00:01:28 (DD:HH:MM:SS)
Time for aging out:00:00:09:34 (DD:HH:MM:SS)
ISID:806978696102
Initiator        Initiator        Target        Target        Connection
IP Address       TCP Port         IP Address     TCP Port     ID
10.10.0.44       33345            10.10.0.101    3260          0
Session 1 :
------------------------------------------------------------------------------------------
Up Time:00:00:01:22 (DD:HH:MM:SS)
Time for aging out:00:00:09:31 (DD:HH:MM:SS)
ISID:806978696102
Initiator        Initiator        Target        Target        Connection
IP Address       TCP Port         IP Address     TCP Port     ID
10.10.0.53       33432            10.10.0.101    3260          0
```

**Related Commands**

- **show iscsi**: Displays the currently configured iSCSI settings.
- **show iscsi sessions**: Displays information on active iSCSI sessions on the switch.
Link Aggregation Control Protocol (LACP)

Overview

This chapter contains commands for Dell Force10’s implementation of the link aggregation control protocol (LACP) for the creation of dynamic link aggregation groups (LAGs — called port-channels in FTOS parlance).

LACP Commands

Use the following commands for LACP:

- clear lacp counters
- debug lacp
- show lacp

clear lacp counters

Clear Port Channel counters.

**Syntax**

clear lacp port-channel-number counters

**Parameters**

- **port-channel-number**
  - Enter a port-channel number:
  - Range: 1 to 128

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator

**Related Commands**

- show lacp Displays the LACP configuration
debug lacp

Debug LACP (events).

Syntax

debug lacp [events | pdu interface [in | out]]

To disable LACP debugging, use the no debug lacp [events | pdu interface [in | out]] command.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>events</td>
<td>(OPTIONAL) Enter the keyword events to debug LACP event information.</td>
</tr>
<tr>
<td>pdu in</td>
<td>out</td>
</tr>
<tr>
<td></td>
<td>• Receive enter in</td>
</tr>
<tr>
<td></td>
<td>• Transmit enter out</td>
</tr>
<tr>
<td>interface in</td>
<td>out</td>
</tr>
<tr>
<td></td>
<td>• For a Ten Gigabit Ethernet interface, enter the keyword TenGigabitEthernet followed by the slot/port information.</td>
</tr>
</tbody>
</table>

Defaults

none

Command Modes

EXEC
EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

show lacp

Displays the LACP matrix.

Syntax

show lacp port-channel-number [sys-id | counters]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>port-channel-number</td>
<td>Enter a port-channel number:</td>
</tr>
<tr>
<td></td>
<td>Range: 1 to 128</td>
</tr>
<tr>
<td>sys-id</td>
<td>(OPTIONAL) Enter the keyword sys-id and the value that identifies a system.</td>
</tr>
<tr>
<td>counters</td>
<td>(OPTIONAL) Enter the keyword counters to display the LACP counters.</td>
</tr>
</tbody>
</table>

Command Modes

EXEC
EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator
Example 1  
**Figure 14-1. show lacp port-channel-number Command Example**

```
FTOS#show lacp 128
Port-channel 1 admin up, oper up, mode lacp
  Actor System ID: Priority 32768, Address 0001.e800.a12b
  Partner System ID: Priority 32768, Address 0001.e801.45a5
  Actor Admin Key 1, Oper Key 1, Partner Oper Key 1
  LACP LAG 1 is an aggregatable link

  A - Active LACP, B - Passive LACP, C - Short Timeout, D - Long Timeout
  E - Aggregatable Link, F - Individual Link, G - IN_SYNC, H - OUT_OF_SYNC
  I - Collection enabled, J - Collection disabled, K - Distribution enabled
  M - Partner Defaulted, N - Partner Non-defaulted, O - Receiver is in expired state,
  P - Receiver is not in expired state

  Port Te 0/1 is enabled, LACP is enabled and mode is lacp
  Actor  Admin: State ACEHJLMP Key 1   Priority 128
        Oper: State ACEGIKNP Key 1   Priority 128
  Partner Admin: State BDHJLMP Key 0   Priority 0
        Oper: State BCEGIKNP Key 1   Priority 128

FTOS#
```

Example 2  
**Figure 14-2. show lacp sys-id Command Example**

```
FTOS#show lacp 1 sys-id
Actor  System ID: Priority 32768, Address 0001.e800.a12b
Partner System ID: Priority 32768, Address 0001.e801.45a5

FTOS#
```

Example 3  
**Figure 14-3. show lacp counter Command Example**

```
FTOS#show lacp 1 counters
------------------------------------------------------------------------
<table>
<thead>
<tr>
<th>Port</th>
<th>Xmit</th>
<th>Recv</th>
<th>Xmit</th>
<th>Recv</th>
<th>Pkts Rx</th>
<th>Pkts Rx</th>
</tr>
</thead>
<tbody>
<tr>
<td>TenGig</td>
<td>0/1</td>
<td>200</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
------------------------------------------------------------------------

FTOS#
```

**Related Commands**

- **clear lacp counters**
  Clears the LACP counters.
- **show interfaces port-channel**
  Displays the information on configured Port Channel groups.
Layer 2

Overview

This chapter describes commands to configure Layer 2 features. It contains the following sections:

• MAC Addressing Commands
• Virtual LAN (VLAN) Commands

MAC Addressing Commands

The following commands are related to configuring, managing, and viewing MAC addresses:

• clear mac-address-table dynamic
• show cam mac stack-unit

Virtual LAN (VLAN) Commands

The following commands configure and monitor virtual local area networks (VLANs). VLANs are a virtual interface and use many of the same commands as physical interfaces.

You can configure an IP address and Layer 3 protocols on a VLAN called Inter-VLAN routing. FTP, TFTP, ACLs, and SNMP are not supported on a VLAN.

Occasionally, while sending broadcast traffic over multiple Layer 3 VLANs, the virtual router redundancy protocol (VRRP) state of a VLAN interface may continually switch between Master and Backup.

For more information, also refer to Virtual LAN (VLAN) Commands.
clear mac-address-table dynamic

Clear the MAC address table of all MAC address learned dynamically.

**Syntax**

`clear mac-address-table dynamic {address mac-address | all | interface interface | vlan vlan-id}`

**Parameters**

- **address mac-address**: Enter the keyword `address` followed by a MAC address in `nn:nn:nn:nn:nn:nn` format.
- **all**: Enter the keyword `all` to delete all MAC address entries in the MAC address table.
- **interface interface**: Enter the following keywords and slot/port or number information:
  - For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
- **vlan vlan-id**: Enter the keyword `vlan` followed by a VLAN ID number from 1 to 4094.

**Command Modes**

- EXEC Privilege

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator

**description**

Add a description about the selected VLAN.

**Syntax**

`description description`

To remove the description from the VLAN, use the `no description` command.

**Parameters**

- **description**: Enter a text string description to identify the VLAN (80 characters maximum).

**Defaults**

- none

**Command Modes**

- INTERFACE VLAN

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator

**Related Commands**

- `show vlan` Displays VLAN configuration.

**show cam mac stack-unit**

Displays the Content Addressable Memory (CAM) size and the portions allocated for MAC addresses and for MAC ACLs.

**Syntax**

`show cam mac stack-unit unit_number port-set port-pipe count [vlan vlan-id] [interface interface]`
### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>stack-unit unit_number</strong></td>
<td>(REQUIRED) Enter the keyword <code>stack-unit</code> followed by a stack member number to select the stack unit for which to gather information. Range: 0 to 5</td>
</tr>
<tr>
<td><strong>port-set port-pipe</strong></td>
<td>(REQUIRED) Enter the keyword <code>port-set</code> followed by a Port-Pipe number to select the Port-Pipe for which to gather information. Range: 0</td>
</tr>
<tr>
<td><strong>address mac-addr</strong></td>
<td>(OPTIONAL) Enter the keyword <code>address</code> followed by a MAC address in the <code>nn:nn:nn:nn:nn:nn</code> format to display information on that MAC address.</td>
</tr>
<tr>
<td><strong>dynamic</strong></td>
<td>(OPTIONAL) Enter the keyword <code>dynamic</code> to display only those MAC addresses learned dynamically by the switch.</td>
</tr>
<tr>
<td><strong>static</strong></td>
<td>(OPTIONAL) Enter the keyword <code>static</code> to display only those MAC address specifically configured on the switch.</td>
</tr>
</tbody>
</table>
| **interface interface** | (OPTIONAL) Enter the keyword `interface` followed by the interface type, slot and port information:  
  • For a 10-Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.                                                                                     |
| **vlan vlan-id** | (OPTIONAL) Enter the keyword `vlan` followed by the VLAN ID to display the MAC address assigned to the VLAN. Range: 1 to 4094.                                                                                      |

### Command Modes

- EXEC
- EXEC Privilege

### Command History

- **Version 8.3.17.0**  Supported on M I/O Aggregator
Link Layer Discovery Protocol (LLDP)

Overview

The link layer discovery protocol (LLDP) advertises connectivity and management from the local station to the adjacent stations on an IEEE 802 LAN. LLDP facilitates multi-vendor interoperability by using standard management tools to discover and make available a physical topology for network management. The Dell Fore10 operating software (FTOS) implementation of LLDP is based on IEEE standard 802.1ab.

LLDP Commands

This chapter contains the following commands, in addition to the commands:

- clear lldp counters
- debug lldp interface
- protocol lldp (Configuration)
- protocol lldp (Interface)
- show lldp neighbors
- show lldp statistics

The starting point for using LLDP is invoking LLDP with the protocol lldp command in either CONFIGURATION or INTERFACE mode.

The information distributed by LLDP is stored by its recipients in a standard management information base (MIB). The information can be accessed by a network management system through a management protocol such as SNMP.

For details about implementing LLDP/LLDP-MED, refer to the Link Layer Discovery Protocol chapter of the Dell PowerEdge Configuration Guide for the M I/O Aggregator.

clear lldp counters

Clear LLDP transmitting and receiving counters for all physical interfaces or a specific physical interface.

**Syntax**

```
clear lldp counters [interface]
```
### debug lldp interface

Enable LLDP debugging to display timer events, neighbor additions or deletions, and other information about incoming and outgoing packets.

**Syntax**

```
display lldp interface {interface | all} {events | packet {brief | detail} {tx | rx | both}}
```

To disable debugging, use the `no display lldp interface {interface | all} {events | packet {brief | detail} {tx | rx | both}}` command.

**Parameters**

- `interface` Enter the following keywords and slot/port or number information:
  - For a 10-Gigabit Ethernet interface, enter the keyword `tenGigabitEthernet` followed by the slot/port information.

- `all` (OPTIONAL) Enter the keyword `all` to display information on all interfaces.

- `events` (OPTIONAL) Enter the keyword `events` to display major events such as timer events.

- `packet` (OPTIONAL) Enter the keyword `packet` to display information regarding packets coming in or going out.

- `brief` (OPTIONAL) Enter the keyword `brief` to display brief packet information.

- `detail` (OPTIONAL) Enter the keyword `detail` to display detailed packet information.

- `tx` (OPTIONAL) Enter the keyword `tx` to display transmit only packet information.

- `rx` (OPTIONAL) Enter the keyword `rx` to display receive only packet information.

- `both` (OPTIONAL) Enter the keyword `both` to display both receive and transmit packet information.

**Defaults**

- none

**Command Modes**

- EXEC Privilege

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator
**protocol lldp (Configuration)**

Enable LLDP globally on the switch.

**Syntax**

```
protocol lldp
```

To disable LLDP globally on the chassis, use the `no protocol lldp` command.

**Defaults**

Disabled

**Command Modes**

CONFIGURATION (conf-lldp)

**Command History**

Version 8.3.17.0   Supported on M I/O Aggregator

**protocol lldp (Interface)**

Enter the LLDP protocol in the INTERFACE mode.

**Syntax**

```
[no] protocol lldp
```

To return to the global LLDP configuration mode, use the `no protocol lldp` command from the Interface mode.

**Defaults**

LLDP is not enabled on the interface.

**Command Modes**

INTERFACE (conf-if-interface-lldp)

**Command History**

Version 8.3.17.0   Supported on M I/O Aggregator

**Usage Information**

You must enable LLDP globally from CONFIGURATION mode before you can configure it on an interface. This command places you in LLDP mode on the interface; it does not enable the protocol.

When you enter the LLDP protocol in the Interface context, it overrides global configurations. When you execute the `no protocol lldp` from INTERFACE mode, interfaces begin to inherit the configuration from global LLDP CONFIGURATION mode.

**show lldp neighbors**

Displays LLDP neighbor information for all interfaces or a specified interface.

**Syntax**

