

# **AOS-CX 10.09 Monitoring Guide**

**6300, 6400 Switch Series**

The Aruba logo consists of the word "aruba" in a lowercase, rounded, orange sans-serif font. The letters are closely spaced, and the 'a' and 'u' have a distinctive shape with a slight curve.

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This document describes features of the AOS-CX network operating system. It is intended for administrators responsible for installing, configuring, and managing Aruba switches on a network.

### Applicable products

This document applies to the following products:

- Aruba 6300 Switch Series (JL658A, JL659A, JL660A, JL661A, JL662A, JL663A, JL664A, JL665A, JL666A, JL667A, JL668A, JL762A)
- Aruba 6400 Switch Series (JL741A, R0X26A, R0X27A, R0X29A, R0X30A)

### Latest version available online

Updates to this document can occur after initial publication. For the latest versions of product documentation, see the links provided in [Support and Other Resources](#).

### Command syntax notation conventions

Convention	Usage
<code>example-text</code>	Identifies commands and their options and operands, code examples, filenames, pathnames, and output displayed in a command window. Items that appear like the example text in the previous column are to be entered exactly as shown and are required unless enclosed in brackets ( [ ] ).
<b>example-text</b>	In code and screen examples, indicates text entered by a user.
Any of the following: <ul style="list-style-type: none"><li>▪ <code>&lt;example-text&gt;</code></li><li>▪ <code>&lt;example-text&gt;</code></li><li>▪ <i>example-text</i></li><li>▪ <i>example-text</i></li></ul>	Identifies a placeholder—such as a parameter or a variable—that you must substitute with an actual value in a command or in code: <ul style="list-style-type: none"><li>▪ For output formats where italic text cannot be displayed, variables are enclosed in angle brackets (&lt; &gt;). Substitute the text—including the enclosing angle brackets—with an actual value.</li><li>▪ For output formats where italic text can be displayed, variables might or might not be enclosed in angle brackets. Substitute the text including the enclosing angle brackets, if any, with an actual value.</li></ul>
	Vertical bar. A logical OR that separates multiple items from which you can choose only one. Any spaces that are on either side of the vertical bar are included for readability and are not a required part of the command syntax.

Convention	Usage
{ }	Braces. Indicates that at least one of the enclosed items is required.
[ ]	Brackets. Indicates that the enclosed item or items are optional.
... or ...	Ellipsis: <ul style="list-style-type: none"> <li>■ In code and screen examples, a vertical or horizontal ellipsis indicates an omission of information.</li> <li>■ In syntax using brackets and braces, an ellipsis indicates items that can be repeated. When an item followed by ellipses is enclosed in brackets, zero or more items can be specified.</li> </ul>

## About the examples

Examples in this document are representative and might not match your particular switch or environment.

The slot and port numbers in this document are for illustration only and might be unavailable on your switch.

### Understanding the CLI prompts

When illustrating the prompts in the command line interface (CLI), this document uses the generic term `switch`, instead of the host name of the switch. For example:

```
switch>
```

The CLI prompt indicates the current command context. For example:

```
switch>
```

Indicates the operator command context.

```
switch#
```

Indicates the manager command context.

```
switch(CONTEXT-NAME)#
```

Indicates the configuration context for a feature. For example:

```
switch(config-if)#
```

Identifies the `interface` context.

### Variable information in CLI prompts

In certain configuration contexts, the prompt may include variable information. For example, when in the VLAN configuration context, a VLAN number appears in the prompt:

```
switch(config-vlan-100)#
```

When referring to this context, this document uses the syntax:

```
switch(config-vlan-<VLAN-ID>#
```

Where `<VLAN-ID>` is a variable representing the VLAN number.

## Identifying switch ports and interfaces

Physical ports on the switch and their corresponding logical software interfaces are identified using the format:

```
member/slot/port
```

### On the 6300 Switch Series

- *member*: Member number of the switch in a Virtual Switching Framework (VSF) stack. Range: 1 to 10. The primary switch is always member 1. If the switch is not a member of a VSF stack, then member is 1.
- *slot*: Always 1. This is not a modular switch, so there are no slots.
- *port*: Physical number of a port on the switch.

For example, the logical interface 1/1/4 in software is associated with physical port 4 on member 1.

### On the 6400 Switch Series

- *member*: Always 1. VSF is not supported on this switch.
- *slot*: Specifies physical location of a module in the switch chassis.
  - Management modules are on the front of the switch in slots 1/1 and 1/2.
  - Line modules are on the front of the switch starting in slot 1/3.
- *port*: Physical number of a port on a line module.

For example, the logical interface 1/3/4 in software is associated with physical port 4 in slot 3 on member 1.

## Identifying modular switch components

- Power supplies are on the front of the switch behind the bezel above the management modules. Power supplies are labeled in software in the format: *member/power supply*:
  - *member*: 1.
  - *power supply*: 1 to 4.
- Fans are on the rear of the switch and are labeled in software as: *member/tray/fan*:
  - *member*: 1.
  - *tray*: 1 to 4.
  - *fan*: 1 to 4.
- Fabric modules are not labeled on the switch but are labeled in software in the format: *member/module*:
  - *member*: 1.
  - *member*: 1 or 2.
- The display module on the rear of the switch is not labeled with a member or slot number.



## Confirming normal operation of the switch by reading LEDs

This task describes using the switch LEDs to confirm that the switch is operating normally.

### Procedure

1. Quick check: Verify that the chassis has power and there are no fault conditions.  
On the front of the switch, verify that the states of the following LEDs are On Green:
  - Power
  - Health
2. Verify that the Health LEDs of all installed line modules are On Green.
3. Verify that the Health LEDs of all installed management modules are On Green.
4. Verify that the network ports are operating normally.
  - a. On the active management module, check the Status Front section. Verify that each LED that indicates a line module is in one of the following states:
    - On Green (normal operation)
    - Off (no line module installed)
  - b. On each line module, verify that each port LED is in one of the following states:
    - On Green, Half-Bright Green, or Flickering Green (normal operation)
    - Off (no cable connected or port off by default in config)
5. Verify that the power supplies are operating normally.
  - a. On the active management module, check the Status Front section. Verify that each LED that indicates a power supply is in one of the following states:
    - On Green (normal operation)
    - Off (no power supply installed)
  - b. On each power supply, verify that LEDs are in the following states:
    - Power LED: On Green
    - Fault LED: Off
6. Verify that the rear components are operating normally by checking the Status Rear section of the active management module:
  - a. Verify that the LEDs for the fabric modules are in one of the following states:
    - On Green (normal operation)
    - Off (component not installed)
  - b. Verify that the LEDs for the fan trays and fans are On Green.
7. Verify that the standby management module is ready to take over as the active management module. On the standby management module, verify the states of the following LEDs:

- Health LED is On Green.
- Management state standby (Stby) LED is On Green.

## Detecting if the switch is not ready for a failover event

This task describes using the switch LEDs to detect if the switch is not ready for the loss of a fabric module or for a failover from the active management module to the standby management module.



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Although you can detect power supply failures by viewing the LEDs, you must use software commands to determine if the power supply redundancy is sufficient to power the chassis if a power supply fails.

---

### Procedure

1. Detect if the standby management module is shut down.  
If the standby management module is shut down, the LED states are as follows:
  - The standby management module health LED is Off.
  - The standby management state active (Actv) LED is Off.
  - The standby management state standby (Stby) LED is Off.
  - On the active management module in the Status Front Management Modules section, the LED for the standby management module is Off. For example, if the active management module is Management Module LED 5, Management Modules LED 6 is Off.
2. Detect if the standby management module is in a transient state. If the standby management module is booting, updating, or in another transient state, the LED states are as follows:
  - The standby management module health LED is Slow Flash Green when the service operating system is running or during an operating system update.
  - The standby management module Booting LED is Slow Flash Green when the AOS-CX operating system is booting.
  - The standby management state active (Actv) LED is Off.
  - The standby management state standby (Stby) LED is Off.
  - On the active management module in the Status Front Management Modules section, the LED for the standby management module is Slow Flash Green.
3. Detect if a fabric module is shut down or not present. If a fabric module is shut down or not present, the LED states are as follows:
  - On the active management module, in the Status Rear section, the LED for the fabric module is Off.
  - On the rear display module, the LED for the fabric module is Off.
  - On the fabric module, the health LED is Off. However, the fabric module is behind fan 1 and is not directly visible.

## Finding faulted components using the switch LEDs

This task describes using the switch LEDs to find components that are in a fault condition.



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All green LEDs—except for chassis power LEDs and the Usr1 LED—are off when the LED mode is set to Light Faults (The Usr1 LED of the LED Mode section of the active management module is On Green and the default behavior for the Usr1 LED is being used.).

---

## Procedure

1. Find the switch that has the fault condition, which is indicated by a chassis health LED in the state of Slow Flash Orange.

The chassis health LED is located on the front of the switch and on the rear panel of the switch.

2. If you are at the back of the switch, on the rear panel, look for LEDs that are in the Slow Flash Orange state:

The Status Rear area has LEDs for power supplies, fabric modules, fan trays, and fans. The number on the LED represents the unit number of the component.

If the only LED in a state of Slow Flash Orange is the Chassis health LED, go to the front of the switch.

3. At the front of the switch, on the active management module, look for LEDs that are in the Slow Flash Orange state:
  - The Status Front area has LEDs for power supplies, line and fabric modules, and management modules. The number on the LED indicates the slot number of the component.
  - The Status Rear area has LEDs for fabric modules and fan trays, with a single LED for all the fans in the fan tray. The number on the LED represents the slot or bay number of the component.

4. Use the number indicated by the LED that is flashing to locate the slot that contains the faulted component.

The fabric modules are located behind the fan trays, and the fabric module number corresponds to the fan tray number.

5. At the front of the switch, on line modules, look for LEDs that are in the Slow Flash Orange state: Module LEDs and Port LEDs indicate faults if their states are Slow Flash Orange.

### Switch and port LEDs for 6300 Switch Series

Figure 1 Switch and Port LEDs

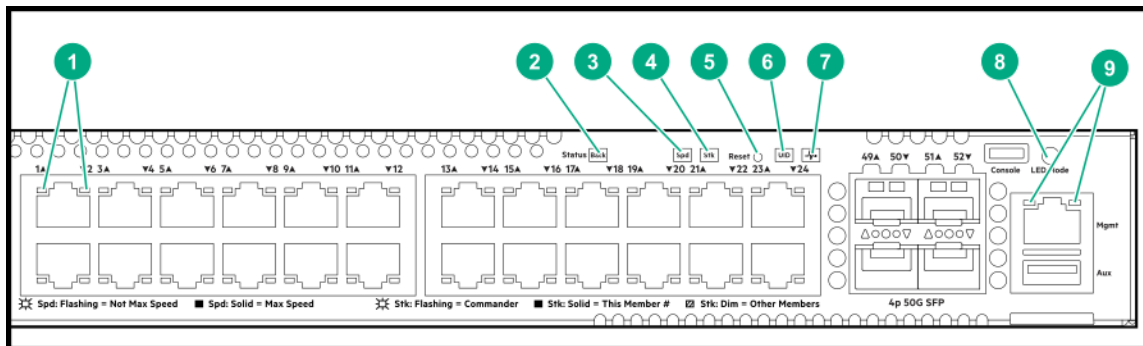


Table 1: Switch and port LEDs: Labels and description

Label	Description
1	Switch port LEDs
2	Back Module status LED
3	Speed mode selected LED
4	PoE mode selected
5	Reset button Usr mode selected LED
6	UID (Unit Identification)
7	Global Status LED
8	LED Mode status LED
9	Management Console LED

Table 2: Front panel LED behavior

Switch LEDs	Function	State	Meaning
Back LED	Status of modular components installed in the back of the chassis (not applicable for 6300F switches)	On - Green	Normal
		Slow Flash - Amber	Fault in one of the modules in the back of the chassis
		Off	No modular components installed in the back of the chassis
PoE LED	Indicates Port LEDs are showing PoE information (not applicable for non PoE switches)	Off	PoE mode not selected
		On - Green	PoE mode selected
		Slow Flash - Amber	Hardware failure PoE enabled port, PoE mode not selected
		On - Amber	Hardware failure PoE enabled port, PoE mode selected
Spd LED	Indicates Port LEDs are showing speed information	Off	Speed mode not selected
		On - Green	Speed mode selected
Stk LED	Indicates Port LEDs are showing stacking mode information	Off	Stacking mode not selected
		On - Green	Stacking mode selected
		On - Amber	A port has a stacking failure. Stacking mode selected
		Slow flash Amber	A port has a stacking failure. Stacking mode not selected
UID LED	User-configurable LED	Off	User defined the locator LED : OFF
		On/Flash Blue (for 30 min)	User defined the locator LED: On/Flash
Global Status Indicator LED	Overall status of the product	Slow Flash - Green	Self-test in progress during UBOOT, SVOS and AOS-CX
		On - Green	Successfully initialized AOS-CX
		Slow Flash - Amber	Recoverable faults (e.g. fans, PSU fault)
		On - Amber	Critical faults (e.g. exceed temperature limit)
OOBM Status Indicator LED	Status of OOBM Link connectivity	Off	OOBM port is not connected, no link established
		Half Bright - Green	OOBM port is enabled and established link with partner

Switch LEDs	Function	State	Meaning
		On - Green	Experiencing high bandwidth utilization
		Activity Flicker - Green	% of the time that the LED light up is roughly proportional to the % of full bandwidth utilization of the port
* Press the Mode Select button to switch between User(default), PoE, Spd, or Stk Mode.			

**Table 3:** Rear Panel LED behavior

Switch LEDs	Function	State/Mode	Meaning
Fan Module Status LED	Status of fan	On - Green	Normal
		Slow flash - Amber	Fan fault
UID LED	User-configurable LED	Off	User define the locator LED : OFF
		On/Flash (30 min) - blue	User define the locator LED: On/Flash
PSU Status Indicator LED	Status of power supply	On Green	Normal
		Off	No power, PSU has invalid AC input of invalid DC outputs
		Slow Flash - Green	Power supply has faulted or warning

## Power Supply for 6300 Switch Series

Fixed format (F) models include built-in power supplies and modular (M) models have rear slots for hot swappable power supplies for customized PoE requirements.



If the switch is configured with redundant power supplies, the switch will not suffer any loss of traffic or performance if a power supply fails, except for possible PoE reallocation on PoE Class 4 and PoE Class 6 switches.

- Aruba X372 54VDC 1050W 110-240VAC Power Supply (JL087A) is a 1050 watt power supply for applicable PoE switches. It offers up to 740 watts of PoE power and is keyed so that it will not fit into the power supply slots of non-PoE Aruba switches.
- Aruba X372 54VDC 680W 100-240VAC Power Supply (JL086A) is a 680 watt power supply for applicable PoE switches. It offers up to 370 watts of PoE power and is keyed so that it will not fit into the power supply slots of non-PoE Aruba switches.
- Aruba X371 12VDC 250W 100-240VAC Power Supply (JL085A) is a 250 watt power supply for the non-PoE switches. This power supply does not provide any PoE power and is keyed so that it will not fit into the power supply slots of Aruba PoE switches.
- Aruba X372 54VDC 1600W 110-240VAC Power Supply (JL670A): A 1600 watt (high-line only) power supply for applicable PoE switches. It offers up to 1440 watts of PoE power, and is keyed so that it will not fit into the power supply slots of non-PoE Aruba switches.

- Aruba 6300M 1050W 36-72VDC PSU (JL758A) is a 1050 watt DC power supply used for 6300M PoE switches. This is keyed so that it will not fit into the power supply slots of non-PoE Aruba switches.
- Aruba 6300M 250W 36-72VDC PSU (JL757A) is a 250 watt DC power supply used for 6300M non-PoE switches. The power supply does not provide any PoE power and is keyed so that it will not fit into the power supply slots of the Aruba PoE switches.

For deployments that need higher port and PoE density, the 6300 supports 60W of PoE in every port of a 48-port switch for a total of 2880W of PoE. The industry standard IEEE 802.3bt High Power PoE support (class 6) provides up to 60W per port for support of the latest IoT devices and APs. PoE support for IEEE 802.3at Power over Ethernet (PoE+) provides up to 30W per port as well as any IEEE 802.3af-compliant end device

High availability with always-on PoE supplies PoE power even during scheduled reboots and firmware upgrades while quick PoE supplies PoE power to powered devices as soon as the switch is plugged into AC power so the device can initialize at the same time as the switch OS boot up.

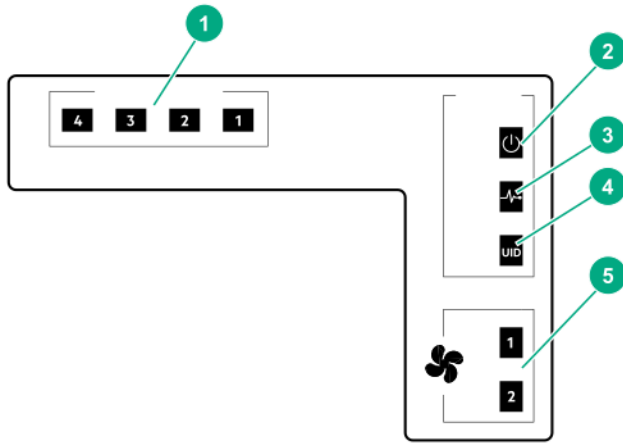
## Redundancy

**Table 1:** 6300 Power Supply Redundancy

PSU1	PSU2	Result	show env power redundancy: operational redundancy
JL086A	JL086A	Supported	n+n
JL086A	JL087A	Not supported	none
JL086A	JL670A HL	Not supported	none
JL086A	JL670A LL	Not supported	none
JL086A	JL758A	Not supported	none
JL087A	JL087A	Supported	n+n
JL087A	JL670A HL	Not supported	none
JL087A	JL670A LL	Not supported	none
JL087A	JL758A	Supported	none
JL670A HL	JL670A HL	Supported	n+n
JL670A LL	JL670A LL	Supported	n+n
JL670A LL	JL670A HL	Not supported	none
JL670A	JL758A	Not supported	none
JL670A LL (740)	JL087A (740)	Not supported	none
JL670A LL (740)	JL758A (740)	Not supported	none

## Switch and port LEDs for 6400 Switch Series

**Figure 1** Rear panel LEDs for 6400 Switch Series

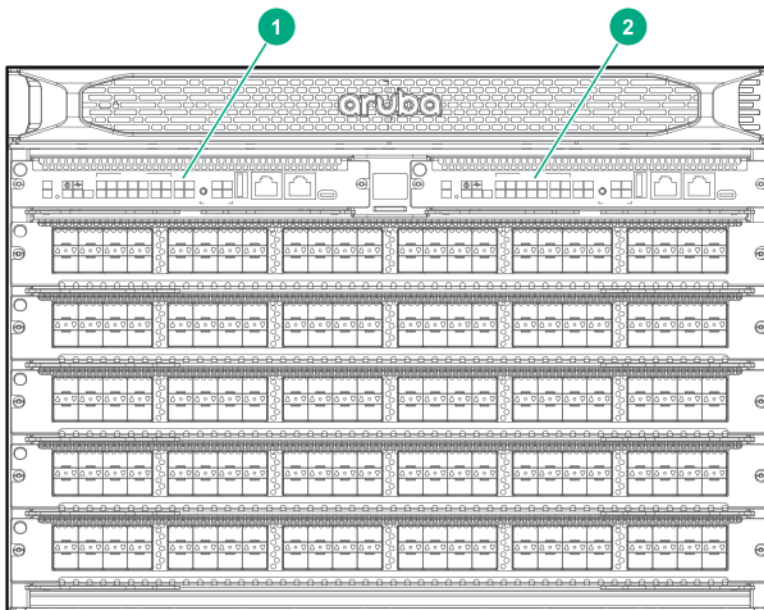


1	Power supply status (1) (2) (3) (4)
2	Chassis power LED
3	Chassis health LED
4	Unit identification (UID) LED
5	Fan tray status (1, 2)

## Front panel LEDs for 6400 Switch Series

The Aruba 6400 switches have two management module (MM) slots. Management modules support control plane activities and in-memory running of the Time Series Database.

