

AOS-CX 10.14.xxxx Fundamentals Guide

6200 Switch Series



Hewlett Packard
Enterprise

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About this document

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:

- HPE Aruba Networking 6200 Switch Series (JL724A, JL725A, JL726A, JL727A, JL728A, R8Q67A, R8Q68A, R8Q69A, R8Q70A, R8Q71A, R8V08A, R8V09A, R8V10A, R8V11A, R8V12A, R8Q72A, JL724B, JL725B, JL726B, JL727B, JL728B, S0M81A, S0M82A, S0M83A, S0M84A, S0M85A, S0M86A, S0M87A, S0M88A, S0M89A, S0M90A, S0G13A, S0G14A, S0G15A, S0G16A, S0G17A)

Latest version available online

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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 ([]).
example-text	In code and screen examples, indicates text entered by a user.
Any of the following: <ul style="list-style-type: none">■ <code><example-text></code>■ <code><example-text></code>■ <i>example-text</i>■ <i>example-text</i>	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">■ For output formats where italic text cannot be displayed, variables are enclosed in angle brackets (<code>< ></code>). Substitute the text—including the enclosing angle brackets—with an actual value.■ 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.
	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"> ■ In code and screen examples, a vertical or horizontal ellipsis indicates an omission of information. ■ 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.

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 Aruba 6200 Switch Series

- *member*: Member number of the switch in a Virtual Switching Framework (VSF) stack. Range: 1 to 8. 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 in slot 1 on member 1.

About AOS-CX

AOS-CX is a new, modern, fully programmable operating system built using a database-centric design that ensures higher availability and dynamic software process changes for reduced downtime. In addition to robust hardware reliability, the AOS-CX operating system includes additional software elements not available with traditional systems, including:

- Automated visibility to help IT organizations scale: The Aruba Network Analytics Engine allows IT to monitor and troubleshoot network, system, application, and security-related issues easily through simple scripts. This engine comes with a built-in time series database that enables customers and developers to create software modules that allow historical troubleshooting, as well as analysis of historical trends to predict and avoid future problems due to scale, security, and performance bottlenecks.
- Programmability simplified: A switch that is running the AOS-CX operating system is fully programmable with a built-in Python interpreter as well as REST-based APIs, allowing easy integration with other devices both on premise and in the cloud. This programmability accelerates IT organization understanding of and response to network issues. The database holds all aspects of the configuration, statistics, and status information in a highly structured and fully defined form.
- Faster resolution with network insights: With legacy switches, IT organizations must troubleshoot problems after the fact, using traditional tools like CLI and SNMP, augmented by separate, expensive monitoring, analytics, and troubleshooting solutions. These capabilities are built in to the AOS-CX operating system and are extensible.
- High availability: For switches that support active and standby management modules, the AOS-CX database can synchronize data between active and standby modules and maintain current configuration and state information during a failover to the standby management module.
- Ease of roll-back to previous configurations: The built-in database acts as a network record, enabling support for multiple configuration checkpoints and the ability to roll back to a previous configuration checkpoint.

AOS-CX system databases

The AOS-CX operating system is a modular, database-centric operating system. Every aspect of the switch configuration and state information is modeled in the AOS-CX switch configuration and state database, including the following:

- Configuration information
- Status of all features
- Statistics

The AOS-CX operating system also includes a time series database, which acts as a built-in network record. The time series database makes the data seamlessly available to Aruba Network Analytics Engine agents that use rules that evaluate network conditions over time. Time-series data about the resources monitored by agents are automatically collected and presented in graphs in the switch Web UI.

Aruba Network Analytics Engine introduction

The Aruba Network Analytics Engine is a first-of-its-kind built-in framework for network assurance and remediation. Combining the full automation and deep visibility capabilities of the AOS-CX operating system, this unique framework enables monitoring, collecting network data, evaluating conditions, and taking corrective actions through simple scripting agents.

This engine is integrated with the AOS-CX system configuration and time series databases, enabling you to examine historical trends and predict future problems due to scale, security, and performance bottlenecks. With that information, you can create software modules that automatically detect such issues and take appropriate actions.

With the faster network insights and automation provided by the Aruba Network Analytics Engine, you can reduce the time spent on manual tasks and address current and future demands driven by Mobility and IoT.

AOS-CX CLI

The AOS-CX CLI is an industry standard text-based command-line interface with hierarchical structure designed to reduce training time and increase productivity in multivendor installations.

The CLI gives you access to the full set of commands for the switch while providing the same password protection that is used in the Web UI. You can use the CLI to configure, manage, and monitor devices running the AOS-CX operating system.

Aruba CX mobile app

The Aruba CX mobile app enables you to use a mobile device to configure or access a supported AOS-CX switch. You can connect to the switch through Bluetooth or Wi-Fi.

You can use this application to do the following:

- Connect to the switch for the first time and configure basic operational settings—all without requiring you to connect a terminal emulator to the console port.
- View and change the configuration of individual switch features or settings.
- Manage the running configuration and startup configuration of the switch, including the following:
 - Transferring files between the switch and your mobile device
 - Sharing configuration files from your mobile device
 - Copying the running configuration to the startup configuration
- Access the switch CLI.

For more information about the Aruba CX mobile app, see:

www.arubanetworks.com/products/networking/switches/cx-mobileapp.

Aruba NetEdit

Aruba NetEdit enables the automation of multidevice configuration change workflows without the overhead of programming.

The key capabilities of NetEdit include the following:

- Intelligent configuration with validation for consistency and compliance
- Time savings by simultaneously viewing and editing multiple configurations

- Customized validation tests for corporate compliance and network design
- Automated large-scale configuration deployment without programming
- Ability to track changes to hardware, software, and configurations (whether made through NetEdit or directly on the switch) with automated versioning

For more information about Aruba NetEdit, search for NetEdit at the following website:

www.hpe.com/support/hpesc

Ansible modules

Ansible is an open-source IT automation platform.

Aruba publishes a set of Ansible configuration management modules designed for switches running AOS-CX software. The modules are available from the following places:

- The `arubanetworks.aoscx_role` role in the Ansible Galaxy at: https://galaxy.ansible.com/arubanetworks/aoscx_role
- The `aoscx-ansible-role` at the following GitHub repository: <https://github.com/aruba/aoscx-ansible-role>

AOS-CX Web UI

The Web UI gives you quick and easy visibility into what is happening on your switch, providing faster problem detection, diagnosis, and resolution. The Web UI provides dashboards and views to monitor the status of the switch, including easy to read indicators for: power supply, temperature, fans, CPU use, memory use, log entries, system information, firmware, interfaces, VLANs, and LAGs. In addition, you use the Web UI to access the Network Analytics Engine, run certain diagnostics, and modify some aspects of the switch configuration.

AOS-CX REST API

Switches running the AOS-CX software are fully programmable with a REST (REpresentational State Transfer) API, allowing easy integration with other devices both on premises and in the cloud. This programmability—combined with the Aruba Network Analytics Engine—accelerates network administrator understanding of and response to network issues.

The AOS-CX REST API enables programmatic access to the AOS-CX configuration and state database at the heart of the switch. By using a structured model, changes to the content and formatting of the CLI output do not affect the programs you write. And because the configuration is stored in a structured database instead of a text file, rolling back changes is easier than ever, thus dramatically reducing a risk of downtime and performance issues.

The AOS-CX REST API is a web service that performs operations on switch resources using HTTPS `POST`, `GET`, `PUT`, and `DELETE` methods.

A switch resource is indicated by its Uniform Resource Identifier (URI). A URI can be made up of several components, including the host name or IP address, port number, the path, and an optional query string. The AOS-CX operating system includes the AOS-CX REST API Reference, which is a web interface based on the Swagger UI. The AOS-CX REST API Reference provides the reference documentation for the REST API, including resources URIs, models, methods, and errors. The AOS-CX REST API Reference shows most of the supported read and write methods for all switch resources.

In-band and out-of-band management

Management communications with a managed switch can be either of the following:

In band

In-band management communications occur through ports on the line modules of the switch, using common communications protocols such as SSH and SNMP.

When you use an in-band management connection, management traffic from that connection uses the same network infrastructure as user data. User data uses the `data plane`, which is responsible for moving data from source to destination. Management traffic that uses the data plane is more likely to be affected by traffic congestion and other issues affecting the user network.

Out of band

OOBM (out-of-band management) communications occur through a dedicated serial or USB console port or through a dedicated networked management port.

OOBM operates on a `management plane` that is separate from the `data plane` used by data traffic on the switch and by in-band management traffic. That separation means that OOBM can continue to function even during periods of traffic congestion, equipment malfunction, or attacks on the network. In addition, it can provide improved switch security: a properly configured switch can limit management access to the management port only, preventing malicious attempts to gain access through the data ports.

Networked OOBM typically occurs on a management network that connects multiple switches. It has the added advantage that it can be done from a central location and does not require an individual physical cable from the management station to the console port of each switch.

SNMP-based management support

The AOS-CX operating system provides SNMP read access to the switch. SNMP support includes support of industry-standard MIB (Management Information Base) plus private extensions, including SNMP events, alarms, history, statistics groups, and a private alarm extension group. SNMP access is disabled by default.

User accounts

To view or change configuration settings on the switch, users must log in with a valid account. Authentication of user accounts can be performed locally on the switch, or by using the services of an external TACACS+ or RADIUS server.

Two types of user accounts are supported:

- Operators: Operators can view configuration settings, but cannot change them. No operator accounts are created by default.
- Administrators: Administrators can view and change configuration settings. A default locally stored administrator account is created with username set to **admin** and no password. You set the administrator account password as part of the initial configuration procedure for the switch.

Initial Configuration

Perform the initial configuration of a factory default switch using one of the following methods:

- Load a switch configuration using zero-touch provisioning (ZTP). When ZTP is used, the configuration is loaded from a server automatically when the switch booted from the factory default configuration.
- Connect to the switch wirelessly with a mobile device through Bluetooth, and use the Aruba CX Mobile App to deploy an initial configuration from a provided template. The template you choose during the deployment process determines how the management interface is configured. Optionally, as the final deployment step, you can select to import the switch into NetEdit through a WiFi connection to the NetEdit server.

Alternatively, you can use the Aruba CX Mobile App to manually configure switch settings and features for a subset of the features you can configure using the CLI. You can also access the CLI through the mobile application.

- Connect the management port on the switch to your network, and then use SSH client software to reach the switch from a computer connected to the same network. This requires that a DHCP server is installed on the network. Configure switch settings and features by executing CLI commands.
- Connect a computer running terminal emulation software to the console port on the switch. Configure switch settings and features by executing CLI commands.



Reserved ports or ports used by other applications/services within the system are not recommended to be used for other services. When two services use the same port there is a chance of unexpected behaviors from these services. Best practice is to use a unique port for each service across the system.

Initial configuration using ZTP

Zero Touch Provisioning (ZTP) configures a switch automatically from a remote server.

Prerequisites

- The switch must be in the factory default configuration.

Do not change the configuration of the switch from its factory default configuration in any way, including by setting the administrator password.

- Your network administrator or installation site coordinator must provide a Category 6 (Cat6) cable connected to the network that provides access to the servers used for Zero Touch Provisioning (ZTP) operations.

Procedure

1. Connect the network to a data port.
See the *Installation Guide* for switch to determine the location of the switch ports.
2. If the switch is powered on, power off the switch.

3. Power on the switch. During the ZTP operation, the switch might reboot if a new firmware image is being installed. ZTP goes to "Failed" state if the switch receives DHCP IP for vlan1 and does not receive any ZTP options within 60 seconds.

Initial configuration using the Aruba CX mobile app

This procedure describes how to use your mobile device to connect to the Bluetooth interface of the switch to connect to the switch for the first time so that you can configure basic operational settings using the Aruba CX mobile app.

Prerequisites

- You have obtained the USB Bluetooth adapter that was shipped with the switch. Information about the make and model of the supported adapter is included in the information about the Aruba CX mobile app in the Apple Store or Google Play.
- The Aruba CX mobile app must be installed on your mobile device.
- Bluetooth must be enabled on your mobile device.
- Your mobile device must be within the communication range of the Bluetooth adapter.
- If you are planning to import the switch into NetEdit, your mobile device must be able to use a Wi-Fi connection—not Bluetooth—to access the NetEdit server.

If your mobile device does not support simultaneous Bluetooth and Wi-Fi connections, you must use the NetEdit interface to import the switch at a later time. You can use the **Devices** tab to display the IP address of the switches you configured using your mobile device.

- The switch must be installed and powered on, with the network operating system boot sequence complete.

For information about installing and powering on the switch, see the *Installation Guide* for the switch.

Because you are using this mobile application to configure the switch through the Bluetooth interface, it is not necessary to connect a console to the switch.

- Bluetooth and USB must be enabled on the switch. On switches shipped from the factory, Bluetooth and USB are enabled by default.

Procedure

1. Install the USB Bluetooth adapter in the USB port of the switch.

For switches that have multiple management modules, you must install the USB Bluetooth adapter in the USB port of the active management module. Typically, the active management module is the module in slot 5.

Switches shipped from the factory have both USB and Bluetooth enabled by default.

For information about the location of the USB port on the switch, see the *Installation Guide* for the switch.

2. Use the Bluetooth settings on your mobile device to pair and connect the switch to your mobile device.

If you are in range of multiple Bluetooth devices, more than one device is displayed on the list of available devices. Switches running the AOS-CX operating system are displayed in the following format:

Switch_model - Serial_number

For example: 8325-987654X1234567 or 8320-AB12CDE123

A switch supports one active Bluetooth connection at a time.

On some Android devices, you might need to change the settings of the paired device to specify that it be used for Internet access.

3. Open the Aruba CX mobile app on your mobile device.



Bluetooth is connected but the switch is not reachable

Symptom

The mobile device settings indicate that the device is connected to the switch through Bluetooth. However, the mobile application indicates that the switch is not reachable.

Solution 1

Cause

The mobile device is paired with a different nearby switch.

Action

1. Verify the model number and serial number of the switch to which you are attempting to connect.
2. Use the Bluetooth settings on your mobile device to pair and connect the switch to your mobile device.

If you are in range of multiple Bluetooth devices, more than one device is displayed on the list of available devices. Switches running the AOS-CX operating system are displayed in the following format:

Switch_model-Serial_number

For example: 8325-987654X1234567 or 8320-AB12CDE123

A switch supports one active Bluetooth connection at a time.

On some Android devices, you might need to change the settings of the paired device to specify that it be used for Internet access.

Solution 2

Cause

The mobile device is connected to a different network—such as through a Wi-Fi connection—that conflicts with the subnet used for the switch Bluetooth connection.

Action

Disconnect the mobile device from the network that is using the conflicting subnet.

For example, use the mobile device settings to turn off or disable Wi-Fi. If you choose to disable Wi-Fi on the mobile device, and you are not able to access cellular service, you will not be able to connect to the NetEdit server to import the switch, but you can still deploy a switch configuration.

Bluetooth is not connected

Symptom

Your mobile device cannot establish a Bluetooth connection to the switch.

Solution 1

Cause

Bluetooth is not enabled on your mobile device.

Action

- Use your mobile device settings application to enable Bluetooth.
- Use the Bluetooth settings on your mobile device to pair and connect the switch to your mobile device.

If you are in range of multiple Bluetooth devices, more than one device is displayed on the list of available devices. Switches running the AOS-CX operating system are displayed in the following format:

Switch_model-Serial_number

For example: 8325-987654X1234567 or 8320-AB12CDE123

A switch supports one active Bluetooth connection at a time.

On some Android devices, you might need to change the settings of the paired device to specify that it be used for Internet access.

Solution 2

Cause

Your mobile device is not within the broadcast range of the Bluetooth adapter.

Action

Move closer to the switch.

Devices can communicate through Bluetooth when they are close, typically within a few feet of each other.

Solution 3

Cause

Your mobile device is not paired with the switch.

Action

1. Use your mobile device settings application to enable Bluetooth.
2. Use the Bluetooth settings on your mobile device to pair and connect the switch to your mobile device.

If you are in range of multiple Bluetooth devices, more than one device is displayed on the list of available devices. Switches running the AOS-CX operating system are displayed in the following format:

Switch_model-Serial_number

For example: 8325-987654X1234567 or 8320-AB12CDE123

A switch supports one active Bluetooth connection at a time.

3. On some Android devices, you might need to change the settings of the paired device to specify that it be used for Internet access.

Solution 4

Cause

Bluetooth is not enabled on the switch.

New switches are shipped from the factory with the USB port and Bluetooth enabled. However, an installed switch might have been configured to disable Bluetooth or disable the USB port, which the USB Bluetooth adapter uses.

Action

Use a different CLI connection to enable Bluetooth on the switch.

- Use the `show bluetooth` CLI command to show the Bluetooth configuration and the status of the Bluetooth adapter.
- To enable the USB port, enter the CLI command: `usb`

- An inserted USB drive must be mounted each time the switch boots or fails over to a different management module. To mount the drive, enter the CLI command: `usb mount`
- To enable Bluetooth, enter the CLI command: `bluetooth enable`

Solution 5

Cause

Another mobile device has already connected to the switch through Bluetooth. This cause is likely if your device is repeatedly disconnected within 1-2 seconds of establishing a connection.

Action

1. Use a different CLI connection to see if there is another device connected:
Use the `show bluetooth` CLI command to show the Bluetooth configuration and the status of the Bluetooth adapter.
2. Either disconnect the other device or use that device to communicate with the switch.
A switch can use Bluetooth to connect to one mobile device at a time.

Solution 6

Cause

The switch has been restarted since the mobile device was last paired with the switch, and the device is having difficulty establishing the Bluetooth connection.

Action

1. Use the Bluetooth mobile device settings to forget the switch device.
2. Use your mobile device settings application to disable Bluetooth.
Use your mobile device settings application to enable Bluetooth.
If you are in range of multiple Bluetooth devices, more than one device is displayed on the list of available devices. Switches running the AOS-CX operating system are displayed in the following format:
Switch_model-Serial_number
For example: 8325-987654X1234567 or 8320-AB12CDE123
A switch supports one active Bluetooth connection at a time.
On some Android devices, you might need to change the settings of the paired device to specify that it be used for Internet access.

Solution 7

Cause

The USB Bluetooth adapter is not installed in the switch.

If the switch has multiple management modules, the USB Bluetooth adapter might be installed in the management module that is not the active management module.

Action

Install the USB Bluetooth adapter in the USB port of the switch.

For switches that have multiple management modules, you must install the USB Bluetooth adapter in the USB port of the active management module. Typically, for new switches, the active management module is the module in slot 5 (Aruba 8400 switches) or slot 1 (Aruba 6400 switches).

For information about the location of the USB port on the switch, see the *Installation Guide* for the switch.

Solution 8

Cause

A problem occurred with the Bluetooth feature on the switch. For example, the software daemon was stopped and then restarted.

Action

1. Use a different connection to the switch CLI to disable and then enable Bluetooth.

```
switch(config)# bluetooth disable  
switch(config)# bluetooth enable
```

2. Use the Bluetooth mobile device settings to forget the switch device.
3. Use your mobile device settings application to disable Bluetooth.
4. Use your mobile device settings application to enable Bluetooth.
5. Use your mobile device settings application to enable Bluetooth.

If you are in range of multiple Bluetooth devices, more than one device is displayed on the list of available devices. Switches running the AOS-CX operating system are displayed in the following format:

Switch_model-Serial_number

For example: 8325-987654X1234567 or 8320-AB12CDE123

A switch supports one active Bluetooth connection at a time.

On some Android devices, you might need to change the settings of the paired device to specify that it be used for Internet access.

Solution 9

Cause

A switch that is member of a stack (but is not the conductor switch), has a USB Bluetooth adapter installed, but mobile application has lost contact with that switch.

Action

Remove and then reinstall the USB Bluetooth adapter.

Do not remove the USB Bluetooth adapter from the conductor switch.

Initial configuration using the CLI

This procedure describes how to connect to the switch for the first time and configure basic operational settings using the CLI. In this procedure, you use a computer to connect to the switch using the either the console port or management port.

Procedure

1. Connect to the [console port](#) or the [management port](#).
2. [Log into the switch for the first time](#).
3. [Configure switch time using the NTP client](#).

Connecting to the console port

Prerequisites

- A switch installed as described in its hardware installation guide.
- A computer with terminal emulation software.

Procedure

1. Connect the USB-C port on the switch to the USB-C port on the computer using a USB-C cable.
2. Start the terminal emulation software on the computer and configure a new serial session with the following settings:
 - Speed: 115200 bps
 - Data bits: 8
 - Stop bits: 1
 - Parity: None
 - Flow control: None
3. Start the terminal emulation session.
4. Press **Enter** once. If the connection is successful, you are prompted to login.

Optional console port speed setting

If desired, the console port speed can be set with the `console baud-rate` command. For example, setting the console port speed to 9600 bps:

```
switch(config)# console baud-rate 9600  
This command will configure the baud rate immediately for the active serial  
console session. After the command is executed the user will be prompted to  
re-login. The serial console will be inaccessible until the terminal client  
settings are updated to match the baud rate of the switch.  
Continue (y/n)? y
```

Showing the console port current speed:

```
switch# show console  
Baud Rate: 9600
```

For details on the `console baud-rate` and `show console` commands, see [Switch system and hardware commands](#).

Connecting to the management port

Prerequisites

- Two Ethernet cables
- SSH client software

Procedure

1. By default, the management interface is set to automatically obtain an IP address from a DHCP server, and SSH support is enabled. If there is no DHCP server on your network, you must configure a static address on the management interface:
 - a. Connect to the [console port](#)
 - b. Configure the [management interface](#).

2. Use an Ethernet cable to connect the management port to your network.
3. Use an Ethernet cable to connect your computer to the same network.
4. Start your SSH client software and configure a new session using the address assigned to the management interface. (If the management interface is set to operate as a DHCP client, retrieve the IP address assigned to the management interface from your DHCP server.)
5. Start the session. If the connection is successful, you are prompted to log in.

Configure using DHCP or static IP



Users can use any data ports for in-band management purposes. IP DHCP is supported on interface VLAN 1 only. All switch ports are part of access VLAN 1 by default. Static IP address and IP DHCP configuration can co-exist on VLAN 1, however static addresses take precedence whenever configured.

DHCP Configuration

```
switch#: config
switch(config)#: vlan 1
Switch(config-vlan-1)#: description Management VLAN
Switch(config-vlan-1)#: end
Switch#
!
Switch(config)#: interface 1/1/1
Switch(config-if)#: description IN-BAND Management Port
Switch(config-if)#: vlan access 1
Switch(config-if)#: no shutdown
Switch(config-if)#: end
Switch#
!
Switch(config)#: interface vlan 1
Switch(config-if-vlan)#: description IN-BAND Management Interface
Switch(config-if-vlan)#: ip dhcp
Switch(config-if-vlan)#: no shutdown
Switch(config-if-vlan)#: end
Switch#
!
```

Without DHCP Configuration

```
switch#: config
switch(config)#: vlan 1
Switch(config-vlan-1)#: description Management VLAN
Switch(config-vlan-1)#: end
Switch#
!
Switch(config)#: interface 1/1/1
Switch(config-if)#: description IN-BAND Management Port
Switch(config-if)#: vlan access 1
Switch(config-if)#: no shutdown
Switch(config-if)#: end
Switch#
!
Switch(config)#: interface vlan 1
Switch(config-if-vlan)#: description IN-BAND Management Interface
Switch(config-if-vlan)#: no ip dhcp
Switch(config-if-vlan)#: ip address 192.168.10.1/24
Switch(config-if-vlan)#: no shutdown
```

```
Switch(config-if-vlan)#: end
Switch#
```

Logging into the switch for the first time

The first time you log in to the switch you must use the default administrator account. This account has no password, so you will be prompted on login to define one to safeguard the switch.

Procedure

1. When prompted to log in, specify **admin**. When prompted for the password, press **ENTER**. (By default, no password is defined.)

For example:

```
switch login: admin
password:
```

2. Define a password for the **admin** account. The password can contain up to 32 alphanumeric characters in the range ASCII 32 to 127, which includes special characters such as asterisk (*), ampersand (&), exclamation point (!), dash (-), underscore (_), and question mark (?).

For example:

```
Please configure the 'admin' user account password.
Enter new password: *****
Confirm new password: *****
switch#
```

3. You are placed into the manager command context, which is identified by the prompt: `switch#`, where `switch` is the model number of the switch. Enter the command `config` to change to the global configuration context `config`.

For example:

```
switch# config
switch(config)#
```

Setting switch time using the NTP client

Prerequisites

- The IP address or domain name of an NTP server.
- If the NTP server uses authentication, obtain the password required to communicate with the NTP server.

Procedure

1. If the NTP server requires authentication, define the authentication key for the NTP client with the command `ntp authentication`.
2. Configure an NTP server with the command `ntp server`.

3. By default, NTP traffic is sent on the default VRF. If you want to send NTP traffic on the management VRF, use the command `ntp vrf`.
4. Review your NTP configuration settings with the commands `show ntp servers` and `show ntp status`.
5. See the current switch time, date, and time zone with the command `show clock`.