```
show lldp neighbors [interface] [detail]
```

**Parameters**

- **interface**
  - (OPTIONAL) Enter the following keywords and slot/port or number information:
    - For a 10-Gigabit Ethernet interface, enter the keyword `tenGigabitEthernet` followed by the slot/port information.

- **detail**
  - (OPTIONAL) Enter the keyword `detail` to display all the TLV information, timers, and LLDP tx and rx counters.
show lldp neighbors

Displays the LLDP statistical information.

Syntax

show lldp neighbors

Defaults

none

Command Modes

EXEC Privilege

Example

Figure 16-1. show lldp neighbors Command Example

Usage

Information

Omitting the keyword detail displays only the remote chassis ID, Port ID, and Dead Interval.
Port Monitoring

Overview

The port monitoring feature allows you to monitor network traffic by forwarding a copy of each incoming or outgoing packet from one port to another port.

Monitoring Commands

- description
- monitor session
- show config
- show monitor session
- show running-config monitor session
- source (port monitoring)

Important Points to Remember

- Port monitoring is supported on physical ports only; virtual local area networks (VLANs) and port-channel interfaces do not support port monitoring.
- The monitoring (destination, “MG”) and monitored (source, “MD”) ports must be on the same switch.
- The monitored (source) interface must be a server-facing interface in the format slot/port, where valid slot numbers are 0-1 and server-facing port numbers are from 1 to 32. The monitoring interface must be an uplink port in the chassis.
- FTOS permits a limited set of commands for monitoring ports. To display these commands, use the ? command.
- A monitoring port may not be a member of a VLAN.
- There may only be one destination port in a monitoring session.
- A source port (MD) can only be monitored by one destination port (MG). If you try to assign a monitored port to more than one monitoring port, the following error is displayed (Message 1).
**Message 1** Assign a Monitored Port to More than One Monitoring Port

FTOS(conf)#mon ses 1
FTOS(conf-mon-sess-1)#source tengig 0/0 destination tengig 0/60 direction both
FTOS(conf-mon-sess-1)#do show mon ses
SessionID Source Destination Direction Mode Type
------- ------- ----------- --------- ---- ----
Port-based 1 TenGig 0/0 TenGig 0/60 both interface

FTOS(conf-mon-sess-1)#mon ses 2
FTOS(conf-mon-sess-2)#source tengig 0/0 destination tengig 0/61 direction both
% Error: MD port is already being monitored.

**Note:** There is no limit to the number of monitoring sessions per system, provided that there are only four destination ports per port-pipe. If each monitoring session has a unique destination port, the maximum number of session is four per port-pipe.

description

Enter a description of this monitoring session.

**Syntax**

description {description}

To remove the description, use the no description {description} command.

**Parameters**

<table>
<thead>
<tr>
<th>description</th>
<th>Enter a description regarding this session (80 characters maximum).</th>
</tr>
</thead>
</table>

| Default | none |

**Command Modes**

MONITOR SESSION (conf-mon-sess-session-ID)

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Related Commands**

| monitor session | Enables a monitoring session. |

monitor session

Create a session for monitoring traffic with port monitoring.

**Syntax**

monitor session session-ID

To delete a session, use the no monitor session session-ID command.

To delete all monitor sessions, use the no monitor session all command.

**Parameters**

<table>
<thead>
<tr>
<th>session-ID</th>
<th>Enter a session identification number.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range: 0 to 65535</td>
</tr>
</tbody>
</table>

| Default | none |


The monitor command is saved in the running configuration at the Monitor Session mode level and can be restored after a chassis reload.

### show config

Displays the current monitor session configuration.

**Syntax**

```
show config
```

**Defaults**

none

**Command Modes**

MONITOR SESSION (conf-mon-sess-<session-ID>)

**Example**

Figure 17-2.  show config Command Example

```
FTOS(conf-mon-sess-5)#show config
!
monitor session 5
source TenGigabitEthernet 0/4 destination TenGigabitEthernet 0/43 direction rx
FTOS(conf-mon-sess-5)#
```

### show monitor session

Displays the monitor information of a particular session or all sessions.

**Syntax**

```
show monitor session {session-ID}
```

To display monitoring information for all sessions, use the show monitor session command.

**Parameters**

- **session-ID**  
  (OPTIONAL) Enter a session identification number. Range: 0 to 65535

**Defaults**

none
show running-config monitor session

Displays the running configuration of all monitor sessions or a specific session.

Syntax

show running-config monitor session {session-ID}

To display the running configuration for all monitor sessions, use just the show running-config monitor session command.

Parameters

session-ID (OPTIONAL) Enter a session identification number.
Range: 0 to 65535

Defaults

none

Command Modes

EXEC
EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 17-4. show running-config monitor session Command Example

Usage Information

The monitoring command is saved in the running configuration at the Monitor Session mode level and can be restored after a chassis reload.
<table>
<thead>
<tr>
<th>command</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>monitor session</td>
<td>Creates a session for monitoring.</td>
</tr>
<tr>
<td>description</td>
<td>Displays a monitor session.</td>
</tr>
</tbody>
</table>
source (port monitoring)

Configure a port monitor source.

**Syntax**

```
source interface destination interface direction \{rx \mid tx \mid both\}
```

To disable a monitor source, use the `no source interface destination interface direction \{rx \mid tx \mid both\}` command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>interface</code></td>
<td>Enter the one of the following keywords and slot/port information:</td>
</tr>
<tr>
<td></td>
<td>• For a 10-Gigabit Ethernet interface, enter the keyword <code>TenGigabitEthernet</code> followed by the slot/port information.</td>
</tr>
<tr>
<td><code>destination</code></td>
<td>Enter the keyword <code>destination</code> to indicate the interface destination.</td>
</tr>
<tr>
<td><code>direction</code></td>
<td>Enter the keyword <code>direction</code> followed by one of the packet directional indicators.</td>
</tr>
<tr>
<td></td>
<td><code>rx</code>: to monitor receiving packets only</td>
</tr>
<tr>
<td></td>
<td><code>tx</code>: to monitor transmitting packets only</td>
</tr>
<tr>
<td></td>
<td><code>both</code>: to monitor both transmitting and receiving packets</td>
</tr>
</tbody>
</table>

**Defaults**

none

**Command Modes**

MONITOR SESSION (conf-mon-sess-session-ID)

**Command History**

Version 8.3.17.0  Supported on M I/O Aggregator

**Example**

```plaintext
Figure 17-5. Configuring a Port Monitor Source Command Example

FTOS(conf-mon-sess-11)#source tengig 10/0 destination tengig 10/47 direction rx
FTOS(conf-mon-sess-11)#
```

**Usage Information**

The monitored (source) interface must be a server-facing interface in the format slot/port, where valid slot numbers are 0-1 and server-facing port numbers are from 1 to 32.
Quality of Service (QoS)

Overview

The Dell Force10 operating software (FTOS) commands for quality of service (QoS) include traffic conditioning and congestion control. This chapter contains the section:

- Policy-Based QoS Commands

Policy-Based QoS Commands

The commands are:

- show qos statistics
- show qos dot1p-queue-mapping

show qos statistics

View QoS statistics.

Syntax

show qos statistics [interface]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface</td>
<td>For a Ten Gigabit Ethernet interface, enter the keyword <code>TenGigabitEthernet</code> followed by the slot/port information.</td>
</tr>
</tbody>
</table>

Defaults

none

Command Modes

EXEC
EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator
Example 1

**Figure 18-1. show qos statistics Command Example**

```
FTOS#show qos statistics
Interface Te 0/20
Queue# Matched Pkts
  0   0
  1   0
  2   0
  3   0
FTOS#
```

**Table 18-1. show qos statistics Command Description (ED and EE Series)**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queue #</td>
<td>Queue Number</td>
</tr>
<tr>
<td>Matched Pkts</td>
<td>The number of packets that matched the class-map criteria.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> When trust is configured, matched packet counters are not</td>
</tr>
<tr>
<td></td>
<td>incremented in this field.</td>
</tr>
</tbody>
</table>

**show qos dot1p-queue-mapping**

View dot1p to queue mapping.

**Syntax**

`show qos dot1p-queue-mapping`

**Defaults**

none

**Command Modes**

EXEC

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

**Figure 18-2. show qos wred-profile Command Example**

```
FTOS#show qos dot1p-queue-mapping
  Dot1p Priority : 0 1 2 3 4 5 6 7
  Queue : 0 0 0 1 2 3 3 3
FTOS#
```
Security

Commands

This chapter describes various types of security commands in the Dell Force10 operating software (FTOS), in the following sections:

- Authentication and Password Commands
- SSH Server and SCP Commands

Note: Starting with FTOS version 7.2.1.0, LEAP with MSCHAP v2 supplicant is implemented.

Authentication and Password Commands

This section contains the following commands controlling management access to the system:

- enable password
- enable restricted
- enable smux-debug
- service password-encryption
- show users
- username

SSH Server and SCP Commands

FTOS supports secure shell (SSH) protocol versions 1.5 and 2.0. SSH is a protocol for secure remote login over an insecure network. SSH sessions are encrypted and use authentication. The SSH and SCP commands are:

- show ip ssh
- show ip ssh client-pub-keys
- show ip ssh rsa-authentication
- ssh
enable password

Change the password for the enable command.

Syntax

```
enable password [level level] [encryption-type] password
```

To delete a password, use the no enable password [encryption-type] password [level level] command.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>level level</td>
<td>(OPTIONAL) Enter the keyword level followed by a number as the level of access. Range: 1 to 15</td>
</tr>
<tr>
<td>encryption-type</td>
<td>(OPTIONAL) Enter the number 7 or 0 as the encryption type. Enter a 7 followed by a text string as the hidden password. The text string must be a password that was already encrypted by a Dell Force10 router. Use this parameter only with a password that you copied from the show running-config file of another Dell Force10 router.</td>
</tr>
<tr>
<td>password</td>
<td>Enter a text string, up to 32 characters long, as the clear text password.</td>
</tr>
</tbody>
</table>

Defaults

No password is configured. level = 15

Command Modes

CONFIGURATION

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

Use this command to define a password for a level.

Passwords must meet the following criteria:

- Start with a letter, not a number.
- Passwords can have a regular expression as the password. To create a password with a regular expression in it, you must use CNTL + v prior to entering regular expression. For example, to create the password abcd] e, you type “abcd CNTL v ] e”. When the password is created, you do not use the CNTL + v key combination and enter “abcd] e”.

Note: The question mark (?) and the tilde (~) are not supported characters.

Related Commands

- show running-config Views the current configuration.

enable restricted

Allows Dell Force10 technical support to access restricted commands.

Syntax

```
enable restricted [encryption-type] password
```

To disallow access to restricted commands, use the no enable restricted command.
enable smux-debug

Enable SMUX debug-level commands.

Syntax

enable smux-debug

To disable SMUX debug, use no enable smux-debug command.

service password-encryption

Encrypt all passwords configured in FTOS.

Syntax

service password-encryption

To store new passwords as clear text, use the no service password-encryption command.

Defaults

Enabled.

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Caution: Encrypting passwords with this command does not provide a high level of security. When the passwords are encrypted, you cannot return them to plain text unless you re-configure them. To remove an encrypted password, use the no password password command.
Usage Information

To keep unauthorized people from viewing passwords in the switch configuration file, use the service password-encryption command. This command encrypts the clear-text passwords created for user name passwords, authentication key passwords, the privileged command password, and console and virtual terminal line access passwords.

To view passwords, use the show running-config command.

show ip ssh
Displays information about established SSH sessions.

Syntax

show ip ssh

Command Modes
EXEC
EXEC Privilege

Example

Figure 19-1. show ip ssh Command Example

FTOS#show ip ssh
2#show ip ssh
SSH server                : disabled.
SSH server version        : v1 and v2.
Password Authentication   : enabled.
Hostbased Authentication  : disabled.
RSA       Authentication  : disabled.
FTOS#

Related Commands

show ip ssh client-pub-keys Displays the client-public keys.

show ip ssh client-pub-keys
Displays the client public keys used in host-based authentication.

Syntax

show ip ssh client-pub-keys

Defaults
none

Command Modes
EXEC

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 19-2. show ip ssh client-pub-keys Command Example

FTOS#show ip ssh client-pub-keys
poclab4,123.12.1.123 ssh-rsa AAAAB3NzaC1yc2EAAAABIBwAAAAEoxx/ QQp8xYh2Oxn07yhVGPao0UfgKolzTH0994eNY+ui+DWEc3cYAcUSLai1MU20DrzhCwyDNp05tKBU3tReG1 o8Axl6+s4hyEMqH2zBFNVqH2pQc+Rs4p2uzrV0F4pRKNax0XdhF3Lk4D460H2RhzVrxgeNnFdpENWIMFJi0 ds= ashwani@poclab4
FTOS#
show ip ssh rsa-authentication
Displays the authorized-keys for the RSA authentication.

Syntax
show ip ssh rsa-authentication {my-authorized-keys}

Parameters
my-authorized-keys | Display the RSA authorized keys.

Defaults
none

Command Modes
EXEC

Command History
Version 8.3.17.0  Supported on M I/O Aggregator

Example
Figure 19-3. show ip ssh rsa-authentication Command Example

FTOS#show ip ssh rsa-authentication my-authorized-keys
ssh-rsa
AAAAB3NzaC1yc2EAAAABIAwAAAEIEAyB17l4gFp4r2DRHIVmc1VZd0SGQzRVly1X1JOMeO6Wd0WuYyzeQMM
4qJc0BwtnoeXfLbcHF3V2hcMQa2N+CRCXw/zCM1nCf0+qVTd1ofsea5r09k500rCp0CNGH23NuGCq9v33m9+U9tMwhS8vy8AVxdH4x4km3c3t5Jvc=freedom@poclab4
FTOS#

Usage Information
This command displays the contents of the file flash:/ADMIN_DIR/ssh/authorized-keys.username.

show users
View information on all users logged into the switch.

Syntax
show users [all]

Parameters
all  (OPTIONAL) Enter the keyword all to view all terminal lines in the switch.

Command Modes
EXEC Privilege

Command History
Version 8.3.17.0  Supported on M I/O Aggregator

Example
Figure 19-4. show users Command Example

FTOS#show user
Line          User          Host(s)       Location
  0  console 0  admin           idle
*+  3  vty 1   admin           idle 172.31.1.4
FTOS#
Table 1 describes the information in the `show users` command example.

### Table 1 show users Command Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(untitled)</td>
<td>Indicates with an asterisk (*) which terminal line you are using.</td>
</tr>
<tr>
<td>Line</td>
<td>Displays the terminal lines currently in use.</td>
</tr>
<tr>
<td>User</td>
<td>Displays the user name of all users logged in.</td>
</tr>
<tr>
<td>Host(s)</td>
<td>Displays the terminal line status.</td>
</tr>
<tr>
<td>Location</td>
<td>Displays the IP address of the user.</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ssh</td>
<td>Enables a user.</td>
</tr>
</tbody>
</table>

**ssh**

Open an SSH connection specifying the hostname, username, port number and version of the SSH client.

FTOS supports both inbound and outbound SSH sessions using IPv4 addressing. Inbound SSH supports accessing the system through the management interface as well as through a physical Layer 3 interface.

**Syntax**

```plaintext
ssh {hostname | ipv4 address} [-l username | -p port-number | -v {1 | 2}]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>hostname</code></td>
<td>(OPTIONAL) Enter the IP address or the hostname of the remote device.</td>
</tr>
<tr>
<td><code>ipv4 address</code></td>
<td>(OPTIONAL) Enter the IP address in dotted decimal format A.B.C.D.</td>
</tr>
<tr>
<td><code>-l username</code></td>
<td>(OPTIONAL) Enter the keyword <code>-l</code> followed by the user name used in this SSH session. Default: The user name of the user associated with the terminal.</td>
</tr>
<tr>
<td><code>-p port-number</code></td>
<td>(OPTIONAL) Enter the keyword <code>-p</code> followed by the port number. Range: 1 to 65536 Default: 22</td>
</tr>
<tr>
<td>`-v {1</td>
<td>2}`</td>
</tr>
</tbody>
</table>

**Defaults**

As above.