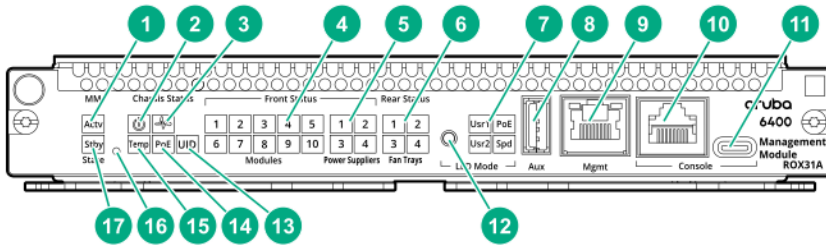
**Figure 1** Management module slots with management modules installed



When two management modules are installed, one operates in active mode and the other operates in standby mode. The active slot is determined by election. Installing two management modules provides control plane high availability.

**Figure 2** Management module features





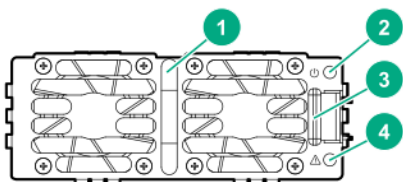
1	Mgmt state (Actv) LED	Indicates the status of the management module after booting. If the MM is the active MM, then the LED glows steady green.
2	System power LED	When the system is receiving power, glows steady green.
3	Management module health LED (green)	Indicates status of the switch. LED glows steady green when switch is ready after booting from the Network Operating System (NOS).
4	Line module status LEDs	Indicates if a line module is installed in a line module slot (1 through 5 for 6405 switches; 1 through 10 on 6410 switches). If a line module is installed in a given slot, then the numbered LED for that slot glows steady green.
5	Front Power supply status (1 2 3 4) LEDs	Indicates if a power supply is installed in the slot. If an active power supply is installed, then the LEDs glow steady green.
6	Fan tray status LEDs (1 - 4)	Indicate if the fan tray is installed in the slot. If a fan tray is installed in the slot, then the LED glows steady green.
7	LED mode: Usr1, Usr2 Spd, and PoE LEDs	The display of these LEDs is based on the LED mode button selection. <ul style="list-style-type: none"> <li>Usr1 LED: Indicates if the line module is working correctly.</li> <li>Usr2 LED: Reserved</li> <li>Spd LED: Indicates the traffic rate of the line module.</li> </ul>
8	Auxillary port	Without a USB device installed, the auxiliary port LED is off after power-on and self-test. With a USB device installed, this LED displays the following after power-on and self-test: <ul style="list-style-type: none"> <li>Steady green: USB installed, initialized, and mounted, but no data transfer.</li> <li>Flicker green: Data transfer in progress</li> </ul>
9	Mgmt port (OOBM Port) with Activity/Link LED	Without an active network connection, this LED is off after power-on and self-test completes. With an active network connection, this LED operates as follows:

		<ul style="list-style-type: none"> <li>▪ Half-bright green: Port enabled and receiving Link indication from connected device.</li> <li>▪ Flickering half-bright to full-bright green: Varying port activity level.</li> <li>▪ Steady green: Port at high utilization.</li> </ul>
10	Serial console port (RJ-45)	
11	USB Micro-B console port	
12	LED Mode button	Changes the behavior of the line module port LEDs. This button changes the LED behavior from the default Link/Activity behavior to cycle through the PoE, speed (Spd), and user (Usr) options.
13	UID (Unit Identification) LED	
14	PoE	Power-over-Ethernet
15	Chassis temperature status (Temp) LED	Indicates the status of the chassis temperature. If the temperature is at or below the specified rating, then the LED glows steady green,
16	Mgmt reset button	A recessed button that is used to reset the selected management module.
17	Mgmt state (Stby) LED	Indicates the status of the management module after booting. If the MM is the standby MM, then the LED glows steady green.

## Power Supply LEDs

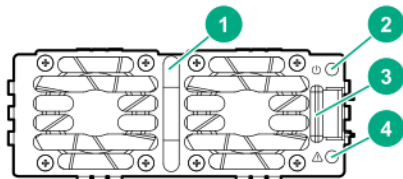
The Aruba 6400 has four power supply unit slots that support the Aruba X382 54DC 2700W AC power supply unit (PSU).

**Figure 3** Aruba X382 54DC 2700W AC Power Supply (JL372A)



1	Power LED (green)
2	Power fail LED (amber)
3	Power supply handle
4	Latch release tab

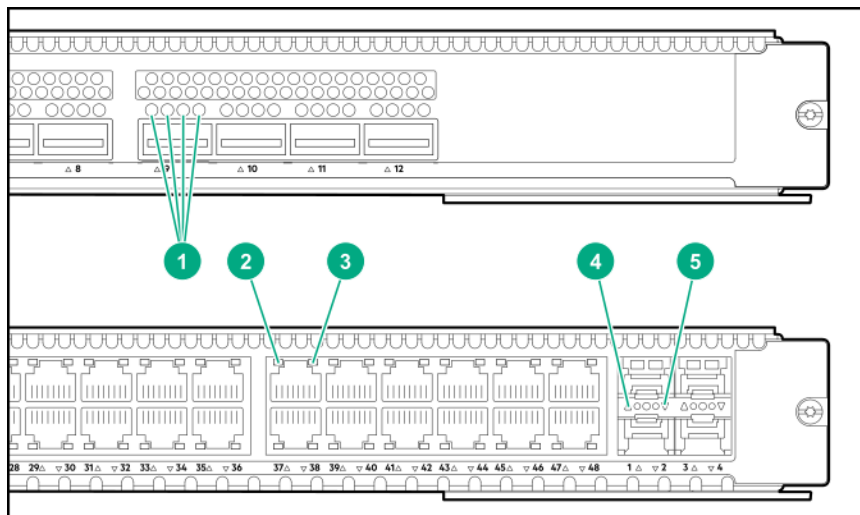
- A single PSU is sufficient for fans and management cards to come up and provide user access and diagnostics.
- At 220 V AC, only two PSUs are required for full operation and a single PSU is sufficient for the fans and management cards to come up and provide user access/diagnostics.
- At 220 V AC: Installing three PSUs offers 2+1 redundancy and installing all four PSUs offers 2+2 redundancy.
- At 110 V AC: The switch offers N + 1 redundancy.
- The PSUs are hot-swappable. The chassis can be connected to an AC power source for a given PSU slot while the PSU for that slot is being removed or installed.



1	Power LED (green)
2	Power fail LED (amber)
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- At 220 V AC: Installing three PSUs offers 2+1 redundancy and installing all four PSUs offers 2+2 redundancy.
- At 110 V AC: The switch offers N + 1 redundancy.
- The PSUs are hot-swappable. The chassis can be connected to an AC power source for a given PSU slot while the PSU for that slot is being removed or installed.

### Line module LEDs



1*	Line module 4-channel port LEDs
2 *	Line module port LED for upper port
3*	Line module port LED for lower port
4*	Line module port LED for upper uplink port
5*	Line module port LED for lower uplink port

### boot fabric-module

boot fabric-module <SLOT-ID>

#### Description

Reboots the specified fabric module.

Parameter	Description
<SLOT-ID>	Specifies the member and slot of the module in the format member/slot. For example, to specify the module in member 1 slot 3, enter 1/3.

#### Usage

The `boot fabric-module` command reboots the specified fabric module. Traffic performance is affected while the module is down.

If the specified module is the only fabric module in an up state, rebooting that module stops traffic switching between line modules and the line modules power down. The line modules power up when one fabric module returns to an up state.

This command is valid for fabric modules only.

#### Examples

Rebooting the fabric module in slot **1/3** when auto-confirm is not enabled:

```
switch# boot fabric-module 1/3
This command will reboot the specified fabric module. Traffic performance may
be affected while the module is down. Rebooting the last fabric module will
stop traffic switching between line modules.
Do you want to continue (y/n)? y

switch#
```

Rebooting the fabric module in slot **1/1** when auto-confirm is enabled:

```
switch# boot fabric-module 1/3
This command will reboot the specified fabric module. Traffic performance may
be affected while the module is down. Rebooting the last fabric module will
stop traffic switching between line modules.
Do you want to continue (y/n) y (auto-confirm)

switch#
```

#### Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

## boot line-module

boot line-module <SLOT-ID>

### Description

Reboots the specified line module.

Parameter	Description
<SLOT-ID>	Specifies the member and slot of the module in the format member/slot. For example, to specify the module in member 1 slot 3, enter 1/3.

### Usage

This command is supported on switches that have multiple line modules.

Reboots the specified line module. Any traffic for the switch passing through the affected module (SSH, TELNET, and SNMP) is interrupted. It can take up to 2 minutes to reboot the module. During that time, you can monitor progress by viewing the event log.

This command is valid for line modules only.

### Examples

Reloading the module in slot 1/1:

```
switch# boot line-module 1/1
This command will reboot the specified line module and interfaces on this
module will not send or receive packets while the module is down. Any
traffic passing through the line module will be interrupted. Management
sessions connected through the line module will be affected. It might take
up to 2 minutes to complete rebooting the module. During that time, you can
monitor progress by viewing the event log.
Do you want to continue (y/n)? y
switch#
```

### Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

## boot management-module

```
boot management-module {active | standby | <SLOT-ID>}
```

### Description

Reboots the specified management module. Choose the management module to reboot by role (active or standby) or by slot number.

Parameter	Description
<i>active</i>	Selects the active management module.
<i>standby</i>	Selects the standby management module.
<SLOT-ID>	Specifies the member and slot of the management module in the format <code>member/slot</code> . For example, to specify the module in member 1 slot 5, enter <code>1/5</code> .

### Usage

This command is supported on switches that have multiple management modules.

This command reboots a single management module in a chassis. Choose the management module to reboot by role (active or standby) or by slot number.

You can use the `show images` command to show information about the primary and secondary system images.

If you reboot the active management module and the standby management module is available, the active management module reboots and the standby management module becomes the active management module.

If you reboot the active management module and the standby management module is not available, you are warned, you are prompted to save the configuration, and you are prompted to confirm the operation.

If you reboot the standby management module, the standby management module reboots and remains the standby management module.

If you attempt to reboot a management module that is not available, the `boot` command is aborted.

Saving the configuration is not required. However, if you attempt to save the configuration and there is an error during the save operation, the `boot` command is aborted.



---

Hewlett Packard Enterprise recommends that you use the `boot management-module` command instead of pressing the module reset button to reboot a management module because if you are rebooting the only available management module, the `boot management-module` command enables you to save the configuration, cancel the reboot, or both.

---

## Examples

Rebooting the active management module when the standby management module is available:

```
switch# boot management-module active
The management-module in slot 1/5 is going down for reboot now.
```

Rebooting the active management module when the standby management module is not available:

```
switch# boot management-module 1/5
The management module in slot 1/5 is currently active and no
standby management module was found.
This will reboot the entire switch.

Do you want to save the current configuration (y/n)? n

This will reboot the entire switch and render it unavailable
until the process is complete.
Continue (y/n)? y
The system is going down for reboot.
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	Manager (#)	Administrators or local user group members with execution rights for this command.

## boot set-default

```
boot set-default {primary | secondary}
```

## Description

Sets the default operating system image to use when the system is booted.

Parameter	Description
primary	Selects the primary network operating system image.
secondary	Selects the secondary network operating system image.

## Example

Selecting the primary image as the default boot image:



```
switch# boot set-default primary
Default boot image set to primary.
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

## boot system

```
boot system [primary | secondary | serviceos]
```

### Description

Reboots all modules on the switch. By default, the configured default operating system image is used. Optional parameters enable you to specify which system image to use for the reboot operation and for future reboot operations.

Parameter	Description
<code>primary</code>	Selects the primary operating system image for this reboot and sets the configured default operating system image to <code>primary</code> for future reboots.
<code>secondary</code>	Selects the secondary operating system image for this reboot and sets the configured default operating system image to <code>secondary</code> for future reboots.
<code>serviceos</code>	Selects the service operating system for this reboot. Does not change the configured default operating system image. The service operating system acts as a standalone bootloader and recovery OS for switches running the AOS-CX operating system and is used in rare cases when troubleshooting a switch.

### Usage

This command reboots the entire system. If you do not select one of the optional parameters, the system reboots from the configured default boot image.

You can use the `show images` command to show information about the primary and secondary system images.

Choosing one of the optional parameters affects the setting for the default boot image:

- If you select the `primary` or `secondary` optional parameter, that image becomes the configured default boot image for future system reboots. The command fails if the switch is not able to set the operating system image to the image you selected.

You can use the `boot set-default` command to change the configured default operating system image.

- If you select `serviceos` as the optional parameter, the configured default boot image remains the same, and the system reboots all management modules with the service operating system.

If the configuration of the switch has changed since the last reboot, when you execute the `boot system` command you are prompted to save the configuration and you are prompted to confirm the reboot operation.

Saving the configuration is not required. However, if you attempt to save the configuration and there is an error during the save operation, the `boot system` command is aborted.

## Examples

Rebooting the system from the configured default operating system image:

```
switch# boot system
Do you want to save the current configuration (y/n)? y
The running configuration was saved to the startup configuration.

This will reboot the entire switch and render it unavailable
until the process is complete.
Continue (y/n)? y
The system is going down for reboot.
```

Rebooting the system from the secondary operating system image, setting the secondary operating system image as the configured default boot image:

```
switch# boot system secondary
Default boot image set to secondary.

Do you want to save the current configuration (y/n)? n

This will reboot the entire switch and render it unavailable
until the process is complete.
Continue (y/n)? y
The system is going down for reboot.
```

Canceling a system reboot:

```
switch# boot system

Do you want to save the current configuration (y/n)? n

This will reboot the entire switch and render it unavailable
until the process is complete.
Continue (y/n)? n
Reboot aborted.
switch#
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

## show boot-history

```
show boot-history [all]
```

### Description

Shows boot information. When no parameters are specified, shows the most recent information about the boot operation, and the three previous boot operations for the active management module. When the `all` parameter is specified, shows the boot information for the active management module and all available line modules. To view boot-history on the standby, the command must be sent on the standby console.

Parameter	Description
<code>all</code>	Shows boot information for the active management module and all available line modules.

### Usage

This command displays the boot-index, boot-ID, and up time in seconds for the current boot. If there is a previous boot, it displays boot-index, boot-ID, reboot time (based on the time zone configured in the system) and reboot reasons. Previous boot information is displayed in reverse chronological order.

Index

The position of the boot in the history file. Range: 0 to 3.

Boot ID

A unique ID for the boot. A system-generated 128-bit string.

Current Boot, up for <SECONDS> seconds

For the current boot, the `show boot-history` command shows the number of seconds the module has been running on the current software.

Timestamp boot reason

For previous boot operations, the `show boot-history` command shows the time at which the operation occurred and the reason for the boot. The reason for the boot is one of the following values:

<DAEMON-NAME> crash

The daemon identified by <DAEMON-NAME> caused the module to boot.

Kernel crash

The operating system software associated with the module caused the module to boot.

Reboot requested through database

The reboot occurred because of a request made through the CLI or other API.

Uncontrolled reboot

The reason for the reboot is not known.

### Examples

Showing the boot history of the active management module:

```
switch# show boot-history
Management module
=====

Index : 3
```

```

Boot ID : f1bf071bdd04492bbf8439c6e479d612
Current Boot, up for 22 hrs 12 mins 22 secs

Index : 2
Boot ID : edfa2d6598d24e989668306c4a56a06d
07 Aug 18 16:28:01 : Reboot requested through database

Index : 1
Boot ID : 0bda8d0361df4a7e8e3acdc1dba5caad
07 Aug 18 14:08:46 : Reboot requested through database

Index : 0
Boot ID : 23da2b0e26d048d7b3f4b6721b69c110
07 Aug 18 13:00:46 : Reboot requested through database
switch#

```

Showing the boot history of the active management module and all line modules:

```

switch# show boot-history all
Management module
=====

Index : 3
Boot ID : f1bf071bdd04492bbf8439c6e479d612
Current Boot, up for 22 hrs 12 mins 22 secs

Index : 2
Boot ID : edfa2d6598d24e989668306c4a56a06d
07 Aug 18 16:28:01 : Reboot requested through database

Index : 1
Boot ID : 0bda8d0361df4a7e8e3acdc1dba5caad
07 Aug 18 14:08:46 : Reboot requested through database

Index : 0
Boot ID : 23da2b0e26d048d7b3f4b6721b69c110
07 Aug 18 13:00:46 : Reboot requested through database

Line module 1/1
=====
Index : 3
10 Aug 17 12:45:46 : dune_agent crashed
...

```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
All platforms	Manager (#)	Administrators or local user group members with execution rights for this command.

Switch system and hardware commands are general commands used to configure fundamental settings on the switch.



---

Refer to the Fundamentals Guide to view the switch system and hardware commands.

---

The switch has limited capacity to store data, collected by switch features and protocols. You can provide virtually unlimited storage capacity by adding user-supplied external storage volumes. Supported volume types and storage protocols include: NFSv3, NFSv4, and SCP (sshfs).

One application of external storage is the saving and restoring of DHCP lease files over SCP or NFS network attached storage systems. SCP file system protocol uses a user mode process to emulate a network file system. The key advantage is packet level encryption and simple configuration. The key disadvantage is slow performance.

You can set up external storage volume credentials and then enable it. A storage management process acts on your requests by enabling the storage volume using the requested storage protocol. You can disable the external storage volume or set it up but leave it disable.

The feature maintains storage volume state. The states are: *\*disabled\** (down), *\*connecting\** (establishing connection), *\*operational\** (up), and *\*unaccessible\** (unavailable).

If a storage volume is unavailable, the system attempts to reconnect periodically. Multiple volumes could connect concurrently. If one connection times out the others can connect immediately.

The system supports server connection through data and management ports.

Data port support requires server IP address on a default VRF.

Once a storage volume is enabled, applications can use the volume to store retrieve and delete files and directories.

## External storage commands

### address (external storage)

```
address {<IPV4-ADDR> | <IPV6-ADDR> | hostname <HOSTNAME>}  
no address {<IPV4-ADDR> | <IPV6-ADDR> | hostname <HOSTNAME>}
```

#### Description

Specifies the NAS IP address or hostname.

The `no` form of this command deletes an IP address or hostname.

Parameter	Description
<IPV4-ADDR>	Specifies the NAS server IPv4 address, Global.
<IPV6-ADDR>	Specifies the IPv6 address of the NAS server.
<HOSTNAME>	Specifies the hostname of the NAS server. String.

#### Examples

Creating the logfiles storage volume with IP address 10.1.1.1:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# address 10.1.1.1
```

Deleting an external storage volume named logfiles:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no address 10.1.1.1
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-external-storage-<VOLUME-NAME>	Administrators or local user group members with execution rights for this command.