Example

This example creates the following configuration:

- Defines the authentication key **1** with the password **myPassword**.
- Defines the NTP server **my-ntp.mydomain.com** and makes it the preferred server.
- Sets the switch to use the management VRF (**mgmt**) for all NTP traffic.

```
switch(config)# ntp authentication-key 1 md5 myPassword
switch(config)# ntp server my-ntp.mydomain.com key 10 prefer
switch(config)# ntp vrf mgmt
```

Configuring banners

1. Configure the banner that is displayed when a user connects to a management interface. Use the command `banner motd`. For example:

```
switch(config)# banner motd ^
Enter a new banner. Terminate the banner with the delimiter you have chosen.
>> This is an example of a banner text which a connecting user
>> will see before they are prompted for their password.
>>
>> As you can see it may span multiple lines and the input
>> will be terminated when the delimiter character is
>> encountered.^
Banner updated successfully!
```

2. Configure the banner that is displayed after a user is authenticated. Use the command `banner exec`. For example:

```
switch(config)# banner exec &
Enter a new banner. Terminate the banner with the delimiter you have chosen.
>> This is an example of a different banner text. This time
>> the banner entered will be displayed after a user has
>> authenticated.
>>
>> & This text will not be included because it comes after the '&'
Banner updated successfully!
```

Using the Web UI

The Web UI is disabled by default. Follow these steps to enable it on the management port and log in. The Web UI is enabled by default on the default VRF.

Prerequisites

- A connection to the switch CLI.

Procedure

1. Log in to the CLI.
2. Switch to `config` context and enable the Web UI on the management port VRF with the command `https-server vrf mgmt`.

For example:

```
switch# config
switch(config)# https-server vrf mgmt
```

3. Start your web browser and enter the IP address of the management port in the address bar,
For example: **https://192.168.1.1**
4. The Web UI starts and you are prompted to log in.

Configuring the management interface

Prerequisites

A connection to the console port.

Procedure

1. Switch to the management interface context with the command `interface mgmt`.
2. By default, the management interface on the management port is enabled. If it was disabled, re-enable it with the command `no shutdown`.
3. Use the command `ip dhcp` to configure the management interface to automatically obtain an address from a DHCP server on the network (factory default setting). Or, assign a static IPv4 or IPv6 address, default gateway, and DNS server with the commands `ip address`, `ipv6 address`, `ip static`, `default-gateway`, and `nameserver`.
4. SSH is enabled by default on the management VRF. If disabled, enable SSH with the command `ssh server vrf mgmt`.

Examples

This example enables the management interface with dynamic addressing using DHCP:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# no shutdown
switch(config-if-mgmt)# ip dhcp
```

This example enables the management interface with static addressing creating the following configuration:

- Sets a static IPv4 address of **198.168.100.10** with a mask of **24** bits.
- Sets the default gateway to **198.168.100.200**.
- Sets the DNS server to **198.168.100.201**.

```
switch(config)# interface mgmt
switch(config-if-mgmt)# no shutdown
switch(config-if-mgmt)# ip static 198.168.100.10/24
switch(config-if-mgmt)# default-gateway 198.168.100.200
switch(config-if-mgmt)# nameserver 198.168.100.201
```

Restoring the switch to factory default settings

Prerequisites

You are connected to the switch through its Console port.



This procedure erases all user information and configuration settings. Consider backing up your running configuration first.

1. Optionally, back up the running configuration with either `copy running-config <REMOTE-URL>` or `copy running-config <STORAGE-URL>`. The `json` storage format is required for later configuration restoration.
2. Switch to the configuration context with the command `config`.
3. Erase all user information and configuration, restoring the switch to its factory default state with the command `erase all zeroize`. Enter `y` when prompted to continue. The switch automatically restarts.
4. Optionally restore your saved configuration (it must be in `json` format) with either `copy <REMOTE-URL> running-config` or `copy <STORAGE-URL> running-config` followed by `copy running-config startup-config`.

Example

Backing up the running configuration to a file on a remote server (using TFTP), resetting the switch to its factory default state, and then restoring the saved configuration.

```
switch# copy running-config tftp://192.168.1.10/backup_cfg json vrf mgmt

  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
  100 10340    0     0  100 10340      0  1329k  --:--:--  --:--:--  --:--:--  1329k
  100 10340    0     0  100 10340      0  1313k  --:--:--  --:--:--  --:--:--  1313k
switch#
switch#
switch# erase all zeroize
This will securely erase all customer data and reset the switch
to factory defaults. This will initiate a reboot and render the
switch unavailable until the zeroization is complete.
This should take several minutes to one hour to complete.
Continue (y/n)? y
The system is going down for zeroization.
[ OK ] Stopped PSPO Module Daemon.
[ OK ] Stopped AOS-CX Switch Daemon for BCM.
...
[ OK ] Stopped Remount Root and Kernel File Systems.
[ OK ] Reached target Shutdown.
reboot: Restarting system
Press Esc for boot options
ServiceOS Information:
```

```

Version:          GT.01.03.0006
Build Date:       2018-10-30 14:20:44 PDT
Build ID:         ServiceOS:GT.01.03.0006:8ee0faaa52da:201810301420
SHA:             xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
...

##### Preparing for zeroization #####

##### Storage zeroization #####
##### WARNING: DO NOT POWER OFF UNTIL #####
##### ZEROIZATION IS COMPLETE #####
##### This should take several minutes #####
##### to one hour to complete #####

##### Restoring files #####

Boot Profiles:

0. Service OS Console
1. Primary Software Image [XL.10.02.0010]
2. Secondary Software Image [XL.10.02.0010]

Select profile(primary):

Booting primary software image...
Verifying Image...

Image Info:
  Name: AOS-CX
  Version: XL.10.02.0010
  Build Id: AOS-CX:XL.10.02.0010:feaf5b9b7f09:201901292014
  Build Date: 2019-01-29 12:43:50 PST

Extracting Image...
Loading Image...
Done.
kexec_core: Starting new kernel
System is initializing
fips_post_check[5473]: FIPS_POST: Cryptographic selftest started...SUCCESS
[ OK ] Started Login banner readiness check.
...
8400X login: admin
Password:

switch#
switch#
switch# copy tftp://192.168.1.10/backup_cfg running-config json vrf mgmt
  % Total      % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left   Speed
100 10340  100 10340    0     0 2858k      0  --:--:-- --:--:-- --:--:-- 2858k
100 10340  100 10340    0     0 2804k      0  --:--:-- --:--:-- --:--:-- 2804k
Large configuration changes will take time to process, please be patient.
switch#
switch#
switch# copy running-config startup-config
Large configuration changes will take time to process, please be patient.
switch#

```

Management interface commands

default-gateway

```
default-gateway <IP-ADDR>
no default-gateway <IP-ADDR>
```

Description

Assigns an IPv4 or IPv6 default gateway to the management interface. An IPv4 default gateway can only be configured if a static IPv4 address was assigned to the management interface. An IPv6 default gateway can only be configured if a static IPv6 address was assigned to the management interface. The default gateway should be on the same network segment.

The **no** form of this command removes the default gateway from the management interface.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255, or IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F.

Examples

Setting a default gateway with the IPv4 address of **198.168.5.1**:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# default-gateway 198.168.5.1
```

Setting an IPv6 address of **2001:DB8::1**:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# default-gateway 2001:DB8::1
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if-mgmt	Administrators or local user group members with execution rights for this command.

ip static

```
ip static <IP-ADDR>/<MASK>
no ip static <IP-ADDR>/<MASK>
```

Description

Assigns an IPv4 or IPv6 address to the management interface.

The **no** form of this command removes the IP address from the management interface and sets the interface to operate as a DHCP client.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255, or IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F.
<MASK>	Specifies the number of bits in an IPv4 or IPv6 address mask in CIDR format (x), where x is a decimal number from 0 to 32 for IPv4, and 0 to 128 for IPv6.

Examples

Setting an IPv4 address of **198.51.100.1** with a mask of **24** bits:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# ip static 198.51.100.1/24
```

Setting an IPv6 address of **2001:DB8::1** with a mask of **32** bits:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# ip static 2001:DB8::1/32
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if-mgmt	Administrators or local user group members with execution rights for this command.

nameserver

```
nameserver <PRIMARY-IP-ADDR> [ <SECONDARY-IP-ADDR> ]
no nameserver <PRIMARY-IP-ADDR> [ <SECONDARY-IP-ADDR> ]
```

Description

Assigns a primary or secondary IPv4 or IPv6 DNS server to the management interface. IPv4 DNS servers can only be configured if a static IPv4 address was assigned to the management interface. IPv6 DNS servers can only be configured if a static IPv6 address was assigned to the management interface. The default gateway should be on the same network segment.

The **no** form of this command removes the DNS servers from the management interface.

Parameter	Description
<PRIMARY-IP-ADDR>	Specifies the IP address of the primary DNS server. Specify the address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255, or IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F.
<SECONDARY-IP-ADDR>	Specifies the IP address of the secondary DNS server. Specify the address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255, or IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F.

Examples

Setting primary and secondary DNS servers with the IPv4 addresses of **198.168.5.1** and **198.168.5.2** :

```
switch(config)# interface mgmt
switch(config-if-mgmt)# nameserver 198.168.5.1 198.168.5.2
```

Setting primary and secondary DNS servers with the IPv6 addresses of **2001:DB8::1** and **2001:DB8::2**:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# nameserver 2001:DB8::1 2001:DB8::2
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if-mgmt	Administrators or local user group members with execution rights for this command.

show interface mgmt

```
show interface mgmt
```

Description

Shows status and configuration information for the management interface.

Example

```
switch# show interface mgmt

Address Mode           : static
Admin State            : up
```

```
Mac Address           : 02:42:ac:11:00:02
IPv4 address/subnet-mask : 192.168.1.10/16
Default gateway IPv4    : 192.168.1.1
IPv6 address/prefix     : 2001:db8:0:1::129/64
IPv6 link local address/prefix: fe80::7272:cfff:fe8d:e485/64
Default gateway IPv6    : 2001:db8:0:1::1
Primary Nameserver      : 2001::1
Secondary Nameserver    : 2001::2
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	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.

NTP commands

ntp authentication

```
ntp authentication
no ntp authentication
```

Description

Enables support for authentication when communicating with an NTP server. The **no** form of this command disables authentication support.

Examples

Enabling authentication support:

```
switch(config)# ntp authentication
```

Disabling authentication support:

```
switch(config)# no ntp authentication
```

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.

ntp authentication-key

```
ntp authentication-key <KEY-ID> {md5 | sha1}
    [{ <PLAINTEXT-KEY> [trusted] | ciphertext <ENCRYPTED-KEY> }]
no ntp authentication-key <KEY-ID> {md5 | sha1}
    [{ <PLAINTEXT-KEY> [trusted] | ciphertext <ENCRYPTED-KEY> }]
```

Description

Defines an authentication key that is used to secure the exchange with an NTP time server. This command provides protection against accidentally synchronizing to a time source that is not trusted. The **no** form of this command removes the authentication key.

Parameter	Description
<KEY-ID>	Specifies the authentication key ID. Range: 1 to 65534.
md5	Selects MD5 key encryption.
sha1	Specifies SHA1 key encryption.
<PLAINTEXT-KEY>	Specifies the plaintext authentication key. Range: 8 to 40 characters. The key may contain printable ASCII characters excluding "#" or be entered in hex. Keys longer than 20 characters are assumed to be hex. To use an ASCII key longer than 20 characters, convert it to hex.
trusted	Specifies that this is a trusted key. When NTP authentication is enabled, the switch only synchronizes with time servers that transmit packets containing a trusted key.
ciphertext <ENCRYPTED-KEY>	Specifies the ciphertext authentication key in Base64 format. This is used to restore the NTP authentication key when copying configuration files between switches or when uploading a previously saved configuration.
	NOTE: When the key is not provided on the command line, plaintext key prompting occurs upon pressing Enter, followed by prompting as to whether the key is to be trusted. The entered key characters are masked with asterisks.

Examples

Defining key 10 with MD5 encryption and a provided plaintext trusted key:

```
switch(config)# ntp authentication-key 10 md5 F82#450b trusted
```

Defining key 5 with SHA1 encryption and a prompted plaintext trusted key:

```
switch(config)# ntp authentication-key 5 sha1
Enter the NTP authentication key: *****
Re-Enter the NTP authentication key: *****

Configure the key as trusted (y/n)? y
```

Removing key 10:

```
switch(config)# no ntp authentication-key 10
```

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.

ntp disable

ntp disable

Description

Disables the NTP client on the switch. The NTP client is disabled by default.

Examples

Disabling the NTP client.

```
switch(config)# ntp disable
```

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.

ntp enable

ntp enable

```
no ntp enable
```

Description

Enables the NTP client on the switch to automatically adjust the local time and date on the switch. The NTP client is disabled by default.

The **no** form of this command disables the NTP client.

Examples

Enabling the NTP client.

```
switch(config)# ntp enable
```

Disabling the NTP client.

```
switch(config)# no ntp enable
```

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.

ntp server

```
ntp server <IP-ADDR> [key <KEY-NUM>] [minpoll <MIN-NUM>] [maxpoll <MAX-NUM>] [burst |  
iburst] [prefer] [version <VER-NUM>]  
no ntp server <IP-ADDR> <IP-ADDR> [key <KEY-NUM>] [minpoll <MIN-NUM>] [maxpoll <MAX-NUM>]  
[burst | iburst] [prefer] [version <VER-NUM>]
```

Description

Defines an NTP server to use for time synchronization, or updates the settings of an existing server with new values. Up to eight servers can be defined.

The **no** form of this command removes a configured NTP server.



The default NTP version is 4; it is backwards compatible with version 3.

Parameter	Description
server <IP-ADDR>	Specifies the address of an NTP server as a DNS name, an IPv4 address (x.x.x.x), where x is a decimal number from 0 to 255, or an IPv6 address (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F.

Parameter	Description
	<p>When specifying an IPv4 address, you can remove leading zeros. For example, the address 192.169.005.100 becomes 192.168.5.100.</p> <p>When specifying an IPv6 address, you can use two colons (::) to represent consecutive zeros (but only once), remove leading zeros, and collapse a hextet of four zeros to a single 0. For example, this address 2222:0000:3333:0000:0000:0000:4444:0055 becomes 2222:0:3333::4444:55.</p>
<code>key <KEY-NUM></code>	Specifies the key to use when communicating with the server. A trusted key must be defined with the command ntp authentication-key and authentication must be enabled with the command ntp authentication . Range: 1 to 65534.
<code>minpoll <MIN-NUM></code>	Specifies the minimum polling interval in seconds, as a power of 2. Range: 4 to 17. Default: 6 (64 seconds).
<code>maxpoll <MAX-NUM></code>	Specifies the maximum polling interval in seconds, as a power of 2. Range: 4 to 17. Default: 10 (1024 seconds).
<code>burst</code>	Send a burst of packets instead of just one when connected to the server. Useful for reducing phase noise when the polling interval is long.
<code>iburst</code>	Send a burst of six packets when not connected to the server. Useful for reducing synchronization time at startup.
<code>prefer</code>	Make this the preferred server.
<code>version <VER-NUM></code>	Specifies the version number to use for all outgoing NTP packets. Range: 3 or 4. Default: 4.
	NOTE: NTP is backwards compatible.

Usage

For features such as Activate and ZTP, a switch that has a factory default configuration will automatically be configured with pool.ntp.org. NTP server configurations via DHCP options are supported. The DHCP server can be configured with maximum of two NTP server addresses which will be supported on the switch. Only IPV4 addresses are supported.

NTP uses a stratum to describe the distance between a network device and an authoritative time source:

- A stratum 1 time server is directly attached to an authoritative time source (such as a radio or atomic clock or a GPS time source).
- A stratum 2 NTP server receives its time through NTP from a stratum 1 time server.

When using multiple servers with same stratum setting, the best practice to configure a preferred server, so NTP will attempt to use the preferred server as the primary NTP connection. If a preferred server is not manually set when NTP is enabled, the configured server with the lowest stratum will automatically be set as the preferred server. If there are servers with the same stratum, this auto prefer status will prevent AOS-CX from toggling between different servers as the primary server. Auto prefer selection of servers with same stratum (if not manually selected) may change after reconfiguring the switch, or after executing the **reboot** command.

Examples

Defining the ntp server pool.ntp.org, using iburst, and NTP version 4.

```
switch(config)# ntp server pool.ntp.org iburst version 4
```

Removing the ntp server pool.ntp.org.

```
switch(config)# no ntp server pool.ntp.org
```

Defining the ntp server my-ntp.mydomain.com and makes it the preferred server.

```
switch(config)# ntp server my-ntp.mydomain.com prefer
```

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.

ntp trusted-key

```
ntp trusted-key <KEY-ID>  
no ntp trusted-key <KEY-ID>
```

Description

Sets a key as trusted. When NTP authentication is enabled, the switch only synchronizes with time servers that transmit packets containing a trusted key.

The **no** form of this command removes the trusted designation from a key.

Parameter	Description
<KEY-ID>	Specifies the identification number of the key to set as trusted. Range: 1 to 65534.

Examples

Defining key 10 as a trusted key.

```
switch(config)# ntp trusted-key 10
```

Removing trusted designation from key 10:


```
switch(config)# no ntp trusted-key 10
```

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.

ntp vrf

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

Description

Specifies the VRF on which the NTP client communicates with an NTP server. The **no** form of the command returns to default VRF.

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

Example

Setting the switch to use the default VRF for NTP client traffic.

```
switch(config)# ntp vrf default
```

Setting the switch to use the default management VRF for NTP client traffic.

```
switch(config)# ntp vrf mgmt
```

Returning the switch to use the default VRF for NTP client traffic.

```
switch(config)# no ntp vrf
```

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 ntp associations

show ntp associations

Description

Shows the status of the connection to each NTP server. The following information is displayed for each server:

- Tally code : The first character is the Tally code:
 - (blank): No state information available (e.g. non-responding server)
 - x : Out of tolerance (discarded by intersection algorithm)
 - . : Discarded by table overflow (not used)
 - - : Out of tolerance (discarded by the cluster algorithm)
 - + : Good and a preferred remote peer or server (included by the combine algorithm)
 - # : Good remote peer or server, but not utilized (ready as a backup source)
 - * : Remote peer or server presently used as a primary reference
 - o : PPS peer (when the prefer peer is valid)
- ID: Server number.
- NAME: NTP server FQDN/IP address (Only the first 24 characters of the name are displayed).
- REMOTE: Remote server IP address.
- REF_ID: Reference ID for the remote server (Can be an IP address).
- ST: (Stratum) Number of hops between the NTP client and the reference clock.
- LAST: Time since the last packet was received in seconds unless another unit is indicated.
- POLL: Interval (in seconds) between NTP poll packets. Maximum (1024) reached as server and client sync.
- REACH: 8-bit octal number that displays status of the last eight NTP messages (377 = all messages received).

Example

```
switch# show ntp associations
-----
ID          NAME          REMOTE          REF-ID ST  LAST  POLL  REACH
-----
1          192.0.1.1          192.0.1.1          .INIT. 16   -    64    0
* 2  time.apple.com      17.253.2.253          .GPSs.  2   70   128   377
-----
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 ntp authentication-keys

show ntp authentication-keys

Description

Shows the currently defined authentication keys.

Examples

```
switch# show ntp authentication-keys
-----
Auth key  Trusted  MD5 password
-----
10        No      *****
20        Yes     *****
```

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 ntp servers

show ntp servers

Description

Shows all configured NTP servers, including any DHCP servers, default pool servers or any server with the status **auto prefer**.

Example

```
switch# show ntp servers
-----
NTP SERVER KEYID MINPOLL MAXPOLL OPTION VER
-----
192.0.1.18      -      5      10 iburst  3
192.0.1.19      -      6      10  none   4
```

```
192.0.1.20 - 6 8 burst 3 prefer
-----
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 ntp statistics

show ntp statistics

Description

Shows global NTP statistics. The following information is displayed:

- Rx-pkts: Total NTP packets received.
- Current Version Rx-pkts: Number of NTP packets that match the current NTP version.
- Old Version Rx-pkts: Number of NTP packets that match the previous NTP version.
- Error pkts: Packets dropped due to all other error reasons.
- Auth-failed pkts: Packets dropped due to authentication failure.
- Declined pkts: Packets denied access for any reason.
- Restricted pkts: Packets dropped due to NTP access control.
- Rate-limited pkts: Number of packets discarded due to rate limitation.
- KOD pkts: Number of Kiss of Death packets sent.

Examples

```
switch(config)# show ntp statistics
                Rx-pkts 100
Current Version Rx-pkts 80
Old Version Rx-pkts 20
                Err-pkts 2
Auth-failed-pkts 1
Declined-pkts 0
Restricted-pkts 0
Rate-limited-pkts 0
                KoD-pkts 0
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 ntp status

show ntp status

Description

Shows the status of NTP on the switch.

Examples

Displaying the status information when the switch is not synced to an NTP server:

```
switch# show ntp status
NTP is enabled.
NTP authentication is enabled.
NTP is using the default VRF for NTP server connections.

Wed Nov 23 23:29:10 PDT 2016
NTP uptime: 187 days, 1 hours, 37 minutes, 48 seconds

Not synchronized with an NTP server.
```

Displaying the status information when the switch is synced to an NTP server:

```
switch# show ntp status
NTP is enabled.
NTP authentication is enabled.
NTP is using the default VRF for NTP server connections.

Wed Nov 23 23:29:10 PDT 2016
NTP uptime: 187 days, 1 hours, 37 minutes, 48 seconds

Synchronized to NTP Server 17.253.2.253 at stratum 2.
Poll interval = 1024 seconds.
Time accuracy is within 0.994 seconds
Reference time: Thu Jan 28 2016 0:57:06.647 (UTC)
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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.

Telnet access

Telnet server enables switches to accept Telnet connections from clients to manage the switch. The user authentication is password based authentication (RADIUS, TACACS+ or locally stored password). The Telnet server can be enabled on a desired VRF using the `telnet server` command. The maximum number of Telnet sessions per VRF is five.

In the default configuration, Telnet access is disabled.

Telnet commands

show telnet server

show telnet server

Description

Shows the Telnet server configuration.

Examples

Showing the Telnet server configuration:

```
switch(config)# show telnet server
TELNET Server Configuration:

  IP Version      : IPv4
  TCP Port        : 23
  Enabled VRFs    : default, vrf1, vrf2,
                   red, green
```

Command History

Release	Modification
10.08.1021	Command introduced on the 6200, 6300, 6400 Switch Series.

Command Information

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

show telnet server sessions

show telnet server sessions [vrf <VRF-NAME> | all-vrfs]

Description

Shows all active Telnet sessions for the specified VRF or all VRFs. If no VRF is provided, the Telnet sessions on the **default** VRF are shown.

Parameter	Description
vrf <VRF-NAME>	Specifies the Telnet sessions for a specific VRF.
all-vrfs	Specifies the Telnet sessions for all VRFs

Examples

Showing the Telnet session on the **default** VRF:

```
switch(config)# show telnet server sessions
TELNET sessions on VRF default:

IPv4 TELNET Sessions:
  Server IP      : 10.1.1.1
  Client IP      : 10.1.1.2
  Client Port    : 58835
```

Showing the Telnet sessions on all VRFs:

```
switch(config)# show telnet server sessions all-vrfs
TELNET sessions on VRF mgmt:

IPv4 TELNET Sessions:
  Server IP      : 10.1.1.1
  Client IP      : 10.1.1.2
  Client Port    : 58835

TELNET sessions on VRF default:

IPv4 TELNET Sessions:
  Server IP      : 20.1.1.1
  Client IP      : 20.1.1.2
  Client Port    : 58837
```

Command History

Release	Modification
10.08.1021	Command introduced on the 6200, 6300, 6400 Switch Series.

Command Information

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

telnet server

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

Description

Enables the Telnet server on the desired VRF. Telnet server is disabled by default. The **no** form of this command disables the Telnet server.

Parameter	Description
vrf <VRF-NAME>	Specifies the VRF on which the Telnet server will be enabled or disabled.

Examples

Configuring the Telnet server on the **mgmt** VRF:

```
switch(config)# telnet server vrf mgmt
```

Command History

Release	Modification
10.08.1021	Command introduced on the 6200, 6300, 6400 Switch Series.

Command Information

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

Interface configuration

Configuring a layer 2 interface

Procedure

1. Change to the interface configuration context for the interface with the command `interface`.
2. Set the interface MTU (maximum transmission unit) with the command `mtu`.
3. Review interface configuration settings with the command `show interface`.

Example

```
switch(config)# interface 1/1/1
switch(config-if)# mtu 1900
```

Single source IP address

Certain IP-based protocols used by the switch (such as RADIUS, sFlow, TACACS, and TFTP), use a client-server model in which the client's source IP address uniquely identifies the client in packets sent to the server. By default, the source IP address is defined as the IP address of the outgoing switch interface on which the client is communicating with the server. Since the switch can have multiple routing interfaces, outgoing packets can potentially be sent on different paths at different times. This can result in different source IP addresses being used for a client, which can create a client identification problem on the server. For example, it can be difficult to interpret system logs and accounting data on the server when the same client is associated with multiple IP addresses.