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

**Figure 19-5. ssh Command Example**

```plaintext
FTOS#ssh 123.12.1.123 -l ashwani -p 5005 -v 2
```
username

Establish an authentication system based on user names.

**Syntax**

```
username name [access-class access-list-name] [nopassword | {password | secret} [encryption-type] password] [privilege level]
```

If you do not want a specific user to enter a password, use the **nopassword** option.

To delete authentication for a user, use the **no username name** command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Enter a text string for the name of the user up to 63 characters.</td>
</tr>
<tr>
<td>access-class</td>
<td>Enter the keyword <strong>access-class</strong> followed by the name of a configured access control list (either an IP access control list or MAC access control list).</td>
</tr>
<tr>
<td>access-list-name</td>
<td></td>
</tr>
<tr>
<td>nopassword</td>
<td>Enter the keyword <strong>nopassword</strong> to specify that the user should not enter a password.</td>
</tr>
<tr>
<td>password</td>
<td>Enter the keyword <strong>password</strong> followed by the <strong>encryption-type</strong> or the password.</td>
</tr>
<tr>
<td>secret</td>
<td>Enter the keyword <strong>secret</strong> followed by the <strong>encryption-type</strong> or the password.</td>
</tr>
<tr>
<td>encryption-type</td>
<td>Enter an encryption type for the <strong>password</strong> that you will enter.</td>
</tr>
<tr>
<td>privilege level</td>
<td>Enter the keyword <strong>privilege</strong> followed by a number from zero (0) to 15.</td>
</tr>
<tr>
<td>password</td>
<td>Enter a string up to 32 characters long.</td>
</tr>
<tr>
<td>secret</td>
<td>Enter the keyword <strong>secret</strong> followed by the <strong>encryption-type</strong>.</td>
</tr>
<tr>
<td>Defaults</td>
<td>The default encryption type for the <strong>password</strong> option is 0. The default encryption type for the <strong>secret</strong> option is 0.</td>
</tr>
</tbody>
</table>

**Command Modes**

CONFIGURATION

**Command History**

- **Version 8.3.17.0** Supported on M I/O Aggregator

**Usage Information**

To view the defined user names, use the **show running-config user** command.

**Related Commands**

- service password-encryption: Specifies a password for users on terminal lines.
- show running-config: Views the current configuration.
Simple Network Management Protocol (SNMP) and Syslog

Overview

This chapter contains commands to configure and monitor the simple network management protocol (SNMP) v1/v2 and Syslog. The chapter contains the following sections:

- SNMP Commands
- Syslog Commands

SNMP Commands

The SNMP command available in the Dell Force10 operating software (FTOS) is:

- snmp-server community

The SNMP is used to communicate management information between the network management stations and the agents in the network elements. FTOS supports SNMP versions 1, and 2c supporting only read-only mode.

Important Points to Remember

- Typically, 5-second timeout and 3-second retry values on an SNMP server are sufficient for both local area network (LAN) and wide area network (WAN) applications. If you experience a timeout with these values, the recommended best practice on Dell Force10 switches (to accommodate their high port density) is to increase the timeout and retry values on your SNMP server to the following:
  - SNMP Timeout—greater than 3 seconds
  - SNMP Retry count—greater than 2 seconds
- SNMP operations are not supported on a virtual LAN (VLAN).

Syslog Commands

The following commands allow you to configure logging functions on all Dell Force10 switches:

- clear logging
- logging hostname
- logging buffered
- logging console
- logging facility
- logging history
- logging history size
- logging monitor
- logging on
- logging source-interface
- logging trap
- show logging
- snmp-server community
- terminal monitor

**clear logging**

Clear the messages in the logging buffer.

**Syntax**
clear logging

**Defaults**
none

**Command Modes**
EXEC Privilege

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Supported on M I/O Aggregator</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td></td>
</tr>
</tbody>
</table>

**Related Commands**

show logging Displays logging settings and system messages in the internal buffer.

**logging hostname**

Configure an IP address or host name of a Syslog server where logging messages will be sent. Multiple logging servers of IPv4 can be configured.

**Syntax**
logging {ipv4-address | hostname}

To disable logging, enter no logging.

**Parameters**

- **ipv4-address**
Enter an IPv4 address (A.B.C.D).

- **hostname**
Enter the name of a host already configured and recognized by the switch.

**Defaults**
Disabled

**Command Modes**
CONFIGURATION

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Supported on M I/O Aggregator</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td></td>
</tr>
</tbody>
</table>

**Related Commands**

logging on Enables the logging asynchronously to logging buffer, console, Syslog server, and terminal lines.

logging trap Enables logging to the Syslog server based on severity.
logging buffered

Enable logging and specify which messages are logged to an internal buffer. By default, all messages are logged to the internal buffer.

**Syntax**

```
logging buffered [level] [size]
```

To return to the default values, use the `no logging buffered` command. To disable logging stored to an internal buffer, use the `no logging buffered` command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>level</code></td>
<td>(OPTIONAL) Indicate a value from 0 to 7 or enter one of the following equivalent words: emergencies, alerts, critical, errors, warnings, notifications, informational, or debugging. Default: 7 or debugging.</td>
</tr>
<tr>
<td><code>size</code></td>
<td>(OPTIONAL) Indicate the size, in bytes, of the logging buffer. The number of messages buffered depends on the size of each message. Range: 40960 to 524288. Default: 40960 bytes.</td>
</tr>
</tbody>
</table>

**Defaults**

`level = 7; size = 40960 bytes`

**Command Modes**

CONFIGURATION

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td>Supported on M I/O Aggregator</td>
</tr>
</tbody>
</table>

**Usage Information**

When you decrease the buffer size, all messages stored in the buffer are lost. Increasing the buffer size does not affect messages stored in the buffer.

**Related Commands**

- `clear logging` Clears the logging buffer.
- `logging hostname` Returns the logging buffered parameters to the default setting.
- `show logging` Displays the logging setting and system messages in the internal buffer.

logging console

Specify which messages are logged to the console.

**Syntax**

```
logging console [level]
```

To return to the default values, use the `logging hostname` command. To disable logging to the console, use the `no logging console` command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>level</code></td>
<td>(OPTIONAL) Indicate a value from 0 to 7 or enter one of the following parameters: emergencies, alerts, critical, errors, warnings, notifications, informational, or debugging. Default: 7 or debugging.</td>
</tr>
</tbody>
</table>

**Defaults**

7 or debugging

**Command Modes**

CONFIGURATION

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td>Supported on M I/O Aggregator</td>
</tr>
</tbody>
</table>
logging facility

Configure the Syslog facility, used for error messages sent to Syslog servers.

Syntax

logging facility [facility-type]

To return to the default values, use the no logging facility command.

Parameters

facility-type

(OPTIONAL) Enter one of the following parameters.

- auth (authorization system)
- cron (Cron/at facility)
- deamon (system deamons)
- kern (kernel)
- local0 (local use)
- local1 (local use)
- local2 (local use)
- local3 (local use)
- local4 (local use)
- local5 (local use)
- local6 (local use)
- local7 (local use)
- lpr (line printer system)
- mail (mail system)
- news (USENET news)
- sys9 (system use)
- sys10 (system use)
- sys11 (system use)
- sys12 (system use)
- sys13 (system use)
- sys14 (system use)
- syslog (Syslog process)
- user (user process)
- uucp (Unix to Unix copy process)

The default is local7.

Defaults

local7

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Related Commands

- clear logging Clears the logging buffer.
- logging hostname Returns the logging console parameters to the default setting.
- show logging Displays the logging settings and system messages in the internal buffer.
- logging on Enables logging.

Related Commands

- clear logging Clears the logging buffer.
- logging hostname Returns the logging console parameters to the default setting.
- show logging Displays the logging settings and system messages in the internal buffer.
logging history

Specify which messages are logged to the history table of the switch and the SNMP network management station (if configured).

**Syntax**

```
logging history level
```

To return to the default values, use the `no logging history` command.

**Parameters**

- **level**
  
  Indicate a value from 0 to 7 or enter one of the following equivalent words: emergencies, alerts, critical, errors, warnings, notifications, informational, or debugging. The default is 4.

**Defaults**

4 or warnings

**Command Modes**

CONFIGURATION

**Command History**

- **Version 8.3.17.0** Supported on M I/O Aggregator

**Related Commands**

- `show logging history` Displays information logged to the history buffer.

logging history size

Specify the number of messages stored in the FTOS logging history table.

**Syntax**

```
logging history size size
```

To return to the default values, use the `no logging history size` command.

**Parameters**

- **size**
  
  Indicate a value as the number of messages to be stored. Range: 0 to 500. Default: 1 message.

**Defaults**

1 message

**Command Modes**

CONFIGURATION

**Command History**

- **Version 8.3.17.0** Supported on M I/O Aggregator

**Usage Information**

When the number of messages reaches the limit you set with the `logging history size` command, older messages are deleted as newer ones are added to the table.

**Related Commands**

- `show logging history` Displays information logged to the history buffer.
logging monitor

Specify which messages are logged to Telnet applications.

Syntax

    logging monitor [level]

To disable logging to terminal connections, use the no logging monitor command.

Parameters

<table>
<thead>
<tr>
<th>level</th>
<th>Indicate a value from 0 to 7 or enter one of the following parameters: emergencies, alerts, critical, errors, warnings, notifications, informational, or debugging.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The default is 7 or debugging.</td>
</tr>
</tbody>
</table>

Defaults

7 or debugging

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Related Commands

logging hostname Returns the logging monitor parameters to the default setting.

logging on

Specify that debug or error messages are asynchronously logged to multiple destinations, such as logging buffer, Syslog server, or terminal lines.

Syntax

    logging on

To disable logging to logging buffer, Syslog server and terminal lines, use the no logging on command.

Defaults

Enabled

Command Modes

CONFIGURATION

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Usage Information

When you use the no logging on command, messages are logged only to the console.

Related Commands

logging hostname Enables logging to Syslog server.
logging buffered Sets the logging buffered parameters.
logging console Sets the logging console parameters.
logging monitor Sets the logging parameters for the terminal connections.
logging source-interface

Specify that the IP address of an interface is the source IP address of Syslog packets sent to the Syslog server.

**Syntax**

```
logging source-interface interface
```

To disable this command and return to the default setting, use the `no logging source-interface` command.

**Parameters**

- `interface` Enter the following keywords and slot/port or number information:
  - For a Ten Gigabit Ethernet interface, enter the keyword `TenGigabitEthernet` followed by the slot/port information.
  - For VLAN interface, enter the keyword `vlan` followed by a number from 1 to 4094.

**Defaults**

Not configured.

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

Syslog messages contain the IP address of the interface used to egress the router. By configuring the `logging source-interface` command, the Syslog packets contain the IP address of the interface configured.

**Related Commands**

-logging trap

Specify which messages are logged to the Syslog server based on the message severity.

**Syntax**

```
logging trap [level]
```

To return to the default values, use the `no logging trap` command. To disable logging, use the `no logging trap` command.

**Parameters**

- `level` Indicate a value from 0 to 7 or enter one of the following parameters: emergencies, alerts, critical, errors, warnings, notifications, informational, or debugging. The default is 6.

**Defaults**

6 or informational.

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Related Commands**

-logging hostname

Enables the logging to another device.

-logging on

Enables logging.
show logging

Displays the logging settings and system messages logged to the internal buffer of the switch.