## directory

```
directory <DIRECTORY-NAME>
no directory <DIRECTORY-NAME>
```

## Description

Selects an existing directory on the external storage volume.

The `no` form of this command clears a directory of an external storage volume.

Parameter	Description
<DIRECTORY-NAME>	Specifies the external storage directory for mapping the volume.

## Examples

Creating a volume named logfiles that is mapped under /home on the server:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# directory /home
```

Clearing the directory /home:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no directory /home
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-external-storage-<VOLUME-NAME>	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

## disable external-storage logfiles

disable  
no disable

### Description

Disables the external storage volume.

The `no` form of this command enables the external storage volume. This is identical to the `enable` command.

### Examples

Disabling a volume named logfiles:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# disable
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-external-storage-<VOLUME-NAME>	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

## enable (external-storage logfiles)

enable  
no enable

### Description



Enables the external storage volume.

The `no` form of this command disables the external storage volume. This is identical to the `disable` command.

## Examples

Creating and then enabling a volume named logfiles:

```
switch(config)# external-storage logfiles  
switch(config-external-storage-logfiles)# enable
```

Disables the external storage volume:

```
switch(config)# external-storage logfiles  
switch(config-external-storage-logfiles)# disable
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-external-storage- <i>&lt;VOLUME-NAME&gt;</i>	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

## external-storage

```
external-storage <VOLUME-NAME>  
no external-storage <VOLUME-NAME>
```

## Description

Creates or updates an external storage volume.

The `no` form of this command deletes an external storage volume.

## Examples

Creating the logfiles storage volume:

```
switch(config)# external-storage logfiles  
switch(config-external-storage-logfiles)#
```

Deleting the logfiles storage volume:

```
switch(config)# no external-storage logfiles
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

## password (external-storage)

```
password [{plaintext | ciphertext} <PASSWORD>]  
no password {plaintext | ciphertext} <PASSWORD>
```

### Description

Sets the password for network attached storage server login.

The `no` form of this command clears the password for network attached storage server login.

Parameter	Description
{ciphertext   plaintext}	Selects the password format.
<PASSWORD>	Specifies the password.  <b>NOTE:</b> When the password is not provided on the command line, plaintext password prompting occurs upon pressing Enter. The entered password characters are masked with asterisks.

### Examples

Creating a volume named logfiles with password Xj#9:

```
switch(config)# external-storage logfiles  
switch(config-external-storage-logfiles)# password plaintext Xj#9
```

Creating a volume named bak1 with a prompted plaintext password:

```
switch(config)# external-storage bak1  
switch(config-external-storage-bak1)# password  
Enter the NAS server password: *****  
Re-Enter the NAS server password: *****
```

Clearing the password for volume logfiles:

```
switch(config)# external-storage logfiles  
switch(config-external-storage-logfiles)# no password plaintext Xj#9
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-external-storage-<VOLUME-NAME>	Administrators or local user group members with execution rights for this command.

## show external-storage

show external-storage [<VOLUME-NAME>]

### Description

Shows external storage configuration and state for all volumes or for a specified volume.

Parameter	Description
<VOLUME-NAME>	Specifies the external storage volume name that the show command will use.

### Examples

```
switch# show external-storage
-----
--
      Address      VRF      Username      Type      Directory      State
-----
--
nfsvol   10.1.1.1      nas      ---           NFSv3      /home
operational
nfsfiles 20.1.1.1      nas      netstorage    NFSv4      /netstor      disabled
scpdev   nasserver     nas      scpstor       SCP        /scp
unaccessible
```

### Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

## show running-config external-storage

```
show running-config external-storage
```

### Description

Shows the running configuration of the external storage.

### Examples

```
switch# show running-config external-storage

external-storage nfsvol
  address 10.1.1.1
  vrf     nas
  type    nfsv4
  directoty /home
  enable
external-storage scpdev
  address 30.1.1.1
  vrf     nas
  username switchuser
  password ciphertext xxx
  type    scp
  directoty /home
  enable
```

### Command History

Release	Modification
10.07 or earlier	--

### Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

## type (external storage)

```
type {nfsv3 | nfsv4 | scp}
no type {nfsv3 | nfsv4 | scp}
```

### Description

Sets the network attached storage access type for reaching the external storage volume.

The `no` form of this command deletes an external storage volume.

Parameter	Description
nfsv3	Specifies the NFSv3 network access protocol.
nfsv4	Specifies the NFSv4 network access protocol.
scp	Specifies the SCP network access protocol.

## Examples

Creating the logfiles volume using NFSV4:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# type nfsv4
```

Clearing the external storage access type:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no type nfsv4
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-external-storage- <i>&lt;VOLUME-NAME&gt;</i>	Administrators or local user group members with execution rights for this command.

## username (external storage)

```
username <USER-NAME>
no username <USER-NAME>
```

### Description

Sets the username for logging in to a network attached storage server.

The `no` form of this command clears a username.

Parameter	Description
<i>&lt;USER-NAME&gt;</i>	Specifies the username.

## Examples

Creating a volume named logfiles with the user name nassuser:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# username nassuser
```

Clearing the user name nassuser from accessing the logfiles volume:

```
switch(config)# external-storage logfiles
switch(config-external-storage-logfiles)# no username nassuser
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-external-storage-<VOLUME-NAME>	Administrators or local user group members with execution rights for this command.

## vrf (external storage)

```
vrf <VRF-NAME>  
no vrf <VRF-NAME>
```

### Description

Setting a VRF to reach network attached storage.

The `no` form of this command clears access of a VRF to network attached storage.

Parameter	Description
<VRF-NAME>	Specifies the VRF name.

### Examples

Creating the logfiles volume and setting a VRF named `nas` to access the network attached storage:

```
switch(config)# external-storage logfiles  
switch(config-external-storage-logfiles)# vrf nas
```

Clearing access of a VRF named `nas` to the network attached storage:

```
switch(config)# external-storage logfiles  
switch(config-external-storage-logfiles)# no vrf nas
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300	config-external-storage-<VOLUME-NAME>	Administrators or local user group

Platforms	Command context	Authority
6400		members with execution rights for this command.

The IP Service Level Agreement (IP-SLA) is a feature that enables the measuring of network performance between two nodes in a network for different service level agreement parameters such as round-trip time (RTT), one-way delay, jitter, reachability, packet loss, and voice quality scores. These two nodes can span across area in access, distribution or core inside a LAN as well as across WAN between core to core or core to Data Centre switches. This feature helps you measure the SLA for different protocols or applications such as UDP echo, UDP jitter (for voice and video), TCP connect, HTTP, and ICMP echo. This guide provides details for managing and monitoring different types of IP-SLAs.

### IP-SLA guidelines

- AOS-CX supports only SLA configuration through CLI and thresholds can be configured using NAE agents using WebUI/REST.
- AOS-CX supports only forever tests. On-demand tests are not supported.
- Maximum sessions: IP-SLA source 500, IP-SLA responder 100.
- NAE can effectively monitor a maximum of 300 parameters, reducing the maximum supported session by 300.
- NAE supports only syslog.
- NAE agents must be triggered for each IP-SLA test on every switch.
- If multiple IP addresses are received for a DNS query, DNS works with the first resolved IP.
- When the DNS server IP is not configured, the first DNS server in `resolve.conf` is used.
- The source interface/IP option is not applicable for SLAs configured on 'mgmt' VRF, as it has only one interface.
- A system time change because of NTP or a manual change causes an incorrect calculation.
- There is no interoperability of UDP echo SLA between AOS-CX and FlexFabric switches.
- Source IP and source port combination must be unique across SLA sessions in a same switch.
- Do not use the same source port across the source and responder sessions in a switch.
- NTP synchronization is a must for SLA types involving one-way delay such as UDP jitter VoIP.
- It is mandatory to set default CoPP to the max value when UDP jitter SLA is enabled otherwise 100% packet loss can be seen and `UDP-Jitter sla` probe will result in failure as seen in the following example.

```
copp-policy default
  class hypertext priority 6 rate 50000 burst 64
  default-class priority 6 rate 99999 burst 9999
```

- Deviations with respect to PVOS results: The packet losses due to internal switch-related issues like interface shutdown or interface flaps will not be considered as 'Probes Timed-out error', as the IP-SLA solution is to measure network performance and anomalies. Rather, this kind of packet loss will be counted in internal counters like 'Destination address unreachable'.



## Limitations with VoIP SLAs

- A maximum of 80 concurrent VoIP SLAs can be scheduled in a 20 second slot.
- A single VoIP probe takes 20 seconds to complete.
- The default and minimum probe interval for VoIP SLA is 120 seconds.
- SLAs scheduled in the same slot, periodically sends 1000 probe packets for 120 seconds in 20 second intervals.
- Default 120 second probe interval is divided in to 6 slots of 20 seconds to avoid synchronization of all configured VoIP SLAs sending probes at the same time.
- SLAs started at the same time exceeding the concurrent limit of 80 must wait for the next 20 second VoIP slot to open before moving to 'running' state.
- The maximum number of VoIP SLAs supported is 80 X 6 slots = 480 SLAs.
- SLAs exceeding 480 will continue to remain in the 'waiting for VoIP slot' until any slot is freed by stopping the running SLA.
- To avoid high RTT, a single switch with more than 20 SLAs should not have single responder SLA.
- When IP is received dynamically (e.g. using DHCP) for interfaces other than management interface, IPSLA source or responder has to be configured only using interface name.

## IP-SLA commands

### http

```
http {get | raw} URL [source {<SOURCE-IPV4-ADDR> | <IFNAME>} source-port <PORT-NUM>]
    [proxy proxy-url] [cache disable] [name-server <IPV4-ADDR-DNS-SERVER>]
    [probe-interval <30-604800>] [version<VERSION-NUMBER>] [http-raw-request <RAW-
    PAYLOAD>]
```

### Description

Configures HTTP as the IP-SLA test mechanism. Requires destination URL and type of HTTP request (raw/get).

Parameter	Description
{get   raw}	Selects HTTP request type as GET or RAW where the system will generate or provide HTTP payload.
URL	Specifies HTTP URL address of syntax. http://<HOST NAME/IP-ADDRESS>:<PORT>/<PATH>.
source {<SOURCE-IPV4-ADDR>   <IFNAME>}	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.
source-port <PORT-NUM>	Specifies the value of the source port for the IP-SLA probes.
cache disable	Selects cache option for the HTTP server. By default the option is enabled.
name-server <IPV4-ADDR-DNS-SERVER>	Specifies the IPv4 address of DNS server.
probe-interval <PROBE-INTERVAL>	Specifies the probe interval in seconds. Range: 30 to 604800.

Parameter	Description
version <VERSION-NUMBER>	Specifies the source interface to use for sending IP-SLA probes.
http-raw-request <RAW-PAYLOAD>	HTTP raw request. String.

## Examples

```
switch(config-ipsla-1)# http get http://device.arubanetworks.com/root/home.html
switch(config-ipsla-1)# http raw
http://device.arubanetworks.com/root/home.html
switch(config-ipsla-1)# http 2.2.2.2 source 1/1/1
switch(config-ipsla-1)# http http://device.arubanetworks.com source 2.2.2.1
switch(config-ipsla-1)# http http://device.arubanetworks.com/root/home.html
source-interface 1/1/1
switch(config-ipsla-1)# http http://device.arubanetworks.com name-server
10.10.10.2
switch(config-ipsla-1)# http raw raw-request "GET /en/US/hmpgs/index.html
HTTP/1.0\r\n\r\n"
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-ip-sla-<IP-SLA-NAME>	Administrators or local user group members with execution rights for this command.

## icmp-echo

```
icmp-echo {<DEST-IPV4-ADDR>|<HOSTNAME>} [source {<SOURCE-IPV4-ADDR> | <IFNAME>}]
[name-server <IPV4-ADDR-DNS-SERVER>] [payload-size <PAYLOAD-SIZE>]
[tos <TYPE-OF-SERVICE>] [probe-interval <PROBE-INTERVAL>]
```

## Description

Configures ICMP echo as the IP-SLA test mechanism. Requires destination address for the IP-SLA test.

Parameter	Description
{<DEST-IPV4-ADDR>   <HOSTNAME>}	Selects the destination IPv4 address for the IP-SLA or the hostname of the destination.
[source {<SOURCE-IPV4-ADDR>   <IFNAME>}]	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.
name-server <IPV4-ADDR-DNS-SERVER>	Specifies the DNS server for destination hostname resolution.

Parameter	Description
payload-size <PAYLOAD-SIZE>	Specifies the payload size of an SLA probe. Range: 0 to 1440.
tos <TYPE-OF-SERVICE>	Specifies the type of serve to be used in the probe packets. Range: 0 to 255.
probe-interval <PROBE-INTERVAL>	Specifies the probe interval in seconds. Range: 5 to 604800.

## Examples

```
switch(config)# ip-sla test
  switch(config-ip-sla-test)# icmp-echo 2.2.2.2
  switch(config-ip-sla-test)# icmp-echo 2.2.2.2 source 3.3.3.3
  switch(config-ip-sla-test)# icmp-echo 2.2.2.2 source 3.3.3.3 payload-size 400
  switch(config-ip-sla-test)# icmp-echo 2.2.2.2 source 3.3.3.3 payload-size 400
name-server 4.4.4.4
  switch(config-ip-sla-test)# icmp-echo 2.2.2.2 source 3.3.3.3 payload-size 400
name-server 4.4.4.4 probe-interval 80
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-ip-sla-<IP-SLA-NAME>	Administrators or local user group members with execution rights for this command.

## ip-sla

```
ip-sla <IP-SLA-NAME>
no ip-sla <IP-SLA-NAME>
```

## Description

Creates an IP Service Level Agreement (SLA) profile and switches to the `config-ip-sla` context. The `no` form of this command deletes an IP-SLA profile. By default, all profile use the default VRF (default).

Parameter	Description
<IP-SLA-NAME>	Specifies an IP-SLA profile name. Length: 1 to 63 characters.

## Examples

Creating an IP-SLA:

```
switch(config)# ip-sla 1
switch(config-ip-sla-1)#
```

Deleting an IP-SLA:

```
switch(config)# no ip-sla 1
switch(config)#
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

## ip-sla responder

```
ip-sla responder <SLA-NAME> {udp-echo | tcp-connect | udp-jitter-voip} <PORT-NUM>
    [source {<SOURCE-IPV4-ADDR> | <IFNAME>}][vrf <VRF-NAME>]
no ip-sla responder <SLA-NAME> {udp-echo | tcp-connect | udp-jitter-voip} <PORT-NUM>
    [source {<SOURCE-IPV4-ADDR> | <IFNAME>}][vrf <VRF-NAME>]
```

## Description

Selects the IP-SLA responder. The responder can be configured for udp-echo, tcp-connect, udp-jitter-voip type. It requires the SLA name, SLA type, and port number as arguments. Source IP/interface ID is a must for type udp-jitter-voip and optional for other types.

The `no` form of this command removes the IP-SLA responder.

Parameter	Description
<SLA-NAME>	Specifies the SLA name.
udp-echo	Enables responder for udp-echo probes.
tcp-connect	Selects TCP connect as the IP-SLA test mechanism.
vrf <VRF-NAME>	Specifies the name of the VRF to use.
udp-jitter-voip	Selects VOIP jitter as the IP-SLA test mechanism.
<PORT-NUM>	Specifies the port number to listen for IP-SLA probes. Range: 1 to 65535.
[source {<SOURCE-IPV4-ADDR>   <IFNAME>}]	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.

## Examples

```
switch(config)# ip-sla responder SLA1 udp-echo 8000 source 2.2.2.2
switch(config)# ip-sla responder SLA1 udp-echo 8000 source 1/1/1
```

```
switch(config)# no ip-sla responder SLA1 udp-echo 8000 source 2.2.2.2
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

## show ip-sla responder

```
show ip-sla responder <SLA-NAME>
```

### Description

Shows the given IP-SLA responder configuration and operation status.

Parameter	Description
<SLA-NAME>	Specifies the SLA name.