To resolve this issue, you can use the commands `ip source-interface` and `ipv6 source-interface` to define a single source IP address that applies to all supported protocols (RADIUS, sFlow, TACACS, and TFTP), or an individual address for each protocol. This ensures that all traffic sent by a client to a server uses the same IP address.

Unsupported transceiver support

Transceiver products (optical, DAC, AOCs) that are listed as supported by a switch model are detailed in the *Transceiver Guide*. Transceiver products that are not listed, are considered unsupported; this would include transceivers that are:

- Non-Aruba branded products
- HPE branded products that were designed for non-AOS-CX switch models (e.g. Comware)
- HPE branded products designated for use in HPE Compute Servers or Storage
- Transceivers originally designated for use in Aruba WLAN controllers or former Mobility Access Switch (MAS) products
- End-of-life Aruba Transceivers

The unsupported transceiver mode (UT-mode) is designed to allow the possible use of these unsupported products. Not all unsupported products can be recognized and enabled; they may be unable to be identified (do not follow the proper MSA standards for identification). These unsupported transceiver products are enabled only on a best-effort basis and there are no guarantees implied for their continued operation.

This feature is enabled by default. A periodic system log will be generated by default at an interval of 24 hours listing the ports on which unsupported transceivers are present. The log interval is configurable and can be disabled by setting the log-interval to `none`.

Configuring an interface persona

A persona is a template interface. It is a mechanism intended to ease the process of configuring one or multiple interfaces that behave in the same manner. For example, a persona could be an uplink interface with a well-known collection of VLANs to which it belongs. Instead of manually configuring each interface one-by-one, the persona collects the common configuration settings and allows them to be applied on the interface or a collection of interfaces.

Persona configuration is similar to configuring other interfaces. Most of the commands in the interface context are available. Because of the nature of the commands, several of them do not apply to the persona (for example, applying the same IP address configuration to several ports) and have been removed from the available list.

The following commands are not supported within the interface context when configuring a persona:

```
aaa authentication port-access dot1x authenticator macsec
arp ipv4 <IPV4_ADDR> mac <MAC_ADDR>
downshift-enable
energy-efficient-ethernet
error-control { auto | none | base-r-fec | rs-fec }
ip bootp-gateway <IPV4-ADDR>
ip forward-protocol udp <IPV4-ADDR> {<PORT-NUM> | <PROTOCOL>}
ip helper-address <IPV4-ADDR> [vrf <VRF-NAME>]
ip igmp router-alert-check [enable | disable]
ip igmp snooping [auto vlan <VLAN-LIST>]
ip igmp snooping [blocked vlan <VLAN-LIST>]
ip igmp snooping [fastleave vlan <VLAN-LIST>]
ip igmp snooping [forced-fastleave vlan <VLAN-LIST>]
ip igmp snooping [forward vlan <VLAN-LIST>]
ip ospf <PROCESS-ID> area <AREA-ID>
ip ospf passive
ip rip <PROCESS-ID> {all-ip | ip-address}
ip rip all-ip disable
ip rip all-ip enable
ip rip all-ip receive disable
ip rip all-ip send disable
ipv6 helper-address multicast {all-dhcp-servers | <MULTICAST-IPV6-ADDR>} egress <PORT-NUM>
ipv6 mld snooping [auto vlan <VLAN-LIST>]
ipv6 mld snooping [blocked vlan <VLAN-LIST>]
ipv6 mld snooping [fastleave vlan <VLAN-LIST>]
ipv6 mld snooping [forced-fastleave vlan <VLAN-LIST>]
ipv6 mld snooping [forward vlan <VLAN-LIST>]
ipv6 neighbor <IPV6-ADDR> mac <MAC-ADDR>
ipv6 ospfv3 <PROCESS-ID> area <AREA-ID>
ipv6 ospfv3 passive
ipv6 ripng <PROCESS-ID>
lACP port-id <PORT-ID>
lACP port-priority <PORT-PRIORITY>
lag <ID>
```

```

link-poe
lldp dot3 eee
lldp dot3 poe
lldp med poe
lldp med poe [priority-override]
persona {access | uplink | custom <PERSONA-NAME>} [copy | attach]
port-access device-profile <DEVICE-PROFILE-NAME>
power-over-ethernet
power-over-ethernet allocate-by {usage | class}
power-over-ethernet assigned-class {3 | 4 | 6 | 8}
power-over-ethernet pd-class-override
power-over-ethernet power-pairs {alt-a|alt-a-and-alt-b}
power-over-ethernet pre-std-detect
power-over-ethernet priority {critical|high|low}
ptp lag-role {primary | secondary}
spanning-tree cost <PORT-COST>
spanning-tree instance <INSTANCE-ID> cost <PORT-COST>
spanning-tree instance <INSTANCE-ID> port-priority <PRIORITY-MULTIPLIER>
spanning-tree port-priority <PRIORITY-MULTIPLIER>
spanning-tree vlan <A:1-4094> cost <0-200000000>
spanning-tree vlan <A:1-4094> port-priority <0-15>
split [confirm]
track by <OBJECT-ID>
vsx-sync {access-lists | qos | rate-limits | vlans | policies | irdp}

```

Modes

There are two supported modes:

1. **Copy**—The `copy` mode is a one-step configuration that copies the persona configuration to an interface. Further changes to the persona will not be applied to the interfaces using that mode.
2. **Attach**—Unlike the `copy` mode, besides applying the configuration to the interface immediately, the `attach` mode also follows the persona configuration. It means that the subsequent changes to the persona will be applied to the interfaces attached to it.

Predefined and custom persona names

There are two predefined interface persona names:

- `uplink`
- `access`

These names have no predefined configuration. To use them, they must be manually configured as needed. You can also create personas with a custom name. These custom personas can be created and configured in the same manner as the predefined ones. The only difference is the command used to apply them to the interface. The procedure below provides the details.

Creating and configuring an interface persona

Follow these steps to create and configure an interface persona:

1. Create the interface **persona** with the command `interface persona <PERSONA-NAME>`.
2. Set the interface configuration as any other physical interface.
3. Review the configuration with the command `show running-configuration current-context`.
4. Switch to an interface context with the command `interface <PORT>`.

5. Apply the persona configuration to the interface and set the mode with the command `persona custom <PERSONA-NAME> <mode>`. Note that `<custom>` is an optional argument, required only if the persona is not one of the predefined names (neither **uplink** nor **access**).

For information on this feature, see the related video on the [Aruba AirHeads Broadcasting Channel](#).

Examples

To copy a predefined persona name configuration to an interface:

1. Configure the interface persona:

```
switch(config)# interface persona uplink
switch(config-if)# no shutdown
switch(config-if)# no routing
switch(config-if)# vlan access 100
switch(config-if)# exit
```

2. Apply the configuration with **copy** mode:

```
switch(config)# interface 1/1/1
switch(config-if)# persona custom mypersona copy
switch(config-if)# exit
```

To attach a custom persona name to several interfaces simultaneously:

1. Configure the interface persona:

```
switch(config)# interface persona mytemplate
switch(config-if)# no shutdown
switch(config-if)# vrf attach upstream
switch(config-if)# exit
```

2. Apply the configuration with **attach** mode:

```
switch(config)# interface 1/1/1-1/1/24
switch(config-if)# persona custom mypersona attach
switch(config-if)# exit
```

Monitor mode

Monitor mode displays interface statistics in real time, updating frequently. The update interval varies by product, number of visible ports, and display options in use. View the current update interval in the help menu.

Formatting options can be supplied either at command launch or while monitor mode is active. Press `?` to see the available formatting options available in the current command context. Exit the help menu with `q`.

Monitor mode detects terminal size to adjust the number of interfaces and statistics viewable on screen. Additional interfaces or statistics columns can be viewed with the navigation keys: Arrow keys, PageUp, PageDown, Home, and End. Serial console does not automatically detect terminal setting changes, resulting in unexpected output. Recommended recovery steps are to exit and restart.

Monitor mode refreshes data automatically until exited with `q`.

Interface commands

allow-unsupported-transceiver

```
allow-unsupported-transceiver [confirm | log-interval {none | <INTERVAL>}]  
no allow-unsupported-transceiver
```

Description

Allows unsupported transceivers to be enabled or establish connections. Transceivers with speeds up to 100G are enabled by this command.



This command is enabled by default, allowing the use of third party transceiver products without adding the command in the configuration. Disabling this command with the **no** form will now disable the command in the running and stored configurations.

The **no** form of this command disallows using unsupported transceivers.

Parameter	Description
confirm	Specifies that unsupported transceiver warnings are to be automatically confirmed.
log-interval none	Disables unsupported transceiver logging.
log-interval <INTERVAL>	Sets the unsupported transceiver logging interval in minutes. Default: 1440 minutes. Range: 1440 to 10080 minutes.

Usage

When none of the parameters are specified it will display a warning message to accept the warranty terms. With **confirm** option the warning message is displayed but the user is not prompted to (y/n) answering. Warranty terms must be agreed to as part of enablement and the support is on best effort basis.

Examples

Allowing unsupported transceivers with follow-up confirmation:

```
switch(config)# allow-unsupported-transceiver  
Warning: The use of unsupported transceivers, DACs, and AOCs is at your  
own risk and may void support and warranty. Please see HPE Warranty terms  
and conditions.  
  
Do you agree and do you want to continue (y/n)? y
```

Allowing unsupported transceivers with confirmation in command syntax:

```
switch(config)# allow-unsupported-transceiver confirm  
Warning: The use of unsupported transceivers, DACs, and AOCs is at your  
own risk and may void support and warranty. Please see HPE Warranty terms  
and conditions.
```

Configuring unsupported transceiver logging with an interval of every 48 hours:

```
switch(config)# allow-unsupported-transceiver log-interval 2880
```

Disabling unsupported transceiver logging:

```
switch(config)# allow-unsupported-transceiver log-interval none
```

Disallowing unsupported transceivers with follow-up confirmation:

```
switch(config)# no allow-unsupported-transceivers  
Warning: Unsupported transceivers, DACs, and AOCs will be disabled,  
which could impact network connectivity. Use 'show allow-unsupported-transceiver'  
to identify unsupported transceivers, DACs, and AOCs.  
  
Ccontinue (y/n)? y
```

Disallowing unsupported transceivers with confirmation in command syntax:

```
switch(config)# no allow-unsupported-transceiver confirm  
Warning: Unsupported transceivers, DACs, and AOCs will be disabled,  
which could impact network connectivity. Use 'show allow unsupported-transceiver'  
to identify unsupported transceivers, DACs, and AOCs.  
  
switch(config)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

default interface

```
default interface <INTERFACE-ID>
```

Description

Sets an interface (or a range of interfaces) to factory default values.

Parameter	Description
<INTERFACE-ID>	Specifies the ID of a single interface or range of interfaces. Format: member/slot/port or member/slot/port-member/slot/port to specify a range.

Examples

Resetting an interface:

```
switch(config)# default default interface 1/1/1
```

Resetting an range of interfaces:

```
switch(config)# default default interface 1/1/1-1/1/10
```

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.

description

```
description <DESCRIPTION>  
no description
```

Description

Associates descriptive information with an interface to help administrators and operators identify the purpose or role of an interface.

The **no** form of this command removes a description from an interface.

Parameter	Description
<DESCRIPTION>	Specify a description for the interface. Range: 1 to 64 ASCII characters (including space, excluding question mark).

Examples

Setting the description for an interface to **DataLink 01**:

```
switch(config-if)# description DataLink 01
```

Removing the description for an interface.

```
switch(config-if)# no description
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

energy-efficient-ethernet

energy-efficient-ethernet

Description

Enables auto-negotiation of Energy-Efficient Ethernet (EEE) on an interface. EEE Negotiation is established only on auto-link negotiation with supported link partners.

Examples

Configuring an interface:

```
switch(config)# interface 1/1/1
switch(config-if)# energy-efficient-ethernet
```

Disabling Energy Efficient Ethernet on an interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no energy-efficient-ethernet
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

flow-control

flow-control rxtx
no flow-control rxtx

Description

Command **flow-control** enables negotiation of IEEE 802.3x link-level flow control on the current interface. The switch advertises link-level flow control support to the link partner. The final configuration is determined based on the capabilities of both partners.

Each invocation of this command replaces the previous configuration.

The **no** form of these commands disables any configured flow control on the selected interface.

Parameter	Description
<code>rxtx</code>	Enables the ability to honor received and to transmit IEEE 802.3x LLFC pause frames to the remote device.

Usage (flow control)

- For interfaces that auto-negotiate, link-level flow control is subject to negotiation, plus speed and other parameters. Both ends of the link must negotiate the same flow control mode for it to be applied.
- For interfaces that do not auto-negotiate, the configured link-level flow control mode is always applied and the user is responsible for ensuring that both ends of the link are configured for the same mode.
- All members of a LAG must have the same flow control configuration.
- Lossless flow control is only supported for single destination unicast traffic. Replicated traffic (for example, broadcast, multicast, mirroring) cannot be guaranteed to be lossless.
- Lossless behavior is not supported when operating in a VSF stack configuration.
- Lossless flow control will only operate correctly when both the ingress and egress interfaces have flow control enabled.

Examples

Enabling support for RXTX flow control:

```
switch(config)# interface 1/1/1
switch(config-if)# flow-control txrx
```

Disabling support for RXTX flow control:

```
switch(config)# interface 1/1/1
switch(config-if)# no flow-control txrx
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config-if</code>	Administrators or local user group members with execution rights for this command.

interface

interface <PORT-NUM>

Description

Switches to the **config-if** context for a physical port. This is where you define the configuration settings for the logical interface associated with the physical port.

Parameter	Description
<PORT-NUM>	Specifies a physical port number. Format: member/slot/port .

Examples

Configuring an interface:

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

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.

interface loopback

interface loopback <ID>
no interface loopback <ID>

Description

Creates a loopback interface and changes to the **config-loopback-if** context. Loopback interfaces are layer 3.

The **no** form of this command deletes a loopback interface.

Parameter	Description
<INSTANCE>	Specifies the loopback interface ID. Range: 1 to 256

Examples

```
switch# config
switch(config)# interface loopback 1
```

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

interpacket-gap

```
interpacket-gap [high average]  
no interpacket-gap
```

Description

Configures the interpacket gap (IPG) between transmitted packets for the interface. The **no** form of this command sets IPG as default.

Parameter	Description
<i>high average</i>	Use a higher average IPG at certain speeds.

Examples

Allow the interface to use a higher IPG.

```
switch(config) # interface 1/1/1  
  
switch(config-if) # interpacket-gap high-average
```

Use default IPG.

```
switch(config) # interface 1/1/1  
  
switch(config-if) # no interpacket-gap
```

Output for **show interface** when **high-average** mode is configured and the port is linked at 1 Gbps.

```
switch(# show interface 1/1/1  
Interpacket gap: high-average
```

Command History

Release	Modification
10.13.1060	Command introduced.

Command Information

Platforms	Command context	Authority
6200	config-if	Administrators or local user group members with execution rights for this command.

interface vlan

```
interface vlan <VLAN-ID>
no interface vlan <VLAN-ID>
```

Description

Creates an interface VLAN also know as an SVI (switched virtual interface) and changes to the **config-if-vlan** context. The specified VLAN must already be defined on the switch.

The **no** form of this command deletes an interface VLAN.

Parameter	Description
<VLAN-ID>	Specifies the loopback interface ID.
none	Do not reserve any internal VLANs.

Examples

```
switch# config
switch(config)# vlan 10
switch(config-vlan-10)# exit
switch(config)# interface vlan 10
switch(config-if-vlan)#
```

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.

ip address

```
ip address <IP-ADDR>/<MASK> [secondary]
no ip address <IP-ADDR>/<MASK> [secondary]
```

Description

Sets an IPv4 address for the current layer 3 interface.

The **no** form of this command removes the IPv4 address from the interface.

Parameter	Description
<code><IP-ADDR></code>	Specifies an IP address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255. You can remove leading zeros. For example, the address 192.169.005.100 becomes 192.168.5.100 .
<code><MASK></code>	Specifies the number of bits in the address mask in CIDR format (x), where x is a decimal number from 0 to 128.
<code>secondary</code>	Specifies a secondary IP address. (Supported on 6300, except for S3L75A, S3L76A, S3L77A.)

Examples

Assigning the IP address **192.168.199.1** with a mask of **24** bits to interface VLAN **10**:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# ip address 192.168.199.1/24
```

Removing the IP address **192.168.199.1** with a mask of **24** bits from interface VLAN **10**:

```
switch(config)# interface vlan 10
switch(config-if-vlan)# no ip address 192.168.199.1/24
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config-if-vlan</code>	Administrators or local user group members with execution rights for this command.

ip mtu

```
ip mtu <VALUE>
```

```
no ip mtu
```

Description

Sets the IP MTU (maximum transmission unit) for an interface. This defines the largest IP packet that can be sent or received by the interface. This value should be less than or equal to the overall MTU for the interface.

The **no** form of this command sets the IP MTU to the default value 1500.

Parameter	Description
<VALUE>	Specifies the IP MTU in bytes. Range: 68 to 9198. Default: 1500.

Examples

Setting the IP MTU to 576 bytes:

```
switch(config-if-vlan)# ip mtu 576
```

Command History

Release	Modification
10.08	Subinterface support added.
10.07 or earlier	--

Command Information

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

ip source-interface

```
ip source-interface {sflow | tftp | radius | tacacs | ntp | syslog | ubt | dhcp-relay |
simplivity | dns | all} {interface <IFNAME> | <IPV4-ADDR>} [vrf <VRF-NAME>]
no ip source-interface {sflow | tftp | radius | tacacs | ntp | syslog | ubt | dhcp-
relay | simplivity | dns | all} [interface <IFNAME> | <IPV4-ADDR>] [vrf <VRF-NAME>]
```

Description

Sets a single source IP address for a feature on the switch. This ensures that all traffic sent the feature has the same source IP address regardless of how it egresses the switch. You can define a single global address that applies to all supported features, or an individual address for each feature.

This command provides two ways to set the source IP addresses: either by specifying a static IP address, or by using the address assigned to a switch interface. If you define both options, then the static IP address takes precedence.

The `no` form of this command deletes the single source IP address for all supported services, or a specific service.

Parameter	Description
sflow tftp radius tacacs ntp syslog ubt dhcp-relay simplivity dns all	Sets a single source IP address for a specific service. The <code>all</code> option sets a global address that applies to all protocols that do not have an address set. For DHCP relay, the address is used as both the source IP and GIADDR.

Parameter	Description
<code>interface <IFNAME></code>	Specifies the name of the interface from which the specified service obtains its source IP address. The interface must have a valid IP address assigned to it. If the interface has both a primary and secondary IP address, the primary IP address is used.
<code><IPV4-ADDR></code>	Specifies the source IP address to use for the specified service. The IP address must be defined on the switch, and it must exist on the specified VRF (which is the <code>default</code> VRF, if the <code>vrf</code> option is not used). Specify the address in IPv4 format (<code>x.x.x.x</code>), where <code>x</code> is a decimal number from 0 to 255.
<code>vrf <VRF-NAME></code>	Specifies the name of a VRF.

Examples

Setting the IPv4 address `10.10.10.5` as the global single source address:

```
switch# config
switch(config)# ip source-interface all 10.10.10.5
```

Clearing the global single source IP address **10.10.10.5**:

```
switch(config)# no ip source-interface all 10.10.10.5
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config</code>	Administrators or local user group members with execution rights for this command.

ip tcp mss

```
ip tcp mss <VALUE>
no ip tcp mss <VALUE>
```

Description

Sets the TCP (Transmission Control Protocol) MSS (Maximum Segment Size) for an interface. When configured, the MSS option in the TCP header is set in the TCP handshake for negotiation during connection establishment. Once the TCP session is established, changing the TCP MSS value on the interface will not affect the existing session.

The **no** form of this command removes the TCP MSS configuration from the interface.



TCP MSS is supported on ROP, SVI, subinterface, and L3 GRE tunnel interface.

Parameter	Description
<VALUE>	Specifies the IPv4 TCP MSS in bytes. Range: 68 to 65495.

Examples

Configuring the IPv4 TCP MSS for the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ip tcp mss 1460
```

Removing the IPv4 TCP MSS configuration from the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip tcp mss 1460
```

Command History

Release	Modification
10.14.1000	Command introduced.

Command Information

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

ip unnumbered

```
ip unnumbered <ifname>
no ip unnumbered <ifname>
```

Description

The *IP unnumbered* feature allows the switch to process IP packets without configuring a unique IP address on an interface by telling the router to use the IP address of another selected interface as the address for that link. Once set, this port will borrow the user-configured primary IPv4 address from an lender interface and use that IP address in its L3 control plane exchange.

The **no** version of this command removes IP unnumbered support for this port. Once unset, this port will remove borrowed IPv4 address.

Parameter	Description
<Ifname >	Name of the interface

Usage

The port where IP unnumbered is configured is known as the borrower interface. Only route-only ports can borrow an address.

The port the address is borrowed from is known as the lender interface. Only a loopback interface can be used as a lender interface. The unnumbered interface and lender interface must belong to the same VRF. Additionally, the lender interface for an IP unnumbered interface cannot itself be configured as unnumbered. The following caveats apply to this feature:

- Only the primary IPv4 address can be borrowed on an IP unnumbered interface. You cannot configure a secondary IP address for an interface that is already configured as an IP unnumbered interface.
- If an IP address is configured on an interface that is already configured as an IP unnumbered interface, it will function as a normal IP interface.
- An IPv6 unnumbered configuration on the interface is not supported. If **ip unnumbered** is enabled on the interface, only the IPv4 address is borrowed. However, Any IPv6 configurations can co-exist with an ip unnumbered interface.
- An IP unnumbered interface cannot have multiple lender interfaces for the same address family.
- The **ip unnumbered** command requires that the interface borrowing the address is a routed port. The **IP unnumbered** feature is only supported on devices connected with point-to-point interfaces.
- An unnumbered IP address can not be used as tunnel source.
- The unnumbered interface and lender interface must belong to the same VRF.
- Deleting a lender interface removes all the associated IP unnumbered references.

Examples

Configuring IP unnumbered for a route-only port:

```
switch(config)# interface 1/1/1
switch(config-if)# ip unnumbered loopback1
```

The following examples removes IP unnumbered support for this port. Once unset, this port will remove the borrowed IPv4 address.

```
switch(config)# interface 1/1/1
switch(config-if)# no ip unnumbered loopback1
```

If an IP address is configured on an interface that is already configured as an IP unnumbered interface (or vice versa), both configurations can coexist on the interface. The switch's arbitration logic ensures that static IP configuration is given priority over unnumbered.

```
switch(config)# interface 1/1/1
switch(config-if)# ip unnumbered interface loopback 1
switch(config-if)# ip address 10.16.1.1/24
switch(config-if)# ip address 192.168.1.2/24 secondary

or

switch(config)# interface 1/1/1
switch(config-if)# ip address 10.16.1.1/24
switch(config-if)# ip unnumbered interface loopback 1
switch(config-if)# ip address 192.168.1.2/24 secondary

switch(config)# sh running-config interface
switch(config-if)# do sh running-config interface 1/1/1
interface 1/1/1
  no shutdown
```

```
ip address 10.16.1.1/24
ip address 192.168.1.2/24 secondary
ip unnumbered interface loopback 1
! ip unnumbered is ignored when static ip is configured
```

If loopback lender interface does not exist during IP unnumbered configuration, a prompt will be displayed in CLI to allow the user to create that interface.

```
switch(config)# interface 1/1/1
switch(config-if)# ip unnumbered interface loopback 1
Lender port not found.
Do you want to create (y/n)? y
switch(config-if)#

Failure case:
switch(config)# ip unnumbered interface loopback 1
Lender port not found.
Do you want to create (y/n)? y
Lender port: loopback1 creation failed
switch(config-if)
```

Command History

Release	Modification
10.14.1000	Command introduced

Command Information

Platforms	Command context	Authority
6200	config-if	Administrators or local user group members with execution rights for this command.

ipv6 address

```
ipv6 address <IPv6-ADDR>/<MASK>{eui64 | [tag <ID>]}
no ipv6 address <IPv6-ADDR>/<MASK>
```

Description

Sets an IPv6 address on the interface.

The **no** form of this command removes the IPv6 address on the interface.



This command automatically creates an IPv6 link-local address on the interface. However, it does not add the **ipv6 address link-local** command to the running configuration. If you remove the IPv6 address, the link-local address is also removed. To maintain the link-local address, you must manually execute the **ipv6 address link-local** command.

Parameter	Description
<IPV6-ADDR>	Specifies the IP address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F. You can use two colons (::) to represent consecutive zeros (but only once), remove leading zeros, and collapse a hextet of four zeros to a single 0. For example, this address 2222:0000:3333:0000:0000:0000:4444:0055 becomes 2222:0:3333::4444:55 .
<MASK>	Specifies the number of bits in the address mask in CIDR format (x), where x is a decimal number from 0 to 128.
eui64	Configure the IPv6 address in the EUI-64 bit format.
tag <ID>	Configure route tag for connected routes. Range: 0 to 4294967295. Default: 0.