**Syntax**

```
show logging [number | history [reverse] [number] | reverse [number] | summary | driverlog [stack-unit number] | kernellog [stack-unit number]]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>number</code></td>
<td>(OPTIONAL) Enter the number of message to be displayed on the output. Range: 1 to 65535</td>
</tr>
<tr>
<td><code>history</code></td>
<td>(OPTIONAL) Enter the keyword <code>history</code> to view only information in the Syslog history table.</td>
</tr>
<tr>
<td><code>reverse</code></td>
<td>(OPTIONAL) Enter the keyword <code>reverse</code> to view the Syslog messages in FIFO (first in, first out) order.</td>
</tr>
<tr>
<td><code>summary</code></td>
<td>(OPTIONAL) Enter the keyword <code>summary</code> to view a table showing the number of messages per type and per slot.</td>
</tr>
<tr>
<td><code>driverlog</code></td>
<td>(OPTIONAL) Enter the keyword <code>driverlog</code> to view the driverlog information per stack-unit. Enter the keyword <code>stack-unit</code> followed by the stack member ID of the switch for which you want to display the driver log. Range: 0 to 1</td>
</tr>
<tr>
<td><code>kernellog</code></td>
<td>(OPTIONAL) Enter the keyword <code>kernellog</code> to view the kernellog information per stack-unit. Enter the keyword <code>stack-unit</code> followed by the stack member ID of the switch for which you want to display the driver log. Range: 0 to 1</td>
</tr>
</tbody>
</table>

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td>Supported on M I/O Aggregator</td>
</tr>
</tbody>
</table>
Example 1 Figure 20-1. show logging Command Example

```
FTOS#show logging
Syslog logging: enabled
  Console logging: level debugging
  Monitor logging: level debugging
  Buffer logging: level debugging, 168 Messages Logged, Size (40960 bytes)
  Trap logging: level informational
    Logging to 172.16.1.162
    Logging to 10.10.10.4
    Logging to 10.1.2.4
    Logging to 172.31.1.4
    Logging to 133.33.33.4
Aug 1 15:05:53: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured from console
Jul 31 20:25:40: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured from console
Jul 31 20:14:03: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured from console
Jul 31 20:03:58: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured from console
Jul 31 18:22:10: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured from console
Jul 31 15:50:30: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured from console
Jul 31 14:26:22: %STKUNIT1-M:CP %SYS-5-CONFIG_I: Configured from console
Jul 31 14:26:17: %STKUNIT1-M:CP %SEC-3-AUTHENTICATION_ENABLE_SUCCESS: Enable password authentication success on console
Jul 31 14:26:17: %STKUNIT1-M:CP %SEC-4-ENABLE_PASSW_NOT_CONFIGURED: Enable password is required for authentication but not configured
Jul 31 10:38:12: %STKUNIT1-M:CP %SYSADM-5-CPU_THRESHOLD_CLR: Overall cpu usage of management-unit drops below threshold. Cpu1minUsage (65%) --More--
```

Example 2 Figure 20-2. show logging history Command Example

```
FTOS#show logging history
Syslog History Table: 1 maximum table entries, saving level warnings or higher
  SNMP notifications not Enabled
May 22 08:53:09: %STKUNIT0-M:CP %SEC-3-AUTHENTICATION_ENABLE_SUCCESS: Enable password authentication success on vty0 (10.11.68.22)
FTOS#
```

Simple Network Management Protocol (SNMP) and Syslog | 217
snmp-server community

Configure a new community string access for SNMPv1, and v2.

**Syntax**

```
snmp-server community community-name {ro}
```

To remove access to a community, use the `no snmp-server community community-string {ro | rw}` command.

**Parameters**

- `community-name` Enter a text string (up to 20 characters long) to act as a password for SNMP.
- `ro` Enter the keyword `ro` to specify read-only permission.

**Defaults**

- none

**Command Modes**

CONFIGURATION

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

Figure 20-4 configures a community named guest that is mapped to the security named guestuser with Read Only (ro) permissions.

**Example**

Figure 20-4. **snmp-server community Command Example**

```
FTOS#config
FTOS(config)# snmp-server community guest ro
```

**Related Commands**

- `show running-config` Displays the current SNMP configuration and defaults.
terminal monitor

Configure the FTOS to display messages on the monitor/terminal.

**Syntax**

```
terminal monitor
```

To return to default settings, use the `terminal no monitor` command.

**Defaults**

Disabled.

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

```
Version 8.3.17.0       Supported on M I/O Aggregator
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>logging monitor</td>
<td>Sets the logging parameters on the monitor/terminal.</td>
</tr>
</tbody>
</table>
Stacking Commands

Overview

Stacking is supported on an Aggregator only on the 40GbE ports on the base module. Stacking is limited to two Aggregators in the same chassis in a single stack. Up to three stacks are supported in an M1000e chassis.

Stacking provides a single point of management and NIC teaming for high availability and higher throughput. To configure an Aggregator stack, you must use the CLI.

The stacking commands are always available and operational, whether or not an Aggregator has a stacking module inserted. You can use the commands to pre-configure an Aggregator, so that the configuration settings are invoked when the Aggregator is attached to other Aggregator blades.

For more information about using the Aggregator stacking feature, refer to the “Stacking Aggregators” chapter in the Dell Force10 Configuration Guide for the M I/O Aggregator.

Stacking Commands

You can use the following commands to manage a stack of Aggregator IO modules:

- `power-cycle stack-unit`
- `reset stack-unit`
- `show system stack-ports`
- `show system stack-unit iom-mode`
- `show system stack-unit fanout`
- `show system stack-unit stack-group`
- `stack-unit iom-mode`
reset stack-unit

Reset any designated stack member except the management unit (master unit).

Syntax

reset stack-unit 0-5 hard

Parameters

0-5 Enter the stack member unit identifier of the stack member to reset.

hard Reset the stack unit if the unit is in a problem state.

Default

none

Command Modes

EXEC Privilege

Usage Information

Resetting the management unit is not allowed (an error message is displayed if you try to do so). Resetting is a soft reboot, including flushing the forwarding tables.

You can run this command directly on the stack standby unit (Standby Master) to reset the standby. You cannot reset any other unit from the standby unit.

Example

Figure 21-1. reset stack-unit Command Example on the Stack Standby Unit

FTOS#show system brief
Stack MAC : 00:1e:c9:f1:00:9b
     -- Stack Info --
     Unit UnitType     Status         ReqTyp          CurTyp          Version     Ports
     -------------------------------
     0   Management   online         I/O-Aggregator  I/O-Aggregator  8-3-17-46   56
     1   Standby      online         I/O-Aggregator  I/O-Aggregator  8-3-17-46   56
     2   Member       not present
     3   Member       not present
     4   Member       not present
     5   Member       not present

FTOS#
FTOS#reset stack-unit 0  <<Resetting master not allowed
% Error: Reset of master unit is not allowed.
FTOS#
FTOS#reset stack-unit 1
FTOS#01:02:00: %STKUNIT0-M:CP %CHMGR-5-STACKUNIT_RESET: Stack unit 1 being reset
01:02:00: %STKUNIT0-M:CP %CHMGR-1-DEL_PORT: Removed port: Te 1/1-32,41-56
01:02:00: %STKUNIT0-M:CP %CHMGR-2-STACKUNIT_DOWN: Stack unit 1 down - reset
01:02:00: %STKUNIT1-S:CP %IFMGR-1-DEL_PORT: Removed port: Te 1/1-32,41-56
01:02:05: %I/O-Aggregator:0 %IFAGT-5-STACK_PORT_LINK_DOWN: Changed stack port state to down: 0/37
01:02:11: %STKUNIT0-M:CP %POLLMGR-2-ALT_STACK_UNIT_STATE: Alternate Stack-unit is not present
FTOS#01:02:12: %STKUNIT0-M:CP %CHMGR-2-STACKUNIT_DOWN: Stack unit 1 down - card removed
Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>reload</td>
<td>Reboots FTOS.</td>
</tr>
<tr>
<td>power-cycle stack-unit</td>
<td>Resets the designated stack member.</td>
</tr>
</tbody>
</table>

show system stack-ports

Displays information about the stacking ports on all switches in the M I/O Aggregator switch stack.

Syntax

show system stack-ports [status | topology]

Parameters

- **status** (OPTIONAL) Enter the keyword **status** to display the command output without the Connection field.
- **topology** (OPTIONAL) Enter the keyword **topology** to limit the table to just the Interface and Connection fields.

Defaults

none

Command Modes

- EXEC
- EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator

Example

**Figure 21-2. show system stack-ports Command Example**

```
FTOS#show system stack-ports
Topology: Daisy chain
Interface  Connection    Link Speed      Admin     Link     Trunk
                      (Gb/s)        Status    Status   Group
------------------------------------------------------------------
0/33                      40             up        down
0/37        1/37          40             up        up
1/33                      40             up        down
1/37        0/37          40             up        up
FTOS#
```

**Figure 21-3. show system stack-ports status Command Example**

```
FTOS#show system stack-ports status
Topology: Daisy chain
Interface  Link Speed       Admin     Link       Trunk
              (Gb/s)         Status    Status     Group
-------------------------------------------------------
0/33         40            up        down
0/37         40            up        up
1/33         40            up        down
1/37         40            up        up
```
Example

Figure 21-4. show system stack-ports topology Command Example

```
FTOS#show system stack-ports topology
Topology: Daisy chain
Interface  Connection   Trunk   Group
-----------------------------
0/33
0/37   1/37
1/33
1/37   0/37
FTOS#
```

Table 21-1. show system stack-ports Command Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topology</td>
<td>Lists the topology of stack ports connected: Ring, Daisy chain, or Standalone</td>
</tr>
<tr>
<td>Interface</td>
<td>The unit/port ID of the connected stack port on this unit</td>
</tr>
<tr>
<td>Link Speed</td>
<td>Link Speed of the stack port in Gb/s</td>
</tr>
<tr>
<td>Admin Status</td>
<td>The only currently listed status is Up.</td>
</tr>
<tr>
<td>Connection</td>
<td>The stack port ID to which this unit’s stack port is connected</td>
</tr>
</tbody>
</table>

Related Commands

- **power-cycle stack-unit** Resets the designated stack member.
- **show diag** Displays the data plane or management plane input and output statistics of the designated component of the designated stack member.
- **show system** Displays the current status of all stack members or a specific member.

**show system stack-unit iom-mode**

Displays the current iom-mode (stack/standalone) and the mode configured after next reboot.

**Syntax**

```
show system stack-unit <unit-number> iom-mode[configured]
```

**Command Modes**

EXEC Privilege

**Command History**

- **Version 8.3.17.0** Supported on M I/O Aggregator

**show system stack-unit fanout**

Displays the current 40GbE ports configured in fanout mode.

**Syntax**

```
show system stack-unit <unit-number> fanout [configured]
```

**Command Modes**

EXEC Privilege

**Command History**

- **Version 8.3.17.0** Supported on M I/O Aggregator
show system stack-unit stack-group

Displays the stack-groups present/configured for a M I/O Aggregator stack unit.

**Syntax**

```
show system stack-unit <unit-number> stack-group [configured]
```

**Parameters**

- `unit number <0-5>`
  Number of the member stack unit. Valid values: 0 to 5. Default: 0.

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Related Commands**

- `reload`
  Reboots FTOS.
- `show system`
  Displays the current status of all stack members or a specific member.

**Example**

**Figure 21-6. show system stack-unit stack-group Command Example**

```
FTOS#show system stack-unit 0 stack-group ?
configured Configured stack groups
<cr>
FTOS#show system stack-unit 0 stack-group configured
Configured stack groups in stack-unit 0

FTOS##show system stack-unit 0 stack-group
Stack group             Ports
------------------------------------
 0              0/33
 1              0/37
 2              0/41
 3              0/45
FTOS#
```
stack-unit iom-mode

Toggle the M I/O Aggregator operating mode from standalone to stack or vice-versa.

Syntax

```
stack-unit <unit-number> iom-mode [stack | standalone]
```

Parameters

- **unit number**
  - Number of the member stack unit. Valid values: 0 to 5. Default: 0.
- **stack**
  - Enable stack mode.
- **standalone**
  - Enable stand-alone mode.

Defaults

standalone

Command Modes

CONFIGURATION

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator

Related Commands

- **reload**
  - Reboots FTOS.
- **show system**
  - Displays the current status of all stack members or a specific member.

Example

```
Figure 21-7. show system stack-unit stack-group Command Example

FTOS(conf)#stack-unit 0 iom-mode stack
% You are about to stack your IOA module, please reload the IOA and then plug in the stacking cable for the changes to take effect.
FTOS(conf)#
```

```
Storm Control

Overview

The Dell Force10 operating software (FTOS) storm control feature allows users to limit or suppress traffic during a traffic storm.

Note: When iSCSI storage devices are detected on the server-ports, storm-control is disabled on the those ports. When the iSCSI devices are off the ports, storm-control is enabled again.

Storm Control Commands

The storm control commands are:

- `io-aggregator broadcast storm-control`
- `show io-aggregator broadcast storm-control status`

**io-aggregator broadcast storm-control**

Rate-limit the broadcast traffic to 1 Gbps.

**Syntax**

`io-aggregator broadcast storm-control`

To disable storm control, use the `no io-aggregator broadcast storm-control` command.

**Defaults**

Enabled

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**show io-aggregator broadcast storm-control status**

Shows if storm control is enabled or disabled. If enabled, displays information on the rate limit value.

**Syntax**

`show io-aggregator broadcast storm-control status`

**Command Modes**

EXEC Privilege
Figure 22-1.  calendar set Command Example

FTOS#show io-aggregator broadcast storm-control status
Storm-Control Enabled
Broadcast Traffic limited to 1000 Mbps
FTOS#
System Time

Overview

The commands in this chapter configure time values on the system, either using the Dell Force10 operating software (FTOS), the hardware, or using the network time protocol (NTP). With NTP, the switch can act only as a client to an NTP clock host. For more information, refer to the “Network Time Protocol” section of the Management chapter in the Dell Force10 Configuration Guide for the M I/O Aggregator.

Time Commands

The NTP commands are:

- calendar set
- show calendar
- show clock
- clock read-calendar
- clock set
- clock summer-time date
- clock summer-time recurring
- clock timezone
- clock update-calendar

calendar set

Set the time and date for the switch hardware clock.

**Syntax**

```
calendar set time month day year
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>time</td>
<td>Enter the time in hours:minutes:seconds. For the hour variable, use the 24-hour format, for example, 17:15:00 is 5:15 pm.</td>
</tr>
<tr>
<td>month</td>
<td>Enter the name of one of the 12 months in English. You can enter the name of a day to change the order of the display to time day month year.</td>
</tr>
</tbody>
</table>
**calendar set**

**Command Modes**
EXEC Privilege

**Command History**
Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

```
Figure 23-1. calendar set Command Example
FTOS#calendar set 12:11:00 21 may 2012
FTOS#
```

You can change the order of the `month` and `day` parameters to enter the time and date as `time day month year`.

In the switch, the hardware clock is separate from the software and is called the calendar. This hardware clock runs continuously. After the hardware clock (the calendar) is set, the FTOS automatically updates the software clock after system bootup. You cannot delete the hardware clock (calendar).