## Examples

```
switch(config)# show ip-sla responder SLA3

SLA Name           : SLA3
IP-SLA Type        : Udp-echo
VRF                 : Default
Responder Port      : 8000
Responder IP        : 2.2.2.3
Responder Interface : 1/1/1
Responder Status    : Running
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

## show ip-sla responder results

```
show ip-sla responder <SLA-NAME> <SOURCE-IPV4-ADDR> <PORT-NUM> results
```

### Description

Shows the given ip-sla responder statistics for a given source IP and port. This command is only applicable for the sources where source IP and port are configured.

Parameter	Description
<SLA-NAME>	Specifies the SLA name.
<SOURCE-IPV4-ADDR>	Specifies the source IPV4 address.
<PORT-NUM>	Specifies the port number. Range: 1 to 65535.

### Examples

```
switch# show ip-sla responder SLA1 2.2.2.1 8000 results

IP-SLA Type       : Udp-echo
VRF Name          : Default
Source IP         : 2.2.2.1
Source Port       : 8000
Responder Port    : 8888
Responder IP      : 2.2.2.3
Responder Interface :
Responder Status  : Running
Packets Received  : 2
Packets Sent      : 2
```

### Command History

Release	Modification
10.07 or earlier	--

### Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

## show ip-sla <SLA-NAME>

```
show ip-sla <SLA-NAME> results
```

### Description

Shows the given IP-SLA source configuration and status.

Parameter	Description
<SLA-NAME>	Specifies the SLA name.
results	Shows the statistics calculated for an SLA type.

## Examples

```
switch# show ip-sla xyz results

IP-SLA session status
  IP-SLA Name           : xyz
  IP-SLA Type           : tcp-connect
  Destination Host Name/IP Address: 2.2.2.1
  Destination Port      : 8888
  Source IP Address/IFName : 2.2.2.2
  Source Port           : 5555
  Status                : Running

IP-SLA session cumulative counters
  Total Probes Transmitted : 1
  Probes Timed-out        : 0
  Bind Error               : 0
  Destination Address Unreachable : 0
  DNS Resolution Failures : 0
  Reception Error         : 0
  Transmission Error      : 0

IP-SLA Latest Probe Results
  Last Probe Time        : 2018 Jul 13 02:00:35
  Packets Sent           : 1
  Packets Received       : 1
  Packet Loss in Test    : 0.0000%

  Minimum RTT(ms)       : 0.7900
  Maximum RTT(ms)       : 0.7900
  Average RTT(ms)       : 0.7900
  DNS RTT(ms)           : 0.0000
  TCP RTT(ms)           : 0.9710

switch(config)# show ip-sla xyz
  IP-SLA Name           : xyz
  Status                : scheduled
  IP-SLA Type           : tcp-connect
  VRF                   : ipslasrc
  Source Port           : 5555
  Source IP              : 2.2.2.2
  Source Interface      :
  Domain Name Server    :
  Probe interval(seconds) : 90

switch(config)# show ip-sla jitter-sla results
  IP-SLA session status
    IP-SLA Name           : jitter-sla
    IP-SLA Type           : udp-jitter-voip
    Destination Host Name/IP Address: 2.2.2.1
    Destination Port      : 8888
    Source IP Address/IFName :
```

```

Source Port          : 5555
Status              : Running

IP-SLA Session Cumulative Counters
Total Probes Transmitted : 1
Probes Timed-out       : 0
Bind Error            : 0
Destination Address Unreachable : 0
DNS Resolution Failures : 0
Reception Error       : 0
Transmission Error    : 0

IP-SLA Latest Probe Results
Last Probe Time      : 2018 Jul 13 02:02:48
Packets Sent         : 1
Packets Received     : 1
Packet Loss in Test  : 0.0000%

Minimum RTT(ms)     : 0.7900
Maximum RTT(ms)     : 0.7900
Average RTT(ms)     : 0.7900
DNS RTT(ms)         : 0.0000

Min Positive SD      : 1      Min Positive DS      : 2
Max Positive SD      : 1      Max Positive DS      : 2
Positive SD Number   : 2      Positive DS Number   : 2
Positive SD Sum      : 2      Positive DS Sum      : 4
Positive SD Average  : 5      Positive DS Average  : 5
Min Negative SD      : 1      Min Negative DS      : 1
Max Negative SD      : 1      Max Negative DS      : 1
Negative SD Number   : 2      Negative DS Number   : 4
Negative SD Sum      : 2      Negative DS Sum      : 4
Negative SD Average  : 5      Negative DS Average  : 5

Max SD Delay         : 0      Max DS Delay         : 0
Min SD Delay         : 0      Min DS Delay         : 0
Average SD Delay     : 0      Average DS Delay     : 0

Voice Scores:
MOS Score           : 4.38   ICPIF                : 0

```

```

switch(config)# show ip-sla m3op
IP-SLA Name        : jitter-sla
Status             : Running
IP-SLA Type        : udp-jitter-voip
VRF                : ipslasrc
Source IP          : 2.2.2.2
Source Interface   :
Domain Name Server :
TOS                : 10
Probe Interval(seconds) : 90
Advantage Factor   : 0
Codec Type         : g711a

```

```

switch(config)# show ip-sla http-sla
IP-SLA Name        : http-sla
Status             : Running
IP-SLA Type        : http
VRF                : ipslasrc
Source IP          : 2.2.2.2

```



```

Source Interface      :
Domain Name Server   : 10.10.10.2
Probe Interval(seconds) : 90
HTTP Request Type    : GET
HTTP/HTTPS URL       : abcd.com/ws/home
Cache                : Enabled
HTTP Proxy URL       :
HTTP Version Number  : 1.1
```



```

##### IP-SLA status description
```
Status	Description
Running	SLA is fully operational
Bind Error	Another service is using the same source port
Interface Down	Interface status is not up
Dns Resolution Error	Failed to resolve destination hostname
No Route	No available route to the responder
Internal Error	Unexpected error prevents SLA session
Disabled	SLA is disabled
Configuration Incomplete	Configuration is not complete to enable the SLA
```

##### IP SLA session cumulative counters description
```
Status	Description
Probes Timed-out	Total numbers of probes failed to receive response.
Bind Error	Total numbers of probes transmission failed as source port not available.
Destination Address Unreachable	Total numbers of probes transmission failed due to route unavailable.
DNS Resolution Failures	Total numbers of probes failed due to DNS resolution failure.
Reception Error	Total numbers of probes failed due to internal error in reception.
Transmission Error	Total numbers of probes failed due to internal error in transmission.
```

```


```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context             | Authority                                                                          |
|--------------|-----------------------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | Operator (>) or Manager (#) | Administrators or local user group members with execution rights for this command. |

## start-test

start-test

## Description

Starts the IP-SLA probes.

## Examples

```
switch(config)# ip-sla test
switch(config-ip-sla-test)# start-test
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context                           | Authority                                                                          |
|--------------|-------------------------------------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | config-ip-sla- <i>&lt;IP-SLA-NAME&gt;</i> | Administrators or local user group members with execution rights for this command. |

## stop-test

stop-test

## Description

Stops the IP-SLA probes.

## Examples

```
switch(config)# ip-sla test
switch(config-ip-sla-test)# stop-test
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context                           | Authority                                                                          |
|--------------|-------------------------------------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | config-ip-sla- <i>&lt;IP-SLA-NAME&gt;</i> | Administrators or local user group members with execution rights for this command. |

## tcp-connect

```
tcp-connect {<DEST-IPV4-ADDR> | <HOSTNAME>} <PORT-NUM> [source {<SOURCE-IPV4-ADDR> |
<IFNAME>} [source-port <PORT-NUM>]] [name-server <IPV4-ADDR-DNS-SERVER>]
[probe-interval <PROBE-INTERVAL>]
```

## Description

Configures TCP connect as the IP-SLA test mechanism. Requires destination address/hostname and destination port for the IP-SLA of tcp-connect IP-SLA type.

| Parameter                                | Description                                                                                              |
|------------------------------------------|----------------------------------------------------------------------------------------------------------|
| {<DEST-IPV4-ADDR>   <HOSTNAME>}          | Selects the destination IPv4 address for the IP-SLA or the hostname of the destination.                  |
| <PORT-NUM>                               | Destination port for the IP-SLA. Range: 1 to 65535.                                                      |
| [source {<SOURCE-IPV4-ADDR>   <IFNAME>}] | Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes. |
| [source-port <PORT-NUM>]                 | Specifies the port for the IP-SLA test.                                                                  |
| [name-server <IPV4-ADDR-DNS-SERVER>]     | Specifies the DNS server for destination hostname resolution.                                            |
| [probe-interval <PROBE-INTERVAL>]        | Probe interval in seconds. Range: 30 to 604800.                                                          |

## Examples

```
switch(config-ipsla-1)# tcp-connect 2.2.2.2 8080
switch(config-ipsla-1)# tcp-connect 2.2.2.2 8080 source 2.2.2.1 source-port
6000
switch(config-ipsla-1)# tcp-connect 2.2.2.2 8080 source 1/1/1 source-port
6000

switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080
source 2.2.2.1 source-port 6000
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080
source 1/1/1 source-port 6000
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080
name-server 10.10.10.2
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context             | Authority                                                                          |
|--------------|-----------------------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | config-ip-sla-<IP-SLA-NAME> | Administrators or local user group members with execution rights for this command. |

## udp-echo

```
udp-echo {<DEST-IPV4-ADDR>|<HOSTNAME>} <PORT-NUM> [source {<SOURCE-IPV4-ADDR> |
<IFNAME>} [source-port <PORT-NUM>]] [name-server <IPV4-ADDR-DNS-SERVER>] [payload-
size
<PAYLOAD-SIZE>] [tos <TYPE-OF-SERVICE>] [probe-interval <PROBE-INTERVAL>]
```

## Description

Configures UDP echo as the IP-SLA test mechanism. Requires destination address/hostname and destination port number for the IP-SLA of udp-echo SLA type.

| Parameter                                | Description                                                                                              |
|------------------------------------------|----------------------------------------------------------------------------------------------------------|
| {<DEST-IPV4-ADDR>   <HOSTNAME>}          | Selects the destination IPv4 address for the IP-SLA or the hostname of the destination.                  |
| <PORT-NUM>                               | Specifies the destination port for the IP-SLA. Range: 1 to 65535.                                        |
| [source {<SOURCE-IPV4-ADDR>   <IFNAME>}] | Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes. |
| [source-port <PORT-NUM>]                 | Specifies source port for the IP-SLA test. Range: 1 to 65535.                                            |
| [name-server <IPV4-ADDR-DNS-SERVER>]     | Specifies the DNS server for destination hostname resolution.                                            |
| [payload-size <PAYLOAD-SIZE>]            | Specifies the payload size of an SLA probe. Range: 28 to 1440.                                           |
| [<TYPE-OF-SERVICE>]                      | Type of service. Range: 0 to 255.                                                                        |
| probe-interval <PROBE-INTERVAL>          | Probe interval in seconds. Range: 5 to 604800.                                                           |

## Examples

```
switch(config-ipsla-1)# udp-echo 2.2.2.2 8080
switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 source 2.2.2.1
switch(config-ipsla-1)# udp-echo https://device.arubanetworks.com 8080
switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 source 1/1/1
switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 source 2.2.2.1 payload-size 50
switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 source 1/1/1 payload-size 50
switch(config-ipsla-1)# udp-echo 2.2.2.2 8080 payload-size 50
switch(config-ipsla-1)# udp-echo https://device.arubanetworks.com 8080 source
2.2.2.1
payload-size 50
switch(config-ipsla-1)# udp-echo https://device.arubanetworks.com 8080 source
1/1/1
payload-size 50
switch(config-ipsla-1)# udp-echo https://device.arubanetworks.com 8080
name-server 10.10.10.2
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context             | Authority                                                                          |
|--------------|-----------------------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | config-ip-sla-<IP-SLA-NAME> | Administrators or local user group members with execution rights for this command. |

## udp-jitter-voip

```
udp-jitter-voip {<DEST-IPV4-ADDR> | <HOSTNAME>} <PORT-NUM> [codec-type <CODEC-TYPE>]
[advantage-factor <VALUE>] [source {<SOURCE-IPV4-ADDR> | <IFNAME>} [source-port
<PORT-NUM>]]
[name-server <IPV4-ADDR-DNS-SERVER>][probe-interval <PROBE-INTERVAL>] [tos <TYPE-OF-
SERVICE>]
```

### Description

Configure UDP jitter voip as the IP-SLA test mechanism. Requires destination address/hostname and source address/interface for the IP-SLA of udp-jitter-voip IP-SLA type.

| Parameter                                | Description                                                                                              |
|------------------------------------------|----------------------------------------------------------------------------------------------------------|
| {<DEST-IPV4-ADDR> <HOSTNAME>}            | Selects the destination IPv4 address for the IP-SLA or the hostname of the destination.                  |
| <PORT-NUM>                               | Selects the port number for the IP-SLA. Range: 1 to 65535.                                               |
| [codec-type <CODEC-TYPE>]                | Selects the codec-type for the Voip IP-SLA test.                                                         |
| [advantage-factor <ADVANTAGE-FACTOR>]    | Selects the value for the advantage factor. Default value is 0.                                          |
| [source {<SOURCE-IPV4-ADDR>   <IFNAME>}] | Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes. |
| [source-port <PORT-NUM>]                 | Specifies the value of source port for the IP-SLA probes.                                                |
| [name-server <IPV4-ADDR-DNS-SERVER>]     | Specifies the DNS server for destination hostname resolution.                                            |
| tos <TYPE-OF-SERVICE>                    | Specifies the type of service. Range: 0 to 255.                                                          |
| probe-interval <PROBE-INTERVAL>          | Specifies the probe interval in seconds. Range: 120 to 604800.                                           |

### Examples

```
switch(config-ipsla-1)# udp-jitter-voip 2.2.2.2 8080 advantage-factor 10 codec-
type g711a
switch(config-ipsla-1)# udp-jitter-voip 2.2.2.2 8080 advantage-factor 10
codec-type g711a source 2.2.2.1
switch(config-ipsla-1)# udp-jitter-voip https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a
switch(config-ipsla-1)# udp-jitter-voip 2.2.2.2 8080 advantage-factor 10
codec-type g711a source 1/1/1
switch(config-ipsla-1)# udp-jitter-voip https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a source 2.2.2.1
switch(config-ipsla-1)# udp-jitter-voip https://device.arubanetworks.com 8080
```

```

advantage-factor 10 codec-type g711a source 1/1/1
switch(config-ipsla-1)# udp-jitter-voip https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a name-server 10.10.10.2 probe-interval 120
source 10.1.1.1 source-port 8888 tos 10

```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context             | Authority                                                                          |
|--------------|-----------------------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | config-ip-sla-<IP-SLA-NAME> | Administrators or local user group members with execution rights for this command. |

## vrf (ip sla)

```

vrf <VRF-NAME>
no vrf [<VRF-NAME>]

```

## Description

Configures the VRF on which the SLA will send or receive packets. By default, the default VRF is used. The `no` form of the command removes VRF from SLA.

| Parameter  | Description                                     |
|------------|-------------------------------------------------|
| <VRF-NAME> | Specifies a VRF name. Length: Default: default. |

## Examples

```
switch(config-ip-sla-test)# vrf ipslasrc
```

```
switch(config-ip-sla-test)# no vrf
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context             | Authority                                                                          |
|--------------|-----------------------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | config-ip-sla-<IP-SLA-NAME> | Administrators or local user group members with execution rights for this command. |

The speed downshift feature allows the user to link-up at sub-optimal speeds when failing to link-up at the highest advertised speed. There are fixed number of link attempts made to establish link at highest advertised speed and when all of them fail and attempt is made to link-up at a lower possible speed.

This feature requires underlying PHY to have support for the same and hence capability is only added to select set of ports. If a link cannot be established at the highest common denominator within a set number of link attempts, the PHY advertises the next highest speed using auto-negotiation.

### Limitations with speed downshift

- Link up may be delayed as certain number of retries are done to establish the link at highest advertise speeds by both link partners before downshifting.
- Link may be established at sub-optimal speed.

### L1-100Mbps downshift commands

#### downshift enable

```
downshift-enable  
no downshift-enable
```

#### Description

Enables/disables automatic speed downshift on an interface that supports downshift, generally 1GBASE-T ports. When enabled, downshift allows an interface to link at a lower advertised speed when unable to establish a stable link at the maximum speed. Downshifting only applies to physical interfaces that are not members of a LAG and is only available when auto-negotiation is enabled. When only one speed is advertised, downshift will not be triggered.

#### Examples

```
switch(config-if)# interface 1/1/1  
switch(config-if)# downshift-enable
```

```
Warning: this is a non-standard mode for use only when standards-based  
auto-negotiation is not able to establish a stable link. Enabling this  
may cause the port to link at a lower than expected speed and should  
not be used on ports that are members of a LAG. Support calls may require  
this feature to be disabled
```

```
Continue (y/n)?
```

```
switch(config-if)#
```

When automatic downshift is enabled:

```
switch(config-if)# show running-config interface
interface 1/1/1
    downshift-enable
```

Disabling automatic speed downshift:

```
switch(config-if)# interface 1/1/1
switch(config-if)# no downshift-enable
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context | Authority                                                                          |
|--------------|-----------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | config-if       | Administrators or local user group members with execution rights for this command. |

## show interface

```
show interface [<IFNNAME>|<IFRANGE>] [brief | physical | extended [non-zero]]
show interface [lag | loopback | tunnel | vlan ] [<ID>] [brief | physical]
show interface [lag | loopback | tunnel | vlan ] [<ID>] [extended [non-zero]]
```

## Description

Shows active configurations and operational status information for interfaces.

| Parameter | Description                                           |
|-----------|-------------------------------------------------------|
| <IFNAME>  | Specifies a interface name.                           |
| <IFRANGE> | Specifies the port identifier range.                  |
| brief     | Shows brief info in tabular format.                   |
| physical  | Shows the physical connection info in tabular format. |
| extended  | Shows additional statistics.                          |
| non-zero  | Shows only non zero statistics.                       |
| LAG       | Shows LAG interface information.                      |
| LOOPBACK  | Shows loopback interface information.                 |
| TUNNEL    | Shows tunnel interface information.                   |
| VLAN      | Shows VLAN interface information.                     |



| Parameter     | Description                                          |
|---------------|------------------------------------------------------|
| <LAG-ID>      | Specifies the LAG number. Range: 1-256               |
| <LOOPBACK-ID> | Specifies the LOOPBACK number. Range: 0-255          |
| <TUNNEL-ID>   | Specifies the tunnel ID. Range: 1-255                |
| <VLAN-ID>     | Specifies the VLAN ID. Range: 1-4094                 |
| VXLAN         | Shows the VXLAN interface information.               |
| <VXLAN-ID>    | Specifies the VXLAN interface identifier. Default: 1 |

## Examples

The following example shows when the interface is configured as a route-only port:

```
switch# show interface 1/1/1

Interface 1/1/1 is up
Admin state is up
Link state: up for 2 days (since Sun Jun 21 05:30:22 UTC 2020)
Link transitions: 1
Description: backup data center link

Hardware: Ethernet, MAC Address: 70:72:cf:fd:e7:b4
MTU 1500
Type 1GbT
Full-duplex
qos trust none
Speed 1000 Mb/s
Auto-negotiation is on
Flow-control: off
Error-control: off
Energy-Efficient Ethernet is enabledMDI mode: MDIX
L3 Counters: Rx Enabled, Tx Enabled
Rate collection interval: 300 seconds

Rates
-----
Mbits / sec          RX          TX          Total (RX+TX)
KPkts / sec          0.00        0.00        0.00
  Unicast             0.00        0.00        0.00
  Multicast           0.00        0.00        0.00
  Broadcast           0.00        0.00        0.00
Utilization %         0.00        0.00        0.00

Statistics
-----
Packets              RX          TX          Total
  Unicast             0           0           0
  Multicast           0           0           0
  Broadcast           0           0           0
Bytes                 0           0           0
Jumbos                0           0           0
Dropped               0           0           0
Filtered              0           0           0
Pause Frames          0           0           0
L3 Packets            0           0           0
L3 Bytes              0           0           0
```

|           |     |     |   |
|-----------|-----|-----|---|
| Errors    | 0   | 0   | 0 |
| CRC/FCS   | 0   | n/a | 0 |
| Collision | n/a | 0   | 0 |
| Runts     | 0   | n/a | 0 |
| Giants    | 0   | n/a | 0 |
| Other     | 0   | 0   | 0 |