Examples

Setting the IPv6 address **2001:0db8:85a3::8a2e:0370:7334** with a mask of 24 bits:

```
switch(config-if)# ipv6 address 2001:0db8:85a3::8a2e:0370:7334/24
```

Removing the IP address **2001:0db8:85a3::8a2e:0370:7334** with mask of 24 bits:

```
switch(config-if)# no ipv6 address 2001:0db8:85a3::8a2e:0370:7334/24
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

ipv6 source-interface

```
ipv6 source-interface {sflow | tftp | radius | tacacs | ntp | syslog | ubt | dhcp-relay | simplivity | dns | all} {interface <IFNAME> | <IPV6-ADDR>} [vrf <VRF-NAME>]
no ipv6 source-interface {sflow | tftp | radius | tacacs | ntp | syslog | ubt | dhcp-relay | simplivity | dns | all} [interface <IFNAME> | <IPV6-ADDR>] [vrf <VRF-NAME>]
```

Description

Sets a single source IP address for a feature on the switch. This ensures that all traffic sent the feature has the same source IP address regardless of how it egresses the switch. You can define a single global address that applies to all supported features, or an individual address for each feature.

This command provides two ways to set the source IP addresses: either by specifying a static IP address, or by using the address assigned to a switch interface. If you define both options, then the static IP address takes precedence.

The `no` form of this command deletes the single source IP address for all supported protocols, or a specific protocol.

Parameter	Description
<code>sflow tftp radius tacacs ntp syslog ubt dhcp-relay simplivity dns all</code>	Sets a single source IP address for a specific protocol. The <code>all</code> option sets a global address that applies to all protocols that do not have an address set.
<code>interface <IFNAME></code>	Specifies the name of the interface from which the specified protocol obtains its source IP address.
<code><IPv6-ADDR></code>	Specifies the source IP address to use for the specified protocol. The IP address must be defined on the switch, and it must exist on the specified VRF (which is the <code>default</code> VRF, if the <code>vrf</code> option is not used). Specify the IP address in IPv6 format (<code>xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx</code>), where <code>x</code> is a hexadecimal number from 0 to F.
<code>vrf <VRF-NAME></code>	Specifies the name of the VRF from which the specified protocol sets its source IP address.

Examples

Configuring the IPv6 address `2001:DB8::1` as the global single source address:

```
switch# config
switch(config)# ip source-interface all 2001:DB8::1/32
```

Configuring the IPv6 address `2001:DB8::1` on VRF `sflow-vrf` on interface `1/1/2` as the single source address for sFlow:

```
switch(config)# vrf sflow-vrf
switch(config-vrf)# exit
switch(config)# interface 1/1/2
switch(config-if)# no shutdown
switch(config-if)# vrf attach sflow-vrf
switch(config-if)# ipv6 address 2001:DB8::1/32
switch(config-if)# exit
switch(config)# ip source-interface sflow interface 1/1/2 vrf sflow-vrf
```

Stop the source IP address from using the IP address on interface **1/1/1** on VRF `one`.

```
switch(config)# no ip source-interface all interface 1/1/1 vrf one
```

Clear the source IP address `2001:DB8::1`.

```
switch(config)# no ip source-interface all 2001:DB8::1
```

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.

ipv6 tcp mss

```
ipv6 tcp mss <VALUE>
no ipv6 tcp mss <VALUE>
```

Description

Sets the TCP (Transmission Control Protocol) MSS (Maximum Segment Size) for an interface. When configured, the MSS option in the TCP header is set in the TCP handshake for negotiation during connection establishment. Once the TCP session is established, changing the TCP MSS value on the interface will not affect the existing session.

The **no** form of this command removes the TCP MSS configuration from the interface.



TCP MSS is supported on ROP, SVI, subinterface, and L3 GRE tunnel interface.

Parameter	Description
<VALUE>	Specifies the IPv6 TCP MSS in bytes. Range: 68 to 65495.

Examples

Configuring the IPv6 TCP MSS for the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ipv6 tcp mss 1440
```

Removing the IPv6 TCP MSS configuration from the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no ipv6 tcp mss 1440
```

Command History

Release	Modification
10.14.1000	Command introduced.

Command Information

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

mtu

mtu <VALUE>
no mtu

Description

Sets the MTU (maximum transmission unit) for an interface. This defines the maximum size of a layer 2 (Ethernet) frame. Frames larger than the MTU (1500 bytes by default) are dropped and cause an ICMP fragmentation-needed message to be sent back to the originator.

To support jumbo frames (frames larger than 1522 bytes), increase the MTU as required by your network. A frame size of up to 9198 bytes is supported.

The largest possible layer 1 frame will be 18 bytes larger than the MTU value to allow for link layer headers and trailers.

The **no** form of this command sets the MTU to the default value 1500.

Parameter	Description
<VALUE>	Specifies the MTU in bytes. Range: 46 to 9198. Default: 1500.

Examples

Setting the MTU on interface **1/1/1** to 1000 bytes:

```
switch(config)# interface 1/1/1
switch(config-if)# no routing
switch(config-if)# mtu 1000
```

Setting the MTU on interface **1/1/1** to the default value:

```
switch(config)# interface 1/1/1
switch(config-if)# no routing
switch(config-if)# no mtu
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

persona

```
persona {access | uplink | custom <PERSONA-NAME>} [copy | attach]
no persona {access | uplink | custom <PERSONA-NAME>} [copy | attach]
```

Description

Associates one of three persona types with an interface to classify the purpose or role of an interface. On the 10000 Switch Series, “access” persona ports are typically connected to workloads / VMs, and the “uplink” (fabric) persona ports are connected to the core / spine.

The **no** form of this command removes the interface persona.

Parameter	Description
access	Selects the access persona type.
uplink	Selects the uplink persona type.
custom <PERSONA-NAME>	Selects the custom persona type with a user-provided name. Range: 1 to 64 printable ASCII characters including space.
copy	Specifies the mode: copies settings from the persona interface of the same name.
attach	Specifies the mode: attaches the specified interface to the persona interface of the same name.

Usage

- If the mode is specified, either copy or attach, the interface configuration is dependent on the interface template whose name is "access", "uplink", or "<PERSONA-NAME>". On the other hand, if the mode is not specified, then the persona is just a label in the interface, and its configuration is not modified even if the interface persona exists. When configuring the mode, one of the following options is possible:
 - The **copy** option performs a one-time copy of the template interface. Subsequent changes to the template are not copied and the 'persona' setting is just a label. If the mode is set to **copy** and the interface persona does not exist, then the CLI command fails with the message "Interface persona not found".
 - The **attach** option performs a copy of the template interface, and subsequent changes to the template interface configuration are immediately applied to all attached interfaces. The template interface does not need to exist before attaching other interfaces to it. After attaching a template, the copied settings can be modified for an individual interface. However, any change in the attached template will overwrite the modified values with the new template values.
- When a mode is specified, it should match an interface created with the command interface persona <PERSONA-NAME>. The only exception to this rule is when the mode is set to **attach** and the persona does not already exist.
- The mode is only available to be configured for an interface that meets the following conditions:
 - IS a physical interface
 - IS NOT a LAG member
 - IS NOT a persona interface

Examples

Configuring an access persona:


```
switch(config)# interface 1/1/1  
switch(config-if)# persona access
```

Configuring an uplink persona:

```
switch(config)# interface 1/1/1  
switch(config-if)# persona uplink
```

Configuring a custom persona named "mypersona":

```
switch(config)# interface 1/1/1  
switch(config-if)#persona custom mypersona
```

Removing the persona setting.

```
switch(config-if)# no persona
```

Copying a predefined persona name configuration to an interface:

1. Configuring the interface persona:

```
switch(config)# interface persona uplink  
switch(config-if)# no shutdown  
switch(config-if)# no routing  
switch(config-if)# vlan access 100  
switch(config-if)# exit
```

2. Applying the configuration from the persona named "mypersona" with **copy** mode:

```
switch(config)# interface 1/1/1  
switch(config-if)# persona custom mypersona copy  
switch(config-if)# exit
```

Attaching a custom persona name named "mypersona" to several interfaces simultaneously:

1. Configuring an interface persona named "mypersona":

```
switch(config)# interface persona mypersona  
switch(config-if)# no shutdown  
switch(config-if)# vrf attach upstream  
switch(config-if)# exit
```

2. Applying the "mypersona" configuration with **attach** mode:

```
switch(config)# interface 1/1/1-1/1/24  
switch(config-if)# persona custom mypersona attach  
switch(config-if)# exit
```

Command History

Release	Modification
10.10	Added optional parameters: attach, copy.
10.09	Command introduced.

Command Information

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

rate-interval

```
rate-interval <VALUE>
no rate-interval
```

Description

This command sets the time interval to calculate interface rates. Lower intervals are more useful for detecting traffic bursts, but may increase computation load to the overall system. Intervals must be a multiple of five seconds. The command-line interface will not accept a rate interval value that is not a multiple of five.

The **no** form of this command sets the rate collection interval to the default value of 300 seconds.

Parameter	Description
<VALUE>	The statistics rate collection interval in seconds. The supported range is 5-300 seconds, where the number of seconds is a multiple of five.

Examples

Setting the rate collection interval to 50 seconds

```
switch(config)# interface 1/1/1
switch(config-if)# rate-interval 50
```

Setting the rate collection interval to the default value:

```
switch(config-if)# no rate-interval
```

The following example shows the command-line interface warning that appears while configuring an invalid rate-interval.

```
switch(config)# interface 1/1/1
switch(config-if)# rate interval 6
The interval must be a multiple of 5.
```

Usage

The rate collection interval must be configured in the multiples of 5. Any other value will be rejected and the CLI will display the error message, **The interval must be a multiple of 5.**

Command History

Release	Modification
10.12.1000	Command supported on all platforms.
10.12	Command Introduced on 6300 and 8360 Switch series.

Command Information

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

routing

routing
no routing

Description

Enables routing support on an interface, creating a L3 (layer 3) interface on which the switch can route IPv4/IPv6 traffic to other devices.

By default, routing is disabled on all interfaces.

The **no** form of this command disables routing support on an interface, creating a L2 (layer 2) interface.



If you enable this configuration, collection of flow tracking statistics is disabled.

Examples

Enabling routing support on an interface:

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

Disabling routing support on an interface:

```
switch(config-if)# no routing
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if	Administrators or local user group members with execution rights for this command.

show allow-unsupported-transceiver

show allow-unsupported-transceiver

Description

Displays configuration and status of unsupported transceivers.

Examples

Showing unallowed unsupported transceivers:

```
switch(config)# show allow-unsupported-transceiver
Allow unsupported transceivers : no
Logging interval               : 1440 minutes
-----
Port       Type           Status
-----
1/1/31     SFP-SX              unsupported
1/1/32     SFP-1G-BXD          unsupported
1/1/2      SFP28DAC3           unsupported
```

Showing allowed unsupported transceivers:

```
switch# show allow-unsupported-transceiver
Allow unsupported transceivers : yes
Logging interval               : 1440 minutes
-----
Port       Type           Status
-----
1/1/31     SFP-SX              unsupported-allowed
1/1/32     SFP-1G-BXD          unsupported-allowed
1/1/2      SFP28DAC3           unsupported
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

show interface

```
show interface [<IFNNAME>|<IFRANGE>] [brief | physical]
show interface [<IFNNAME>|<IFRANGE>] [extended [non-zero] | [human-readable]]
show interface [<IFNNAME>] monitor [human-readable]
```

```
show interface [lag | loopback | tunnel | vlan ] [<ID>] [brief]
show interface lag [<LAG-ID>] [extended [non-zero] | [human-readable]]
show interface lag [<LAG-ID>] monitor [human-readable]
```

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, including the tx filtered and rx filtered counters. <ul style="list-style-type: none"> Rx filter packets are protocol packets received when the protocol is disabled on the switch and there is only one port in the VLAN. Protocols include OSPF, PIM, RIP, LACP, and LLDP. An example of a Tx filtered packet would be a multicast packet being filtered from going out of the ingress port.
human-readable	Shows statistics rounded to the nearest power of 1000, for example, 1K, 345M, 2G. This is available only in the CLI interface output.
non-zero	Shows only non zero statistics.
LAG	Shows LAG interface information.
monitor	Continuously monitor interface statistics.
LOOPBACK	Shows loopback interface information.
TUNNEL	Shows tunnel interface information.
VLAN	Shows 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	Shows the VXLAN interface information.
<VXLAN-ID>	Specifies the VXLAN interface identifier. Default: 1

Examples

Showing information when interface 1/1/1 is configured:

```

MDI mode: MDIX
VLAN Mode: native-untagged
Native VLAN: 1
Allowed VLAN List: all
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            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
Filtered            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

```

Showing information 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

```

Showing information 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

```

Showing information 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 Admin   Port    Status | Config
Status | Config (Watts) State Information Description
-----

```

1/1/1	1GbT		up	up	1G	auto	off	off
on	on	--	10M/100M/1G		--			

Showing the monitor information:



In monitor mode, the CLI refreshes data automatically until it is exited by entering **q**. Pressing **?** opens the help menu to display which options are available in this context.

```

Interface 1/1/1 is up
Rate                               RX                               TX                               Total (RX+TX)
-----
Mbits / sec                        30196.43                        30196.43                        60392.85
MPkts / sec                        58977.39                        58977.40                        117954.79
Unicast                            0.00                            0.00                            0.00
Multicast                          58977.39                        58977.40                        117954.79
Broadcast                          0.00                            0.00                            0.00
Utilization %                       75.49                           75.49                           150.98
Statistic                          RX                               TX                               Total (RX+TX)
-----
Packets                            4756527649                      4756527865                      9513055514
Unicast                            0                                0                                0
Multicast                          4756527649                      4756527865                      9513055514
Broadcast                          2                                0                                2
Bytes                              304417778668                    304417795428                    608835574096
Jumbos                             0                                0                                0
Dropped                            0                                19028847730                      19028847730
Pause Frames                       0                                0                                0
Errors                             0                                0                                0
CRC/FCS                            0                                n/a                              0
help: ?, quit: q

```

```

Help for Interface Monitor
h Toggle human-readable mode
c Clear interface statistics
Does not apply to rates
Arrows, PgUp, PgDn, Home, End
Navigate interface statistics
Delay: 2
help: ?, quit: q

```

Showing the output for interface 1/1/1 in human-readable format:



In human-readable format, the **< 1** symbol for **Utilization** indicates that the amount of packets is between zero and one. This is true in cases where the number of bytes increases but the number of packets and the **Utilization** value is not displayed even in the normal output, where the human-readable parameter is not included in the command.

```

switch(config-if)# show interface 1/1/1 human-readable
Interface 1/1/1 is up
Rate                               RX                               TX                               Total (RX+TX)
-----
Bits / sec                         3M                               3M                               6M
Pkts / sec                         316                             316                             633

```

Unicast	319	319	638
Multicast	0	0	0
Broadcast	0	0	0
Utilization %	< 1	< 1	< 1
Statistic	RX	TX	Total

Packets	577K	577K	1M
Unicast	577K	577K	1M
Multicast	0	51	51
Broadcast	0	15	15
Bytes	744M	745M	1G
Jumbos	0	0	0
Dropped	0	0	0
Filtered	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

Showing information about extended counters:



The output of the `show interface extended` command varies depending on the switch model and configuration.

```
switch(config-if)# show interface 1/1/17 extended
-----
Interface 1/1/17
-----
Statistics                                     Value
-----
Dot1d Tp Port In Frames                      547
Dot1d Tp Port Out Frames                     608
Dot3 In Pause Frames                        0
Dot3 Out Pause Frames                       0
Ethernet Stats Broadcast Packets             19
Ethernet Stats Bytes                        40162
Ethernet Stats Packets                      342
...
-----
Error-Statistics                             Value
-----
Dot1d Base Port MTU Exceeded Discards        0
Dot3 Control In Unknown Opcodes              0
Dot3 Stats Alignment Errors                  0
Dot3 Stats FCS Errors                        0
Dot3 Stats Frame Too Longs                   0
Dot3 Stats Internal Mac Transmit Errors       0
Ethernet RX Oversize Packets                  0
...
```

Showing interface link-status:

```
switch# show interface link-status
-----
```


Port	Type	Physical Link State	Link Transitions	Last Change
1/1/1	1G-BT	down	0	--
1/1/2	1G-BT	up	1	1 minute ago (Fri Mar 09 12:36:56 UTC 2018)
1/1/3	1G-BT	up	1	1 minute ago (Fri Mar 09 12:36:56 UTC 2018)
1/1/4	--	down	0	--
1/1/5	--	down	0	--

Showing interface loopback 1 link-status:

Port	Type	Physical Link State	Link Transitions	Last Change
loopback1	--	up	--	--

Showing interface 1/1/2-1/1/3 link-status:

Port	Type	Physical Link State	Link Transitions	Last Change
1/1/2	1G-BT	up	1	1 minute ago (Fri Mar 09 12:36:56 UTC 2018)
1/1/3	1G-BT	up	1	1 minute ago (Fri Mar 09 12:36:56 UTC 2018)

Showing interface link-status:

```
switch# show interface link-status
```

Port	Type	Physical Link State	Link Transitions	Link Flaps Ignored	Last Change
1/1/1	1G-BT	down	0	0	--
1/1/2	1G-BT	up	1	0	1 minute ago (Fri Mar 09 12:36:56 UTC 2018)
1/1/3	1G-BT	up	1	0	1 minute ago (Fri Mar 09 12:36:56 UTC 2018)
1/1/4	--	down	0	0	--
1/1/5	--	down	0	0	--

Command History

Release	Modification
10.11	Added monitor parameter.
10.10	Added human-readable parameter.
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 dom

```
show interface [<INTERFACE-ID>] dom [detail]
```

Description

Shows diagnostics information and alarm/warning flags for the optical transceivers (SFP, SFP+, QSFP+). This information is known as DOM (Digital Optical Monitoring). DOM information also consists of vendor determined thresholds which trigger high/low alarms and warning flags.

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

Example

```
switch# show interface dom
```

Port	Type	Channel	Temperature (Celsius)	Voltage (Volts)	Tx Bias (mA)	Rx Power (mW/dBm)	Tx Power (mW/dBm)
1/1/1	SFP+SR		47.65	3.31	8.40	0.08, -10.96	0.63, -2.49
1/1/2	SFP+SR		n/a	n/a	n/a	n/a	n/a
1/1/3	SFP+DA3		42.10	3.24	n/a	n/a	n/a
1/1/4	QSFP+SR4	1	44.46	3.30	6.12	0.08, -10.96	0.63, -1.95
2			44.46	3.30	6.04	0.08, -10.96	0.63, -2.00
3			44.46	3.30	6.51	0.08, -10.96	0.60, -2.16
4			44.46	3.30	6.19	0.08, -10.96	0.63, -1.94

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 energy-efficient ethernet

```
show interface [<IFNAME>|<IFRANGE>] energy-efficient-ethernet
```

Description

Displays Energy-Efficient Ethernet information for the interface.

Parameter	Description
<IFNAME>	Specifies the name of an interface on the switch. Use the format member/slot/port (for example, 1/1/1).
<IFRANGE>	Specifies the port identifier range of an interface on the switch. Use the format member/slot/port (for example, 1/1/1).

Example

The following example shows when the interfaces are Energy-Efficient Ethernet capable.

```
switch# show interface energy-efficient-ethernet
-----
Port      Enabled    Negotiated  Speed      TX Wake    RX Wake
          (MB/s)     Time (us)   Time (us)
-----
1/1/1     no         no          --         --         --
1/1/2     yes        yes         100        36         36
1/1/3     yes        yes         1000       17         17
1/1/4     no         no          --         --         --
1/1/5     yes        no          1000       --         --
```

The following example shows when the interface is not Energy-Efficient Ethernet capable :

```
switch# show interface 1/1/1 energy-efficient-ethernet
Port 1/1/1 does not support Energy-Efficient-Ethernet
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	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 interface flow-control

```
show interface [<IFNAME>|<IFRANGE>] flow-control [detail]
```

Description

Shows the flow control configuration, status, and statistics of the specified interface for interfaces on which flow control is enabled.



If **detail** is not specified, this command shows a summary of all flow controlled interfaces with one interface per line. If **detail** is specified, this command shows flow control detailed statistics.



As of AOS-CX 10.10, the separate **show flow-control** command has been removed, with it being effectively replaced by this command.

Parameter	Description
<code><IFNAME> <IFRANGE></code>	Specifies the interface (port) name or range. When no interface range is specified, only interfaces with flow control enabled in the configuration or status are shown.
<code>detail</code>	Shows detailed information.

Examples

Showing summary flow control information:

```
switch# show interface flow-control
-----
Port      Flow
          Control
-----
1/1/1     config: llfc rx
          status: llfc rx
1/1/2     config: llfc rx
          status: none
```

Showing summary flow control information with PFC:

```
switch# show interface flow-control
-----
Port      Flow
          Control
-----
1/1/1     config: pfc rxtx-1,2
          status: pfc rxtx-1,2
1/1/2     config: pfc rxtx-5
          status: none
```

Showing summary flow control information with PFC:

```
switch# show interface flow-control
  Flow Control Watchdog Settings
    Trigger Timeout: 100 milliseconds
    Resume Time:    100 milliseconds
-----
Port      Flow          Watchdog      Watchdog
          Control      Status       Timeouts
-----
1/1/1     config: pfc rxtx-1,2
          status: pfc rxtx-1,2
1/1/2     config: pfc rxtx-5
          status: none
```

1/1/1	config: llfc rx status: llfc rx		
1/1/2	config: llfc rx status: llfc rx	incompatible	0
1/1/10	config: pfc rxtx-1,2 status: pfc rxtx-1,2	enabled	1234
1/1/12	config: pfc rxtx-1,2 status: pfc rxtx-1,2	error	0
1/1/32:4	config: pfc rxtx-5 status: pfc rxtx-5		

Showing summary flow control information where the configuration does not match status due to a reboot required to apply PFC configuration in hardware:

```
switch# show interface flow-control
```

Flow Control Watchdog Settings
 Trigger Timeout: 100 milliseconds (actual: not applied)
 Resume Time: 100 milliseconds (actual: not applied)

Port	Flow Control	Watchdog Status	Watchdog Timeouts
1/1/1	config: llfc rx status: llfc rx		
1/1/2	config: llfc rx status: llfc rx	incompatible	0
1/1/10	config: pfc rxtx-1,2 status: none	pending	1234
1/1/12	config: pfc rxtx-1,2 status: none	pending	0
1/1/32:4	config: pfc rxtx-5 status: none		

Showing detailed flow control information with RX flow control enabled:

```
switch# show interface 1/1/1 flow-control detail
```

Interface 1/1/1 is up
 Admin state is up
 Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
 Flow-control: llfc rx

Statistics	RX
Dot3 Pause Frames	0

Showing detailed flow control information with RX flow control enabled:

```
switch# show interface 1/1/1 flow-control detail
```

Interface 1/1/1 is up
 Admin state is up

```
Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
Flow-control: llfc rx
Flow-control watchdog: disabled
```

Statistics	RX
Dot3 Pause Frames	0

Showing detailed flow control information with RXTX flow control enabled:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
Admin state is up
Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
Flow-control: llfc rxtx
```

Statistics	RX	TX
Dot3 Pause Frames	0	0

Showing detailed flow control information with PFC enabled:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
Admin state is up
Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
Flow-control: pfc rxtx-4,5
```

Statistics	RX	TX
Priority 0 Pauses	0	0
Priority 1 Pauses	0	0
Priority 2 Pauses	0	0
Priority 3 Pauses	0	0
Priority 4 Pauses	0	0
Priority 5 Pauses	0	0
Priority 6 Pauses	0	0
Priority 7 Pauses	0	0
Total Pause Frames	0	0

Showing detailed flow control information with PFC enabled and flow control watchdog disabled:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
Admin state is up
Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
Flow-control: pfc rxtx-4,5
Flow-control watchdog: disabled
```

Statistics	RX	TX
Priority 0 Pauses	0	0
Priority 1 Pauses	0	0

```

Priority 2 Pauses          0          0
Priority 3 Pauses          0          0
Priority 4 Pauses          0          0
Priority 5 Pauses          0          0
Priority 6 Pauses          0          0
Priority 7 Pauses          0          0
Total Pause Frames        0          0
Interface 1/1/1 is up
Admin state is up
Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
Flow-control: pfc rxtx-4,5
Flow-control watchdog: disabled

```

Statistics	RX	TX
-----	-----	-----
Priority 0 Pauses	0	0
Priority 1 Pauses	0	0
Priority 2 Pauses	0	0
Priority 3 Pauses	0	0
Priority 4 Pauses	0	0
Priority 5 Pauses	0	0
Priority 6 Pauses	0	0
Priority 7 Pauses	0	0
Total Pause Frames	0	0

Showing detailed flow control information with both PFC and flow control watchdog enabled:

```

switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
Admin state is up
Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
Flow-control: pfc rxtx-4,5
Flow-control watchdog: enabled

```

Statistics	RX	TX
-----	-----	-----
Priority 0 Pauses	0	0
Priority 1 Pauses	0	0
Priority 2 Pauses	0	0
Priority 3 Pauses	0	0
Priority 4 Pauses	0	0
Priority 5 Pauses	0	0
Priority 6 Pauses	0	0
Priority 7 Pauses	0	0
Total Pause Frames	0	0

Queue	Watchdog Timeouts
-----	-----
Queue 0	0
Queue 1	0
Queue 2	0
Queue 3	0
Queue 4	0
Queue 5	0
Queue 6	0
Queue 7	0

Showing detailed flow control information when flow control watchdog is enabled in the configuration but it could not be applied because the configured flow control mode is not compatible with watchdog:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
Admin state is up
Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
Flow-control: llfc rx
Flow-control watchdog: incompatible
```

Showing detailed flow control information when flow control watchdog is enabled in the configuration but could not be applied because a compatible flow control mode first requires a reboot:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
Admin state is up
Link state: up for 3 minutes (since Thu Apr 07 16:38:02 UTC 2022)
Flow-control: off
Flow-control watchdog: pending
```

Command History

Release	Modification
10.10	Examples updated with new and changed output elements.
10.08	Command introduced.

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 link-diagnostics

```
show interface [<IFNAME>|<IFRANGE>] link-diagnostics
```

Description

Shows information about select link diagnostics, including MAC, PHY, and Transceiver diagnostics.

Parameter	Description
<IFNAME>	Specifies a interface name.
<IFRANGE>	Specifies the port identifier range.
link-diagnostics	Shows link diagnostics information.

Examples

Showing interface information for 1/1/12 link-diagnostics:

```
switch# show interface 1/1/12 link-diagnostics
```

Interface 1/1/12	Current State	Changes	Last Change
Port Status	Waiting for link		
Link Down Reason	Local fault		
Transceiver			
No transceiver	--	0	--
TX Fault	--	0	--
Transceiver error	--	0	--
System error	--	0	--
DOM error	--	0	--
Configuring transceiver	--	0	--
Transceiver disabled	--	0	--
Transceiver unsupported	--	0	--
MAC and PHY			
TX Disabled	--	0	--
Autoneg Incomplete	--	0	--
No Signal Detected	--	0	--
No RX Lock	True	1	22 seconds ago
(Tue Nov 14 14:30:48 UTC 2023)			
Remote Fault	--	0	--
Local Fault	True	1	22 seconds ago
(Tue Nov 14 14:30:48 UTC 2023)			
Link State	Down	1	16 seconds ago
(Tue Nov 14 14:30:54 UTC 2023)			

```
switch# show interface 1/1/12 link-diagnostics
```

Interface 1/1/12	Current State	Changes	Last Change
Port Status	Link up		
Link Down Reason	--		
Transceiver			
No transceiver	--	0	--
TX Fault	--	0	--
Transceiver error	--	0	--
System error	--	0	--
DOM error	--	0	--
Configuring transceiver	--	0	--
Transceiver disabled	--	0	--
Transceiver unsupported	--	0	--
MAC and PHY			
TX Disabled	--	2	22 seconds
ago (Tue Nov 14 14:30:48 UTC 2023)			
Autoneg Incomplete	--	0	--
No Signal Detected	--	2	22 seconds
ago (Tue Nov 14 14:30:48 UTC 2023)			
No RX Lock	--	2	22 seconds
ago (Tue Nov 14 14:30:48 UTC 2023)			
Remote Fault	--	2	21 seconds
ago (Tue Nov 14 14:30:49 UTC 2023)			
Local Fault	--	2	22 seconds
ago (Tue Nov 14 14:30:48 UTC 2023)			
Link State	Up	1	16 seconds
ago (Tue Nov 14 14:30:54 UTC 2023)			

Showing interface information for 1/1/7-1/1/8 link-diagnostics:

```
switch# show interface 1/1/7-1/1/8 link-diagnostics
```

Interface 1/1/7	Current State	Changes	Last Change
Port Status	Link up		
Link Down Reason	--		
Transceiver			
No transceiver	--	0	--
TX Fault	--	0	--
Transceiver error	--	0	--
System error	--	0	--
DOM error	--	0	--
Configuring transceiver	--	0	--
Transceiver disabled	--	0	--
Transceiver unsupported	--	0	--
MAC and PHY			
TX Disabled	--	2	22 seconds
ago (Tue Nov 14 14:30:48 UTC 2023)			
Autoneg Incomplete	--	0	--
No Signal Detected	--	2	22 seconds
ago (Tue Nov 14 14:30:48 UTC 2023)			
No RX Lock	--	2	22 seconds
ago (Tue Nov 14 14:30:48 UTC 2023)			
Remote Fault	--	2	21 seconds
ago (Tue Nov 14 14:30:49 UTC 2023)			
Local Fault	--	2	22 seconds
ago (Tue Nov 14 14:30:48 UTC 2023)			
Link State	Up	1	16 seconds
ago (Tue Nov 14 14:30:54 UTC 2023)			

Interface 1/1/8	Current State	Changes	Last Change
Port Status	Link up		
Link Down Reason	--		
Transceiver			
No transceiver	--	0	--
TX Fault	--	0	--
Transceiver error	--	0	--
System error	--	0	--
DOM error	--	0	--
Configuring transceiver	--	0	--
Transceiver disabled	--	0	--
Transceiver unsupported	--	0	--
MAC and PHY			
TX Disabled	--	2	22 seconds ago
(Tue Nov 14 14:30:48 UTC 2023)			
Autoneg Incomplete	--	0	--
No Signal Detected	--	2	22 seconds ago
(Tue Nov 14 14:30:48 UTC 2023)			
No RX Lock	--	2	22 seconds ago
(Tue Nov 14 14:30:48 UTC 2023)			
Remote Fault	--	2	21 seconds ago
(Tue Nov 14 14:30:49 UTC 2023)			
Local Fault	--	2	22 seconds ago
(Tue Nov 14 14:30:48 UTC 2023)			
Link State	Up	1	16 seconds ago
(Tue Nov 14 14:30:54 UTC 2023)			

Command History

Release	Modification
10.14	Command introduced.

Command Information

Platforms	Command context	Authority
9300P	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 statistics

```
show interface [<IFNAME>|<IFRANGE>] statistics [non-zero] [human-readable]
show interface [<IFNAME>|<IFRANGE>] statistics monitor [non-zero] [human-readable]
show interface [<IFNAME>|<IFRANGE>] error-statistics [non-zero] [human-readable]
show interface [<IFNAME>|<IFRANGE>] error-statistics monitor [non-zero] [human-readable]
show interface lag [<LAG-ID>] statistics [non-zero] [human-readable]
show interface lag [<LAG-ID>] statistics monitor [non-zero] [human-readable]
show interface lag [<LAG-ID>] error-statistics [non-zero] [human-readable]
show interface lag [<LAG-ID>] error-statistics monitor [non-zero] [human-readable]
show interface vxlan <VXLAN-ID> statistics [non-zero] [human-readable]
```

Description

Shows statistics for switch interfaces such as packets transmitted and received, bytes transmitted and received, broadcast and multicast packets.

Parameter	Description
<IFNAME>	Specifies a interface name.
<IFRANGE>	Specifies the port identifier range.
LAG	Shows LAG interface information.
<LAG-ID>	Specifies the LAG number. Range: 1-256
VXLAN	Shows the VXLAN interface information.
<VXLAN-ID>	Specifies the VXLAN interface identifier. Default: 1
monitor	Continuously monitor interface statistics.
human-readable	Shows statistics rounded to the nearest power of 1000, for example, 1K, 345M, 2G.
non-zero	Shows only non zero statistics.

Examples

Showing statistics of all interfaces:

```
show interface statistics
```

Interface	RX Bytes	RX Packets	RX Drops	TX Bytes	TX Packets	TX Drops	RX Broadcast	RX Multicast	TX Broadcast	TX Multicast	RX Pause	TX Pause
1/1/1	2727136	1975	0	17796	195	0	82	1788	96	54	0	0
1/1/10	0	0	0	0	0	0	0	0	0	0	0	0
1/1/11	0	0	0	0	0	0	0	0	0	0	0	0
1/1/12	0	0	0	0	0	0	0	0	0	0	0	0
...												
1/1/30 - lag1	0	0	0	11271	92	0	0	0	0	51	0	0
1/1/31 - lag2	2360	25	50	2732119	2040	0	0	0	178	1839	0	0
1/1/32 - lag2	0	0	0	11373	93	0	0	0	0	51	0	0
vlan1	0	0	0	0	0	0	0	0	0	0	0	0

Showing statistics of all interfaces with only non-zero statistics:

```
show interface statistics non-zero
```

Interface	RX Bytes	RX Packets	RX Drops	TX Bytes	TX Packets	TX Drops	RX Broadcast	RX Multicast	TX Broadcast	TX Multicast	RX Pause	TX Pause
1/1/1	2727136	1975	0	17796	195	0	82	1788	96	54	0	0
1/1/30 - lag1	0	0	0	11271	92	0	0	0	0	51	0	0
1/1/31 - lag2	2360	25	50	2732119	2040	0	0	0	178	1839	0	0
1/1/32 - lag2	0	0	0	11373	93	0	0	0	0	51	0	0

Showing statistics of all interfaces in the human-readable format:

```
show interface statistics human-readable
```

Interface	RX Bytes	RX Pkts	RX Drops	TX Bytes	TX Pkts	TX Drops	RX Bcast	RX Mcast	TX Bcast	TX Mcast	RX Pause	TX Pause
1/1/1	744M	577K	0	745M	578K	0	0	0	73	287	0	0
1/1/2	474M	367K	0	475M	369K	0	0	0	73	288	0	0
1/1/3	0	0	0	0	0	0	0	0	0	0	0	0

Showing statistics of a single interfaces:

```
show interface 1/1/2 statistics
```

Interface	RX Bytes	RX Packets	RX Drops	TX Bytes	TX Packets	TX Drops	RX Broadcast	RX Multicast	TX Broadcast	TX Multicast	RX Pause	TX Pause
1/1/2	2725080	1931	0	25877	253	0	21	1788	65	55	0	0

Showing statistics of all members of a LAG interface:

```
show interface lag1 statistics
```

Interface	RX Bytes	RX Packets	RX Drops	TX Bytes	TX Packets	TX Drops	RX Broadcast	RX Multicast	TX Broadcast	TX Multicast	RX Pause	TX Pause
1/1/3 - lag1	2424	26	0	2734082	2062	0	0	0	191	1848	0	0
1/1/30 - lag1	0	0	0	12383	100	0	0	0	0	59	0	0
lag1	2424	26	0	2746465	2162	0	0	0	191	1907	0	0

Showing error statistics of all interfaces:

```
show interface error-statistics
```

Interface	RX Errors	TX Errors	Giants	Runts	CRC/FCS	Collisions
1/1/1	190	20	100647	0	0	0
1/1/10	0	0	100	290	7165	949
1/1/11	0	0	0	0	0	0
1/1/12	0	0	0	0	0	0
...						
1/1/30 - lag1	1500	500	45800	0	0	0
1/1/31 - lag2	0	0	11	27	0	0
1/1/32 - lag2	0	0	0	0	6	18

Showing monitor statistics:



The rows and columns of show interface monitor statistics depends on the length of width of the client terminal. The CLI can be navigated using the arrow keys as well as the PageUp, PageDown, Home, and End keys.

```
show interface statistics monitor
```

Interface	RX Bytes	RX Packets >>
1/1/1	3440525421984	53758209526
1/1/2	3440526607008	53758228042
1/1/3	3440527785312	53758246453
1/1/30	3440559671264	53758744653
1/1/31	3440560851680	53758763098
1/1/32	3440562028704	53758781489

help: ?, quit: q

Help for Interface Monitor

f Toggle full statistics
h Toggle human-readable mode
n Toggle non-zero mode
r Toggle rate display

c Clear interface statistics
Does not apply to rates

Arrows, PgUp, PgDn, Home, End
Navigate interface statistics

Delay:2

help: ?, quit: q

Showing monitor error statistics in human-readable format:

```
show interface 1/1/1-1/1/3,1/1/30-1/1/32 error-statistics monitor human-readable
```

Interface	RX Errors	TX Errors	RX Giants	RX Runts	CRC/FCS	Collisions
1/1/1	0	0	0	0	0	0
1/1/2	0	0	0	0	0	0
1/1/3	0	0	0	0	0	0
1/1/30	0	0	0	0	0	0
1/1/31	0	0	0	0	0	0
1/1/32	0	0	0	0	0	0

Human-readable

help: ?, quit: q

Help for Interface Monitor

h Toggle human-readable mode
n Toggle non-zero mode

c Clear interface statistics
Does not apply to rates

Arrows, PgUp, PgDn, Home, End
Navigate interface statistics

Delay:2

help: ?, quit: q

Command History

Release	Modification
10.11	Added moitor parameter.
10.10	Added human-readable parameter.
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 transceiver

```
show interface [<INTERFACE-ID>] transceiver [detail | threshold-violations]
```

Description

Displays information about transceivers present in the switch. The information shown varies for different transceiver types and manufacturers. Only basic information is shown for unsupported HPE and third-party transceivers installed in the switch and they are also identified with an asterisk in the output.

Parameter	Description
<INTERFACE-ID>	Specifies the name or range of an interface on the switch. Use the format member/slot/port (for example, 1/3/1).
detail	Show detailed information for the interfaces.
threshold-violations	Show threshold violations for transceivers.

Example

Showing summary transceiver information with identification of unsupported transceivers:

```
switch(config)# show interface transceiver
-----
Port      Type      Product   Serial     Part
Number    Number    Number
-----
1/1/1     SFP+SR    J9150A    MYxxxxxxx  1990-3657
1/1/2     SFP+ER*   --        --         --
1/2/1     QSFP+SR4  JH233A    MYxxxxxxx  2005-1234
1/2/2     QSFP+ER4* --        --         --
1/3/1     SFP28DAC3 844477-B21 MYxxxxxxx  77fc-7ce7
* unsupported transceiver
```

Showing detailed transceiver information:

```
switch(conf#) show interface transceiver detailing
Transceiver in 1/1/1
  Interface Name      : 1/1/1
  Type                : SFP+SR
  Connector Type      : LC
  Wavelength          : 850nm
  Transfer Distance   : 0m (SMF), 30m (OM1), 80m (OM2), 300m (OM3)
  Diagnostic Support  : DOM
  Product Number      : J9150A
  Serial Number       : MYxxxxxxx
  Part Number        : 1990-3657
```

Status

Temperature : 47.65C
Voltage : 3.31V
Tx Bias : 8.40mA
Rx Power : 0.08mW, -10.96dBm
Tx Power : 0.56mW, -2.49dBm

Recent Alarms :

Rx power low alarm
Rx power low warning
Recent Errors :
Rx loss of signal

Transceiver in 1/1/2

Interface Name : 1/1/2
Type : unknown
Connector Type : ??
Wavelength : ??
Transfer Distance : ??
Diagnostic Support : ??
Product Number : ??
Serial Number : ??
Part Number : ??

Transceiver in 1/2/1

Interface Name : 1/2/1
Type : QSFP+SR4
Connector Type : MPO
Wavelength : 850nm
Transfer Distance : 0m (SMF), 0m (OM1), 0m (OM2), 100m (OM3)
Diagnostic Support : DOM
Product Number : JH233A
Serial Number : MYxxxxxxx
Part Number : 2005-1234

Status

Temperature : 44.46C
Voltage : 3.30V

Channel#	Tx Bias (mA)	Rx Power (mW/dBm)	Tx Power (mW/dBm)

1	6.12	0.00, -inf	0.63, -1.95
2	6.04	0.00, -inf	0.63, -2.00
3	6.51	0.00, -inf	0.60, -2.16
4	6.19	0.00, -inf	0.63, -1.94

Recent Alarms :

Channel 1 :

Rx power low alarm
Rx power low warning

Channel 2 :

Rx power low alarm
Rx power low warning

Channel 3 :

Rx power low alarm
Rx power low warning

Channel 4 :

Rx power low alarm
Rx power low warning

```

Recent Errors :
Channel 1 :
    Rx Loss of Signal
Channel 2 :
    Rx Loss of Signal
Channel 3 :
    Rx Loss of Signal
Channel 4 :
    Rx Loss of Signal

Transceiver in 1/2/2
Interface Name      : 1/2/2
Type                : unknown
Connector Type      : ??
Wavelength          : ??
Transfer Distance   : ??
Diagnostic Support   : ??
Product Number      : ??
Serial Number       : ??
Part Number         : ??

Transceiver in 1/3/1
Interface Name      : 1/3/1
Type                : SFP28DAC3
Connector Type      : Copper Pigtail
Transfer Distance    : 0.00km (SMF), 0m (OM1), 0m (OM2), 0m (OM3)
Diagnostic Support   : None
Product Number      : 844477-B21
Serial Number       : MYxxxxxxx
Part Number         : 77fc-7ce7

```

Showing detailed transceiver information with identification of unsupported transceivers:

```

Transceiver in 1/1/2
Interface Name      : 1/1/2
Type                : SFP+ER (unsupported)
Connector Type      : LC
Wavelength          : 3590nm
Transfer Distance    : 80m (SMF), 0m (OM1), 0m (OM2), 0m (OM3)
Diagnostic Support   : DOM
Vendor Name         : INNOLIGHT
Vendor Part Number   : TR-PX15Z-NHP
Vendor Part Revision: 1A
Vendor Serial number: MYxxxxxxx

Status
Temperature         : 28.88C
Voltage              : 3.30V
Tx Bias              : 65.53mA
Rx Power             : 0.00mW, -inf
Tx Power             : 1.47mW, 1.67dBm

Recent Alarms:
Rx Power low alarm
Rx Power low warning
Recent Errors:

```

Showing transceiver threshold-violations:


```
switch(config)# show interface transceiver threshold-violations
```

Port	Type	Channel	Type(s) of Recent Threshold Violation(s)
1/1/1	SFP+SR		Tx bias high warning 50.52 mA > 40.00 mA
1/1/2	SFP+ER*		??
1/2/1	QSFP+SR4	1	Tx power low alarm -17.00 dBm < -0.50 dBm
		2	Tx bias low warning 3.12 mA < 4.00 mA
1/2/2	QSFP+ER4*		??
1/3/1	SFP28DAC3		n/a
* unsupported transceiver			

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 utilization

```
show interface [<IFNAME>|<IFRANGE>] utilization [non-zero]
```

Description

Displays physical port throughput and utilization.

Parameter	Description
<IFNAME>	Specifies an interface name.
<IFRANGE>	Specifies the port identifier range.
utilization	Displays utilization statistics.
non-zero	Displays non-zero statistics

Examples

The following example shows port utilization of all interfaces:

```
switch# show interface utilization
```

```

-----|-----|-----|-----
-----|-----
Interval |          RX          |          TX          | Total (RX+TX) |
Interface | seconds | Mbps | Kpkt/s | Util % | Mbps | Kpkt/s | Util % | Mbps |
Kpkt/s   Util % | Description
-----|-----|-----|-----|-----|-----|-----|-----|-----|
1/1/1      300  9578.02  788.70  95.78   25.70   45.89   0.26  9603.72
834.59    96.04  Aruba-AP
1/1/2      300   25.71   45.90   0.26  9581.09  788.96   95.81  9606.80
834.86    96.07  Aruba2530-AP-conce...
1/1/3 - lag123  300   0.00   0.00   0.00   0.00   0.00   0.00   0.00
0.00     0.00  ISL: SWRTS-0064-1
1/1/4      300  9261.79  804.52  92.62  9496.70  823.97   94.97  18758.50
1628.48  187.58  Backup data center...
1/1/5      300  9496.70  823.97  94.97  9261.79  804.52   92.62  18758.50
1628.48  187.58  --

```

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 ip interface

show ip interface <INTERFACE-ID>[{lag|loopback|vlan|tunnel <ID>}]

Description

Shows status and configuration information for an IPv4 interface.

Parameter	Description
<INTERFACE-ID>	Specifies the name of an interface. Format: member/slot/port .
lag <ID>	Show LAG interface information, where <ID> is 1-256.
loopback <ID>	Show loopback interface information, where <ID> is 0-255.
tunnel <ID>	Show tunnel interface information, where <ID> is 1-255.
vlan <ID>	Show VLAN interface information, where <ID> is 1-4094.

Example

```
switch# show ip interface 1/1/1
Interface 1/1/1 is up
Admin state is up
Hardware: Ethernet, MAC Address: 70:72:cf:fd:e7:b4
IP MTU 1500
IP TCP MSS 1460
IPv4 address 192.168.1.1/24
L3 Counters: Rx Enabled, Tx Enabled
Statistic                RX                TX                Total
-----
L3 Packets                0                0                0
L3 Bytes                  0                0                0
```

```
switch# show ip interface 1/1/1
Interface 1/1/1 is up
Admin state is up
Hardware: Ethernet, MAC Address: 70:72:cf:fd:e7:b4
IP MTU 1500
IP TCP MSS 1460
IP Directed Broadcast is Disabled
IPv4 address 2.2.2.2/32 [unnumbered to loopback1]
L3 Counters: Rx Disabled, Tx Disabled
```

```
switch# show ip interface loopback 1
Interface loopback1 is up
Admin state is up
Hardware: Loopback
IP Directed Broadcast is Disabled
IPv4 address 192.168.1.1/24
```

Command History

Release	Modification
10.14.1000	Command output can display information for an IP unnumbered interface and IP TCP MSS configuration.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 ip source-interface

```
show ip source-interface {sflow | tftp | radius | tacacs | all} [vrf <VRF-NAME>]
```

Description

Shows single source IP address configuration settings.

Parameter	Description
sflow tftp radius tacacs all	Shows single source IP address configuration settings for a specific protocol. The all option shows the global setting that applies to all protocols that do not have an address set.
vrf <VRF-NAME>	Specifies the name of a VRF.

Examples

```
Showing single source IP address configuration settings for sFlow:
switch# show ip source-interface sflow
Source-interface Configuration Information
-----
Protocol          Source Interface
-----
sflow             10.10.10.1
```

Showing single source IP address configuration settings for all protocols:

```
switch# show ip source-interface all
Source-interface Configuration Information
-----
Protocol          Source Interface
-----
all               1/1/1
```

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.

show ipv6 interface

```
show ipv6 interface <INTERFACE-ID>
```

Description

Shows status and configuration information for an IPv6 interface.

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

Examples

```
switch# show ipv6 interface 1/1/1
Interface 1/1/1 is up
  Admin state is up
  IPv6 address:
    2001:0db8:85a3:0000:0000:8a2e:0370:7334/24 [VALID]
  IPv6 link-local address: fe80::1e98:ecff:fee3:e800/64 (default) [VALID]
  IPv6 virtual address configured: none
  IPv6 multicast routing: disable
  IPv6 Forwarding feature: enabled
  IPv6 multicast groups locally joined:
    ff02::ff70:7334 ff02::ffe3:e800 ff02::1 ff02::1:ff00:0
    ff02::2
  IPv6 multicast (S,G) entries joined: none
  IPv6 MTU: 1524 (using link MTU)
  IPv6 TCP MSS 1440
  IPv6 unicast reverse path forwarding: none
  IPv6 load sharing: none
  RX
    0 packets, 0 bytes
  TX
    0 packets, 0 bytes
```

```
switch# show ipv6 interface 1/1/14.1
Interface 1/1/14.1 is up
  Admin state is up
  IPv6 address:
    30::1/64 [VALID]
  IPv6 link-local address: fe80::b86a:97c0:122:2f42/64 [VALID]
  IPv6 virtual address configured: none
  IPv6 multicast routing: disable
  IPv6 Forwarding feature: enabled
  IPv6 multicast groups locally joined:
    ff02::1 ff02::1:ff22:2f42 ff02::1:ff00:1 ff02::1:ff00:0
    ff02::2
  IPv6 multicast (S,G) entries joined: none
  IPv6 MTU 1500
  IPv6 TCP MSS 1440
  IPv6 unicast reverse path forwarding: none
  IPv6 load sharing: none
  Encapsulation dot1q ID: 20
```

```
switch# show ipv6 interface lag2.1
Interface lag2.1 is up
  Admin state is up
  IPv6 address:
    40::1/64 [VALID]
  IPv6 link-local address: fe80::b86a:97c0:122:2f42/64 [VALID]
  IPv6 virtual address configured: none
  IPv6 multicast routing: disable
  IPv6 Forwarding feature: enabled
  IPv6 multicast groups locally joined:
    ff02::1 ff02::1:ff22:2f42 ff02::1:ff00:1 ff02::1:ff00:0
    ff02::2
  IPv6 multicast (S,G) entries joined: none
  IPv6 MTU 1500
  IPv6 TCP MSS 1440
  IPv6 unicast reverse path forwarding: none
  IPv6 load sharing: none
  Encapsulation dot1q ID: 30
```

Command History

Release	Modification
10.14.1000	Command output can display information for an IP unnumbered interface and IPv6 TCP MSS configuration.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 ipv6 source-interface