To manually update the software with the hardware clock, use the command `clock read-calendar`.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clock read-calendar</td>
<td>Sets the software clock based on the hardware clock.</td>
</tr>
<tr>
<td>clock set</td>
<td>Sets the software clock.</td>
</tr>
<tr>
<td>clock update-calendar</td>
<td>Sets the hardware clock based on the software clock.</td>
</tr>
<tr>
<td>show clock</td>
<td>Displays the clock settings.</td>
</tr>
</tbody>
</table>

**show calendar**

Displays the current date and time based on the switch hardware clock.

**Syntax**

```
show calendar
```

**Command Modes**
EXEC
EXEC Privilege

**Command History**
Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

```
Figure 23-2. show clock Command Example
FTOS#show calendar
12:29:34 pacific Tue May 22 2012
FTOS#
```
show clock
Displays the current clock settings.

Syntax
show clock [detail]

Parameters
detail (OPTIONAL) Enter the keyword detail to view the source information of the clock.

Command Modes
EXEC
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

Example
Figure 23-3. show clock Command Example
FTOS#show clock
12:30:04.402 pacific Tue May 22 2012
FTOS#

FTOS#show clock detail
12:30:26.892 pacific Tue May 22 2012
Time source is RTC hardware
Summer time starts 00:00:00 UTC Wed Mar 14 2012
Summer time ends 00:00:00 pacific Wed Nov 7 2012
FTOS#

Related Commands
clock summer-time recurring Displays the time and date from the switch software clock.
show calendar Displays the time and date from the switch hardware clock.

clock read-calendar
Set the software clock on the switch from the information set in hardware clock (calendar).

Syntax
clock read-calendar

Defaults
Not configured.

Command Modes
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

Usage
Information
In the switch, the hardware clock is separate from the software and is called the calendar. This hardware clock runs continuously. After the hardware clock (the calendar) is set, the FTOS automatically updates the software clock after system bootup.
You cannot delete this command (that is, there is not a “no” version of this command).

clock set

Set the software clock in the switch.

Syntax

clock set time month day year

Parameters

time  Enter the time in hours:minutes:seconds. For the hour variable, use the 24-hour format, example, 17:15:00 is 5:15 pm.

month Enter the name of one of the 12 months, in English.
You can enter the number of a day and change the order of the display to time month day.

day  Enter the number of the day.
Range: 1 to 31.
You can enter the name of a month to change the order of the display to time month day.

year  Enter a four-digit number as the year.
Range: 1993 to 2035.

Defaults
Not configured

Command Modes
EXEC Privilege

Command History

Version 8.3.17.0 Supported on M I/O Aggregator

Example

Figure 23-5.  clock set Command Example

FTOS#clock set 12:11:00 21 may 2012
FTOS#

Usage Information

You can change the order of the month and day parameters to enter the time and date as time day month year. You cannot delete the software clock.

The software clock runs only when the software is up. The clock restarts, based on the hardware clock, when the switch reboots.

Dell Force10 recommends using an outside time source, such as NTP, to ensure accurate time on the switch.
clock summer-time date

Set a date (and time zone) on which to convert the switch to daylight saving time on a one-time basis.

**Syntax**

```
clock summer-time time-zone date start-month start-day start-year start-time end-month end-day end-year end-time [offset]
```

To delete a daylight saving time zone configuration, use the `no clock summer-time` command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>time-zone</strong></td>
<td>Enter the three-letter name for the time zone. This name is displayed in the <code>show clock</code> output.</td>
</tr>
<tr>
<td><strong>start-month</strong></td>
<td>Enter the name of one of the 12 months in English. You can enter the name of a day to change the order of the display to <code>time day month year</code>.</td>
</tr>
<tr>
<td><strong>start-day</strong></td>
<td>Enter the number of the day. Range: 1 to 31. You can enter the name of a month to change the order of the display to <code>time day month year</code>.</td>
</tr>
<tr>
<td><strong>start-year</strong></td>
<td>Enter a four-digit number as the year. Range: 1993 to 2035.</td>
</tr>
<tr>
<td><strong>start-time</strong></td>
<td>Enter the time in hours:minutes. For the hour variable, use the 24-hour format, example, 17:15 is 5:15 pm.</td>
</tr>
<tr>
<td><strong>end-day</strong></td>
<td>Enter the number of the day. Range: 1 to 31. You can enter the name of a month to change the order of the display to <code>time day month year</code>.</td>
</tr>
<tr>
<td><strong>end-month</strong></td>
<td>Enter the name of one of the 12 months in English. You can enter the name of a day to change the order of the display to <code>time day month year</code>.</td>
</tr>
<tr>
<td><strong>end-time</strong></td>
<td>Enter the time in hours:minutes. For the hour variable, use the 24-hour format, example, 17:15 is 5:15 pm.</td>
</tr>
<tr>
<td><strong>end-year</strong></td>
<td>Enter a four-digit number as the year. Range: 1993 to 2035.</td>
</tr>
<tr>
<td><strong>offset</strong></td>
<td>(OPTIONAL) Enter the number of minutes to add during the summer-time period. Range: 1 to 1440. Default: 60 minutes</td>
</tr>
</tbody>
</table>

**Defaults**

Not configured.

**Command Modes**

CONFIGURATION

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.0</td>
<td>Supported on M I/O Aggregator</td>
</tr>
</tbody>
</table>

**Related Commands**

- `calendar set` Sets the hardware clock.
clock summer-time recurring

Set the software clock to convert to daylight saving time on a specific day each year.

**Syntax**

```
clock summer-time.time-zone recurring [start-week start-day start-month start-time end-week end-day end-month end-time [offset]]
```

To delete a daylight saving time zone configuration, use the `no clock summer-time` command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>time-zone</td>
<td>Enter the three-letter name for the time zone. This name is displayed in the <code>show clock</code> output. You can enter up to eight characters.</td>
</tr>
</tbody>
</table>
| start-week | (OPTIONAL) Enter one of the following as the week that daylight saving begins and then enter values for `start-day` through `end-time`:  
  - `week-number`: Enter a number from 1-4 as the number of the week in the month to start daylight saving time.  
  - `first`: Enter this keyword to start daylight saving time in the first week of the month.  
  - `last`: Enter this keyword to start daylight saving time in the last week of the month. |
| start-day | Enter the name of the day that you want daylight saving time to begin. Use English three letter abbreviations, for example, Sun, Sat, Mon, etc. Range: Sun – Sat |
| start-month | Enter the name of one of the 12 months in English. |
| start-time | Enter the time in hours:minutes. For the hour variable, use the 24-hour format, example, 17:15 is 5:15 pm. |
| end-week | Enter the one of the following as the week that daylight saving ends:  
  - `week-number`: enter a number from 1-4 as the number of the week to end daylight saving time.  
  - `first`: enter the keyword first to end daylight saving time in the first week of the month.  
  - `last`: enter the keyword last to end daylight saving time in the last week of the month. |
| end-day | Enter the weekday name that you want daylight saving time to end. Enter the weekdays using the three letter abbreviations, for example Sun, Sat, Mon etc. Range: Sun to Sat |
| end-month | Enter the name of one of the 12 months in English. |
| end-time | Enter the time in hours:minutes:seconds. For the hour variable, use the 24-hour format, example, 17:15:00 is 5:15 pm. |
| offset | (OPTIONAL) Enter the number of minutes to add during the summer-time period. Range: 1 to 1440. Default: 60 minutes. |

**Defaults**

Not configured.

**Command Modes**

CONFIGURATION

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator
Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>calendar set</td>
<td>Sets the hardware clock.</td>
</tr>
<tr>
<td>clock summer-time date</td>
<td>Sets a date (and time zone) on which to convert the switch to daylight saving time on a one-time basis.</td>
</tr>
<tr>
<td>show clock</td>
<td>Displays the current clock settings.</td>
</tr>
</tbody>
</table>

**clock timezone**

Configure a timezone for the switch.

**Syntax**

```
clock timezone timezone-name offset
```

To delete a timezone configuration, use the `no clock timezone` command.

**Parameters**

- **timezone-name**
  - Enter the name of the timezone. You cannot use spaces.
- **offset**
  - Enter one of the following:
    - A number from 1 to 23 as the number of hours in addition to UTC for the timezone.
    - A minus sign (-) followed by a number from 1 to 23 as the number of hours

**Default**

Not configured.

**Command Modes**

CONFIGURATION

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

Coordinated universal time (UTC) is the time standard based on the International Atomic Time standard, commonly known as Greenwich Mean time. When determining system time, you must include the differentiator between UTC and your local timezone. For example, San Jose, CA is the Pacific Timezone with a UTC offset of -8.

**clock update-calendar**

Set the switch hardware clock based on the software clock.

**Syntax**

```
clock update-calendar
```

**Defaults**

Not configured.

**Command Modes**

EXEC Privilege

**Command History**

- Version 8.3.17.0 Supported on M I/O Aggregator

**Usage Information**

Use this command only if you are sure that the hardware clock is inaccurate and the software clock is correct.

You cannot delete this command (that is, there is not a “no” form of this command).
<table>
<thead>
<tr>
<th>Related Commands</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>calendar set</td>
<td>Sets the hardware clock.</td>
</tr>
</tbody>
</table>
Uplink Failure Detection (UFD)

Overview

Uplink failure detection (UFD) provides detection of the loss of upstream connectivity and, if used with network interface controller (NIC) teaming, automatic recovery from a failed link.

UFD Commands

The UFD commands are:

- `debug uplink-state-group`
- `defer-timer`
- `no enable`
- `show running-config uplink-state-group`
- `show uplink-state-group`
- `uplink-state group 1`
debug uplink-state-group

Enable debug messages for events related to a specified uplink-state group or all groups.

Syntax

```
debug uplink-state-group [group-id]
```

To turn off debugging event messages, use the `no debug uplink-state-group [group-id]` command.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>group-id</td>
<td>Enables debugging on the specified uplink-state group. Valid <code>group-id</code> values are 1 to 16.</td>
</tr>
</tbody>
</table>

Defaults

none

Command Modes

EXEC Privilege

Command History

- Version 8.3.17.0 Supported on M I/O Aggregator
### defer-timer

Set the number of seconds to wait for the upstream link (LAG 128) to recover before shutting down downstream server-facing links.

<table>
<thead>
<tr>
<th>Syntax</th>
<th><code>defer-timer seconds</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameters</td>
<td><code>seconds</code></td>
</tr>
<tr>
<td>Range:</td>
<td>0-120 seconds</td>
</tr>
<tr>
<td>Defaults</td>
<td>None</td>
</tr>
<tr>
<td>Command Modes</td>
<td>UPLINK-STATE-GROUP-1</td>
</tr>
<tr>
<td>Command History</td>
<td></td>
</tr>
<tr>
<td>Version 8.3.17.4</td>
<td>Supported on M I/O Aggregator</td>
</tr>
</tbody>
</table>

Use the `defer-timer` command to configure the defer timer that prevents unwanted flapping of server ports when the uplink port channel (LAG 128) goes down and comes up.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>uplink-state group 1</code></td>
<td>Enter the uplink-state group 1 configuration mode.</td>
</tr>
</tbody>
</table>
**no enable**

Disable the default UFD link-tracking configuration.

**Syntax**

```markdown
no enable
```

**Defaults**

All downstream server-facing ports are brought down when the upstream LAG 128 goes down.

**Command Modes**

UPLINK-STATE-GROUP-1

**Command History**

<table>
<thead>
<tr>
<th>Version</th>
<th>Supported on M I/O Aggregator</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.17.4</td>
<td></td>
</tr>
</tbody>
</table>

**Usage Information**

Use the `no enable` command to ensure that server-facing ports on an Aggregator remain up and continue transmitting traffic without being automatically disabled when LAG 128 connectivity to an upstream switch/router goes down.

To re-enable the UFD link-tracking configuration, enter the `enable` command in uplink-state-group-1 configuration mode.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>uplink-state group 1</code></td>
<td>Enter the uplink-state group 1 configuration mode.</td>
</tr>
</tbody>
</table>
show running-config uplink-state-group

Displays the current configuration of one or more uplink-state groups.

**Syntax**

```
show running-config uplink-state-group [group-id]
```

**Parameters**

- `group-id` Displays the current configuration of all uplink-state groups or a specified group. Valid `group-id` values are 1 to 16.

**Defaults**

none

**Command Modes**

- EXEC
- EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

Figure 24-1. show running-config uplink-state-group Command Example

```
FTOS#show running-config uplink-state-group
!
uplink-state-group 1
  downstream TenGigabitEthernet 0/1-32
  downstream TenGigabitEthernet 1/1-32
  upstream Port-channel 128
  defer-timer 10
FTOS#
```

**Related Commands**

- `show uplink-state-group` Displays status information on a specified uplink-state group or all groups.
show uplink-state-group

Displays status information on a specified uplink-state group or all groups.