When the interface is currently linked at a downshifted speed:

```
switch(config-if)# show interface 1/1/1

Interface 1/1/1 is up
...
Auto-negotiation is on with downshift active
```

When the interface is currently linked with energy-efficient-ethernet negotiated:

```
switch(config-if)# show interface 1/1/1

Interface 1/1/1 is up
...
Energy-Efficient Ethernet is enabled and active
```

When the interface is shut down during a VSX split:

```
switch(config-if)# show interface 1/1/1

Interface 1/1/1 is down
Admin state is up
State information: Disabled by VSX
Link state: down for 3 days (since Tue Mar 16 05:20:47 UTC 2021)
Link transitions: 0
Description:

Hardware: Ethernet, MAC Address: 04:09:73:62:90:e7
MTU 1500
Type SFP+DAC3
Full-duplex
qos trust none
Speed 0 Mb/s
Auto-negotiation is off
Flow-control: off
Error-control: off
VLAN Mode: native-untagged
Native VLAN: 1
Allowed VLAN List: 1502-1505
Rate collection interval: 300 seconds

Rate                               RX                               TX                               Total (RX+TX)
-----
Mbits / sec                        0.00                            0.00                            0.00
KPkts / sec                        0.00                            0.00                            0.00
  Unicast                          0.00                            0.00                            0.00
  Multicast                         0.00                            0.00                            0.00
  Broadcast                        0.00                            0.00                            0.00
Utilization                        0.00                            0.00                            0.00
```

| Statistic    | RX  | TX  | Total |
|--------------|-----|-----|-------|
| Packets      | 0   | 0   | 0     |
| Unicast      | 0   | 0   | 0     |
| Multicast    | 0   | 0   | 0     |
| Broadcast    | 0   | 0   | 0     |
| Bytes        | 0   | 0   | 0     |
| Jumbos       | 0   | 0   | 0     |
| Dropped      | 0   | 0   | 0     |
| Pause Frames | 0   | 0   | 0     |
| Errors       | 0   | 0   | 0     |
| CRC/FCS      | 0   | n/a | 0     |
| Collision    | n/a | 0   | 0     |
| Runts        | 0   | n/a | 0     |
| Giants       | 0   | n/a | 0     |

When the interface is configured with EEE and the EEE has auto-negotiated:

```
switch(config-if)# show interface 1/1/1 physical
```

```
-----
-----
-----
EEE          PoE Power      Link   Admin      Speed      Flow-Control
Port         Type              Status  Config    Status | Config  Port
Status | Config (Watts)   State  Information Status | Config  Status | Config
-----
-----
-----
1/1/1       1GbT              up      up        1G       auto      off   off
on          on                10M/100M/1G  --          --
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context             | Authority                                                                                                                                                              |
|---------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show interface downshift-enable

```
show interface [<IFNAME>|<IFRANGE>] downshift-enable
```

### Description

Displays speed downshift information, including the interface speed status and configuration.

| Parameter | Description                          |
|-----------|--------------------------------------|
| <IFNAME>  | Specifies a interface name.          |
| <IFRANGE> | Specifies the port identifier range. |

## Examples

Showing automatic downshift information:

```
switch(config-if)# show interface downshift-enable
-----
Port          Downshift          Speed
             Enabled | Active   Status  | Config
-----
1/1/1        yes      yes      100M-FDx auto
1/1/2        yes      no       1G       auto
1/1/3        yes      no       100M-FDx 100M-FDx
1/1/4        no       no       --       auto
```

Showing automatic downshift information on per interface:

```
switch(config-if)# show interface 1/1/2 downshift-enable
-----
Port          Downshift          Speed
             Enabled | Active   Status  | Config
-----
1/1/2        yes      no       1G       auto
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context | Authority                                                                                                                                                              |
|--------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6300<br>6400 | config          | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## show running-config interface

```
show running-config interface [<IFNNAME>|<IFRANGE>]
show running-config interface [lag | loopback | tunnel | vlan ] [<ID>]
```

## Description

Displays active configurations of various switch interfaces.

| Parameter     | Description                                           |
|---------------|-------------------------------------------------------|
| <IFNAME>      | Specifies a interface name.                           |
| <IFRANGE>     | Specifies the port identifier range.                  |
| LAG           | Specifies LAG interface information                   |
| LOOPBACK      | Specifies loopback interface information.             |
| TUNNEL        | Specifies tunnel interface information.               |
| VLAN          | Specifies VLAN interface information.                 |
| <LAG-ID>      | Specifies the LAG number. Range: 1-256.               |
| <LOOPBACK-ID> | Specifies the LOOPBACK number. Range: 0-255.          |
| <TUNNEL-ID>   | Specifies the tunnel ID. Range: 1-255.                |
| <VLAN-ID>     | Specifies the VLAN ID. Range: 1-4094.                 |
| VXLAN         | Specifies the VXLAN interface information.            |
| <VXLAN-ID>    | Specifies the VXLAN interface identifier. Default: 1. |

## Examples

Showing 1/1/2 interface configuration:

```
switch(config-if)# show running-config interface 1/1/2

interface 1/1/2
  no shutdown
  description DC-23
  exit
```

Showing loopback interfaces configured:

```
switch(config-if)# show running-config interface loopback

interface loopback 1
  description lb interface 1
  exit
interface loopback 2
  description lb interface 2
  exit
```

Showing loopback interfaces not configured:

```
switch(config-if)# show running-config interface loopback

No loopback interfaces configured.
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

### Command Information

| Platforms    | Command context | Authority                                                                                                                                                              |
|--------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6300<br>6400 | config          | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

Mirroring allows you to replicate all traffic arriving and/or leaving the selected system interfaces. This data can be used for collection or analysis.

The traffic replicated using mirroring can be sent to a separate interface on the same switch as the traffic source for analysis or inspection. Such a collection of interfaces and settings is called a mirror session.

A mirror session can be configured with many traffic sources but only a single output, or destination. In the initial configuration, the mirror session is disabled. You have enable the feature to start the replication.



---

Care must be taken in choosing the number and rates of sources to avoid over-saturating a session destination. A mirror session with multiple 10G sources can overwhelm a single 10G destination and important data may be lost.

---

## Mirror statistics

Mirror statistics are reset for a Mirror-to-CPU session when an interface is added or removed from a LAG that is a source interface in the Mirror session and during a failover.

## Classifier policies and mirroring sessions

Network traffic can be mirrored to a destination interface in two ways:

- Using a mirroring session alone.
- Using Classifier Policies with mirror actions in conjunction with a mirroring session.

Basic mirroring sessions provide coarse control over the type of traffic mirrored from a source: all received, all transmitted, or both. However, a traffic class within a Classifier Policy applied to a source can provide much finer grained control of mirrored traffic. For example, a policy can match on many different aspects of the Ethernet or IPv4 or IPv6 header information in each frame or packet received or transmitted on an interface.

The steps to configure a policy and class with a mirror action are the following:

1. Configuring a mirroring session with a destination interface.
2. Enabling the mirroring session.
3. Configuring the Classifier Policy, specifying the mirroring session ID in the mirror action.

If the packets being mirrored are received from a VLAN that is not allowed on the mirror destination, the mirrored packets would be dropped at the mirror destination interface. When the mirrored packets are dropped at the destination, the mirror output packet and byte count will increment, however the packets will not be received at the mirror destination.

The mirror destination port among the active mirror sessions must be unique. That is, if an interface is configured as a source or destination in an active mirror session, the same port cannot be used as a destination in another active mirror session.

## VLAN as a source

AOS-CX allows configuration of VLAN as a mirroring source. When a VLAN source is configured in the 'rx' direction, all packets are mirrored as they are received in the switch. When a VLAN source is configured in 'tx' direction, all packets are mirrored as they are transmitted out of the switch.

More than one source VLAN can be configured in a mirror session. Each such VLAN may specify its own direction.

There is a limit of 1024 source VLANs in each direction of a given mirror session.

Same VLANs can be configured as a mirror source for multiple sessions.

Note: When changing a source VLAN in an enabled mirror session (that is, adding, changing direction, or removing), mirrored packets being transmitted out the mirror destination port from other mirror sources may be briefly interrupted during the reconfiguration.

Direction of an existing source VLAN can be updated in one of two ways:

1. Reenter the `source vlan` command with the new preferred direction.
2. Use the `no` form of the command with a direction (rx or tx) to selectively remove the specified direction. Specifying the last remaining direction for that VLAN will remove the VLAN from the configuration entirely.

For packets bridged through the switch:

If the mirror is configured in 'both' direction, two copies of packets are mirrored, otherwise one copy of the packet will be mirrored.

For routed packets:

- If the mirror is configured in the 'rx' direction, packets are mirrored in the pre-routed form with the destination MAC address as the switch address.
- If the mirror is configured in the 'tx' direction, packets are mirrored in the post-routed form with the source MAC as the switch address. Destination MAC is the nexthop gateway or station.
- If the mirror is configured in the 'both' direction, one copy of the packet will be mirrored.

Control plane packets generated by the switch's CPU are processed both in the ingress and the egress packet processing pipeline. The following are the behaviors for mirroring with VLAN as source:

- If the mirror is configured in the 'rx' or 'tx' direction, the packets are mirrored to the mirror destination.
- If the mirror is configured in the 'both' direction, two copies of the packets are mirrored to the mirror destination.

## Mirroring commands

### clear mirror

```
clear mirror [all | <SESSION-ID>]
```

#### Description

Clears the mirror statistics for all configured mirror sessions or a specified session



| Parameter    | Description                                                   |
|--------------|---------------------------------------------------------------|
| all          | Specifies all configured sessions.                            |
| <SESSION-ID> | Specifies a numeric identifier for the session. Range: 1 to 4 |

## Examples

Clearing mirror statistics for all configured mirror sessions:

```
switch# clear mirror all
```

Clearing mirror statistics for mirror session 1:

```
switch# clear mirror 1
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context | Authority                                                                          |
|---------------|-----------------|------------------------------------------------------------------------------------|
| All platforms | Manager (#)     | Administrators or local user group members with execution rights for this command. |

## comment

```
comment <COMMENT>
no comment
```

### Description

Specifies a comment for the mirroring session.

When used in mirror endpoint command context, specifies a comment for the mirror endpoint.

The `no` form of this command removes the comment.

| Parameter | Description                                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------------------|
| <COMMENT> | A comment string of up to 64 characters composed of letters, numbers, underscores, dashes, spaces, and periods. |

### Usage

Comments are optional and can be added or removed at any time without affecting the state of the mirroring session.

Adding a comment to a session that already has a comment replaces the existing comment.

### Examples

Adding a comment to a mirror session:

```
switch(config-mirror-3) # comment This Mirror will be removed during next
maintenance window
```

Removing the comment from mirror session 3:

```
switch(config-mirror-3) # no comment
```

Adding a comment to a mirror endpoint:

```
switch(config-mirror-endpoint-test) # comment Monitor endpoint traffic
```

Replacing the existing comment for mirror endpoint:

```
switch(config-mirror-endpoint-test) # comment Monitor statistics on each endpoint
interfaces
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context                                                    | Authority                                                                          |
|---------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------|
| All platforms | config-mirror- <i>&lt;SESSION-ID&gt;</i><br>config-mirror-endpoint | Administrators or local user group members with execution rights for this command. |

## copy tcpdump-pcap

```
copy tcpdump-pcap <FILE-NAME> <REMOTE-URL>
```

### Description

Saves packet capture files to external storage.

| Parameter                 | Description                                                                    |
|---------------------------|--------------------------------------------------------------------------------|
| <i>&lt;FILE-NAME&gt;</i>  | Specifies the packet capture file to save.                                     |
| <i>&lt;REMOTE-URL&gt;</i> | Specifies the external storage to which the packet capture file will be saved. |

### Usage

Only four files can be saved at any point on the switch. Packet capture files are not saved after a failover or reboot. View a list of saved files using `diag utilities list-files`.

## Examples

Saving my\_capture\_file.pcap to sftp://root@10.0.0.2/file.pcap:

```
switch# copy tcpdump-pcap my_capture_file.pcap sftp://root@10.0.0.2/file.pcap
root@10.0.0.2's passwd:
Connected to 10.0.0.2.
sftp > put my_capture_file.pcap file.pcap
Uploading my_capture_file.pcap to /root/file.pcap
my_capture_file.pcap          100%   156   219.8KB/s   00:00
Copied successfully.
```

## Command History

| Release | Modification       |
|---------|--------------------|
| 10.08   | Command introduced |

## Command Information

| Platforms    | Command context | Authority                                                                          |
|--------------|-----------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | Manager (#)     | Administrators or local user group members with execution rights for this command. |

## copy tshark-pcap

```
copy tshark-pcap <REMOTE-URL> [vrf <VRF-NAME>]
```

## Description

Copies the tshark capture data to a file on a TFTP or SFTP server.

| Parameter      | Description                                                                                                                                                          |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <REMOTE-URL>   | Specifies the capture file on a remote TFTP or SFTP server. The URL syntax is:<br>{tftp://   sftp://<USER>@} {<IP>   <HOST>} [:<PORT>]<br>[;blocksize=<SIZE>]/<FILE> |
| vrf <VRF-NAME> | Specifies the name of a VRF. Default: default.                                                                                                                       |

## Example

Copying the capture data to a file on SFTP server 10.0.0.2:

```
switch# copy tshark-pcap sftp://root@10.0.0.2/file.pcap

root@10.0.0.2's password:
Connected to 10.0.0.2.
sftp> put packets.pcap file.pcap
Uploading packets.pcap to /root/file.pcap
packets.pcap          100%   156   219.8KB/s   00:00
Copied successfully.
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context | Authority                                                                          |
|--------------|-----------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | Manager (#)     | Administrators or local user group members with execution rights for this command. |

## destination cpu

destination cpu  
no destination cpu

### Description

The command causes the mirror session to transmit mirrored packets to the switch CPU. This destination may be configured for multiple sessions, however only one such configured session may be active at a given time.

The diagnostic utility Tshark may be used to view and capture packets transmitted to the CPU through this route. Ctrl+C must be entered to terminate a Tshark capture session. More details can be found in the *Supportability Guide*.

The `no` form of this command will immediately stops mirroring traffic to the CPU, but will not remove any sources from the mirror configuration.

### Examples

Configuring a mirror session with CPU as the destination.

```
switch# config
switch(config)# mirror session 1
switch(config-mirror-1)# destination cpu
```

Removing the destination entirely.

```
switch(config-mirror-1)# no destination cpu
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context                          | Authority                                                                          |
|---------------|------------------------------------------|------------------------------------------------------------------------------------|
| All platforms | config-mirror- <i>&lt;SESSION-ID&gt;</i> | Administrators or local user group members with execution rights for this command. |

## destination interface

```
destination interface {<INTERFACE-ID>|<LAG-NAME>}  
no destination interface {<INTERFACE-ID>|<LAG-NAME>}
```

### Description

Configures the specified interface as the destination of the mirrored traffic.

The `no` form of this command immediately disables the mirroring session and removes the specified destination interface from the configuration.

| Parameter      | Description                                          |
|----------------|------------------------------------------------------|
| <INTERFACE-ID> | Specifies a interface. Format: member/slot/port.     |
| <LAG-NAME>     | Specifies a LAG (link aggregation group) identifier. |

### Usage

Configuring a different destination interface in an enabled mirroring session causes all mirrored traffic to use the new destination interface. This action might cause a temporary suspension of mirrored source traffic during the reconfiguration.

### Examples

*On the 6400 Switch Series, interface identification differs.*

Configuring a mirroring session and adding an interface as a destination:

```
switch(config) # mirror session 1  
switch(config-mirror-1) # destination interface 1/1/1
```

Replacing the existing destination with different interface:

```
switch(config-mirror-1) # destination interface 1/1/12
```

Removing a destination:

```
switch(config-mirror-1) # no destination interface 1/1/12
```

### Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

### Command Information

| Platforms     | Command context            | Authority                                                                          |
|---------------|----------------------------|------------------------------------------------------------------------------------|
| All platforms | config-mirror-<SESSION-ID> | Administrators or local user group members with execution rights for this command. |

## destination tunnel

```
destination tunnel <TUNNEL-IPV4> source <SOURCE-IPv4-ADDR>  
    dscp <DSCP-VALUE> vrf <VRF-NAME>
```

```
no destination tunnel
```

### Description

Specifies the tunnel where all mirrored traffic for the session is transmitted. Only one tunnel destination is allowed per session.

You may configure multiple mirror sessions with the same source/destination IP address pair, however, only one of those sessions sharing the same source/destination IP address pair can be enabled at a given time.

ERSPAN is not supported leaving the switch by the OOB port. If VRF management is configured for an ERSPAN session, the session will be in "mirror\_err\_tunnel\_oob\_port\_not\_supported" operation status.

ERSPAN is not supported leaving the switch encapsulated within another tunnel (e.g. GRE IPv4). When the path to the destination IP address will leave via a tunnel, the session will be in "tunnel\_route\_resolution\_not\_populated" operation status.



---

The interface/LAG used to transmit ERSPAN packets should not be a source in the same mirror session.

---

The `no` form of this command will cease the use of the tunnel and disable the session.

| Parameter          | Description                                                                                                     |
|--------------------|-----------------------------------------------------------------------------------------------------------------|
| <TUNNEL-IPV4-ADDR> | Specifies the tunnel address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255.               |
| <SOURCE-IPv4-ADDR> | Specifies the source address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255.               |
| <DSCP-VALUE>       | Specifies the DSCP value to be carried within the DS field of ERSPAN packet header. Range: 0 to 63. Default: 0. |
| <VRF-NAME>         | Specifies a VRF name. Default: default.                                                                         |

### Examples

Creating a Mirror Session and adding tunnel destination, source, dscp, and VRF:

```
switch# config  
switch(config)# mirror session 1  
switch(config-mirror-1)# destination tunnel 1.1.1.1 source 2.2.2.2 dscp 10 vrf  
default
```

Replacing the existing tunnel destination:

```
switch(config-mirror-1)# destination tunnel 11.12.13.14 source 2.2.2.2 dscp 10 vrf  
default
```

Replacing the existing destination with a different DSCP value:

```
switch(config-mirror-1) # destination tunnel 11.12.13.14 source 2.2.2.2 dscp 2 vrf default
```

Replacing the existing destination with a different VRF:

```
switch(config-mirror-1) # destination tunnel 11.12.13.14 source 2.2.2.2 dscp 2 vrf newvrf
```

Removing the destination:

```
switch(config-mirror-1) # no destination tunnel
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms    | Command context            | Authority                                                                          |
|--------------|----------------------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | config-mirror-<SESSION-ID> | Administrators or local user group members with execution rights for this command. |

## diagnostic

diagnostic

```
diag utilities tshark [file]  
diag utilities tshark [delete-file]
```

## Description

Captures packets from a mirror-to-cpu session, and save the most recent 32MB to pcap file which can then be copied and analyzed. When capturing a mirror-to-cpu session to a file, packets will not be dumped to the console.