```
show ipv6 source-interface {sflow | tftp | radius | tacacs | all} [vrf <VRF-NAME>]
```

Description

Shows single source IP address configuration settings.

Parameter	Description
sflow tftp radius tacacs all	Shows single source IP address configuration settings for a specific protocol. The all option shows the global setting that applies to all protocols that do not have an address set.
vrf <VRF-NAME>	Specifies the name of a VRF.

Examples

Showing single source IP address configuration settings for sFlow:

```
switch# show ipv6 source-interface sflow

Source-interface Configuration Information
-----
Protocol      Source Interface
-----
sflow         2001:DB8::1
```

Showing single source IP address configuration settings for all protocols:

```
switch# show ipv6 source-interface all

Source-interface Configuration Information
-----
Protocol      Source Interface
-----
all           1/1/1
```

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.

shutdown

shutdown
no shutdown

Description

Disables an interface. Interfaces are disabled by default when created.
The **no** form of this command enables an interface.

Examples

Disabling an interface:

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

Enabling an interface:

```
switch(config-if)# no shutdown
```

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.

speed

speed {<SPEED> | <SPEED-DUPLEX> | auto [<SPEED>] }
no speed

Description

Configures the link speed, duplex, and auto-negotiation settings for an interface.

The no form of this command removes the configurations and returns to the defaults.

Parameter	Description
Speed	Configures interface speed, duplex, and auto-negotiation.
10-full	10 Mbps, full duplex, no auto-negotiation
10-half	10 Mbps, half duplex, no auto-negotiation
100-full	100 Mbps, full duplex, no auto-negotiation
100-half	100 Mbps, half duplex, no auto-negotiation
1000-full	1000 Mbps, full duplex, no auto-negotiation
10g	10 Gbps, full duplex, no auto-negotiation
25g	25 Gbps, full duplex, no auto-negotiation
40g	40 Gbps, full duplex, no auto-negotiation
50g	50 Gbps, full duplex, no auto-negotiation
100g	100 Gbps, full duplex, no auto-negotiation
200g	200 Gbps, full duplex, no auto-negotiation
	NOTE: Not applicable for override.
400g	400 Gbps, full duplex, no auto-negotiation
	NOTE: Not applicable for override.
auto	Auto-negotiate speed and duplex. More than one speed can be set at a time.
10m	Allow interface to link at 10 Mbps.
100m	Allow interface to link at 100 Mbps.
1g	Allow interface to link at 1 Gbps.
2.5g	Allow interface to link at 2.5 Gbps.
5g	Allow interface to link at 5 Gbps.
10g	Allow interface to link at 10 Gbps.
25g	Allow interface to link at 25 Gbps.
40g	Allow interface to link at 40 Gbps.
50g	Allow interface to link at 50 Gbps.
100g	Allow interface to link at 100 Gbps.

Parameter	Description
200g	Allow interface to link at 200 Gbps.
400g	Allow interface to link at 400 Gbps.

Usage

The following options can be configured for an interface. The option available is based on the interface type.

`speed <SPEED-DUPLEX>`

Uses a fixed speed and duplex mode with no auto-negotiation. Half-duplex is only supported for 10 Mbps and 100 Mbps link speeds.

`speed <SPEED>`

Uses a fixed speed with no auto-negotiation. If the currently installed transceiver does not support the speed, the setting is ignored and the port will use the highest speed that is supported.

`speed auto`

Uses auto-negotiation and offers all speeds supported by the port and transceiver. This is the default. If the link technology does not support auto-negotiation this setting is ignored, and the port uses the highest possible fixed speed.

`speed auto <SPEED>`

Uses auto-negotiation and offers the specified speeds only. For ports that support pluggable transceivers, only speeds supported by the transceiver are offered and other speeds are ignored. If the link technology does not support auto-negotiation, this setting is ignored and the port uses the highest possible fixed speed.

Examples

Configuring an interface to operate at a fixed speed of 1000 Mbps with full duplex and no auto-negotiation:

```
switch(config)# interface 1/1/1
switch(config-if)# speed 1000-full
```

Configuring an interface to operate at a fixed speed of 10 Gbps with no auto-negotiation:

```
switch(config)# interface 1/1
switch(config-if)# speed 10g
```

Configuring an interface to auto-negotiate and advertise only 1 Gbps and 2.5 Gbps speeds:

```
switch(config)# interface 1/1/1
switch(config-if)# speed auto 1g 2.5g
```

Configuring an interface to override the detected transceiver speed and use the configured speed if the installed transceiver does not support auto-negotiation:

```
switch(config)# interface 1/1/1
switch(config-if)# speed auto 50g override
```

Configuring an interface to use default settings for speed, duplex, and auto-negotiation:

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

Command History

Release	Modification
10.09.0001	Speeds not supported by hardware hidden by CLI.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if	Administrators or local user group members with execution rights for this command.

Source interface selection

The source IP address is determined by the system and is typically the IP address of the outgoing interface in the routing table. However, routing switches may have multiple routing interfaces and outgoing packets can potentially be sent by different paths at different times. This results in different source IP addresses.

AOS-CX provides a configuration model that allows the selection of an IP address to use as the source address for all outgoing traffic. This allows unique identification of the software application on the server site regardless of which local interface has been used to reach the destination server. The source interface selection supports selecting an IP address or interface name.



If the source interface and source IP are configured, Source IP will have priority.

Source-interface selection commands

ip source-interface (protocol <ip-addr>)

```
ip source-interface <PROTOCOL> <IP-ADDR> [vrf <VRF-NAME>]
no ip source-interface <PROTOCOL> <IP-ADDR> [vrf <VRF-NAME>]
```

Description

Configures the source-interface IPv4 address to use for the specified protocol. If a VRF is not given, the default VRF applies. If no interface option is given, the device floods through interfaces and VRFs to reach Aruba Central. Whichever reaches Aruba Central will be picked automatically.

The `no` form of this command removes all configurations.

Parameter	Description
<PROTOCOL>	Specifies the protocol to configure. all Selects all protocols that can be configured by this command. central Selects Aruba Central. dhcp_relay Selects DHCP relay. dns Selects DNS. ntp Selects NTP. radius Selects radius. sflow

Parameter	Description
	Selects sFlow. sFlow
	Selects simplivity. sFlow
	Selects syslog. syslog
	Selects TACACS. tacacs
	Selects TFTP. tftp
<IP-ADDR>	Specifies the IPv4 address.
vrf <VRF-NAME>	Specifies the VRF name.

Examples

Configuring source-interface IPv4 10.1.1.1 to use for the TFTP protocol:

```
switch(config)# ip source-interface tftp 10.1.1.1
```

Configuring source-interface IPv4 10.1.1.2 to use for the TFTP protocol on VRF green :

```
switch(config)# ip source-interface tftp 10.1.1.2 vrf green
```

Removing source-interface IPv4 10.1.1.1 configuration for the TFTP protocol:

```
switch(config)# no ip source-interface tftp 10.1.1.1
```

Removing source-interface IPv4 10.1.1.2 configuration for TFTP protocol on VRF green:

```
switch(config)# no ip source-interface tftp 10.1.1.2 vrf green
```

Configuring source-interface IPv4 10.1.1.1 to use for the DNS protocol:

```
switch(config)# ip source-interface dns 10.1.1.1
```

Configuring source-interface IPv4 10.1.1.2 to use for the DNS protocol on VRF green :

```
switch(config)# ip source-interface dns 10.1.1.2 vrf green
```

Removing source-interface IPv4 10.1.1.1 configuration for the DNS protocol:

```
switch(config)# no ip source-interface dns 10.1.1.1
```

Removing source-interface IPv4 10.1.1.2 configuration for the DNS protocol on VRF green:

```
switch(config)# no ip source-interface dns 10.1.1.2 vrf green
```

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.

ip source-interface

```
ip source-interface <PROTOCOL> {<IP-ADDR>|interface <IFNAME>} [vrf <VRF-NAME>]  
no ip source-interface <PROTOCOL> interface <IFNAME> [vrf <VRF-NAME>]
```

Description

Configures the IPv4 source-interface interface to use for the specified protocol. If a VRF is not given, the default VRF applies.

The **no** form of this command removes the specified configuration.

Parameter	Description
<PROTOCOL>	Specifies the protocol to configure. all Selects the source for all protocols covered by this command. central Selects Aruba Central. dhcp_relay Selects DHCP relay. When you configure a dhcp_relay source interface, you must also enable DHCP relay Option 82 using the dhcp-relay option 82 source-interface command. dns Selects DNS. http Selects HTTP. ntp Selects NTP. ptp Selects PTP. radius Selects RADIUS. sflow

Parameter	Description
	Selects sFlow. sftp-scp
	Selects SFTP and SCP. ssh-client
	Selects SSH Client. syslog
	Selects the source for syslog packets. tacacs
	Selects the source for TACACS packets. tftp
	Selects TFTP. ubt
	Selects UBT.
	Specifies the VRF name.
<IFNAME>	Specifies the interface name.
<IP-ADDR>	Specifies the IPv4 address.
vrf <VRF-NAME>	Specifies the VRF name.

Examples

Configuring IPv4 source-interface interface 1/1/1 to use for the TFTP protocol:

```
switch(config)# ip source-interface tftp interface 1/1/1
```

Configuring IPv4 source-interface interface 1/1/2 to use for the TFTP protocol on VRF green :

```
switch(config)# ip source-interface tftp interface 1/1/2 vrf green
```

Removing IPv4 source-interface 1/1/1 configuration for the TFTP protocol:

```
switch(config)# no ip source-interface tftp interface 1/1/1
```

Removing source-interface interface 1/1/2 configuration for TFTP protocol on VRF green:

```
switch(config)# no ip source-interface tftp interface 1/1/2 vrf green
```

Configuring source-interface IPv4 10.1.1.1 to use for the TFTP protocol:

```
switch(config)# ip source-interface tftp 10.1.1.1
```

Configuring source-interface IPv4 10.1.1.2 to use for the TFTP protocol on VRF green :

```
switch(config)# ip source-interface tftp 10.1.1.2 vrf green
```

Removing source-interface IPv4 10.1.1.1 configuration for the TFTP protocol:

```
switch(config)# no ip source-interface tftp 10.1.1.1
```

Removing source-interface IPv4 10.1.1.2 configuration for TFTP protocol on VRF green:

```
switch(config)# no ip source-interface tftp 10.1.1.2 vrf green
```

Configuring source-interface IPv4 10.1.1.1 to use for the DNS protocol:

```
switch(config)# ip source-interface dns 10.1.1.1
```

Configuring source-interface IPv4 10.1.1.2 to use for the DNS protocol on VRF green :

```
switch(config)# ip source-interface dns 10.1.1.2 vrf green
```

Removing source-interface IPv4 10.1.1.1 configuration for the DNS protocol:

```
switch(config)# no ip source-interface tftp 10.1.1.1
```

Removing source-interface IPv4 10.1.1.2 configuration for the DNS protocol on VRF green:

```
switch(config)# no ip source-interface dns 10.1.1.2 vrf green
```

Command History

Release	Modification
10.12.1000	Added <code>cental</code> , <code>sftp-scp</code> , and <code>ssh-client</code> parameters.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config</code>	Administrators or local user group members with execution rights for this command.

ipv6 source-interface

```
ipv6 source-interface <PROTOCOL> <IPV6-ADDR> [vrf <VRF-NAME>]  
no source-interface <PROTOCOL> <IPV6-ADDR> [vrf <VRF-NAME>]
```

Description

Configures the source-interface IPv6 address to use for the specified protocol. If a VRF is not given, the default VRF applies.

The `no` form of this command removes the specified protocol configuration.

Parameter	Description
<code><PROTOCOL></code>	Specifies the protocol to configure. <ul style="list-style-type: none">▪ <code>all</code>:Selects all protocols supported by this command.▪ <code>central</code>:Selects Aruba Central.▪ <code>ntp</code>:Selects NTP.▪ <code>radius</code>:Selects radius.▪ <code>sflow</code>:Selects sFlow.▪ <code>syslog</code>:Selects syslog.▪ <code>tacacs</code>:Selects TACACS.▪ <code>tftp</code>:Selects TFTP.
<code><IPv6-ADDR></code>	Specifies the IPv6 address.
<code>vrf <VRF-NAME></code>	Specifies the VRF name.

Examples

Configuring source-interface IPv6 1111:2222 to use for the TFTP protocol:

```
switch(config)# ipv6 source-interface tftp 1111:2222
```

Configuring source-interface IPv6 1111:3333 to use for TFTP protocol on VRF green :

```
switch(config)# ipv6 source-interface tftp 1111:3333 vrf green
```

Removing source-interface IPv6 1111:2222 configuration for TFTP protocol:

```
switch(config)# no ipv6 source-interface tftp 1111:2222
```

Removing source-interface IPv6 1111:3333 configuration for TFTP protocol on VRF green:

```
switch(config)# no ipv6 source-interface tftp 1111:3333 vrf green
```

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.

ipv6 source-interface dns

```
ipv6 source-interface {dns | all} {interface | X:X::X:X} [vrf <VRF-NAME>]
[no] ipv6 source-interface {dns | all} {interface | X:X::X:X} [vrf <VRF-NAME>]
```

Description

Configures the IPv6 source-interface or source IP for IPv6 DNS clients.

The **no** form of this command removes all configurations.

Parameter	Description
<PROTOCOL>	<p>Specifies the protocol to configure.</p> <p>all Selects all protocols supported by this command.</p> <p>central Selects Aruba Central.</p> <p>dhcp_relay Selects DHCP relay.</p> <p>dns Selects DNS packet source.</p> <p>http Selects HTTP.</p> <p>ntp Selects NTP.</p> <p>radius Selects radius.</p> <p>sftp-scp Selects SFTP and SCP.</p> <p>sflow Selects sFlow.</p> <p>ssh-client Selects SSH Client.</p> <p>syslog Selects syslog.</p> <p>tacacs Selects TACACS.</p> <p>tftp SelectsTFTP.</p> <p>ubt SelectsUBT.</p>
<IPV6-ADDR>	Specifies the IPv6 address.
vrf <VRF-NAME>	Specifies the VRF name.

Examples

Configuring IPv6 source-interface dns :

```
switch(config)# ipv6 source-interface
all           All protocols
central       Aruba Central protocol
dhcp_relay    DHCP_RELAY protocol
dns           DNS protocol
http          HTTP protocol
ntp           NTP protocol
radius        RADIUS protocol
sflow         sFlow protocol
sftp-scp      SFTP and SCP protocols
ssh-client    SSH Client protocol
syslog        syslog protocol
tacacs        TACACS protocol
tftp          TFTP protocol
```

Configuring IPv6 source -interface dns:

```
switch(config)# ipv6 source-interface dns
X:X::X:X      Specify an IPv6 address
interface     Interface information
```

Configuring IPv6 source-interface dns on 1::1:

```
switch(config)# ipv6 source-interface dns 1::1
vrf           VRF Configuration
<cr>
```

Configuring IPv6 source-interface dns on 1::1: vrf:

```
switch(config)# ipv6 source-interface dns 1::1 vrf
VRF_NAME      VRF name
```

Configuring IPv6 source-interface dns on 1::1 vrf BLUE

```
switch(config)# ipv6 source-interface dns 1::1 vrf BLUE
switch(config)# ipv6 source-interface dns interface vlan10
vrf           VRF Configuration
<cr>
```

Configuring IPv6 source-interface dns on vlan10 vrf BLUE:

```
switch(config)# ipv6 source-interface dns interface vlan10 vrf BLUE
```

Command History

Release	Modification
10.13	Command introduced.

Command Information

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

ipv6 source-interface

```
ipv6 source-interface <PROTOCOL> {<IPV6-ADDR>|interface <IFNAME>} [vrf <VRF-NAME>]
no ipv6 source-interface <PROTOCOL> {<IPV6-ADDR>|interface <IFNAME>} [vrf <VRF-NAME>]
```

Description

Configures the IPv6 source-interface interface to use for the specified protocol. If a VRF is not given, the default VRF applies.

The **no** form of this command removes all configurations.

Parameter	Description
<PROTOCOL>	Specifies the protocol to configure. all Selects all protocols supported by this command. central Selects Aruba Central. dhcp_relay Selects DHCP relay. dns Selects DNS packets http Selects HTTP. ntp Selects NTP. radius Selects radius. sftp-scp Selects SFTP and SCP. sflow Selects sFlow. ssh-client Selects SSH Client. syslog Selects syslog. tacacs Selects TACACS. tftp SelectsTFTP.

Parameter	Description
<IPv6-ADDR>	Specifies the IPv6 address.
<IFNAME>	Specifies the interface name.
vrf <VRF-NAME>	Specifies the VRF name.

Examples

Configuring IPv6 source-interface interface 1/1/1 to use for the TFTP protocol :

```
switch(config)# ipv6 source-interface tftp interface 1/1/1
```

Configuring IPv6 source-interface interface 1/1/2 to use for the TFTP protocol on VRF green :

```
switch(config)# ipv6 source-interface tftp interface 1/1/2 vrf green
```

Removing IPv6 source-interface interface 1/1/1 configuration for the TFTP protocol:

```
switch(config)# no ipv6 source-interface tftp interface 1/1/1
```

Removing IPv6 source-interface interface 1/1/2 configuration for the TFTP protocol on VRF green:

```
switch(config)# no ipv6 source-interface tftp interface 1/1/2 vrf green
```

Configuring source-interface IPv6 1111:2222 to use for the TFTP protocol:

```
switch(config)# ipv6 source-interface tftp 1111:2222
```

Configuring source-interface IPv6 1111:3333 to use for TFTP protocol on VRF green :

```
switch(config)# ipv6 source-interface tftp 1111:3333 vrf green
```

Removing source-interface IPv6 1111:2222 configuration for TFTP protocol:

```
switch(config)# no ipv6 source-interface tftp 1111:2222
```

Removing source-interface IPv6 1111:3333 configuration for TFTP protocol on VRF green:

```
switch(config)# no ipv6 source-interface tftp 1111:3333 vrf green
```

Command History

Release	Modification
10.13.0001	Added the dns protocol parameter.
10.12.1000	Added central , sftp-scp , dhcp_relay and ssh-client parameters.
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 ip source-interface

```
show ip source-interface <PROTOCOL> [vrf <VRF-NAME> | all-vrfs]
```

Description

Displays the source interface information for all VRFs or a specific VRF.

If a VRF is not specified, the default is displayed.

Parameter	Description
<PROTOCOL>	Specifies the protocol to show.
all	Shows the source interface configuration for all other protocols.
central	Shows the source interface configuration for Aruba Central.
dhcp relay	Shows the source interface configuration for DHCP relay.
dns	Shows the source interface configuration for DNS.
http	Shows the source interface configuration for HTTP.
ntp	Shows the source interface configuration for NTP.
ptp	Shows the source interface configuration for PTP.
radius	Shows the source interface configuration for radius.
sflow	Shows the source interface configuration for sFlow.
sftp-scp	Shows source interface configuration for SFTP and SCP.
ssh-client	

Parameter	Description
	Shows source interface configuration for SSH Client. syslog
	Shows the source interface configuration for syslog. tacacs
	Shows the source interface configuration for TACACS. tftp
	Shows the source interface configuration for TFTP. ubt
	Shows the source interface configuration for PTP.
<code>vrf <VRF-NAME></code>	Specifies the VRF name.
<code>all-vrfs</code>	Shows the source interface configuration for all VRFs.

Examples

Displaying all source-interface protocol configurations for VRF red:

```
switch# show ip source-interface all vrf red
Source-interface Configuration Information
-----
Protocol      Src-Interface      Src-IP      VRF
-----
all           1/1/1             red
switch#
```

Displaying all source-interface protocol configurations for default VRF:

```
switch# show ip source-interface all
Source-interface Configuration Information
-----
Protocol      Src-Interface      Src-IP      VRF
-----
all           1.1.1.1           default
switch#
```

Displaying all source-interface protocol configurations for all VRFs:

```
switch# show ip source-interface all all-vrfs
Source-interface Configuration Information
-----
Protocol      Src-Interface      Src-IP      VRF
-----
all           2.2.2.2           all-vrfs
all           1.1.1.1           default
all           1/1/1/1           red
switch#
```

Command History

Release	Modification
10.12.1000	Added <code>central</code> , <code>sftp-scp</code> , and <code>ssh-client</code> parameters.
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 ipv6 source-interface

```
show ipv6 source-interface <PROTOCOL> [detail] [vrf <VRF-NAME> | all-vrfs]
```

Description

Displays the IPV6 source interface information configured in the router for all VRFs or a specific VRF. If a VRF is not specified, the default is displayed.

Parameter	Description
<code><PROTOCOL></code>	Specifies the protocol to show. <code>all</code> Shows the source interface configuration for all other protocols. <code>central</code> Shows the source interface configuration for Aruba Central. <code>dhcp_relay</code> Shows the source interface configuration for DHCP relay. <code>dns</code> Shows the source interface configuration for DNS. <code>http</code> Shows the source interface configuration for HTTP. <code>ntp</code> Shows the source interface configuration for NTP. <code>radius</code> Shows the source interface configuration for radius. <code>sflow</code> Shows the source interface configuration for sFlow. <code>sftp-scp</code> Shows source interface configuration for SFTP and SCP. <code>ssh-client</code> Shows source interface configuration for SSH Client. <code>syslog</code> Shows the source interface configuration for syslog. <code>tacacs</code>

Parameter	Description
	Shows the source interface configuration for TACACS. tftp
	Shows the source interface configuration for TFTP.
vrf <VRF-NAME>	Specifies the VRF name.
all-vrfs	Shows the source interface configuration for all VRF.

Examples

Displaying all IPv6 source-interface protocol configurations for default VRF:

```
switch# show ipv6 source-interface all
Source-interface Configuration Information
-----
Protocol      Src-Interface      Src-IP              VRF
-----
all           1111::2222         default
switch#
```

Displaying all IPv6 source-interface protocol configuration for VRF red:

```
switch# show ipv6 source-interface all vrf red
Source-interface Configuration Information
-----
Protocol      Src-Interface      Src-IP              VRF
-----
all           1/1/1             2005::2             red
switch#
```

Displaying all IPv6 source-interface protocol configurations for all VRFs:

```
switch# show ipv6 source-interface all all-vrfs
Source-interface Configuration Information
-----
Protocol      Src-Interface      Src-IP              VRF
-----
all           2222::3333        all-vrfs
all           1111::2222        default
all           1/1/1             2::2               red
switch#
```

Displaying all IPv6 source-interface protocol configurations for dns all VRFs:

```
switch# show ipv6 source-interface dns all-vrfs
Source-interface Configuration Information
-----
--
Protocol      Src-Interface      Src-IP              VRF
-----
--
dns           1::3              blue
dns           1::4              default
dns           1::2              red
switch#
```


Command History

Release	Modification
10.13	Added <code>dns</code> parameters.
10.12.1000	Added <code>central</code> , <code>sftp-scp</code> , and <code>ssh-client</code> parameters.
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 running-config

`show running-config`

Description

Displays the current running configuration.

Examples

Displaying the running configuration (only items of interest to source interface selection are shown in this example output command):



Aruba Central is the priority agent. If no command is specified for `ip source-interface`, Central will choose the command automatically if it is reachable on any of the known ports.

```
switch# show running-config
vrf green
ip source-interface tftp interface 1/1/2 vrf green
ip source-interface radius interface 1/1/2 vrf green
ip source-interface ntp interface 1/1/2 vrf green
ip source-interface tacacs interface 1/1/2 vrf green
ip source-interface dns interface 1/1/2 vrf green
ip source-interface central interface 1/1/2 vrf green
ip source-interface all interface 1/1/2 vrf green
ipv6 source-interface tftp 2222::3333 vrf green
ipv6 source-interface radius 2222::3333 vrf green
ipv6 source-interface ntp 2222::3333 vrf green
ipv6 source-interface tacacs 2222::3333 vrf green
ipv6 source-interface central 2222::3333 vrf green
ipv6 source-interface all 2222::3333 vrf green
ip source-interface tftp 10.20.3.1
ip source-interface radius 10.20.3.1
ip source-interface ntp 10.20.3.1
ip source-interface tacacs 10.20.3.1
ip source-interface dns 10.20.3.1
ip source-interface central 10.20.3.1
ip source-interface all 10.20.3.1
interface 1/1/1
```

```
no shutdown
ip address 10.20.3.1/24
interface 1/1/2
vrf attach green
ip address 20.1.1.1/24
ipv6 address 2222::3333/64
interface 1/1/45
no shutdown
ip address 100.1.0.1/24
ipv6 address 1111::2222/64
ip route 100.2.0.0/24 10.20.3.2
switch#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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.

VLANs

VLANs are primarily used to provide network segmentation at layer 2. VLANs enable the grouping of users by logical function instead of physical location. They make managing bandwidth usage within networks possible by:

- Allowing grouping of high-bandwidth users on low-traffic segments
- Organizing users from different LAN segments according to their need for common resources and individual protocols
- Improving traffic control at the edge of networks by separating traffic of different protocol types.
- Enhancing network security by creating subnets to control in-band access to specific network resources

VLANs are generally assigned on an organizational basis rather than on a physical basis. For example, a network administrator could assign all workstations and servers used by a particular workgroup to the same VLAN, regardless of their physical locations.