**Syntax**

```
show uplink-state-group [group-id] [detail]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>group-id</td>
<td>Displays status information on a specified uplink-state group or all groups. Valid group-id values are 1 to 16.</td>
</tr>
<tr>
<td>detail</td>
<td>Displays additional status information on the upstream and downstream interfaces in each group</td>
</tr>
</tbody>
</table>

**Defaults**

none

**Command Modes**

EXEC

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example**

```
FTOS#show uplink-state-group
Uplink State Group: 1   Status: Enabled, Down
FTOS#show uplink-state-group 1

Uplink State Group: 1   Status: Enabled, Down
FTOS#show uplink-state-group 1 detail

(Up): Interface up   (Dwn): Interface down   (Dis): Interface disabled

Uplink State Group    : 1       Status: Enabled, Down
Defer Timer           : 10 sec 
Upstream Interfaces   : Po 128(Dwn)
Downstream Interfaces : Te 0/1(Dis) Te 0/2(Dis) Te 0/3(Dis) Te 0/4(Dis) Te 0/5(Dis) Te 0/6(Dis) Te 0/7(Dis) Te 0/8(Dis) Te 0/9(Dis) Te 0/10(Dis) Te 0/11(Dis) Te 0/12(Dis) Te 0/13(Dis) Te 0/14(Dis) Te 0/15(Dis) Te 0/16(Dis) Te 0/17(Dis) Te 0/18(Dis) Te 0/19(Dis) Te 0/20(Dis) Te 0/21(Dis) Te 0/22(Dis) Te 0/23(Dis) Te 0/24(Dis) Te 0/25(Dis) Te 0/26(Dis) Te 0/27(Dis) Te 0/28(Dis) Te 0/29(Dis) Te 0/30(Dis) Te 0/31(Dis) Te 0/32(Dis) Te 1/1(Dis) Te 1/2(Dis) Te 1/3(Dis) Te 1/4(Dis) Te 1/5(Dis) Te 1/6(Dis) Te 1/7(Dis) Te 1/8(Dis) Te 1/9(Dis) Te 1/10(Dis) Te 1/11(Dis) Te 1/12(Dis) Te 1/13(Dis) Te 1/14(Dis) Te 1/15(Dis) Te 1/16(Dis) Te 1/17(Dis) Te 1/18(Dis) Te 1/19(Dis) Te 1/20(Dis) Te 1/21(Dis) Te 1/22(Dis) Te 1/23(Dis) Te 1/24(Dis) Te 1/25(Dis) Te 1/26(Dis) Te 1/27(Dis) Te 1/28(Dis) Te 1/29(Dis) Te 1/30(Dis) Te 1/31(Dis) Te 1/32(Dis)
```

**Related Commands**

- `show running-config uplink-state-group`

Displays the current configuration of one or more uplink-state groups.
uplink-state group 1

Enter the uplink-state-group-1 configuration mode to:

- Disable the uplink-state group 1 configuration.
- Configure the defer-timer setting used for UFD link tracking.

Syntax

uplink-state group 1

Command Modes

CONFIGURATION

Command History

Version 8.3.17.4 Supported on M I/O Aggregator

Usage Information

In some network topologies, you may prefer that server-facing ports on an Aggregator remain up and continue transmitting traffic without being automatically disabled when LAG 128 connectivity to an upstream switch/router goes down. In the event of a loss in upstream connectivity, you can enter the uplink-state-group-1 configuration level to:

- Disable UFD link tracking to keep downstream server ports operationally up.
- Configure the defer timer used for UFD link tracking. The defer timer prevents unwanted flapping of server ports when the uplink port channel (LAG 128) goes down and comes up.

To re-enable the default UFD link-tracking configuration, enter the `enable` command in uplink-state-group-1 configuration mode.

Related Commands

defer-timer Set the number of seconds to wait for the upstream link (LAG 128) to recover before disabling downstream server-facing links.

no enable Disables the default UFD link-tracking configuration.
Debugging and Diagnostics

This chapter contains three sections:

- Offline Diagnostic Commands
- Hardware Commands

Offline Diagnostic Commands

The offline diagnostics test suite is useful for isolating faults and debugging hardware. While tests are running, the Dell Force10 operating software (FTOS) results are saved as a text file (TestReport-SU-X.txt) in the flash directory. The `show file` command is available only on Master and Standby.

Important Points to Remember

- Offline diagnostics can only be run when the unit is offline.
- Offline diagnostics cannot be run in Stacking mode.
- You can only run offline diagnostics on a unit to which you are connected via the console. In other words, you cannot run diagnostics on a unit to which you are connected via a stacking link.
- Diagnostic results are stored in a file (TestReport-SU-X.txt) in the flash directory. To review the results, use the `show file` command, which prints the results to the screen.
- Diagnostics only test connectivity, not the entire data path.

The offline diagnostics commands are:

- `diag stack-unit`
- `offline stack-unit`
- `online stack-unit`
- `show diag`

Hardware Commands

These commands display information from a hardware sub-component or ASIC.

The hardware commands are:

- `clear hardware stack-unit`
- `hardware watchdog`
- `show diag`
• show hardware stack-unit
• show hardware system-flow

clear hardware stack-unit
Clear statistics from selected hardware components.

Syntax
clear hardware stack-unit 0–5 {counters | unit 0–1 counters | cpu data-plane statistics | cpu party-bus statistics | stack-port 0–52}

Parameters
- stack-unit 0-5
  Enter the keyword stack-unit followed by 0 to 5 to select a particular stack member and then enter one of the following command options to clear a specific collection of data.
- counters
  Enter the keyword counters to clear the counters on the selected stack member.
- unit 0–0 counters
  Enter the keyword unit along with a port-pipe number, from 0 to 1, followed by the keyword counters to clear the counters on the selected port-pipe.
- cpu data-plane statistics
  Enter the keywords cpu data-plane statistics to clear the data plane statistics.
- cpu party-bus statistics
  Enter the keywords cpu party-bus statistics to clear the management statistics.
- stack-port 33–56
  Enter the keyword stack-port followed by the port number of the stacking port to clear the statistics of the particular stacking port.
  Range: 33 to 56
  Note: You can identify stack port numbers by physical inspection of the rear modules. The numbering is the same as for the 10G ports. You can also inspect the output of the show system stack-ports command.

Defaults
none

Command Modes
EXEC Privilege

Command History
Version 8.3.17.0 Supported on M I/O Aggregator

Related Commands
show diag Displays the data plane or management plane input and output statistics of the designated component of the designated stack member.
diag stack-unit

Run offline diagnostics on a stack unit.

**Syntax**

diag stack-unit number {alllevels | level0 | level1 | level2 [verbose no-reboot] | terminate | interactive [test <id>]}

- **number**: Enter the stack-unit number.
  Range: 0 to 5

- **alllevels**: Enter the keyword `alllevels` to run the complete set of offline diagnostic tests.

- **level0**: Enter the keyword `level0` to run Level 0 diagnostics. Level 0 diagnostics check for the presence of various components and perform essential path verifications. In addition, they verify the identification registers of the components on the board.

- **level1**: Enter the keyword `level1` to run Level 1 diagnostics. Level 1 diagnostics is a smaller set of diagnostic tests with support for automatic partitioning. They perform status/self test for all the components on the board and test their registers for appropriate values. In addition, they perform extensive tests on memory devices (e.g., SDRAM, flash, NVRAM, EEPROM, and CPLD) wherever possible. There are no tests on 10G links. At this level, stack ports are shut down automatically.

- **level2**: Enter the keyword `level2` to run Level 2 diagnostics. Level 2 diagnostics is a full set of diagnostic tests with no support for automatic partitioning. Level 2 diagnostics are used primarily for on-board loopback tests and more extensive component diagnostics. Various components on the board are put into loop back mode, and test packets are transmitted through those components. These diagnostics also perform snake tests using VLAN configurations. You must physically remove the unit from the stack to test 10G links.

- **verbose**: Enter the keyword `verbose` to run the diagnostic in verbose mode. Verbose mode gives more information in the output than standard mode.

- **no-reboot**: Enter the keyword `no-reboot` to avoid automatic rebooting of the chassis after completion of diagnostic execution. Generally, this option is never used because if you run the diagnostic once again without rebooting the chassis, it may cause an issue with the diagnostic results.

- **terminate**: Enter the keyword `terminate` to stop the execution of the level diag that is already started using the diag stack-unit command. Once this CLI is issued, syslogs indicating the termination of the diag test is displayed. The diag results for the executed tests are stored in the flash directory (TestReport-SU-X.txt).

- **interactive**: Enter the keyword `interactive` to run some individual diag tests such as POWERLEDTEST, STATUSLEDTEST and so on. The help option under the interactive command displays the list of tests that can be run.

**Defaults**

none

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

---

hardware watchdog

Set the watchdog timer to trigger a reboot and restart the system.

**Syntax**

hardware watchdog

**Defaults**

Enabled
**Command Mode**

CONFIGURATION

**Command History**

Version 8.3.17.0 | Supported on M I/O Aggregator

**Usage Information**

This command enables a hardware watchdog mechanism that automatically reboots an FTOS switch/router with a single unresponsive unit. This is a last resort mechanism intended to prevent a manual power cycle.

### offline stack-unit

Place a stack unit in the offline state.

**Syntax**

`offline stack-unit number`

**Parameters**

`number` Enter the stack unit number.

Range: 0 to 5

**Defaults**

none

**Command Mode**

EXEC Privilege

**Command History**

Version 8.3.17.0 | Supported on M I/O Aggregator

**Usage Information**

While executing the offline stack unit CLI, the following warning message is displayed:

*Warning - offline of stack unit will bring down all the protocols and the unit will be operationally down, except for running Diagnostics.*

Make sure that stacking is not configured for Diagnostics execution. Also, reboot/online command is necessary for normal operation after the offline command is issued.

### online stack-unit

Place a stack unit in the online state.

**Syntax**

`online stack-unit number`

**Parameters**

`number` Enter the stack unit number.

Range: 0 to 5

**Defaults**

none

**Command Mode**

EXEC Privilege

**Command History**

Version 8.3.17.0 | Supported on M I/O Aggregator
show diag

View diagnostics information.

**Syntax**

`show diag {information | stack-unit number [detail | periodic | summary] | testcase}`

**Parameters**

- **information**
  - Enter the keyword `information` to view current diagnostics information in the system.

- **stack-unit unit-id**
  - Enter the keyword `stack-unit` followed by the `unit-id` to display information on a specific stack member. Range: 0 to 5.

- **detail**
  - (OPTIONAL) Enter the keyword `detail` to view detailed diagnostics information.

- **summary**
  - (OPTIONAL) Enter the keyword `summary` to view a summary of the diagnostics information. By default, the summary is displayed.

- **testcase**
  - Enter the keyword `testcase` to view the list of all the diag tests available.

**Defaults**

Summary

**Command Modes**

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example 1**

**Figure 25-1. show diag information Command Example**

```plaintext
FTOS#show diag information
Diag information:
Diag software image version:
8-3-17-36
Stack-unit Member  0:     Unit diags are terminated (Stackunit Offline).
Stack-unit Member  1:     Not present.
Stack-unit Member  2:     Not present.
Stack-unit Member  3:     Not present.
Stack-unit Member  4:     Not present.
Stack-unit Member  5:     Not present.
```

**Example 2**

**Figure 25-2. show diag stack-unit Command Example**

```plaintext
FTOS#show diag stackunit 0
Diag status of Stackunit member 0:  
-------------------------------------------------------------------
Stackunit is currently offline.
Stackunit level0 diag issued at Tue May 15, 2012 11:11:47 AM.
Current diag status:           Unit diags are terminated.
Total number of diags:         17
Number of diags performed:    1
Number of diags passed:       1
Number of diags failed:       0
Number of diags pending:      16
Last Test executed:           POWERRAILSTATUSTEST
Last notification received at: Tue May 15, 2012 11:12:24 AM
```
Example 3

Figure 25-3. show diag testcase stack-unit Command Example

FTOS#show diag testcase stack-unit 0

******************************************************** Navasota Diagnostics Test
********************************************************

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Test Description</th>
<th>Test Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>POWERRAILSTATUSTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>2</td>
<td>OPTMODSLOTPOWERSTATUSTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>3</td>
<td>TSENSORACCESTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>4</td>
<td>RTCPRESENCETEST</td>
<td>Level0</td>
</tr>
<tr>
<td>5</td>
<td>CPUSDRAmarktPRESENCETEST</td>
<td>Level0</td>
</tr>
<tr>
<td>6</td>
<td>CPUSDRAmSIZETEST</td>
<td>Level0</td>
</tr>
<tr>
<td>7</td>
<td>USBAACCESTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>8</td>
<td>USBHOSTCONTROLLERACCESTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>9</td>
<td>SDFLASHACCESTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>10</td>
<td>QSFPLPLUSPOWERMODESTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>11</td>
<td>CPLPRESENCETEST</td>
<td>Level0</td>
</tr>
<tr>
<td>12</td>
<td>FLASHACCESTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>13</td>
<td>BOARDREVTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>14</td>
<td>MGMTPHYPRESENCETEST</td>
<td>Level0</td>
</tr>
<tr>
<td>15</td>
<td>OPTMODTYPESTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>16</td>
<td>QSFPLPLUSPRESENCETEST</td>
<td>Level0</td>
</tr>
<tr>
<td>17</td>
<td>CPUPREDTECTTEST</td>
<td>Level0</td>
</tr>
<tr>
<td>101</td>
<td>RTCFUNCTIONTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>102</td>
<td>RTCROLLOVERTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>103</td>
<td>GPIOACCESTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>104</td>
<td>PSOCACCESTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>105</td>
<td>PCIEBCM56846ACCESTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>106</td>
<td>CPUSDRAmACCESTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>107</td>
<td>CPUSDRAmAETSTTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>108</td>
<td>CPUSDRAmAETSTTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>109</td>
<td>USBFILECOPYTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>110</td>
<td>FLASHRWTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>111</td>
<td>I2CSTRESSTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>112</td>
<td>AVSPowerCNTRLACCESTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>113</td>
<td>SERVERPORTPHYACCESTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>114</td>
<td>SERVERPORTPHYRWTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>115</td>
<td>QSFPLPLUSPHYACCESTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>116</td>
<td>QSFPLPLUSPHYRWTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>117</td>
<td>QSFPLPLUSPHYEXTLINKTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>118</td>
<td>QSFPLPLUSIPROMTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>119</td>
<td>OPTMODPHYACCESTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>120</td>
<td>OPTMODPHYRWTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>121</td>
<td>OPTMODPHYEXTLINKTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>122</td>
<td>OPTMODMODULEIPROMTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>123</td>
<td>MGTMPHYACCESTTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>124</td>
<td>SDFLASHFICOPYSTRESSTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>201</td>
<td>QSFPLPLUSPHYLINKSPEEDTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>202</td>
<td>OPTMODPHYNKSPREADTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>203</td>
<td>MGTMPHYLOOPBACKTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>204</td>
<td>MGTMACLOOPBACKTEST</td>
<td>Level1</td>
</tr>
<tr>
<td>205</td>
<td>CPUSNAKESERVERPORTPHYLPBKTEST</td>
<td>Level2</td>
</tr>
<tr>
<td>206</td>
<td>CPUSNAKESERVERPORTMACLPBKTEST</td>
<td>Level2</td>
</tr>
<tr>
<td>207</td>
<td>CPUSNAKEQSFPPHPHYLPBKTEST</td>
<td>Level2</td>
</tr>
<tr>
<td>208</td>
<td>CPUSNAKEQSFPPMACLPBKTEST</td>
<td>Level2</td>
</tr>
<tr>
<td>209</td>
<td>CPUSNAKEOPTMODPHYLPBKTEST</td>
<td>Level2</td>
</tr>
<tr>
<td>210</td>
<td>CPUSNAKEOPTMODMACLPBKTEST</td>
<td>Level2</td>
</tr>
</tbody>
</table>

Total Diagnostic Testcases in All Levels: 51

******************************************************** END

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### Example 4

**Figure 25-4. show diag testcase stack-unit interactive Command Example**