---

The `diagnostic` command must be entered prior to the `diag utilities tshark` command.

---

Use the `delete-file` form of this command to delete the most recent capture file.

Since `file` and `delete-file` are optional, the behavior of the base command `diag utilities tshark` does **not** save anything to a file, and instead dumps the tshark session to the console until **CTRL + c** is entered.

| Parameter   | Description                                 |
|-------------|---------------------------------------------|
| file        | Saves captured packets to a temporary file. |
| delete-file | Deletes the most recent captured file.      |

## Example

Performing diagnostic:

```
switch# diagnostic

switch# diagnostic utilities tshark file
Inspecting traffic mirrored to the CPU until Ctrl-C is entered
^CEnding traffic inspection.
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context | Authority                                                                          |
|---------------|-----------------|------------------------------------------------------------------------------------|
| All platforms | Manager (#)     | Administrators or local user group members with execution rights for this command. |

## diag utilities tcpdump

```
diag utilities tcpdump [command <TEXT> | delete file <FILE-NAME> | list-files |
vrf <VRF-NAME> | count <COUNT-NUM> | proto <PROTO-NUM> | host-ip <IP-ADDR> | source-ip
<IP-ADDR> | destination-ip <IP-ADDR> | host-port <PORT> | source-port <PORT> |
destination-port <PORT> | verbosity <LEVEL> | print <DATA> | ethernet-type <ETH-NUM>]
```

## Description

Captures traffic received or transmitted over a network.

| Parameter               | Description                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------|
| command <TEXT>          | Captures packets based on a specified tcpdump command string.                                     |
| delete file <FILE-NAME> | Deletes specified tcpdump list files.                                                             |
| list-files              | Lists all the tcpdump capture files saved on the device.                                          |
| vrf <VRF-NAME>          | Captures packets on the specified VRF. If no VRF is named, the default is used.                   |
| count <COUNT-NUM>       | Runs the tcpdump command until the specified number of packets are captured. Range: 1-2147483647. |
| proto <PROTO-NUM>       | Captures packets of a particular type based on IP protocol number. Range: 0-255.                  |
| host-ip <IP-ADDR>       | Captures packets matching with the source or destination IP address.                              |
| source-ip <IP-ADDR>     | Captures packets from the specified IP address.                                                   |



| Parameter                                   | Description                                                                                                             |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <code>destination-ip &lt;IP-ADDR&gt;</code> | Captures packets sent to the specified IP address.                                                                      |
| <code>host-port &lt;PORT&gt;</code>         | Captures packets matching with the source or destination port.                                                          |
| <code>source-port &lt;PORT&gt;</code>       | Captures packets from the specified IP port.                                                                            |
| <code>destination-port &lt;PORT&gt;</code>  | Captures packets sent to the specified IP port.                                                                         |
| <code>verbosity &lt;LEVEL&gt;</code>        | Captures packets of the specified verbosity. Range: level1-level4. If no verbosity is specified, the default is level1. |
| <code>print &lt;DATA&gt;</code>             | Captures the data of each packet. The maximum is 262144 bytes                                                           |
| <code>ethernet-type &lt;ETH-NUM&gt;</code>  | Captures packets based on the particular ethernet type. Range: 0-65535.                                                 |

## Usage

- When using the `command` option, the only traffic captured will be packets that have been mirrored to the CPU.
- When using the `command` option, command line sanitization is performed to prevent options that may cause harm or security issues. The following options are blocked:
  - `-i/--interface`
  - `-Z`
  - `-B/--buffer-size`
  - `-C`
  - `-W`
  - `-Z/--relinquish-privileges`
- Non-word operators such as "&" or "|" are not allowed. Use boolean keywords such as "and," "or," and "not."
- When using `command -r` to read a file, do not provide any directory path characters. Use `list-files` command to get the list of file names currently saved on the device, and then use those file names.
- A total of four files can be saved at any given point on the device. Packet capture files are not saved after a failover or reboot, but can be saved to external storage using the `copy tcpdump-pcap` command.

## Examples

Inspecting traffic mirrored to the CPU via `tcpdump` and saving the output to `my_capture_file.pcap`:

```
switch# diag utilities tcpdump command -c 2 -x -w my_capture_file.pcap
Inspecting traffic mirrored to the CPU via tcpdump until Ctrl-C is entered.
2 packets captured
2 packets received by filter
0 packets dropped by kernel
Ending traffic capture.
```

Listing saved capture files:

```
switch# diag utilities tcpdump list-files
my_capture_file.pcap
```

Reading my\_capture\_file.pcap:

```
switch# diag utilities tcpdump command -r my_capture_file.pcap
reading from file /tmp/tcpdump/my_capture_file1.pcap, link-type EN10MB (Ethernet)
 1 11:59:34.047867 IP6 localhost.40318 > localhost.ntp: NTPv2, Reserved, length
12
    0x0000:  0000 0304 0006 0000 0000 0000 0000 0000  86dd .....
    0x0010:  600a 7e47 0014 1140 0000 0000 0000 0000  `~G...@.....
    0x0020:  0000 0000 0000 0001 0000 0000 0000 0000  .....
    0x0030:  0000 0000 0000 0001 9d7e 007b 0014 0027  .....~.{...!
    0x0040:  1601 0001 0000 0000 0000 0000  .....
 2 11:59:34.047915 IP6 localhost.ntp > localhost.40318: NTPv2, Reserved, length
12
    0x0000:  0000 0304 0006 0000 0000 0000 0000 0000  86dd .....
    0x0010:  6b8d 23c5 0014 1140 0000 0000 0000 0000  k.#....@.....
    0x0020:  0000 0000 0000 0001 0000 0000 0000 0000  .....
    0x0030:  0000 0000 0000 0001 007b 9d7e 0014 0027  .....{.~...!
    0x0040:  d681 0001 c016 0000 0000 0000  .....

```

Removing my\_capture\_file.pcap:

```
switch# diag utilities tcpdump delete-file my_capture_file.pcap
Successfully removed file
```

## Command History

| Release | Modification       |
|---------|--------------------|
| 10.08   | Command introduced |

## Command Information

| Platforms    | Command context | Authority                                                                          |
|--------------|-----------------|------------------------------------------------------------------------------------|
| 6300<br>6400 | Manager (#)     | Administrators or local user group members with execution rights for this command. |

## disable (mirror session)

disable

### Description

Disables the mirroring session specified by the current command context.

### Usage

By default, mirroring sessions are disabled.

When a mirroring session is disabled, the `show mirror` command for that session ID shows an Admin Status of `disable` and an Operation Status of `disabled`.

### Example

Disabling a mirroring session:

```
switch(config)# mirror session 3
switch(config-mirror-3)# disable
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context            | Authority                                                                          |
|---------------|----------------------------|------------------------------------------------------------------------------------|
| All platforms | config-mirror-<SESSION-ID> | Administrators or local user group members with execution rights for this command. |

## enable (mirror session)

enable

### Description

Enables the mirroring session for the current command context.

### Usage

By default, mirroring sessions are disabled.

When a mirroring session is enabled, the `show mirror` command for that session ID shows an `Admin Status of enable` and an `Operation Status of enabled`.

If sFlow is enabled on an interface and a mirroring session specifies the same interface as the source of received traffic (the source is configured with a direction of `rx` or `both`):

- The attempt to enable the mirroring session fails and an error is returned.



---

When adding, removing, or changing the configuration of a source interface in an enabled mirroring session, packets from other mirror sources using the same destination interface might be interrupted.

---

## Example

*On the 6400 Switch Series, interface identification differs.*

Configuring and enabling a mirroring session:

```
switch(config)# mirror session 3
switch(config-mirror-3)# source interface 1/1/2 rx
switch(config-mirror-3)# destination interface 1/1/3
switch(config-mirror-3)# comment Monitor router port ingress-only traffic
switch(config-mirror-3)# enable
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context            | Authority                                                                          |
|---------------|----------------------------|------------------------------------------------------------------------------------|
| All platforms | config-mirror-<SESSION-ID> | Administrators or local user group members with execution rights for this command. |

## mirror session

```
mirror session <SESSION-ID>
no mirror session <SESSION-ID>
```

### Description

Creates a mirroring session configuration context or enters an existing mirroring session configuration context.

From this context, you can enter commands to configure and enable or disable the mirroring session.

The `no` form of this command removes an existing mirroring session from the configuration.

| Parameter    | Description                                     |
|--------------|-------------------------------------------------|
| <SESSION-ID> | Specifies the session identifier. Range: 1 to 4 |

### Examples

```
switch(config)# mirror session 1
switch(config-mirror-1)#

switch(config)# mirror session 3
switch(config-mirror-3)#

switch(config)# no mirror session 1
switch(config)#
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context | Authority                                                                          |
|---------------|-----------------|------------------------------------------------------------------------------------|
| All platforms | config          | Administrators or local user group members with execution rights for this command. |

## show mirror

```
show mirror [<SESSION-ID>] [vsx-peer]
```

## Description

Shows information about mirroring sessions. If `<SESSION-ID>` is not specified, then the command shows a summary of all configured mirroring sessions. If `<SESSION-ID>` is specified, then the command shows detailed information about the specified mirroring session.

| Parameter                       | Description                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>&lt;SESSION-ID&gt;</code> | Specifies the session identifier. Range: 1 to 4                                                                                                                                                                                  |
| <code>vsx-peer</code>           | Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX. |

## Usage

Admin Status indicates the configured status. Admin Status is one of the following values:

`enable`

The mirroring session is enabled.

`disable`

The mirroring session has been configured but not yet enabled, or has been disabled.

Operation Status indicates the status of the mirroring session. Operation Status is one of the following values:

`dest_doesnt_exist`

The configured destination interface is not found in the system. The mirroring session cannot be enabled.

`destination_shutdown`

The mirroring session is enabled, but the destination interface is shut down. No traffic can be monitored.

`disabled`

The mirroring session is disabled and is not in an error condition.

`enabled`

The mirroring session is enabled.

`external/driver_error`

An internal ASIC hardware error occurred.

`hit_active_sessions_capacity`

The mirroring session could not be enabled because the maximum number of supported mirroring sessions are already enabled.

`internal_error`

An invalid parameter was passed to the ASIC software layer.

`no_dest_configured`

The mirroring session does not have a destination interface configured.

`no_name_configured`

A software error occurred. The mirroring session does not have a session ID in its configuration.

`null_mirror`

A software error occurred. The session object reference is invalid.

`out_of_memory`

The system is out of memory, reboot recommended.

`tunnel_route_resolution_not_populated`

If the destination tunnel IP address is not reachable.

`unknown_error`

An unexpected error occurred.

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing summary information about all configured mirroring sessions:

```
switch# show mirror
ID Admin Status Operation Status
-----
1 enable enabled
2 disable disabled
3 disable disabled
4 enable internal_error
```

Showing detailed information about a single mirroring session:

```
switch# show mirror 3
Mirror Session: 3
Admin Status: disable
Operation Status: disabled
Comment: Monitor router port ingress-only traffic
Source: interface 1/1/2 rx
Destination: interface 1/1/3
Output Packets: 0
Output Bytes: 0
switch#
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context             | Authority                                                                                                                                                              |
|---------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All platforms | Operator (>) or Manager (#) | Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only. |

## source interface

```
source interface {<PORT-NUM> | <LAG-NAME>} [<DIRECTION>]
no source interface {<PORT-NUM> | <LAG-NAME>} [<DIRECTION>]
```

### Description

Configures the specified interface (either an Ethernet port or a LAG) as a source of traffic to be mirrored. The `no` form of this command ceases mirroring traffic from the specified source interface and removes the source interface from the mirroring session configuration.

| Parameter   | Description                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------------------|
| <PORT-NUM>  | Specifies a physical port on the switch. Use the format <code>member/slot/port</code> (for example, <code>1/3/1</code> ). |
| <LAG-NAME>  | Specifies the identifier for the LAG (link aggregation group).                                                            |
| <DIRECTION> | Selects the direction of traffic to be mirrored from this source                                                          |

| Parameter | Description                                                                        |
|-----------|------------------------------------------------------------------------------------|
|           | interface. There is no default for this parameter. Valid values are the following: |
| both      | Mirror both transmitted and received packets.                                      |
| rx        | Mirror only received packets.                                                      |
| tx        | Mirror only transmitted packets.                                                   |

## Usage

There is a limit of source interfaces in each direction of a given mirror session:

| Switch | Source interface limit |
|--------|------------------------|
| 6300   | 64                     |
| 6400   | 64                     |

However, there is a practical limit to the amount of traffic that a mirror destination can transmit. For example, mirroring session with multiple 10G sources can overwhelm a single 10G destination.



When adding, removing, or changing the configuration of a source port in an enabled mirroring session, packets from other mirror sources using the same destination port might be interrupted.

## Examples

Configuring a mirrored traffic source interface:

```
switch(config-mirror-1) # source interface
LAG-NAME      Enter a LAG name. For example, lag10
PORT-NUM      Enter a port number
```

Creating a mirroring session and configuring a source interface to mirror both transmitted and received packets:

```
switch(config) # mirror session 1
switch(config-mirror-1) # source interface 1/1/1 both
```

Creating a second mirroring session and configuring two source interfaces. One port mirroring only transmitted packets and the other mirroring both transmitted and received packets:

```
switch(config) # mirror session 2
switch(config-mirror-2) # source interface 1/1/3 tx
switch(config-mirror-2) # source interface 1/2/1 both
```

Removing the first source interface:

```
switch(config-mirror-2) # no source interface 1/2/3
```

Configuring a source interface to mirror received packets only:

```
switch(config-mirror-3)# source interface 1/1/2 rx
```

Configuring a source interface to mirror both transmitted and received packets:

```
switch(config-mirror-1)# source interface 1/1/1 both
```

Configuring a LAG as source interface to mirror both transmitted and received packets:

```
switch(config-mirror-4)# source interface lag1 both
```

Stopping the mirroring of received packets from a configured source interface:

```
switch(config-mirror-4)# no source interface lag1 rx
```

## Command History

| Release          | Modification |
|------------------|--------------|
| 10.07 or earlier | --           |

## Command Information

| Platforms     | Command context                          | Authority                                                                          |
|---------------|------------------------------------------|------------------------------------------------------------------------------------|
| All platforms | config-mirror- <i>&lt;SESSION-ID&gt;</i> | Administrators or local user group members with execution rights for this command. |

## source vlan

### Syntax

```
source vlan <VLAN-NUM> {rx | tx | both}  
no source vlan <VLAN-NUM> [rx | tx | both]
```

### Description

Adds or removes VLAN as a source of traffic to be mirrored. More than one source VLAN can be configured in a mirror session. Each VLAN may specify its own direction.

The `no` version of the command ceases mirroring traffic from the specified source VLAN and removes the source from the mirror configuration.

There is a limit of 1024 source VLANs in each direction of a given mirror session. The same VLAN can be configured as a mirror source for multiple sessions.

### Command context

```
config
```

### Parameters

```
<VLAN-NUM>
```



Configured VLAN number.

rx

Mirror only received traffic.

tx

Mirror only transmitted traffic.

both

Mirror both received and transmitted traffic.

## Authority

Administrators or local user group members with execution rights for this command.

## Example

Create a mirror session and add VLAN 10 as a source of traffic in both directions on that port.

```
switch(config)# mirror session 1  
switch(config-mirror-1)# source vlan 10 both
```

Create a second mirror session and add VLAN 10 as a transmit sources of traffic and VLAN 20 in both receive and transmit directions.

```
switch(config)# mirror session 2  
switch(config-mirror-2)# source vlan 10 tx  
switch(config-mirror-2)# source vlan 20 both
```

Reconfigure the source in session 2 to be receive only by respecifying the source interface configuration.

```
switch(config-mirror-2)# source vlan 10 rx
```

From the second session, remove the first source interface entirely and remove the transmit direction from the other so that mirroring only occurs in the receive direction.