Hosts in the same VLAN can directly communicate with one another. A router or a Layer 3 switch is required for hosts in different VLANs to communicate with one another.

VLANs help reduce bandwidth waste, improve LAN security, and enable network administrators to address issues such as scalability and network management.



Refer to the Layer 2 Bridging Guide for VLAN configuration and commands.

Configuration and firmware management

Configuration and firmware management

Upgrade and downgrade scenarios

Upgrade and downgrade scenarios are provided by the Configuration Migration Framework (CMF).

Upgrades

All upgrade scenarios are supported and configuration is migrated.

Downgrades

The following scenario is supported:

Create a checkpoint before upgrading.

Upgrade.

Perform config changes.

Set the startup configuration to the checkpoint created in step 1.

Downgrade



Configuration changes that occur after the checkpoint in step 1 will be lost during the downgrade.

Limitations

The following are the limitations of upgrade and downgrade scenarios provided by CMF.

Table 1: *Configuration from and to the same build*

From/to	Checkpoint	Running	Startup
Checkpoint	N/A	Supported	Supported
Running	Supported	N/A	Supported
Startup	Supported	Supported	N/A
Config from URL in CLI Format	Supported	Supported	Supported
Config from URL in JSON Format	Supported	Supported	Supported

Table 2: *Configuration from an older build to a newer build (upgrade)*

From/to	Checkpoint	Running	Startup
Config from URL in CLI Format	Not supported	Not supported	Not supported

From/to	Checkpoint	Running	Startup
Config from URL in JSON Format	Not supported	Not supported	Not supported
Startup	Not supported	Supported	Supported

Table 3: Configuration from a newer build to an older build (downgrade)

From/to	Checkpoint	Running	Startup
Config from URL in CLI Format	Not supported	Not supported	Not supported
Config from URL in JSON Format	Not supported	Not supported	Not supported
Startup	Not supported	Not supported	Not supported

Hot-patch software

Overview

Hot-patching provides users of AOS-CX with a way to update running software without rebooting their system. Hot-patches are distributed as signed .patch files and are applied on top of an official AOS-CX image.

A hot-patch can be downloaded from a remote server onto an AOS-CX switch then applied without rebooting the switch. By default, the software patch remains on the switch after it is applied, and is automatically reapplied when the switch reboots. In order to revert an applied hot-patch update, the patch must be disabled. When the hot-patch is disabled, rebooting the box is not necessary, though the hot-patch will still remain on the system. The hot-patch can be removed from the system after disabling the hot-patch.

Once a downloaded hot-patch is removed, it must be downloaded again before it can be reapplied.



Hot-patches are cumulative, meaning that each subsequent patch is a superset of the previous patch(es) for a given software image. When multiple hot-patches are required, the first should be removed after the second has been applied.

Prerequisites

- AOS-CX hot-patch software can be obtained from Aruba customer support, and is identified with a **.patch** extension. The name of the patch indicates the version of AOS-CX to which it can be applied. For example, the patch **FL.10.12.XXXX-YYYY.patch** indicates that the patch can be applied on top of switch image **FL.10.12.XXXX.swi** and brings software up to date with the **FL.10.12.YYYY** release.
- Hot-patch software can be applied only after it has been downloaded to the switch.

Caveats and limitations

- Hot-patch files cannot be managed when the switch is loaded with a .swi image that does not support the hot-patch feature.
- Only restartable daemons can be updated with a hot-patch file.

- Each hot-patch applies to only one release image and each subsequent hot-patch for that release image is cumulative. This means that applying the most recent hot-patch provides all the same fixes included in previous hot-patches. As such, only one hot-patch can be applied at a time.
- incompatible and un-applied hot-patches are allowed to remain on the system and in the config to support rollback to the previous version of the software, and to automatically apply any hot-patches that have been previously applied.
- A maximum of ten hot-patches are allowed to be present or preconfigured on the system at a time.
- A daemon/service may restart if it has a hard dependency on another service that gets restarted by being hot-patched. Upon rebooting, hot-patches are reapplied after daemons have started.
- The **dpsed** and **hpe-cardd** daemon cannot have a hot-patch applied while a switchover or failover is in progress.

To apply a hot-patch update

1. Request a hot-patch from Aruba customer support, then place the hot-patch on an FTP-SFTP server.
2. Use the **copy** command to copy the hot-patch from the remote server to the standalone switch or VSF.
3. Use the **hot-patch apply** command to apply the patch.

To unapply hot-patch update

This option only unapplies the patch, but does not remove the patch from the device. The patch can be reapplied again since it is still on the device. If an unapplied patch needs to be removed/deleted from the switch, it can be removed with the command **hot-patch remove <patch>.patch**.

```
switch(config)# show hot-patch
Name                               Status
-----
FL_10_12_0001-0002.patch          Not applied
switch(config)# hot-patch apply FL_10_12_0001-0002.patch
switch(config)#
switch(config)# show hot-patch
Name                               Status
-----
FL_10_12_0001-0002.patch          Applied

switch(config)# no hot-patch apply FL_10_12_0001-0002.patch
switch(config)# show hot-patch
Name                               Status
-----
FL_10_12_0001-0002.patch          Not applied

switch(config)#
switch(config)# hot-patch remove FL_10_12_0001-0002.patch
Do you want to save the current configuration (y/n)? y
The running configuration was saved to the startup configuration.
switch(config)#
switch(config)# show hot-patch
No hot-patch found or configured
switch(config)#
```

To remove/delete a patch:

An applied hot-patch can be both unapplied and removed from the device with the command **hot-patch remove <patch-name>.patch**. The patch cannot be reapplied unless it is downloaded again.

Checkpoints

A checkpoint is a snapshot of the running configuration of a switch and its relevant metadata during the time of creation. Checkpoints can be used to apply the switch configuration stored within a checkpoint whenever needed, such as to revert to a previous, clean configuration. Checkpoints can be applied to other switches of the same platform. A switch is able to store multiple checkpoints.

Checkpoint types

The switch supports two types of checkpoints:

- **System generated checkpoints:** The switch automatically generates a system checkpoint whenever a configuration change occurs.
- **User generated checkpoints:** The administrator can manually generate a checkpoint whenever required.

Maximum number of checkpoints

- Maximum checkpoints: 64 (including the startup configuration)
- Maximum user checkpoints: 32
- Maximum system checkpoints: 32

User generated checkpoints

User checkpoints can be created at any time, as long as one configuration difference exists since the last checkpoint was created. Checkpoints can be applied to either the running or startup configurations on the switch.

All user generated checkpoints include a time stamp to identify when a checkpoint was created.

A maximum of 32 user generated checkpoints can be created.

System generated checkpoints

System generated checkpoints are automatically created by default. Whenever a configuration change occurs, the switch starts a timeout counter (300 seconds by default). For each additional configuration change, the timeout counter is restarted. If the timeout expires with no additional configuration changes being made, the switch generates a new checkpoint.

System generated checkpoints are named with the prefix `CPC` followed by a time stamp in the format `<YYYYMMDDHHMMSS>`. For example: `CPC20170630073127`.

System checkpoints can be applied using the checkpoint rollback feature or copy command.

A maximum of 32 system checkpoints can be created. Beyond this limit, the newest system checkpoint replaces the oldest system checkpoint.

Supported remote file formats

You can restore a switch configuration by copying a switch configuration stored on a USB drive or a remote network device through SFTP/TFTP. The remote file formats that the switch supports depends on where you plan to restore the checkpoint.

Restoring a checkpoint to a...	File type supported
Running configuration	<ul style="list-style-type: none"> ▪ CLI ▪ JSON ▪ Checkpoint
Startup configuration	<ul style="list-style-type: none"> ▪ JSON ▪ Checkpoint
Specified checkpoint	Specified checkpoint

Rollback

The term rollback is used to refer to when a switch configuration is reverted to a pre-existing checkpoint.

For example, the following command applies the configuration from checkpoint `ckpt1`. All previous configurations are lost after the execution of this command: `checkpoint rollback ckpt1`

You can also specify the rollback of the running configuration or of the startup configuration with a specified checkpoint, as shown with the following command: `copy checkpoint <checkpoint-name> {running-config | startup-config}`

Checkpoint auto mode

Checkpoint auto mode configures the switch with failover support, causing it to automatically revert to a previous configuration if it becomes inoperable or inaccessible due to configuration changes that are being made.

After entering checkpoint auto mode, you have a set amount of time to add, remove, or modify the existing switch configuration. To save your changes, you must execute the `checkpoint auto confirm` command before the auto mode timer expires. If you do not execute the `checkpoint auto confirm` command within the specified time, all configuration changes you made are discarded and the running configuration reverts to the state it was before entering checkpoint auto mode.

Testing a switch configuration in checkpoint auto mode

Process overview:

1. Enable the checkpoint auto mode.
2. To save the configuration, enter the `checkpoint auto confirm` command before the specified time set in step 1.

Checkpoint commands

checkpoint auto

```
checkpoint auto <TIME-LAPSE-INTERVAL>
```

Description

Starts auto checkpoint mode. In auto checkpoint mode, the switch temporarily saves the runtime configuration as a checkpoint only for the specified time lapse interval. Configuration changes must be saved before the interval expires, otherwise the runtime configuration is restored from the temporary checkpoint.

Parameter	Description
<code><TIME-LAPSE-INTERVAL></code>	Specifies the time lapse interval in minutes. Range: 1 to 60.

Usage

To save the runtime checkpoint permanently, run the **checkpoint auto confirm** command during the time lapse interval. The filename for the saved checkpoint is named **AUTO <YYYYMMDDHHSS>**. If the **checkpoint auto confirm** command is not entered during the specified time lapse interval, the previous runtime configuration is restored.

Examples

Confirming the auto checkpoint:

```
switch# checkpoint auto 20
Auto checkpoint mode expires in 20 minute(s)
switch# WARNING Please "checkpoint auto confirm" within 2 minutes
switch# checkpoint auto confirm
checkpoint AUTO20170801011154 created
```

In this example, the runtime checkpoint was saved because the **checkpoint auto confirm** command was entered within the value set by the **time-lapse-interval** parameter, which was 20 minutes.

Not confirming the auto checkpoint:

```
switch# checkpoint auto 20
Auto checkpoint mode expires in 20 minute(s)
switch# WARNING Please "checkpoint auto confirm" within 2 minutes
WARNING: Restoring configuration. Do NOT add any new configuration.
Restoration successful
```

In this example, the runtime checkpoint was reverted because the **checkpoint auto confirm** command was not entered within the value set by the **time-lapse-interval** parameter, which was 20 minutes.

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.

checkpoint auto confirm

checkpoint auto confirm

Description

Signals to the switch to save the running configuration used during the auto checkpoint mode. This command also ends the auto checkpoint mode.

Usage

To save the runtime checkpoint permanently, run the **checkpoint auto confirm** command during the time lapse value set by the **checkpoint auto TIME-LAPSE-INTERVAL** command. The generated checkpoint name will be in the format **AUTO <YYYYMMDDHHSS>**. If the **checkpoint auto confirm** command is not entered during the specified time lapse interval, the previous runtime configuration is restored.

Examples

Confirming the auto checkpoint:

```
switch# checkpoint auto confirm
```

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.

checkpoint diff

```
checkpoint diff {<CHECKPOINT-NAME1> | running-config | startup-config}  
               {<CHECKPOINT-NAME2> | running-config | startup-config}
```

Description

Shows the difference in configuration between two configurations. Compare checkpoints, the running configuration, or the startup configuration.

Parameter	Description
{<CHECKPOINT-NAME1> running-config startup-config}	Selects either a checkpoint, the running configuration, or the startup configuration as the baseline.
{<CHECKPOINT-NAME2> running-config startup-config}	Selects either a checkpoint, the running configuration, or the startup configuration to compare.

Usability

The output of the **checkpoint diff** command has several symbols:

- The plus sign (+) at the beginning of a line indicates that the line exists in the comparison but not in the baseline.
- The minus sign (-) at the beginning of a line indicates that the line exists in the baseline but not in the comparison.

Examples

In the following example, the configurations of checkpoints **cp1** and **cp2** are displayed before the `checkpoint diff` command, so that you can see the context of the **checkpoint diff** command.

```
switch# show checkpoint cp1
Checkpoint configuration:
!
!Version AOS-CX XL.10.00.0002
!Schema version 0.1.8
module 1/1 product-number jl363a
!
!
!
!
!
!
!
vlan 1,200
interface 1/1/1
    no shutdown
    ip address 1.0.0.1/24
interface 1/1/2
    no shutdown
    ip address 2.0.0.1/24

switch# show checkpoint cp2
Checkpoint configuration:
!
!Version AOS-CX XL.10.00.0002
!Schema version 0.1.8
module 1/1 product-number jl363a
!
!
!
!
!
!
!
vlan 1,200,300
interface 1/1/1
    no shutdown
    ip address 1.0.0.1/24
interface 1/1/2
    no shutdown
    ip address 2.0.0.1/24

switch# checkpoint diff cp1 cp2
--- /tmp/chkpt11501550258421 2017-08-01 01:17:38.420514016 +0000
+++ /tmp/chkpt21501550258421 2017-08-01 01:17:38.420514016 +0000
@@ -9,7 +9,7 @@
!
!
!
-vlan 1,200
+vlan 1,200,300
```

```
interface 1/1/1
  no shutdown
  ip address 1.0.0.1/24
```

```
switch# checkpoint diff chkpt01 chkpt02
--- /tmp/chkpt011607564301327
+++ /tmp/chkpt021607564301353
@@ -1,7 +1,7 @@
!
!Version AOS-CX PL.10.06.0100V
!export-password: default
-hostname Switch
+hostname Switch1
  user admin group administrators password ciphertext
  AQBapTyg9tpaiAaTfSVV5eNdFzOORRvZ6CMpglh1P+LQUHQLYgAAAGAhmRqFbkNvrgy2SBVk7H8C5hvg/I
  ib8rWYFZLEaSCroBNP9EwMu+hLNM0xmsh45yG8dncP7WkxjwrW4p4Qra6dVfr0EW8xh/lpQf8F/2Wki20L
  c9JLXiYge7ti0H6cVn+G
  radius-server tracking interval 60
  no usb

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.

checkpoint post-configuration

checkpoint post-configuration

no checkpoint post-configuration

Description

Enables creation of system generated checkpoints when configuration changes occur. This feature is enabled by default.

The **no** form of this command disables system generated checkpoints.

Usage

System generated checkpoints are automatically created by default. Whenever a configuration change occurs, the switch starts a timeout counter (300 seconds by default). For each additional configuration change, the timeout counter is restarted. If the timeout expires with no additional configuration changes being made, the switch generates a new checkpoint.

System generated checkpoints are named with the prefix **CPC** followed by a time stamp in the format **<YYYYMMDDHHMMSS>**. For example: **CPC20170630073127**.

System checkpoints can be applied using the checkpoint rollback feature or copy command.

A maximum of 32 system checkpoints can be created. Beyond this limit, the newest system checkpoint replaces the oldest system checkpoint.

Examples

Enabling system checkpoints:

```
switch(config)# checkpoint post-configuration
```

Disabling system checkpoints:

```
switch(config)# no checkpoint post-configuration
```

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.

checkpoint post-configuration timeout

```
checkpoint post-configuration timeout <TIMEOUT>
```

```
no checkpoint post-configuration timeout <TIMEOUT>
```

Description

Sets the timeout for the creation of system checkpoints. The timeout specifies the amount of time since the latest configuration for the switch to create a system checkpoint.

The **no** form of this command resets the timeout to 300 seconds, regardless of the value of the <TIMEOUT> parameter.

Parameter	Description
timeout <TIMEOUT>	Specifies the timeout in seconds. Range: 5 to 600. Default: 300.

Examples

Setting the timeout for system checkpoints to 60 seconds:

```
switch(config)# checkpoint post-configuration timeout 60
```

Resetting the timeout for system checkpoints to 300 seconds:

```
switch(config)# no checkpoint post-configuration timeout 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.

checkpoint rename

```
checkpoint rename <OLD-CHECKPOINT-NAME> <NEW-CHECKPOINT-NAME>
```

Description

Renames an existing checkpoint.

Parameter	Description
<OLD-CHECKPOINT-NAME>	Specifies the name of an existing checkpoint to be renamed.
<NEW-CHECKPOINT-NAME>	Specifies the new name for the checkpoint. The checkpoint name can be alphanumeric. It can also contain underscores (_) and dashes (-). NOTE: Do not start the checkpoint name with CPC because it is used for system-generated checkpoints.

Examples

Renaming checkpoint **ckpt1** to **cfg001**:

```
switch# checkpoint rename ckpt1 cfg001
```

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.

checkpoint rollback

```
checkpoint rollback {<CHECKPOINT-NAME> | startup-config}
```

Description

Applies the configuration from a pre-existing checkpoint or the startup configuration to the running configuration.

Parameter	Description
<CHECKPOINT-NAME>	Specifies a checkpoint name.
startup-config	Specifies the startup configuration.

Examples

Applying a checkpoint named **ckpt1** to the running configuration:

```
switch# checkpoint rollback ckpt1
Success
```

Applying a startup checkpoint to the running configuration:

```
switch# checkpoint rollback startup-config
Success
```

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.

copy checkpoint <CHECKPOINT-NAME> <REMOTE-URL>

```
copy checkpoint <CHECKPOINT-NAME> <REMOTE-URL> [vrf <VRF-NAME>]
```

Description

Copies a checkpoint configuration to a remote location as a file. The configuration is exported in checkpoint format, which includes switch configuration and relevant metadata.

Parameter	Description
<CHECKPOINT-NAME>	Specifies the name of a checkpoint.
<REMOTE-URL>	Specifies the remote destination and filename using the syntax: TFTP format: tftp://<IP-ADDR>[:<PORT-NUM>] [;blocksize=<Value>]/<FILENAME> SFTP format: sftp://<USERNAME>@<IP-ADDR> [:<PORT-NUM>]/<FILENAME> SCP format: scp://USER@{IP HOST}[:PORT]/FILE
vrf <VRF-NAME>	Specifies a VRF name.

Examples

Copying checkpoint configuration to remote file through TFTP:

```
switch# copy checkpoint ckpt1 tftp://192.168.1.10/ckptmeta vrf default
##### 100.0%
Success
```

Copying checkpoint configuration to remote file through SFTP:

```
switch# copy checkpoint ckpt1 sftp://root@192.168.1.10/ckptmeta vrf default
The authenticity of host '192.168.1.10 (192.168.1.10)' can't be established.
ECDSA key fingerprint is SHA256:FtOm6Uxuxumil7VCwLnhz92H9LkJY+eURbdddOETy50.
Are you sure you want to continue connecting (yes/no)? yes
root@192.168.1.10's password:
sftp> put /tmp/ckptmeta ckptmeta
Uploading /tmp/ckptmeta to /root/ckptmeta
Warning: Permanently added '192.168.1.10' (ECDSA) to the list of known hosts.
Connected to 192.168.1.10.
Success
```

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.

copy checkpoint <CHECKPOINT-NAME> {running-config | startup-config}

```
copy checkpoint <CHECKPOINT-NAME> {running-config | startup-config}
```


Description

Copies an existing checkpoint configuration to the running configuration or to the startup configuration.

Parameter	Description
<code><CHECKPOINT-NAME></code>	Specifies the name of an existing checkpoint.
<code>{running-config startup-config}</code>	Selects whether the running configuration or the startup configuration receives the copied checkpoint configuration. If the startup configuration is already present, the command overwrites the startup configuration.

Examples

Copying **ckpt1** checkpoint to the running configuration:

```
switch# copy checkpoint ckpt1 running-config
Success
```

Copying **ckpt1** checkpoint to the startup configuration:

```
switch# copy checkpoint ckpt1 startup-config
Success
```

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.

copy checkpoint <CHECKPOINT-NAME> <STORAGE-URL>

`copy checkpoint <CHECKPOINT-NAME> <STORAGE-URL>`

Description

Copies an existing checkpoint configuration to a USB drive. The file format is defined when the checkpoint was created.

Parameter	Description
<code><CHECKPOINT-NAME></code>	Specifies the name of the checkpoint to copy. The checkpoint name can be alphanumeric. It can also contain underscores (_) and dashes (-).
<code><STORAGE-URL></code>	Specifies the name of the target file on the USB drive using the following syntax: <code>usb:/<FILE></code> The USB drive must be formatted with the FAT file system.

Examples

Copying the **test** checkpoint to the **testCheck** file on the USB drive:

```
switch# copy checkpoint test usb:/testCheck
Success
```

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.

copy **<REMOTE-URL>** checkpoint **<CHECKPOINT-NAME>**

```
copy <REMOTE-URL> checkpoint <CHECKPOINT-NAME> [vrf <VRF-NAME>]
```

Description

Copies a remote configuration file to a checkpoint. The remote configuration file must be in checkpoint format.

Parameter	Description
<code><REMOTE-URL></code>	Specifies a remote file using the following syntax: TFTP format: <code>tftp://<IP-ADDR>[:<PORT-NUM>] [;blocksize=<Value>]/<FILENAME></code> SFTP format: <code>sftp://<USERNAME>@<IP-ADDR> [:<PORT-NUM>]/<FILENAME></code> SCP format: <code>scp://USER@{IP HOST}[:PORT]/FILE</code>
<code><CHECKPOINT-NAME></code>	Specifies the name of the target checkpoint. The checkpoint name can be alphanumeric. It can also contain underscores (_) and dashes (-). Required.

Parameter	Description
	NOTE: Do not start the checkpoint name with <code>CPC</code> because it is used for system-generated checkpoints.
<code>vrf <VRF-NAME></code>	Specifies a VRF name. Default: default.

Examples

Copying a checkpoint format file to checkpoint **ckpt5** on the default VRF:

```
switch# copy tftp://192.168.1.10/ckptmeta checkpoint ckpt5
##### 100.0%
100.0%
Success
```

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.

copy <REMOTE-URL> {running-config | startup-config}

copy <REMOTE-URL> {running-config | startup-config } [vrf <VRF-NAME>]

Description

Copies a remote file containing a switch configuration to the running configuration or to the startup configuration.

Parameter	Description
<code><REMOTE-URL></code>	Specifies a remote file with the following syntax: TFTP format: tftp://<IP-ADDR>[:<PORT-NUM>] [;blocksize=<Value>]/<FILENAME> SFTP format: sftp://<USERNAME>@<IP-ADDR> [:<PORT-NUM>]/<FILENAME> SCP format: scp://USER@{IP HOST}[:PORT]/FILE

Parameter	Description
{running-config startup-config}	Selects whether the running configuration or the startup configuration receives the copied checkpoint configuration. If the startup configuration is already present, the command overwrites the startup configuration.
vrf <VRF-NAME>	Specifies the name of a VRF. Default: default.

Usage

The switch copies only certain file types. The format of the file is automatically detected from contents of the file. The **startup-config** option only supports the JSON file format and checkpoints, but the **running-config** option supports the JSON and CLI file formats and checkpoints.

When a file of the CLI format is copied, it overwrites the running configuration. The CLI command does not clear the running configuration before applying the CLI commands. All of the CLI commands in the file are applied line-by-line. If a particular CLI command fails, the switch logs the failure and it continues to the next line in the CLI configuration. The event log (**show events -d hpe-config**) provides information as to which command failed.

Examples

Copying a JSON format file to the running configuration:

```
switch# copy tftp://192.168.1.10/runjson running-config
##### 100.0%
Configuration may take several minutes to complete according to configuration file
size
--0%----10%----20%----30%----40%----50%----60%----70%----80%----90%----100%--
Success
```

Copying a CLI format file to the running configuration with an error in the file:

```
switch# copy tftp://192.168.1.10/runcli running-config
##### 100.0%
Configuration may take several minutes to complete according to configuration file
size
--0%----10%----20%----30%----40%----50%----60%----70%----80%----90%----100%--
Some of the configuration lines from the file were NOT applied. Use 'show
events -d hpe-config' for more info.
##### 100.0%
Configuration may take several minutes to complete according to configuration file
size
--0%----10%----20%----30%----40%----50%----60%----70%----80%----90%----100%--
Some of the configuration lines from the file were NOT applied. Use 'show
events -d hpe-config' for more info.
```

Copying a CLI format file to the startup configuration:

```
switch# copy tftp://192.168.1.10/startjson startup-config
##### 100.0%
100.0%
Success
```

Copying an unsupported file format to the startup configuration:

```
switch# copy tftp://192.168.1.10/startfile startup-config
##### 100.0%
100.0%
unsupported file format
```

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.

copy running-config {startup-config | checkpoint <CHECKPOINT-NAME>}

copy running-config {startup-config | checkpoint <CHECKPOINT-NAME>}

Description

Copies the running configuration to the startup configuration or to a new checkpoint. If the startup configuration is already present, the command overwrites the existing startup configuration.

Parameter	Description
startup-config	Specifies that the startup configuration receives a copy of the running configuration.
checkpoint <CHECKPOINT-NAME>	Specifies the name of a new checkpoint to receive a copy of the running configuration. The checkpoint name can be comprised of alphanumeric character, underscores (_) and dashes (-), and must be 32 characters or fewer. NOTE: Do not start the checkpoint name with CPC because it is used for system-generated checkpoints.