```
FTOS#show diag testcase stack-unit 0 interactive
**************************************************** Navasota Diagnostics Test
****************************************************
Test ID    Test Description                 Test Level
-------    ----------------                 ----------
401        POWERLEDTEST                     Interactive
402        DEBUGLEDTEST                     Interactive
403        STATUSLEDTEST                    Interactive
404        OPTMODLEDCONTROLTEST             Interactive
405        FIXEDLEDCONTROLTEST              Interactive
406        RTCBATTERYTEST                   Interactive
407        CPLDRESETTEST                    Interactive
408        I2CDEVICESCANTEST                Interactive
409        SERVERPORTPHYEXTLINKTEST         Interactive
410        CPUSNAKEQSFPPEXTLPBKTEST         Interactive
411        CPUSNAKEOPTMODEXTLPBKTEST        Interactive

Total Diagnostic Testcases in Interactive: 11
**************************************************** END
```

show hardware stack-unit

Displays the data plane or management plane input and output statistics of the designated component of the designated stack member.

**Syntax**

```
show hardware stack-unit 0-5 {buffer [buffer unit | port [(1-56) | all] total buffer | buffer unit (1) port (1-56) queue [(0-14) | all] buffer-info} {phy-firmware-version} {cpu data-plane statistics [stack-port 0-52] | cpu party-bus statistics | cpu private-mgmt statistics | drops [unit 0-1 [port 1-56]] | stack-port 33-56 | unit 0-0 {counters | details | port-stats [detail] | register}}
```

**Parameters**

<table>
<thead>
<tr>
<th>stack-unit 0-5 () {command-option}</th>
<th>Enter the keyword stack-unit followed by 0 to 5 to select a particular stack member and then enter one of the following command options to display a collection of data based on the option entered.</th>
</tr>
</thead>
<tbody>
<tr>
<td>buffer</td>
<td>Enter the keyword buffer, optionally followed by the keywords total-buffer to show the total buffer statistics per stack unit. Enter the keywords buffer unit then total-buffer to display the buffer details per unit and mode of allocation. To display the forwarding plane statistics containing the packet buffer usage per port per stack unit, enter the keywords buffer unit followed by port and the port number (1-56 or all), then buffer-info. To display the forwarding plane statistics containing the packet buffer statistics per COS per port, enter the keywords buffer unit and port (1-56), and queue (0-14 or all), and buffer-info. Buffer unit default: 1</td>
</tr>
<tr>
<td>fpga</td>
<td>Enter the keyword fpga, to display fpga details.</td>
</tr>
<tr>
<td>fru</td>
<td>Enter the keyword fru, to display fru details.</td>
</tr>
<tr>
<td>phy-firmware-version</td>
<td>Each member of the stack is updated automatically with the latest firmware while booting as well as during OIR. Enter the keyword phy-firmware-version, to dump the physical firmware version for stack units.</td>
</tr>
</tbody>
</table>
**cpu data-plane statistics** Enter the keywords **cpu data-plane statistics**, optionally followed by the keywords **stack port** and its number — 0 to 52 — to display the data plane statistics, which shows the High Gig (Higig) port raw input/output counter statistics to which the stacking module is connected.

**cpu party-bus statistics** Enter the keywords **cpu party-bus statistics**, to display the Management plane input/output counter statistics of the pseudo party bus interface.

**cpu private-mgmt statistics** Enter the keywords **cpu private-mgmt statistics**, to display the Management plane input/output counter statistics of the Private Management interface.

**drops [unit 0-0 [port 1-56]]** Enter the **drops** keyword to display internal drops on the selected stack member. Optionally, use the **unit** keyword with 0 to select port-pipe 0, and then use **port 1-56** to select a port on that port-pipe.

**stack-port 33-56** Enter this keyword and a stacking port number to select a stacking port for which to display statistics. Identify the stack port number as you would to identify a 10G port that was in the same place in one of the rear modules.  
**Note:** You can identify stack port numbers by physical inspection of the rear modules. The numbering is the same as for the 10G ports. You can also inspect the output of the show system stack-ports command.

**unit 0-0 {counters | details | port-stats [detail] | register}** Enter the **unit** keyword followed by 0 for port-pipe 0, and then enter one of the following keywords to troubleshoot errors on the selected port-pipe and to give status on why a port is not coming up to register level: **counters**, **details**, **port-stats [detail]**, or **register**

---

**Defaults**

none

**Command Modes**

EXEC

EXEC Privilege

**Command History**

Version 8.3.17.0 Supported on M I/O Aggregator

**Example 1**

**Figure 25-5. show hardware stack-unit phy-firmware-version Command Example**

```bash
FTOS#show hardware stack-unit 1 phy-firmware-version

<table>
<thead>
<tr>
<th>PortNumber</th>
<th>Status</th>
<th>Programmed Version</th>
<th>SW Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>Present</td>
<td>01.05</td>
<td>01.05</td>
</tr>
<tr>
<td>42</td>
<td>Present</td>
<td>01.05</td>
<td>01.05</td>
</tr>
<tr>
<td>43</td>
<td>Present</td>
<td>01.05</td>
<td>01.05</td>
</tr>
<tr>
<td>44</td>
<td>Present</td>
<td>01.05</td>
<td>01.05</td>
</tr>
<tr>
<td>45</td>
<td>Not Present</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>46</td>
<td>Not Present</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>47</td>
<td>Not Present</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>48</td>
<td>Not Present</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>49</td>
<td>Present</td>
<td>01.06</td>
<td>01.06</td>
</tr>
<tr>
<td>50</td>
<td>Present</td>
<td>01.06</td>
<td>01.06</td>
</tr>
<tr>
<td>51</td>
<td>Present</td>
<td>01.06</td>
<td>01.06</td>
</tr>
<tr>
<td>52</td>
<td>Present</td>
<td>01.06</td>
<td>01.06</td>
</tr>
<tr>
<td>53</td>
<td>Present</td>
<td>01.06</td>
<td>01.06</td>
</tr>
<tr>
<td>54</td>
<td>Present</td>
<td>01.06</td>
<td>01.06</td>
</tr>
<tr>
<td>55</td>
<td>Present</td>
<td>01.06</td>
<td>01.06</td>
</tr>
<tr>
<td>56</td>
<td>Present</td>
<td>01.06</td>
<td>01.06</td>
</tr>
</tbody>
</table>

FTOS#
In the above example, the “Status” field represents presence of OPTM ports, “Programmed version” field represents loaded firmware version, and “SW version” represents SDK version.

Example 2  
**Figure 25-6.  show hardware stack-unit cpu data-plane statistics Command Example**

```
FTOS#show hardware stack-unit 1 cpu data-plane statistics

bc pci driver statistics for device:
rxHandle        :7392
noMhdr          :0
noMbuf          :0
noClus          :0
recvvd          :7392
dropped         :0
recvToNet       :7392
rxError         :0
rxDatapathErr   :0
rxPkt(COS0)     :0
rxPkt(COS1)     :0
rxPkt(COS2)     :10
rxPkt(COS3)     :0
rxPkt(COS4)     :0
rxPkt(COS5)     :338
rxPkt(COS6)     :0
rxPkt(COS7)     :7044
rxPkt(UNIT0)    :7392
transmitted     :29899
txRequested     :29899
noTxDesc        :0
txError         :0
txReqTooLarge   :0
txInternalError :0
txDatapathErr   :0
txPkt(COS0)     :0
txPkt(COS1)     :0
txPkt(COS2)     :0
txPkt(COS3)     :0
txPkt(COS4)     :0
txPkt(COS5)     :0
txPkt(COS6)     :0
txPkt(COS7)     :0
txPkt(UNIT0)    :0
FTOS#
```

Example 3  
**Figure 25-7.  show hardware stack-unit cpu party-bus statistics Command Example**

```
FTOS#show hardware stack-unit 1 cpu party-bus statistics

Input Statistics:
8189 packets, 8076608 bytes
0 dropped, 0 errors
Output Statistics:
366 packets, 133100 bytes
0 errors
FTOS#
```

Example 4  
**Figure 25-8.  show hardware stack-unit drops (drop summary for entire switch) Command Example**

```
FTOS#show hardware stack-unit 1 drops

UNIT No: 0
Total Ingress Drops : 7448
Total IngMac Drops  : 0
Total Mmu Drops     : 0
Total EgMac Drops   : 0
Total Egress Drops  : 16
FTOS#
```
Example 5

**Figure 25-9. show hardware stack-unit drops unit (drop summary per port) Command Example**

```
FTOS#show hardware stack-unit 1 drops unit 0

UserPort    PortNumber    Ingress Drops   IngMac Drops    Total Mmu Drops  EgMac Drops
1            1              0               0               0               0
2            2              0               0               0               0
3            3              0               0               0               0
4            4              728             0               0               5
5            5              0               0               0               0
6            6              0               0               0               0
7            7              0               0               0               0
8            8              0               0               0               0
9            9              0               0               0               0
10           10             0               0               0               0

--More--
```

```
FTOS#
```

Example 6

**Figure 25-10. show hardware stack-unit drops (drop counters per port) Command Example**

```
FTOS#show hardware stack-unit 1 drops unit 0 port 27

--- Ingress Drops ---
Ingress Drops : 0
IBP CBP Full Drops : 0
PortSTPnotFwd Drops : 0
IPV4 L3 Discards : 0
Policy Discards : 0
Packets dropped by FP : 0
(L2+L3) Drops : 0
Port bitmap zero Drops : 0
Rx VLAN Drops : 0
--- Ingress MAC counters---
Ingress FCSDrops : 0
Ingress MTUExceeds : 0
--- Mmu Drops ---
HOL DROPS : 0
TxPurge CellErr : 0
Aged Drops : 0
--- Egress MAC counters---
Egress FCS Drops : 0
--- Egress FORWARD PROCESSOR Drops ---
IPV4 L3UC Aged & Drops : 0
TTL Threshold Drops : 0
INVALID VLAN CNTR Drops : 0
L2MC Drops : 0
PKT Drops of ANY Conditions : 0
Hg MacUnderflow : 0
TX Err PKT Counter : 0 25
```

```
FTOS#
```
Example 7

Figure 25-11. show hardware stack-unit port-statistics Command Example

```
FTOS#show hardware stack-unit 1 unit 0 port-stats
ena/ speed/ link auto STP  lrn inter max loop
port link duplex scan neg? state pause discrd ops face frame back
xe0 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1554
xe1 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe2 up 1G FD  SW Yes Forward None  FA GMII 11996
xe3 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe4 down 10G FD  SW Yes Block None  FA KR 8996
xe5 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe6 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe7 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe8 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe9 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe10 down 10G FD  SW Yes Forward  Tag  F  KR 1550
xe11 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe12 !ena 1G FD  SW Yes Block None  FA GMII 11996
xe13 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe14 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe15 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe16 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe17 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe18 down 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe19 !ena 1G FD  SW Yes Forward  Tag  F  GMII 1550
xe20 down 1G FD  SW Yes Forward  Tag  F  GMII 1550
```

Example 8

Figure 25-12. show hardware stack-unit 0 register Command Example

```
FTOS#show hardware stack-unit 0 unit 0 register
0x0f180d34 ALTERNATE_EMIRROR_BITMAP_PARITY_CONTROL.ipipe0 = 0x00000001
0x0f180d35 ALTERNATE_EMIRROR_BITMAP_PARITY_STATUS_INTR.ipipe0 = 0x00000000
0x0f180d36 ALTERNATE_EMIRROR_BITMAP_PARITY_STATUS_NACK.ipipe0 = 0x00000000
0x0018070c ARB_EOP_DEBUG.ipipe0 = 0x00000000
0x00180312 ARB_RAM_DBGCTRL.ipipe0 = 0x00000000
0x03300000 ASF_PORT_SPEED.cpu0 = 0x00000000
0x03322000 ASF_PORT_SPEED.xe0 = 0x00000000
0x03326000 ASF_PORT_SPEED.xe1 = 0x00000000
0x0332a000 ASF_PORT_SPEED.xe2 = 0x00000007
0x0332e000 ASF_PORT_SPEED.xe3 = 0x00000000
0x03332000 ASF_PORT_SPEED.xe4 = 0x00000000
0x03336000 ASF_PORT_SPEED.xe5 = 0x00000000
0x0333a000 ASF_PORT_SPEED.xe6 = 0x00000000
0x0333e000 ASF_PORT_SPEED.xe7 = 0x00000000
0x03342000 ASF_PORT_SPEED.xe8 = 0x00000000
0x03346000 ASF_PORT_SPEED.xe9 = 0x00000000
0x0334a000 ASF_PORT_SPEED.xe10 = 0x00000000
0x03350000 ASF_PORT_SPEED.xe11 = 0x00000000
0x03354000 ASF_PORT_SPEED.xe12 = 0x00000000
0x03358000 ASF_PORT_SPEED.xe13 = 0x00000000
0x0335c000 ASF_PORT_SPEED.xe14 = 0x00000000
0x03360000 ASF_PORT_SPEED.xe15 = 0x00000000
0x03364000 ASF_PORT_SPEED.xe16 = 0x00000000
0x03368000 ASF_PORT_SPEED.xe17 = 0x00000000
0x0336c000 ASF_PORT_SPEED.xe18 = 0x00000000
0x03370000 ASF_PORT_SPEED.xe19 = 0x00000000
0x03374000 ASF_PORT_SPEED.xe20 = 0x00000000
0x03378000 ASF_PORT_SPEED.xe21 = 0x00000000
0x0337c000 ASF_PORT_SPEED.xe22 = 0x00000000
0x03380000 ASF_PORT_SPEED.xe23 = 0x00000000
0x03384000 ASF_PORT_SPEED.xe24 = 0x00000000
0x03388000 ASF_PORT_SPEED.xe25 = 0x00000000
0x0338c000 ASF_PORT_SPEED.xe26 = 0x00000000
0x03390000 ASF_PORT_SPEED.xe27 = 0x00000000
0x03394000 ASF_PORT_SPEED.xe28 = 0x00000000
0x03398000 ASF_PORT_SPEED.xe29 = 0x00000000
!------------------ output truncated ------------------!
Debugging and Diagnostics

Example 9  
**Figure 25-13. show hardware stack-unit unit details Command Example**