```
switch(config-mirror-2)# no source vlan 10  
switch(config-mirror-2)# no source vlan 20 tx
```

Message received when trying to add more than 1024 mirror source VLANs

```
switch(config-mirror-2)# source vlan 2000 rx  
The maximum number of source VLANs per mirror session is 1024 in each direction
```

**Configuring SNMP:** Refer to the *SNMP/MIB Guide* for information on how to add SNMP so a device can be monitored from a network management system (NMS).

**Configuring an SNMP trap receiver:** Refer to the *SNMP/MIB Guide* and specific information about the `show snmp trap` command to enable SNMP traps.

- The Power-over-Ethernet (PoE) subsystem manages power supplied to devices using standard Ethernet data cables. A Power Sourcing Equipment (PSE) supplies DC power as well as Ethernet connectivity to a Powered Device (PD) using a standard Ethernet cable. The maximum current depends on the PD Requested Class.
- A PoE subsystem contains two parts : a PSE and PD. A Power Sourcing Equipment (PSE) is a device that provides power through a standard Ethernet cable. A PoE capable switch functions as PSE. All Aruba PoE switches are considered as PSEs. A PD is a device powered by a PSE. Examples of PD are VoIP phones, Wireless APs, and IP cameras.
- When a PD or any network cable is connected to a PSE port, the PSE applies a detection voltage and measures the resistance value of the PD. If resistance is within IEEE 802.3 standard values (23 - 26k ohm), the connected device is treated as PD and classification begins. For legacy devices to be detected, you must enable prestandard detection on the switch.
- PDs are divided into different types and classes based on PD power requirements. The power supplied by the PSE is higher than the power PD draws to accommodate for the line losses that can result with the use of the standard maximum length cable(100m).
  - Type 1: PSE can supply maximum of 15.4W, and PD can draw a maximum of 13W.
  - Type 2: PSE can supply maximum of 30W, and PD can draw a maximum of 25.5W.
  - Type 3: PSE can supply maximum of 60W, and PD can draw a maximum of 51W.
  - Type 4: PSE can supply maximum of 90W, and PD can draw a maximum of 71W.
- Classes of PD:
  - Class 0: Type1 PD, it can draw a maximum of 13W.
  - Class 1: Type1 PD, it can draw a maximum of 3.84W.
  - Class 2: Type1 PD, it can draw a maximum of 6.49W.
  - Class 3: Type1 PD, it can draw a maximum of 13W.
  - Class 4: Type2 PD, it can draw a maximum of 25.5W.
  - Class 5: Type3 PD, it can draw a maximum of 40W.
  - Class 6: Type3 PD, it can draw a maximum of 51W.
  - Class 7: Type4 PD, it can draw a maximum of 62W.
  - Class 8: Type4 PD, it can draw a maximum of 71.3W.
- IEEE 802.3bt introduced 4-Pair PoE as a means of supplying higher power to PDs that need more than the current 25.5W supplied by IEEE 802.3at. To increase the available power without damaging the Ethernet cable, the standard introduced the ability to use all four pairs within the Ethernet cable instead of the two pairs used by previous standards (802.3at, 802.3af).
- Supported protocols:
  - Compatibility with IEEE 802.3af, 802.3at, 802.3bt and prestandard.
  - Long first class event supported on Type 3-4 PSE.
  - Support for Single Signature (SS) Type 0-6 and Dual Signature (DS) Type 0-4 PDs.
  - Multi-Event classification permits mutual ID of SS Class 0-6 and DS Class 0-4.

- Support LLDP Data Link Layer (DLL) Type 1-2 extension 12-octet TLV and Type 3-4 extension 29-octet TLV.
- Default PSE assigned class delivers the maximum PSE capable power at initial power up based on PD requested class.
- Always-on PoE is a feature that provides the ability for a switch to continue to provide power across user initiated reboots through software. Always-on PoE is enabled by default and no additional configuration is needed.




---

PDs only remain powered, no data transfer or PoE power negotiation can occur until the switch has completely booted up and in normal operation. PD faults occurring prior to full switch boot up will result in PoE power removal and restart the detection process only after switch returns to normal operation.

---

## PoE commands

All PoE configuration commands except `threshold` configuration and `always-on poe` configuration are entered at the `config-if` context. The PoE threshold command is used at the system level whereas the `always-on poe` and `power-over-ethernet quick-poe` commands are set at the slot level. These commands can only be configured in the global configuration context.

### lldp dot3 poe

```
lldp dot3 poe
no lldp dot3 poe
```

#### Description

Enables 802.3 TLV list in LLDP to advertise for Power over Ethernet Data Link Layer Classification. LLDP dot3 TLV is by default enabled for PoE.

The `no` form of this command disables 802.3 TLV list in LLDP.

#### Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling 802.3 TLV list in LLDP:

```
switch(config)# interface 1/1/1
switch(config-if)# lldp dot3 poe
```

Disabling 802.3 TLV list in LLDP:

```
switch(config-if)# no lldp dot3 poe
```

#### Command History

Release	Modification
10.07 or earlier	--

#### Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## lldp med poe

```
lldp med poe [priority-override]
no lldp med poe [priority-override]
```

### Description

Enables MED TLV list in LLDP to advertise for Power over Ethernet Data Link Layer Classification. Also enables the lldp-MED TLV priority to override user configured port priority for Power over Ethernet. When both dot3 and MED are enabled, dot 3 will take precedence. MED TLV is by default enabled for PoE. Priority over-ride is by default disabled.

The `no` form of this command disables MED TLV list in LLDP.

Parameter	Description
[priority-override]	System defined name of the interface.

### Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling and disabling LLDP MED PoE:

```
switch(config)# interface 1/1/1
switch(config-if)# lldp med poe
switch(config-if)# no lldp med poe
```

Enabling and disabling LLDP MED PoE priority override:

```
switch(config-if)# lldp med poe priority-override
```

### Command History

Release	Modification
10.07 or earlier	--

### Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## power-over-ethernet

```
power-over-ethernet
no power-over-ethernet
```

## Description

Enables per-interface power distribution. Per-port power is enabled by default with priority low. PoE cannot be disabled for individual ports when Quick PoE is enabled for the entire switch or line module. The `no` form of this command disables per-interface power distribution.

## Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling per-interface power distribution:

```
switch(config)# interface 1/1/1  
switch(config-if)# power-over-ethernet
```

Disabling per-interface power distribution:

```
switch(config-if)# no power-over-ethernet
```

Showing Quick PoE enabled:

```
switch(config-if)# power-over-ethernet quick-poe 1/1  
switch(config-if)# interface 1/1/1  
switch(config-if)# no power-over-ethernet  
Interface PoE cannot be disabled when Quick PoE is enabled.
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## power-over-ethernet allocate-by

```
power-over-ethernet allocate-by {usage | class}  
no power-over-ethernet allocate-by {usage | class}
```

## Description

Configures the power allocation method. Power allocation method is initially based on usage. PSE Allocated power value will change to LLDP negotiated power if and when LLDP exchange takes place between PSE and PD. When there is no LLDP negotiation, PSE Allocated Power Value will be the actual instantaneous power draw and reserve power based on actual consumption. In allocate-by class, power allocation is based on PD requested class and PSE allocated power value will be the LLDP negotiated power when LLDP exchange takes place between PSE and PD. When there is no LLDP negotiation, PSE

Allocate Power will be based on PD class. Reserve power is based on PD Class. By default, power allocation is by usage.

The `no` form of this command resets the action to default.

## Examples

*On the 6400 Switch Series, interface identification differs.*

Configuring the power allocation method:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet allocate-by usage
switch(config-if)# power-over-ethernet allocate-by class
```

Resetting power allocation method:

```
switch(config-if)# no power-over-ethernet allocate-by class
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## power-over-ethernet always-on

```
power-over-ethernet always-on <MODULE-ID>
no power-over-ethernet always-on <MODULE-ID>
```

### Description

Always-on PoE is a feature that provides the ability to the switch to continue to provide power across a soft reboot. It is applicable only to the interfaces which were connected and delivering before the soft reboot. Also, power will not be delivered if power to the switch is interrupted. This command enables or disables the always-on PoE feature at the switch or the slot level. By default, always-on PoE is enabled at the switch or the slot level.

The `no` form of this command disables power distribution on soft reboot.

Parameter	Description
<MODULE-ID>	Module number to apply always-on PoE configuration.

## Examples

Enabling per-interface power distribution:

```
switch(config) # power-over-ethernet always-on 1/1
```

Disabling per-interface power distribution:

```
switch(config) # no power-over-ethernet always-on 1/1
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

## power-over-ethernet assigned-class

```
power-over-ethernet assigned-class {3 | 4 | 6}  
no power-over-ethernet assigned-class
```

### Description

Limit PoE power based on the assigned class. When an user assigns a maximum class to an interface, the PSE will limit the maximum power delivered to the PD up to a total power draw not exceeding the PSE assigned-class power. Power demotion occurs when a PD requested class is higher than the PSE assigned class, permitting the PD to receive power and operate in a reduced power mode. PoE ports cannot set an assigned class when Quick PoE is enabled on the subsystem. The default assigned class is 4 for 2-pair capable PSE and 6 for 4-pair capable PSE.

The `no` form of this command resets the action to default.

### Examples

*On the 6400 Switch Series, interface identification differs.*

Setting PoE assigned class:

```
switch(config) # interface 1/1/1  
switch(config-if) # power-over-ethernet assigned-class 4
```

Resetting PoE assigned class to default:

```
switch(config-if) # no power-over-ethernet assigned-class 4
```

Showing Quick PoE enabled:



```

switch(config)# power-over-ethernet quick-poe 1/1
switch(config)# interface 1/1/1
switch(config)# power-over-ethernet assigned-class 4
Interface assigned class cannot be configured when Quick PoE is enabled.

```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## power-over-ethernet power-pairs

```

power-over-ethernet power-pairs {alt-a | alt-a-and-alt-b}
no power-over-ethernet power-pairs {alt-a | alt-a-and-alt-b}

```

### Description

Configures the four-pair capable switch to operate in a mode, that restricts the power delivery for class 0 to class 4 single signature devices to operate only on ALT-A power pair.



When configured, a warning message is displayed. User must accept the warning by entering `Y` to enable the mode.

The `no` form of this command resets the power pairs to default PoE pairs.

Parameter	Description
alt-a	Delivers power only on the ALT-A pair.
alt-a-and-alt-b	Delivers power on the ALT-A and ALT-B pairs. This is the default configuration on all PoE interfaces.

### Usage

IEEE 802.3bt devices such as four-pair (class 5 and higher) and dual signature powered devices require power on both pairs. However, there is no such restriction on IEEE 802.3af (class 0 to class 3) and IEEE 802.3at (class 4) powered devices not to draw power on both pairs if the overall consumption does not violate the power class limit. For such powered devices, a `power-pairs` configuration is provided to configure the 4-pair capable switch to restrict power on only one power pair.

### Examples

Configuring PoE power pairs:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet power-pairs alt-a
```

This setting configures the interface to deliver power only on the ALT-A cable pair when a Class 0-4 device is connected. Devices that require power on all pairs may not operate correctly.

Continue (y/n)? y

Resetting the PoE power pair to default:

```
switch(config-if)# no power-over-ethernet power-pairs alt-a
```

This setting configures the interface to deliver power on the ALT-A and ALT-B cable pairs. This is the default and most devices work properly with this setting, however some older Class 0-4 devices may not operate correctly.

Continue (y/n)? y

## Command History

Release	Modification
10.09	Command Introduced

## Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## power-over-ethernet pre-std-detect

```
power-over-ethernet pre-std-detect
no power-over-ethernet pre-std-detect
```

### Description

Before IEEE 802.3 released the first Power over Ethernet standard (802.3af), vendors had shipped PoE capable switches and PD's. As we are backward compatible Aruba will support both IEEE standard and pre-standard 802.3af Power over Ethernet PD's concurrently. This CLI allows the user to enable or disable pre-802.3af-standard device detection and powering on the specific port. When pre-std-detect is enabled, power will be delivered on PairA only. Default is disabled.

The `no` form of this command resets the action to default.

### Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling standard device detection:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet pre-std-detect
```

Disabling standard device detection:

```
switch(config-if)# no power-over-ethernet pre-std-detect
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## power-over-ethernet priority

```
power-over-ethernet priority {critical | high | low}
no power-over-ethernet priority {critical | high | low}
```

### Description

Sets PoE priority for an interface. Specifying critical, high, or low indicates the priority of the interface in the event of power over-subscription. Within the same priority level, higher power-priority line-module ports have higher precedence. With same PoE priority and same line-module priority, lower numbered line-module ports have higher precedence. Per-interface PoE priority is low by default.

The `no` form of this command resets the priority to default PoE priority "low".

### Examples

Configuring PoE priority:

```
switch(config)# interface 1/1/1
switch(config-if)# power-over-ethernet priority critical
switch(config-if)# power-over-ethernet priority high
```

Resetting the PoE priority to default:

```
switch(config-if)# no power-over-ethernet priority high
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## power-over-ethernet quick-poe

```
power-over-ethernet quick-poe <MODULE-ID>  
no power-over-ethernet
```

### Description

Quick PoE is a feature that provides the ability for the switch to provide power to the connected powered device as soon as switch goes through cold reboot. When quick PoE is enabled on the subsystem PoE port disablement and PD demotion is not allowed. also quick PoE enablement is not allowed if any of the port is disabled on the subsystem. User should not over-subscribe the PoE power when quick PoE is enabled. Quick PoE saved configuration will work irrespective of the configuration change at reboot.

Enables quick PoE feature on the switch or the subsystem level. By default, quick-PoE is disabled for the subsystem.

The `no` form of this command disables quick PoE.

Parameter	Description
<MODULE-ID>	Specifies module number for quick PoE configuration .

### Examples

*On the 6400 Switch Series, interface identification differs.*

Enabling and disabling quick PoE:

```
switch(config)# power-over-ethernet quick-poe 1/2  
switch(config)# no power-over-ethernet quick-poe 1/2
```

```
switch(config-if)# power-over-ethernet quick-poe 1/1  
PoE must be enabled on all interfaces before enabling Quick PoE
```

```
switch(config-if)# power-over-ethernet quick-poe 1/3  
All interfaces must use the default assigned class before enabling Quick PoE
```

### Command History

Release	Modification
10.07 or earlier	--

### Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## power-over-ethernet threshold

```
power-over-ethernet threshold <PERCENTAGE>
no power-over-ethernet threshold <PERCENTAGE>
```

### Description

Sets the threshold at which the system will send an excess power consumption notification trap. Default value is 80 percentage.

The `no` form of this command resets the action to default.

Parameter	Description
<PERCENTAGE>	Excess power consumption trap threshold. Range 1-99.

### Examples

Setting the power-over-ethernet threshold:

```
switch(config)# power-over-ethernet threshold 75
```

Resetting the power-over-ethernet threshold to default:

```
switch(config-if)# no power-over-ethernet threshold 75
```

### Command History

Release	Modification
10.07 or earlier	--

### Command Information

Platforms	Command context	Authority
6300 6400	config	Administrators or local user group members with execution rights for this command.

## power-over-ethernet trap

```
power-over-ethernet trap
no power-over-ethernet trap
```

### Description

This command enables/disables the SNMP trap generation for PoE related events at system level. PoE trap generation is enabled by default.

The `no` form of this command resets the priority to default PoE priority "low".

## Examples

Enabling SNMP trap generation for PoE:

```
switch(config)# power-over-ethernet trap
```

Disabling SNMP trap generation for PoE:

```
switch(config-if)# no power-over-ethernet trap
```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	config-if	Administrators or local user group members with execution rights for this command.

## show lldp local

```
show lldp local-device [<INTERFACE-ID>]
```

### Description

Displays information advertised by the switch if the LLDP feature is enabled by user.

Parameter	Description
<INTERFACE-ID>	Specifies an interface. Format: member/slot/port

## Examples

*On the 6400 Switch Series, interface identification differs.*

Showing LLDP local device:

```
switch# show lldp local-device 1/1/10
Local Port Data
=====
Port-ID           : 1/1/10
Port-Desc         : "1/1/10"
Port VLAN ID     : 0

PoE Plus Information

PoE Device Type   : Type 2 PSE
```

```

Power Source      : Primary
Power Priority    : low
PSE Allocated Power: 25.0 W
PD Requested Power : 25.0 W

```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

## show lldp neighbor

```
show lldp neighbor [<INTERFACE-ID>]
```

### Description

Displays detailed information about a particular neighbor connected to a particular interface.

Parameter	Description
<INTERFACE-ID>	Specifies an interface. Format: member/slot/port

### Examples

*On the 6400 Switch Series, interface identification differs.*

Showing LLDP neighbor information when there is only one neighbor:

```

switch# show lldp neighbor-info 1/1/10

Port                : 1/1/10
Neighbor Entries    : 1
Neighbor Entries Deleted : 0
Neighbor Entries Dropped : 0
Neighbor Entries Aged-Out : 0
Neighbor Chassis-Name : 84:d4:7e:ce:5d:68
Neighbor Chassis-Description : ArubaOS (MODEL: 325), Version Aruba IAP
Neighbor Chassis-ID : 84:d4:7e:ce:5d:68
Neighbor Management-Address : 169.254.41.250
Chassis Capabilities Available : Bridge, WLAN
Chassis Capabilities Enabled :
Neighbor Port-ID    : 84:d4:7e:ce:5d:68
Neighbor Port-Desc  : eth0
TTL                 : 120
Neighbor Port VLAN ID :
Neighbor PoEplus information : DOT3
Neighbor Device Type : TYPE2 PD

```

```

Neighbor Power Priority      : Unkown
Neighbor Power Source       : Primary
Neighbor Power Requested    : 25.0 W
Neighbor Power Allocated    : 0.0 W
Neighbor Power Supported    : No
Neighbor Power Enabled      : No
Neighbor Power Class        : 5
Neighbor Power Paircontrol   : No
Neighbor Power Pairs        : SIGNAL

```

## Command History

Release	Modification
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

## show power-over-ethernet

6300 Switch Series:

```
show power-over-ethernet [member <MEMBER-ID>] [brief]
```

6400 Switch Series:

```
show power-over-ethernet [<MODULE-ID>] [brief]
```

6300, 6400 Switch Series:

```
show power-over-ethernet [<IFRANGE>] [brief]
```

## Description

Displays the status information of the full system. Displays the brief status of all port or given port if parameter brief is used. Displays the detailed status of given port.

Parameter	Description
<MODULE-ID>	Displays detailed status for the given module.
<IFRANGE>	Port identifier range.
<IFNAME>	Display the detailed status of given port.
brief	Display the brief status of all ports or the given port.

## Examples

Showing sample output for show power-over-ethernet on standalone box with VSF capability:



```
switch# show power-over-ethernet

System Power Status for member 1

Configured Power Status      : No redundancy
Operational Power Status     : No redundancy
Total Available Power        : 740 W
Total Failover Pwr Avl      : 0 W
Total Redundancy Power       : 0 W
Total Power Drawn            : 0 W +/- 6W
Total Power Reserved         : 0 W
Total Remaining Power        : 740 W
Trap Threshold                : 80 %
Trap Enabled                  : Yes
Always-on PoE Enabled        : 1/1
Quick PoE Enabled            : None
```

```
Internal Power
  Total Power
  PS      (Watts)      Status
  -----
  1       0            Absent
  2       740          Ok
```

```
System Power Status for member 2

Configured Power Status      : No redundancy
Operational Power Status     : No redundancy
Total Available Power        : 600 W
Total Failover Pwr Avl      : 0 W
Total Redundancy Power       : 0 W
Total Power Drawn            : 0 W +/- 6W
Total Power Reserved         : 0 W
Total Remaining Power        : 600 W
Trap Threshold                : 80 %
Trap Enabled                  : Yes
Always-on PoE Enabled        : None
Quick PoE Enabled            : None
```

```
Internal Power
  Total Power
  PS      (Watts)      Status
  -----
  1       0            Absent
  2       600          Ok
```

Showing sample output for power-over-ethernet member:

```
switch# show power-over-ethernet member 1

System Power Status for member 1

Configured Power Status      : No redundancy
Operational Power Status     : No redundancy
Total Available Power        : 740 W
Total Failover Pwr Avl      : 0 W
Total Redundancy Power       : 0 W
Total Power Drawn            : 0 W +/- 6W
Total Power Reserved         : 0 W
```

```

Total Remaining Power      : 740 W
Trap Threshold             : 80 %
Trap Enabled               : No
Always-on PoE Enabled     : 1/1
Quick PoE Enabled         : 1/1

```

Internal Power

```

      Total Power
PS      (Watts)      Status
-----
1        0            Absent
2       740           Ok

```

Showing sample output for power-over-ethernet brief in a VSF stack:

```
switch# show power-over-ethernet brief
```

Status and Configuration Information for PoE

Member 1 Power Status