```
FTOS#show hardware stack-unit 0 unit 0 details

**************************************************
The total no of FP & CSF Devices in the Card is 1
The total no of FP Devices in the Card is 1
The total no of CSF Devices in the Card is 0
The number of ports in device 0 is - 49
The number of Hg ports in devices 0 is - 1
The CPU Port of the device is 0
The starting unit no the SWF in the device is 0
**************************************************

cbmLinkMonStatusShow: The Current Link Status Is

Front End Link Status 0x200000000000000000000000
Front End Port Present Status 0x000000000000000000000000
Back Plane Link Status 0x00000000

**************************************************
Link Status of all the ports in the Device - 0

The linkStatus of Front End Port 1 is FALSE
The linkStatus of Front End Port 2 is FALSE
The linkStatus of Front End Port 3 is TRUE
The linkStatus of Front End Port 4 is FALSE
The linkStatus of Front End Port 5 is FALSE
The linkStatus of Front End Port 6 is FALSE
The linkStatus of Front End Port 7 is FALSE
The linkStatus of Front End Port 8 is FALSE
The linkStatus of Front End Port 9 is FALSE
The linkStatus of Front End Port 10 is FALSE
The linkStatus of Front End Port 11 is FALSE
The linkStatus of Front End Port 12 is FALSE
The linkStatus of Front End Port 13 is FALSE
The linkStatus of Front End Port 14 is FALSE
The linkStatus of Front End Port 15 is FALSE
The linkStatus of Front End Port 16 is FALSE
The linkStatus of Front End Port 17 is FALSE
The linkStatus of Front End Port 18 is FALSE
The linkStatus of Front End Port 19 is FALSE
The linkStatus of Front End Port 20 is FALSE
The linkStatus of Front End Port 21 is FALSE
The linkStatus of Front End Port 22 is FALSE
The linkStatus of Front End Port 23 is FALSE
The linkStatus of Front End Port 24 is FALSE
The linkStatus of Front End Port 25 is FALSE
The linkStatus of Front End Port 26 is FALSE
The linkStatus of Front End Port 27 is FALSE
The linkStatus of Front End Port 28 is FALSE
The linkStatus of Front End Port 29 is FALSE
The linkStatus of Front End Port 30 is FALSE
The linkStatus of Front End Port 31 is FALSE
The linkStatus of Front End Port 32 is FALSE
The linkStatus of Front End Port 37 is FALSE

!------------------ output truncated ---------------!
```

Example 10  
**Figure 25-14. show hardware stack-unit per stack unit buffer Command Example**

```
FTOS#show hardware stack-unit 0 buffer total-buffer

FTOS#sh hardware stack-unit 0 buffer total-buffer

Total Buffers allocated per Stack-Unit 46080
```
Example 11  
**Figure 25-15. show hardware stack-unit per port buffer (a Specific Port) Command Example**

```plaintext
FTOS(conf)#show hardware stack-unit 0 buffer unit 0 port 1 buffer-info
----- Buffer Stats for Unit 0 Port 1 -----  
Maximum Shared Limit for the Port: 30720  
Default Packet Buffer allocate for the Port: 120  
Used Packet Buffer for the Port: 0
```

Example 12  
**Figure 25-16. show hardware stack-unit queue buffer Command Example**

```plaintext
FTOS(conf)#show hardware stack-unit 0 buffer unit 0 port 1 queue 2 buffer-info
----- Buffer Stats for Unit 0 Port 1 Queue 2 -----  
Maximum Shared Limit: 30720  
Default Packet Buffer allocate for the Queue: 8
Used Packet Buffer: 0
```

**Related Commands**

- `show interfaces port-channel` Displays information on all interfaces on a specific stack member.
- `show processes cpu` Displays CPU usage information based on running processes.
- `show system stack-ports` Displays information about the stacking ports on all switches in the stack.
- `show system` Displays the current status of all stack members or a specific member.

---

**show hardware system-flow**

Displays Layer 2 ACL or QoS data for the selected stack member and stack member port-pipe.

**Syntax**

`show hardware system-flow layer2 stack-unit 0-5 port-set 0-0 [counters]`

**Parameters**

- `acl | qos` For the selected stack member and stack member port-pipe, display which system flow entry the packet hits and what queue the packet takes as it dumps the raw system flow tables.
- `stack-unit 0-5` Enter the keyword `stack-unit` followed by 0 to 5 to select a stack member ID.
- `port-set 0-0 [counters]` Enter the keyword `port-set` with a port-pipe number — 0. (OPTIONAL) Enter the keyword `counters` to display hit counters for the selected ACL or QoS option.

**Defaults**

`none`

**Command Modes**

`EXEC Privilege`

**Command History**

<table>
<thead>
<tr>
<th>Version 8.3.17.0</th>
<th>Supported on M I/O Aggregator</th>
</tr>
</thead>
</table>

---
### Example 1

**Figure 25-17. show hardware system-flow layer2 counters Command Example**

```
FTOS#show hardware system-flow layer2 stack-unit 0 port-set 0 counters

+-----------------+---------------------------------+---------+
| EntryId         | Description                      | #HITS   |
|-----------------+---------------------------------+---------|
| 2048            | STP BPDU Redirects               | 0       |
| 2047            | LLDP BPDU Redirects              | 164904  |
| 2045            | LACP traffic Redirects           | 0       |
| 2044            | GVRP traffic Redirects           | 0       |
| 2043            | ARP Reply Redirects              | 0       |
| 2042            | 802.1x frames Redirects          | 0       |
| 2041            | VRRP frames Redirects            | 0       |
| 2040            | IPv6VRRP frames Redirects        | 0       |
| 2039            | GRAT ARP                         | 0       |
| 2036            | IPV6 Mcast Control Traffic       | 128840  |
| 2000            | VLT ARP SYNC Frames              | 0       |
| 1999            | ICL Hellos                       | 0       |
| 1998            | ICL MAC SYNC Frames              | 0       |
| 1997            | VLT Tunneled STP Frames          | 0       |
| 1995            | DROP Cases                       | 43207   |
| 1917            | L3 Term Traffic ClassId 1 to Q6  | 0       |
| 1916            | L3 CPU Bound Traffic ClassId 2 to Q5| 0       |
| 1915            | Unknown MCAST Packets            | 0       |
| 1792            | BGP with TTL1, L4 SRC port Redirects | 0       |
| 1791            | BGP with TTL1, L4 DST Port Redirects | 0       |

FTOS#
```
Example 2

Figure 25-18.  show hardware system-flow layer2 (non-counters) Command Example

FTOS#show hardware system-flow layer2 stack-unit 0 port-set 0

########### FP Entry for redirecting STP BPDU to CPU Port ###############
EID 2048: gid=1,
slice=15, slice_idx=0x00, prio=0x800, flags=0x82, Installed
tcam: color_indep=0,
    higig=0, higig_mask=0,
    KEY=0x00000000 00000000 00000000 0180c200 00000000 00000000 00000000
    FPF4=0x00
    MASK=0x00000000 00000000 00000000 00000000 00000000 00000000 fffffff0
action={act=Drop, param0=0(0x00), param1=0(0x00)},
action={act=CopyToCpu, param0=0(0x00), param1=0(0x00)},
action={act=UpdateCounter, param0=1(0x01), param1=0(0x00)},
meter=NULL,
counter={idx=0, mode=0x01, entries=1}

########### FP Entry for redirecting LLDP BPDU to RSM ###############
EID 2047: gid=1,
slice=15, slice_idx=0x01, prio=0x7ff, flags=0x82, Installed
tcam: color_indep=0,
    higig=0, higig_mask=0,
    KEY=0x00000000 00000000 00000000 0180c200 00000000 00000000 00000000
    FPF4=0x00
    MASK=0x00000000 00000000 00000000 00000000 00000000 00000000 ffffffff0
action={act=Drop, param0=0(0x00), param1=0(0x00)},
action={act=CopyToCpu, param0=0(0x00), param1=0(0x00)},
action={act=UpdateCounter, param0=1(0x01), param1=0(0x00)},
meter=NULL,
counter={idx=1, mode=0x01, entries=1}

########### FP Entry for redirecting LACP traffic to CPU Port ###############
EID 2045: gid=1,
slice=15, slice_idx=0x02, prio=0x7fd, flags=0x82, Installed
tcam: color_indep=0,
    higig=0, higig_mask=0,
    KEY=0x00000000 00000000 00000000 0180c200 00000000 00000000 00000000
    FPF4=0x00
    MASK=0x00000000 00000000 00000000 00000000 00000000 00000000 ffffffff0
action={act=Drop, param0=0(0x00), param1=0(0x00)},
action={act=CopyToCpu, param0=0(0x00), param1=0(0x00)},
action={act=UpdateCounter, param0=1(0x01), param1=0(0x00)},
meter=NULL,
counter={idx=2, mode=0x01, entries=1}

########### FP Entry for redirecting GVRP traffic to RSM ###############
EID 2044: gid=1,
slice=15, slice_idx=0x03, prio=0x7fc, flags=0x82, Installed
tcam: color_indep=0,
    higig=0, higig_mask=0,
    KEY=0x00000000 00000000 00000000 00000000 00000000 00000806 00001600
    FPF4=0x00
    MASK=0x00000000 00000000 00000000 00000000 00000000 00000000 0000fffff
action={act=Drop, param0=0(0x00), param1=0(0x00)},
action={act=CopyToCpu, param0=0(0x00), param1=0(0x00)},
action={act=UpdateCounter, param0=1(0x01), param1=0(0x00)},
meter=NULL,
counter={idx=3, mode=0x01, entries=1}

########### FP Entry for redirecting ARP Replies to RSM ###############
EID 2043: gid=1,
slice=15, slice_idx=0x04, prio=0x7fb, flags=0x82, Installed
tcam: color_indep=0,
    higig=0, higig_mask=0,
    KEY=0x00000000 00000000 00000000 00000000 00000000 00000000 00008065
    FPF4=0x00
    MASK=0x00000000 00000000 00000000 00000000 00000000 00000000 0000fffff
action={act=Drop, param0=0(0x00), param1=0(0x00)},
action={act=CopyToCpu, param0=0(0x00), param1=0(0x00)},
action={act=UpdateCounter, param0=1(0x01), param1=0(0x00)},

--------- output truncated -----------------!
Internet Control Message Protocol (ICMP) Message Types

This chapter lists and describes the possible internet control message protocol (ICMP) Message Types resulting from a ping. The first three columns list the possible symbol or type/code. For example, you would receive a ! or 03 as an echo reply from your ping.

Table 26-1. ICMP Messages and Their Definitions

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Code</th>
<th>Description</th>
<th>Query</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>•</td>
<td></td>
<td></td>
<td>Timeout (no reply)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>!</td>
<td>0</td>
<td>3</td>
<td>echo reply</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>3</td>
<td></td>
<td>destination unreachable:</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>network unreachable</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>host unreachable</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>protocol unreachable</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>port unreachable</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>fragmentation needed but don’t fragment bit set</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>source route failed</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>destination network unknown</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td>destination host unknown</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td>source host isolated (obsolete)</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>destination network administratively prohibited</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td>destination host administratively prohibited</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td>network unreachable for TOS</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>host unreachable for TOS</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td>communication administratively prohibited by filtering</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td>host precedence violation</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td>precedence cutoff in effect</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>0</td>
<td>source quench</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>redirect</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>redirect for network</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>redirect for host</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>redirect for type-of-service and network</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>redirect for type-of-service and host</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td></td>
<td>echo request</td>
<td>•</td>
<td></td>
</tr>
</tbody>
</table>
Table 26-1. ICMP Messages and Their Definitions

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Code</th>
<th>Description</th>
<th>Query</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>0</td>
<td></td>
<td>router advertisement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td></td>
<td>router solicitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&amp; 11</td>
<td></td>
<td></td>
<td>time exceeded:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td></td>
<td>time-to-live equals 0 during transit</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>time-to-live equals 0 during reassembly</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>parameter problem:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>IP header bad (catchall error)</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>required option missing</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>13</td>
<td>0</td>
<td></td>
<td>timestamp request</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>14</td>
<td>0</td>
<td></td>
<td>timestamp reply</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>15</td>
<td>0</td>
<td></td>
<td>information request (obsolete)</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td></td>
<td>information reply (obsolete)</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>17</td>
<td>0</td>
<td></td>
<td>address mask request</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>18</td>
<td>0</td>
<td></td>
<td>address mask reply</td>
<td></td>
<td>•</td>
</tr>
</tbody>
</table>