```

Available: 370 W Reserved: 55.60 W Remaining: 314.40 W
Always-on PoE Enabled: 1/1
Quick PoE Enabled: None

```

PoE Port	Pwr En	Power Priority	Pre-std Detect	Alloc Act	PSE Pwr Rsrvd	PD Pwr Draw	PoE Port Status	PD Sign	Cls	Type
1/1/1	Yes	Low	Off	Class	0.0 W	0.0 W	Denied	None	4	2
1/1/2	Yes	Critical	Off	Usage	1.6 W	1.5 W	Delivering*	Single	0	1
1/1/3	Yes	High	Off	Class	54.0 W	25.5 W	Delivering**^	Dual	1/3	3
1/1/4	No	Low	On	Usage	0.0 W	0.0 W	Disabled	None	N/A	N/A

Member 2 Power Status

```

Available: 600 W Reserved: 0.00 W Remaining: 600 W
Always-on PoE Enabled: None
Quick PoE Enabled: None

```

PoE Port	Pwr En	Power Priority	Pre-std Detect	Alloc Act	PSE Pwr Rsrvd	PD Pwr Draw	PoE Port Status	PD Sign	Cls	Type
2/1/1	Yes	Low	Off	Class	0.0 W	0.0 W	Searching	None	N/A	N/A
2/1/2	Yes	Critical	Off	Usage	0.0 W	0.0 W	Searching	None	N/A	N/A
2/1/3	Yes	High	Off	Class	0.0 W	0.0 W	Searching	None	N/A	N/A
2/1/4	No	Low	On	Usage	0.0 W	0.0 W	Disabled	None	N/A	N/A

\*This port may go down in the event of a PSU failure.

^This port is power demoted due to user config or power availabilty.

Showing sample output for power-over-ethernet brief for a Chassis system:

```
switch# show power-over-ethernet brief
```

Status and Configuration Information for PoE

Power Status

```

Available: 370 W Reserved: 55.60 W Remaining: 314.40 W
Always-on PoE Enabled: 1/1,1/3,1/4,1/7
Quick PoE Enabled: None

```

PoE Port	Pwr En	Power Priority	Pre-std Detect	Alloc Act	PSE Pwr Rsrvd	PD Pwr Draw	PoE Port Status	PD Sign	Cls	Type
1/1/1	Yes	Low	Off	Class	0.0 W	0.0 W	Denied	None	4	2
1/1/2	Yes	Critical	Off	Usage	1.6 W	1.5 W	Delivering*	Single	0	1
1/1/3	Yes	High	Off	Class	54.0 W	25.5 W	Delivering^	Dual	1/3	3
1/1/4	No	Low	On	Usage	0.0 W	0.0 W	Disabled	None	N/A	N/A

\*This port may go down in the event of a PSU failure.

^This port is power demoted due to user config or power availability.

Showing sample output for power-over-ethernet brief per-port:

```
switch# show power-over-ethernet 1/1/1 brief
```

Status and Configuration Information for port 1/1/1

Member 1Power Status

Available: 370 W Reserved: 55.60 W Remaining: 314.40 W

Always-on PoE Enabled: 1/1

PoE Port	Pwr En	Power Priority	Pre-std Detect	Alloc Act	PSE Pwr Rsrvd	PD Pwr Draw	PoE Port Status	PD Sign	Cls	Type
1/1/1	Yes	Low	Off	Class	0.0 W	0.0 W	Denied	None	4	2

Showing sample output for power-over-ethernet brief for interface range:

For 6300 Switch series:

```
switch# show power-over-ethernet 1/1/1-1/1/2 brief
```

Status and Configuration Information for port 1/1/1-1/1/2

Member 1Power Status

Available: 370 W Reserved: 55.60 W Remaining: 314.40 W

Always-on PoE Enabled: 1/1

Quick PoE Enabled: None

PoE Port	Pwr En	Power Priority	Pre-std Detect	Alloc Act	PSE Pwr Rsrvd	PD Pwr Draw	PoE Port Status	PD Sign	Cls	Type
1/1/1	Yes	Low	Off	Class	0.0 W	0.0 W	Denied	None	4	2
1/1/2	Yes	Critical	Off	Usage	1.6 W	1.5 W	Delivering*	Single	0	1

For 6400 Switch series:

```
switch# show power-over-ethernet 1/1/1-1/1/2 brief
```

Status and Configuration Information for port 1/1/1-1/1/2

Power Status

Available: 360 W Reserved: 0.00 W Remaining: 360.00 W

Always-on PoE Enabled: 1/1

Quick PoE Enabled: None

PoE Port	Pwr En	Power Priority	Pre-std Detect	Alloc Act	PSE Pwr Rsrvd	PD Pwr Draw	PoE Port Status	PD Sign	Cls	Type
1/1/1	Yes	Low	Off	Usage	0.0 W	0.0 W	Searching	N/A	N/A	N/A
1/1/2	Yes	Low	Off	Usage	0.6 W	0.0 W	Searching	N/A	N/A	N/A

Showing sample output for power-over-ethernet for a missing line card:

```
switch# show power-over-ethernet 1/3 brief  
Module 1/3 is not physically present.
```

Showing sample output for power-over-ethernet brief for a missing member:

```
switch# show power-over-ethernet member 3 brief  
Member 3 is not physically present.
```

Showing sample output for power-over-ethernet port when physical interface is not present:

```
switch# show power-over-ethernet 2/1/1  
Interface 2/1/1 is not present.
```

Showing power-over-ethernet port with dual signature PD connected:

```
switch# show power-over-ethernet 1/1/1  
  
Status and Configuration Information for port 1/1/1*  
  
Power Enable           : Yes           PD signature           : Dual  
PoE PairA Status      : Delivering  PoE PairB Status      : Delivering  
Alloc-by Configured   : Class       Alloc-by Actual        : Class  
User Profile Priority  : High        Port Config Priority    : Low  
Port Priority          : High        Pre-std Detect         : Disabled  
PD Type               : Type3       User Assigned Class    : Class6  
PairA Requested Class : Class1     PairB Requested Class  : Class4  
PairA Assigned Class  : Class1     PairB Assigned Class   : Class4  
Fault Status PairA    : None        Fault Status PairB     : None  
PD Class Override     : Disabled   Power Pairs Configured : alt-a  
Power Pairs Applied   : alt-a-and-  
  
alt-b  
  
PoE Counter Information  
  
Over Current Cnt PairA : 0           MPS Absent Cnt PairA   : 0  
Power Denied Cnt PairA : 0           Short Cnt PairA        : 0  
Over Current Cnt PairB : 0           MPS Absent Cnt PairB   : 0  
Power Denied Cnt PairB : 0           Short Cnt PairB        : 0  
  
Power Information  
  
PSE Voltage           : 56.3 V       PSE Reserved power     : 34.0 W  
PD Current Draw       : 4.1 A        PD Power Draw          : 24.6 W  
PD Average Power Draw : 24.0 W       PD Peak Power Draw     : 25.1 W  
  
LLDP Information  
  
MED Override          : Enabled  
MED Priority           : High  
PSE TLV Configured   : dot3, med
```

```

PSE TLV Sent Type           : dot3-ext
PD TLV Sent Type           : med, dot3-ext
DS PSE Allocated Power Value Alt A : 2.5 W
DS PD Requested Power Value Mode A : 2.5 W
DS PSE Allocated Power Value Alt B : 25.0 W
DS PD Requested Power Value Mode B : 25.0 W

```

Showing power-over-ethernet port with single signature PD connected:

```
switch# show power-over-ethernet 1/1/1
```

Status and Configuration Information for port 1/1/9\*

```

Power Enable           : Yes           PD signature           : None
PoE Port Status       : Delivering     PD Type                : Type3
Alloc-by Configured   : Usage          Alloc-by Actual        : Usage
User Profile Priority  : High           Port Config Priority    : Low
Port Priority          : High           Pre-std Detect         : Disabled
PD Requested Class    : Class1         PSE Assigned Class     : Class1
Fault Status          : None           User set Assigned Class : Class6
PD Class Override     : Disabled       Power Pairs Configured : alt-a-and-alt-
b
Power Pairs Applied   : alt-a-and-alt-
b

```

PoE Counter Information

```

Over Current Cnt      : 0             MPS Absent Cnt         : 0
Power Denied Cnt     : 0             Short Cnt              : 0

```

Power Information

```

PSE Voltage           : 56.3 V         PSE Reserved power    : 8.6 W
PD Current Draw       : 1.1 A          PD Power Draw         : 8.6 W
PD Average Power Draw : 8.0 W          PD Peak Power Draw    : 9.1 W

```

LLDP Information

```

LLDP Detect           : Disabled
PSE TLV Configured   : N/A
PSE TLV Sent Type    : N/A
PD TLV Sent Type     : N/A
PSE Allocated Power Value : 0.0 W
PD Requested Power Value : 0.0 W

```

Showing power-over-ethernet for a port range:

```
switch# show power-over-ethernet 1/1/3-1/1/4
```

Status and Configuration Information for port 1/1/3

```

Power Enable           : Yes           PD signature           : None
PoE Port Status       : Delivering     PD Type                : Type3
Alloc-by Config       : Usage          Alloc-by Actual        : Usage
User Profile Priority  : High           Port Config Priority    : Low
Port Priority          : High           Pre-std Detect         : Disabled
PD Requested Class    : Class1         PSE Assigned Class     : Class1

```

```

Fault Status           : None
PD Class Override     : Disabled
User set Assigned Class : Class6
Power Pairs Configured : alt-a-and-alt-
b
Power Pairs Applied    : alt-a-and-alt-
b

```

PoE Counter Information

```

Over Current Cnt      : 0
Power Denied Cnt     : 0
MPS Absent Cnt       : 0
Short Cnt             : 0

```

Power Information

```

PSE Voltage           : 56.3 V
PD Current Draw       : 1.1 A
PD Average Power Draw : 8.0 W
PSE Reserved power    : 8.6 W
PD Power Draw         : 8.6 W
PD Peak Power Draw    : 9.1 W

```

LLDP Information

```

LLDP Detect           : Disabled
PSE TLV Configured   : N/A
PSE TLV Sent Type    : N/A
PD TLV Sent Type     : N/A
PSE Allocated Power Value : 0.0 W
PD Requested Power Value : 0.0 W

```

Status and Configuration Information for port 1/1/4\*

```

Power Enable          : Yes
PoE Port Status      : Delivering
Alloc-by Config       : Usage
User Profile Priority : High
Port Priority         : High
PD Requested Class   : Class1
Fault Status         : None
PD Class Override     : Disabled
PD signature          : None
PD Type              : Type3
Alloc-by Actual       : Usage
Port Config Priority  : Low
Pre-std Detect        : Disabled
PSE Assigned Class   : Class1
User set Assigned Class : Class6
Power Pairs Configured : alt-a
Power Pairs Applied   : alt-a

```

PoE Counter Information

```

Over Current Cnt      : 0
Power Denied Cnt     : 0
MPS Absent Cnt       : 0
Short Cnt             : 0

```

Power Information

```

PSE Voltage           : 56.3 V
PD Current Draw       : 1.1 A
PD Average Power Draw : 4.0 W
PSE Reserved power    : 4.3 W
PD Power Draw         : 4.3 W
PD Peak Power Draw    : 4.3 W

```

LLDP Information

```

LLDP Detect           : Disabled
PSE TLV Configured   : N/A
PSE TLV Sent Type    : N/A
PD TLV Sent Type     : N/A
PSE Allocated Power Value : 0.0 W
PD Requested Power Value : 0.0 W

```

## Command History

Release	Modification
10.09	Added power-pairs configuration in the <code>show power-over-ethernet &lt;IFRANGE&gt;</code> output.
10.07 or earlier	--

## Command Information

Platforms	Command context	Authority
6300 6400	Operator (>) or Manager (#)	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

You can manage and monitor the AOS-CX switch through Aruba AirWave. The following benefits and functions include:

- Configuration (partial configuration)
- Device topology
- Immediate and historical trend reports
- Monitoring of the device and user connected to the network.
- Network discovery
- Syslogs and trap receiver

For information about which versions of Aruba AirWave support AOS-CX, see the *AOS-CX Release Notes*.

## SNMP support and AirWave

For AirWave to discover and monitor the switch, you must:

- Enable the SNMP services on the switch.
- Configure the SNMP agent to use the SNMP version supported by the management station.

### SNMP on the switch

The switch provides SNMP services through the management channel and the data interfaces. Functionality, such as device discovery from NMS, syslog and trap forwarding, can be any channel configured by you.

Although the SNMP server can be enabled on both VRFs (`mgmt` and `default`), only one instance of SNMP can be running. The highest priority is on the `default` VRF.

For example, assume that SNMP is first enabled on the `mgmt` VRF (`snmp-server vrf mgmt`). Then, SNMP is enabled on the `default` VRF (`snmp-server vrf default`) without disabling SNMP on the `mgmt` (using an equivalent `no` form of the command). The `show running-config` command displays both `snmp-server vrf` commands; however, the SNMP instance is running only on the `default` VRF (highest priority).

```
switch# config
switch(config)# snmp-server vrf mgmt
switch(config)# snmp-server vrf default
switch(config)# show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.01.
led locator on
!
!
!
snmp-server vrf default
snmp-server vrf mgmt
```



!  
...

## Supported features with AirWave and the AOS-CX switch

AirWave supports the following features with the AOS-CX switch:

Device management	Device discovery using SNMPv2C and SNMPv3
	Device dashboards
Monitoring management	Device health attributes (device status/reachability)
	Interface and VLAN management
	Initiates an SSH connection from Aruba AirWave to AOS-CX so that the device outputs from the AOS-CX CLI can be displayed in the Aruba AirWave user interface.
	Firmware versions
	Displays neighbor devices connected to AOS-CX switches
	Device topology
Configuration management	Partial configuration
Alarm management	Alarm triggers (device and interface up/down, new device discoveries, custom event triggers)
	Syslogs and traps
Report management	Device inventory, interface utilization, and device reachability reports
	Summary report of device model, firmware, and boot loader version

## Configuring the AOS-CX switch to be monitored by AirWave

### Prerequisites

Aruba AirWave is active on the network.

### Procedure

1. Enable SNMP on the switch by entering the `snmp-server vrf mgmt` command.

```
switch(config)# snmp-server vrf mgmt  
switch(config)# snmp-server vrf default
```

2. Configure the SNMPv2C community to public by entering the `snmp-server community public` command. In this instance, `public` is a read-only community string.

```
switch(config)# snmp-server community public
```

3. The community-string is used by SNMPv1 and SNMPv2C for unencrypted authentication. SNMPv3 lets you encrypt the authentication mechanism. To enable SNMPv3, enter the `snmpv3 user` and `snmpv3 context` commands.

```
switch(config)# snmpv3 user Admin auth sha auth-pass ciphertext
AQBapZHf2d20GYr/xcGUzYzm0zjNf/4VKHtSqbNImqtfYbJYCgAAALkGFJVcSp3nZ3o=
priv des priv-pass ciphertext
AQBapb0H2poBQKXPoVsC9L9qzZyfJQnzR7hmTr7LGsOsI7K3CgAAAKP98Rq2jfTrFwQ=
switch(config)# snmpv3 context Admin
```

For discovering devices in AirWave through the SNMPv3 community, the SNMPv3 context name is not mandatory. Devices can still be discovered in Aruba AirWave without the SNMPv3 context name.

4. Enter the `logging` command for enabling syslog forwarding to a remote syslog server, such as AirWave:

```
switch(config)# logging 10.0.10.2 severity debug
```

5. SNMP traps enable an agent to notify the management station of significant events by way of an unsolicited SNMP message. Enable SNMP traps by entering the `snmp-server host` command:

```
switch(config)# snmp-server host 10.10.10.10 trap version v2c vrf default
```

SNMP traps cannot be forwarded from AOS-CX 10.00 switches that have the VRF configured as `mgmt`. Later versions of AOS-CX support SNMP trap forwarding even when the VRF is configured as `default` or `mgmt`.

6. For information on how to add a device for monitoring in the Aruba AirWave user interface, see the documentation for Aruba AirWave.

### Accessing Aruba Support

Aruba Support Services	<a href="https://www.arubanetworks.com/support-services/">https://www.arubanetworks.com/support-services/</a>
Aruba Support Portal	<a href="https://asp.arubanetworks.com/">https://asp.arubanetworks.com/</a>
North America telephone	1-800-943-4526 (US & Canada Toll-Free Number) +1-408-754-1200 (Primary - Toll Number) +1-650-385-6582 (Backup - Toll Number - Use only when all other numbers are not working)
International telephone	<a href="https://www.arubanetworks.com/support-services/contact-support/">https://www.arubanetworks.com/support-services/contact-support/</a>

Be sure to collect the following information before contacting Support:

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

#### Other useful sites

Other websites that can be used to find information:

Airheads social forums and Knowledge Base	<a href="https://community.arubanetworks.com/">https://community.arubanetworks.com/</a>
AOS-CX Switch Software Documentation Portal	<a href="https://www.arubanetworks.com/techdocs/AOS-CX/help_portal/Content/home.htm">https://www.arubanetworks.com/techdocs/AOS-CX/help_portal/Content/home.htm</a>
Aruba Hardware Documentation and Translations Portal	<a href="https://www.arubanetworks.com/techdocs/hardware/DocumentationPortal/Content/home.htm">https://www.arubanetworks.com/techdocs/hardware/DocumentationPortal/Content/home.htm</a>

Aruba software	<a href="https://asp.arubanetworks.com/downloads">https://asp.arubanetworks.com/downloads</a>
Software licensing	<a href="https://lms.arubanetworks.com/">https://lms.arubanetworks.com/</a>
End-of-Life information	<a href="https://www.arubanetworks.com/support-services/end-of-life/">https://www.arubanetworks.com/support-services/end-of-life/</a>
Aruba Developer Hub	<a href="https://developer.arubanetworks.com/">https://developer.arubanetworks.com/</a>

## Accessing Updates

You can access updates from the Aruba Support Portal or the HPE My Networking Website.

### Aruba Support Portal

<https://asp.arubanetworks.com/downloads>

If you are unable to find your product in the Aruba Support Portal, you may need to search My Networking, where older networking products can be found:

### My Networking

<https://www.hpe.com/networking/support>

To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:

<https://support.hpe.com/portal/site/hpsc/aae/home/>

Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

To subscribe to eNewsletters and alerts:

<https://asp.arubanetworks.com/notifications/subscriptions> (requires an active Aruba Support Portal (ASP) account to manage subscriptions). Security notices are viewable without an ASP account.

## Warranty Information

To view warranty information for your product, go to <https://www.arubanetworks.com/support-services/product-warranties/>.

## Regulatory Information

To view the regulatory information for your product, view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at <https://www.hpe.com/support/Safety-Compliance-EnterpriseProducts>

### Additional regulatory information

Aruba is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements, environmental data (company programs,

product recycling, energy efficiency), and safety information and compliance data, (RoHS and WEEE). For more information, see <https://www.arubanetworks.com/company/about-us/environmental-citizenship/>.

## Documentation Feedback

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