Examples

Copying the running configuration to the startup configuration:

```
switch# copy running-config startup-config
Success
```

Copying the running configuration to a new checkpoint named **ckpt1**:

```
switch# copy running-config checkpoint ckpt1
Success
```

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.

copy {running-config | startup-config} <REMOTE-URL>

copy {running-config | startup-config} <REMOTE-URL> {cli | json} [vrf <VRF-NAME>]

Description

Copies the running configuration or the startup configuration to a remote file in either CLI or JSON format.

Parameter	Description
{running-config startup-config}	Selects whether the running configuration or the startup configuration is copied to a remote file.
<REMOTE-URL>	Specifies the remote file using the syntax: TFTP format: tftp://<IP-ADDR>[:<PORT-NUM>] [;blocksize=<Value>]/<FILENAME> SFTP format: sftp://<USERNAME>@<IP-ADDR> [:<PORT-NUM>]/<FILENAME> SCP format: scp://USER@{IP HOST}[:PORT]/FILE
{cli json}	Selects the remote file format: P: CLI or JSON.
vrf <VRF-NAME>	Specifies the name of a VRF. Default: default.

Examples

Copying a running configuration to a remote file in CLI format:

```
switch# copy running-config tftp://192.168.1.10/runcli cli
##### 100.0%
Success
```

Copying a running configuration to a remote file in JSON format:

```
switch# copy running-config tftp://192.168.1.10/runjson json
##### 100.0%
Success
```

Copying a startup configuration to a remote file in CLI format:

```
switch# copy startup-config sftp://root@192.168.1.10/startcli cli
root@192.168.1.10's password:
sftp> put /tmp/startcli startcli
Uploading /tmp/startcli to /root/startcli
Connected to 192.168.1.10.
Success
```

Copying a startup configuration to a remote file in JSON format:

```
switch# copy startup-config sftp://root@192.168.1.10/startjson json
root@192.168.1.10's password:
sftp>
root@192.168.1.10's password:
sftp> put /tmp/startjson startjson
Uploading /tmp/startjson to /root/startjson
Connected to 192.168.1.10.
Success
```

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.

copy {running-config | startup-config} <STORAGE-URL>

copy {running-config | startup-config} <STORAGE-URL> {cli | json}

Description

Copies the running configuration or a startup configuration to a USB drive.

Parameter	Description
{running-config startup-config}	Selects the running configuration or the startup configuration to be copied to the switch USB drive.
<STORAGE-URL>	Specifies a remote file with the following syntax: usb:/<file>
{cli json}	Selects the format of the remote file: CLI or JSON.

Usage

The switch supports JSON and CLI file formats when copying the running or starting configuration to the USB drive. The USB drive must be formatted with the FAT file system.

The USB drive must be enabled and mounted with the following commands:

```
switch(config)# usb
switch(config)# end
switch# usb mount
```

Examples

Copying a running configuration to a file named **runCLI** on the USB drive:

```
switch# copy running-config usb:/runCLI cli
Success
```

Copying a startup configuration to a file named **startCLI** on the USB drive:

```
switch# copy startup-config usb:/startCLI cli
Success
```

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.

copy startup-config running-config

copy startup-config running-config

Description

Copies the startup configuration to the running configuration.

Examples

```
switch# copy startup-config running-config
Success
```

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.

copy <STORAGE-URL> running-config

```
copy <STORAGE-URL> {running-config | startup-config | checkpoint <CHECKPOINT-NAME>}
```

Description

This command copies a specified configuration from the USB drive to the running configuration, to a startup configuration, or to a checkpoint.

Parameter	Description
<STORAGE-URL>	Specifies the name of a configuration file on the USB drive with the syntax: usb:/<FILE>
running-config	Specifies that the configuration file is copied to the running configuration. The file must be in CLI, JSON, or checkpoint format or the copy will fail. the copy will not work.
startup-config	Specifies that the configuration file is copied to the startup configuration. The switch stores this configuration between reboots. The startup configuration is used as the operating configuration following a reboot of the switch. The file must be in JSON or checkpoint format or the copy will fail.
checkpoint <CHECKPOINT-NAME>	Specifies the name of a new checkpoint file to receive a copy of the configuration. The configuration file on the USB drive must be in checkpoint format. NOTE: Do not start the checkpoint name with CPC because it is used for system-generated checkpoints.

Usage

This command requires that the USB drive is formatted with the FAT file system and that the file be in the appropriate format as follows:

- **running-config:** This option requires the file on the USB drive be in CLI, JSON, or checkpoint format.
- **startup-config:** This option requires the file on the USB drive be in JSON or checkpoint format.
- **checkpoint <checkpoint-name>:** This option requires the file on the USB drive be in checkpoint format.

Examples

Copying the file **runCli** from the USB drive to the running configuration:

```
switch# copy usb:/runCli running-config
Configuration may take several minutes to complete according to configuration
file size
--0%----10%----20%----30%----40%----50%----60%----70%----80%----90%----100%--
```

Success

Copying the file **startUp** from the USB drive to the startup configuration:

```
switch# copy usb:/startUp startup-config
Success
```

Copying the file **testCheck** from the USB drive to the **abc** checkpoint:

```
switch# copy usb:/testCheck checkpoint abc
Success
```

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.

erase

```
erase
  checkpoint <checkpoint-name>
  core-dump all|daemon|dsm|kernel|vsf
  startup-config
  all
```

Description

Deletes an existing checkpoint, startup configuration, or core-dump.

Parameter	Description
<code>checkpoint <CHECKPOINT-NAME></code>	Specifies the name of a checkpoint.
<code>core-dump</code> <code>all daemon <daemon-name></code> <code> kernel</code>	Erase one of the following sets of core-dump files: <ul style="list-style-type: none">all: Erase all core-dump files.daemon <daemon-name>: Erase daemon core-dump files.kernel: Erase the kernel core-dump.vsf: Erase daemon core-dump files for VSF.
<code>startup-config</code>	Specifies the startup configuration.
<code>all</code>	Specifies all checkpoints.

Examples

Erasing checkpoint **ckpt1**:

```
switch# erase checkpoint ckpt1
```

Erasing the startup configuration:

```
switch# erase startup-config
```

Erasing all checkpoints:

```
switch# erase checkpoint all
```

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 checkpoint <CHECKPOINT-NAME>

```
show checkpoint <CHECKPOINT-NAME> [json]
```

Description

Shows the configuration of a checkpoint.

Parameter	Description
<CHECKPOINT-NAME>	Specifies the name of a checkpoint.
[json]	Specifies that the output is displayed in JSON format.

Examples

Showing the configuration of the **ckpt1** checkpoint in CLI format:

```
switch# show checkpoint ckpt1
Checkpoint configuration:
!
!Version AOS-CX PL.10.07.0000K-75-g55e5193
!export-password: default
lacp system-priority 65535
user admin group administrators password ciphertext
AQBapQjwipbev36io0jFfde7ZzrHckncal1D+3n8XFTZKQdmYgAAADetYOeHSme93xzdD0uz6Vr9K1+XBz
```

```

B+2GB0UBxSF7rvGN2x8KSgkqv7iqXVQ0Te6LkSMnH4BdNaT3Bf25qyvOqmr4YakO1V3rg8zAOADkPktQD8
joTHXflzwomoIzcmv/uX
cli-session
    timeout 0
!
!
!
!
ssh server vrf default
vlan 1
spanning-tree
interface lag 1
    no shutdown
    vlan access 1
interface lag 128
    no shutdown
    vlan access 1
interface lag 129
    shutdown
    vlan access 1
    lacp mode active
interface 1/1/1
    no shutdown
    lag 128
    lacp port-id 65535
interface 1/1/2
    no shutdown
    vlan access 1
interface 1/1/3
    no shutdown
    vlan access 1
interface 1/1/4
    no shutdown
    vlan access 1
interface 1/1/5
    no shutdown
    vlan access 1
interface 1/1/6
    no shutdown
    vlan access 1
interface 1/1/7
    no shutdown
    vlan access 1
interface 1/1/8
    no shutdown
    vlan access 1
interface 1/1/9
    no shutdown
    vlan access 1
interface 1/1/10
    no shutdown
    vlan access 1
interface 1/1/11
    no shutdown
    vlan access 1
interface 1/1/12
    no shutdown
    vlan access 1
interface 1/1/13
    no shutdown
    vlan access 1
interface 1/1/14

```

```

no shutdown
vlan access 1
interface 1/1/15
no shutdown
vlan access 1
interface 1/1/16
no shutdown
vlan access 1
interface vlan 1
ip dhcp
snmp-server vrf default
!
!
!
!
!
https-server vrf default

```

Showing the configuration of the **ckpt1** checkpoint in JSON format:

```

switch# show checkpoint ckpt1 json
Checkpoint configuration:
{
  "AAA_Server_Group": {
    "local": {
      "group_name": "local"
    },
    "none": {
      "group_name": "none"
    }
  },
  ...
  ...
  ...
  ...

```

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 checkpoint <CHECKPOINT-NAME> hash

show checkpoint <CHECKPOINT-NAME> hash [cli | json]

Description

Shows a configuration checkpoint hash calculated with the SHA-256 algorithm. When the output format is not specified, the CLI format is used. This enables you to determine whether there has been a configuration change since a previous hash was calculated.

Parameter	Description
<CHECKPOINT-NAME>	Specifies an existing checkpoint name.
[cli json]	Selects either the CLI or JSON format.

Examples

Showing a checkpoint SHA-256 hash in JSON format:

```
switch# show checkpoint ckpt1 hash json
Calculating the hash: [Success]

The SHA-256 hash of the checkpoint in JSON format, created in image XX.10.08.xxxx:

cc7a57a9bbb4e6600d3b4180296a35f6af9e797ce9c439955dfe5de58b06da9e

This hash is only valid for comparison to a baseline hash if the configuration has
not been explicitly changed (such as with a CLI command, REST operation, etc.)
or implicitly changed (such as by changing a hardware module, upgrading the
SW version, etc.).
```

Command History

Release	Modification
10.08	Command introduced

Command Information

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

show checkpoint post-configuration

show checkpoint post-configuration

Description

Shows the configuration settings for creating system checkpoints.

Examples

```
switch# show checkpoint post-configuration

Checkpoint Post-Configuration feature
-----

Status           : enabled
Timeout (sec)    : 300
```

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 checkpoint

show checkpoint

Description

Shows a detailed list of all saved checkpoints.

Examples

Showing a detailed list of all saved checkpoints:

```
switch# show checkpoint
```

NAME	TYPE	WRITER	DATE (YYYY/MM/DD)	IMAGE VERSION
ckpt1	checkpoint	User	2017-02-23T00:10:02Z	XX.01.01.000X
ckpt2	checkpoint	User	2017-03-08T18:10:01Z	XX.01.01.000X
ckpt3	checkpoint	User	2017-03-09T23:11:02Z	XX.01.01.000X
ckpt4	checkpoint	User	2017-03-11T00:00:03Z	XX.01.01.000X
ckpt5	latest	User	2017-03-14T01:12:27Z	XX.01.01.000X

Command History

Release	Modification
10.08	Command syntax show checkpoint list all is replaced with show checkpoint.
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 checkpoint date

show checkpoint date <START-DATE> <END-DATE>

Description

Shows detailed list of all saved checkpoints created within the specified date range.

Parameter	Description
<code><START-DATE></code>	Specifies the starting date for the range of saved checkpoints to show. Format: YYYY-MM-DD .
<code><END-DATE></code>	Specifies the ending date for the range of saved checkpoints to show. Format: YYYY-MM-DD .

Examples

Showing a detailed list of saved checkpoints for a specific date range:

```
switch# show checkpoint date 2017-03-08 2017-03-12
```

NAME	TYPE	WRITER	DATE (YYYY/MM/DD)	IMAGE	VERSION
ckpt2	checkpoint	User	2017-03-08T18:10:01Z	XX.01.01.000X	
ckpt3	checkpoint	User	2017-03-09T23:11:02Z	XX.01.01.000X	
ckpt4	checkpoint	User	2017-03-11T00:00:03Z	XX.01.01.000X	

Command History

Release	Modification
10.08	Command syntax <code>show checkpoint list date <START-DATE> <END-DATE></code> is replaced with <code>show checkpoint date <START-DATE> <END-DATE></code>
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 running-config hash

```
show running-config hash [cli | json]
```

Description

Shows the running-config checkpoint hash, calculated with the SHA-256 algorithm. When the output format is not specified, the CLI format is used. This enables you to determine whether there has been a configuration change since a previous hash was calculated.

Parameter	Description
<code>[cli json]</code>	Selects either the CLI or JSON format.

Examples

Showing the running-config checkpoint SHA-256 hash in CLI format:


```
switch# show running-config hash cli
Calculating the hash: [Success]

SHA-256 hash of the config in CLI format:

8db4e7e10f4b7f1a6ab17ad2b4efe0e72f1849103eaf43da62aa1d715075b89e

This hash is only valid for comparison to a baseline hash if the configuration has
not been explicitly changed (such as with a CLI command, REST operation, etc.)
or implicitly changed (such as by changing a hardware module, upgrading the
SW version, etc.).
```

Command History

Release	Modification
10.08	Command introduced

Command Information

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

show startup-config hash

show startup-config hash [cli | json]

Description

Shows the startup-config checkpoint hash, calculated with the SHA-256 algorithm. When the output format is not specified, the CLI format is used. This enables you to determine whether there has been a configuration change since a previous hash was calculated.

Parameter	Description
[cli json]	Selects either the CLI or JSON format.

Examples

Showing the startup-config checkpoint SHA-256 hash in CLI format:

```
switch# show startup-config hash cli
Calculating the hash: [Success]

SHA-256 hash of the config in CLI format:

8db4e7e10f4b7f1a6ab17ad2b4efe0e72f1849103eaf43da62aa1d715075b89e

This hash is only valid for comparison to a baseline hash if the configuration has
not been explicitly changed (such as with a CLI command, REST operation, etc.)
or implicitly changed (such as by changing a hardware module, upgrading the
SW version, etc.).
```

Command History

Release	Modification
10.08	Command introduced

Command Information

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

write memory

`write memory`

Description

Saves the running configuration to the startup configuration. It is an alias of the command **copy running-config startup-config**. If the startup configuration is already present, this command overwrites the startup configuration.

Examples

```
switch# write memory
Success
```

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 commands

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
primary	Selects the primary operating system image for this reboot and sets the configured default operating system image to primary for future reboots.
secondary	Selects the secondary operating system image for this reboot and sets the configured default operating system image to secondary for future reboots.
serviceos	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.
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|{vsf member <1-10>}]
```

Description

Shows boot history information. When no parameters are specified, shows the most recent information about the current boot operation, and the three previous boot operations for the switch. When the **all** parameter is specified, the output of this command shows the boot information for the active management module.

.



To view boot-history on a standby, the command must be sent on the conductor console.

Parameter	Description
all	Optional. Shows boot information for the active management module.
vsf member <1-10>	Optional. Display boot history for the specified VSF member

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.

The output of this command includes the following information:

Parameter	Description
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 <time>	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	<p>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:</p> <ul style="list-style-type: none"> ▪ <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. ▪ Uncontrolled reboot: The reason for the reboot is not known. ▪ Reboot requested through database: The reboot occurred because of a request made through the CLI or other API.

Examples

Showing the boot history of the active management module:

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

Index : 2
Boot ID : c34a2c2499004a02bbeeff4992e1fdbd
Current Boot, up for 1 days 13 hrs 13 mins 27 secs

Index : 1
Boot ID : bfba9bc486304e57904ac717a0ccbdcd
02 Sep 23 02:55:33 : CPU request reset with 0x20201, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:55:33 : Switch boot count is 2

Index : 0
Boot ID : a88a71b7ca9a4574af7e3b811ddfdc7e
02 Sep 23 02:49:26 : Reboot requested by user, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:50:02 : Switch boot count is 1

Index : 3
Boot ID : f00ba10c8c44457f83fee303d014a89a
25 Aug 23 10:27:42 : Power on reset with 0x1, Version: FL.10.14.0000-1465-
g9df95249d06b0~dirty
25 Aug 23 10:28:18 : Switch boot count is 3
25 Aug 23 10:29:02 : Primary overtemperature fault detected with 0x2 in PSU 1/1
```

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

```
switch#
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
...

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
...
```

The following example displays the boot history for the VSF member 2.

```
switch# show boot-history vsf member 2

Member-2
=====

Index : 0
```

```
Boot ID : df99026c194a44f1944a3e7685fb4d90
Current Boot, up for 3 hrs 31 mins 39 secs

Index : 3
Boot ID : 7bf4104903fe4ad1ba4bce40e8099c76
10 Aug 17 10:02:24 : Reboot requested through database
10 Aug 17 10:02:13 : Switch boot count is 2
```

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.

Firmware management commands

copy {primary | secondary} <REMOTE-URL>

copy {primary | secondary} <REMOTE-URL> [vrf <VRF-NAME>]

Description

Uploads a firmware image to a TFTP or SFTP server.

Parameter	Description
{primary secondary}	Selects the primary or secondary image profile to upload. Required
<REMOTE-URL>	Specifies the URL to receive the uploaded firmware using SFTP , TFTP or SCP. TFTP format: tftp://<IP-ADDR>[:<PORT-NUM>] [;blocksize=<Value>]/<FILENAME> SFTP format: sftp://<USERNAME>@<IP-ADDR> [:<PORT-NUM>]/<FILENAME> SCP format: scp://USER@{IP HOST}[:PORT]/FILE
vrf <VRF-NAME>	Specifies a VRF name. Default: default.

Examples

TFTP upload:


```
switch# copy primary tftp://192.0.2.0/00_10_00_0002.swi
##### 100.0%
Verifying and writing system firmware...
```

SFTP upload:

```
switch# copy primary sftp://swuser@192.0.2.0/00_10_00_0002.swi
swuser@192.0.2.0's password:
Connected to 192.0.2.0.
sftp> put primary.swi XL_10_00_0002.swi
Uploading primary.swi to /users/swuser/00_10_00_0002.swi
primary.swi                                100% 179MB 35.8MB/s 00:05
```

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.

copy {primary | secondary} <FIRMWARE-FILENAME>

copy {primary | secondary} <FIRMWARE-FILENAME>

Description

Copies a firmware image to USB storage.

Parameter	Description
{primary secondary}	Selects the primary or secondary image from which to copy the firmware. Required
<FIRMWARE-FILENAME>	Specifies the name of the firmware file to create on the USB storage device. Prefix the filename with usb:/ . For example: usb:/firmware_v1.2.3.swi For information on how to format the path to a firmware file on a USB drive, see USB URL.

Examples

```
switch# copy primary usb:/11.10.00.0002.swi
```

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.

copy primary secondary

copy primary secondary

Description

Copies the firmware image from the primary to the secondary location.

Examples

```
switch# copy primary secondary
The secondary image will be deleted.

Continue (y/n)? y
Verifying and writing system firmware...
```

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.

copy <REMOTE-URL>

copy <REMOTE-URL> {hot-patch|primary|secondary} [vrf <VRF-NAME>]

Description

Downloads a hot-patch or firmware image from a TFTP or SFTP server.

Parameter	Description
<REMOTE-URL>	Specifies the URL from which to download the firmware using SFTP or TFTP. TFTP format:

Parameter	Description
	<pre>tftp://<IP-ADDR>[:<PORT-NUM>] [;blocksize=<Value>]/<FILENAME></pre> <p>SFTP format:</p> <pre>sftp://<USERNAME>@<IP-ADDR> [:<PORT-NUM>]/<FILENAME></pre> <p>SCP format:</p> <pre>scp://USER@{IP HOST}[:PORT]/FILE</pre>
<code>{hot-patch primary secondary}</code>	<p>Select a hot-patch or a primary or secondary image profile for receiving the downloaded firmware. Required.</p> <p>NOTE: For more information about hot-patch, see hot-patch.</p>
<code>vrf <VRF-NAME></code>	Specifies the name of a VRF. Default: default.

TFTP usage

To specify a URL with:

- an IPv4 address: **tftp://192.0.2.1/a.txt**
- an IPv6 address: **tftp://[2000::2]/a.txt**
- a hostname: **tftp://hpe.com/a.txt**

To specify TFTP with:

- the port number of the server in the URL: **tftp://192.0.2.1:12/a.txt**
- the blocksize in the URL: **tftp://192.0.2.1;blocksize=1462/a.txt**
The valid blocksize range is 8 to 65464.
- the port number of the server and blocksize in the URL: **tftp://192.0.2.1:12;blocksize=1462/a.txt**

To specify a file in a directory of URL: **tftp://192.0.2.1/dir/a.txt**

SFTP usage

To specify:

- A URL with an IPv4 address: **sftp://user@192.0.2.1/a.txt**
- A URL with an IPv6 address: **sftp://user@[2000::2]/a.txt**
- A URL with a hostname: **sftp://user@hpe.com/a.txt**
- SFTP port number of a server in the URL: **sftp://user@192.0.2.1:12/a.txt**
- A file in a directory of URL: **sftp://user@192.0.2.1/dir/a.txt**
- To specify a file with absolute path in the URL: **sftp://user@192.0.2.1/home/user/a.txt**

SCP Usage

To specify:

- A username with an IP address: **scp://user@192.0.2.1:12/a.txt**
- A username with a remote host: **scp://user@hpe.com/a.txt**

Examples

TFTP download for a hot-patch:

```
switch# copy tftp://192.168.1.1/FL.10.12.0001-0002.patch hot-patch vrf vrf1

Fetching /users/swuser/FL.10.10.0001-0002.patch to hotpatch.dnld.uE2YT1
FL.10.12.0001-0002.patch                      100%   62KB   12.4MB/s   00:00

Verifying and writing hot-patch...
```

TFTP download for primary software image:

```
switch# copy tftp://192.10.12.0/FL_10_12_0001.swi primary
The primary image will be deleted.

Continue (y/n)? y
##### 100.0%
Verifying and writing system firmware...
```

SFTP download:

```
switch# copy sftp://swuser@192.10.12.0/FL_10_12_0001.swi primary
The primary image will be deleted.

Continue (y/n)? y
The authenticity of host '192.10.12.0 (192.10.12.0)' can't be established.
ECDSA key fingerprint is SHA256:L64khLwlyLgXlARKRmiwcAAK8oRaQ8C0oWP+PkGBXHY.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.10.12.0' (ECDSA) to the list of known hosts.
swuser@192.10.12.0's password:
Connected to 192.10.12.0.
Fetching /users/swuser/ss.10.00.0002.swi to ss.10.00.0002.swi.dnld
/users/swuser/ss.10.00.0002.swi                100%  179MB  25.6MB/s   00:07
Verifying and writing system firmware...
```

Command History

Release	Modification
10.12	The hot-patch parameter is supported on all platforms.
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.

copy secondary primary

copy secondary primary

Description

Copies the firmware image from the secondary to the primary location.

Examples

```
switch# copy secondary primary
The primary image will be deleted.

Continue (y/n)? y
Verifying and writing system firmware...
```

```
switch# copy sftp://stor@192.22.1.0/im-switch.swi primary vrf mgmt
The primary image will be deleted.

Continue (y/n)? y
The authenticity of host '192.22.1.0 (192.22.1.0)' can't be established.
ECDSA key fingerprint is SHA256:MyIlxbdKnehYut0NLfL69gDpNzCmZqBVvBaRR46m7o8.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.22.1.0' (ECDSA) to the list of known hosts.
stor@192.22.1.0's password:
Connected to 192.22.1.0.
sftp> get c8d5b9f-topflite.swi c8d5b9f-topflite.swi.dnld
Fetching /home/dr/im-switch.swi to c8d5b9f-topflite.swi.dnld
/home/dr/im-switch.swi          100% 226MB 56.6MB/s 00:04

Verifying and writing system firmware...
```

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.

copy <STORAGE-URL>

```
copy <STORAGE-URL> {hot-patch|primary|secondary}
```

Description

Copies, verifies, and installs a hot-patch or firmware image from a USB storage device connected to the active management module.

Parameter	Description
<STORAGE-URL>	Specifies the name of the firmware file to copy from the storage device. Required. USB format: usb:/<FILENAME>
{hot-patch primary secondary}	Select a hot-patch image or a primary or secondary profile for receiving the copied firmware. NOTE: For more information about hot-patch, see hot-patch .

USB usage

To specify a file:

- In a USB storage device: **usb:/a.txt**
- In a directory of a USB storage device: **usb:/dir/a.txt**

Examples

```
switch# copy usb:/FL.10.12.0001-0002.patch
```

```
switch# copy usb:/FL.10.12.0001.swi primary
The primary image will be deleted.

Continue (y/n)? y

Verifying and writing system firmware...
```

Command History

Release	Modification
10.12	The hot-patch parameter is supported on all platforms.
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.

copy hot-patch

```
copy hot-patch <Word> {<REMOTE-URL>|<Storage-URL>} [vrf <VRF-NAME>]
```

Description

Copies a hot-patch from a switch to the specified remote URL or storage URL.

Parameter	Description
<Word>	Name of the hot-patch software to upload.
<REMOTE-URL>	Specifies the URL to receive the uploaded patch using SFTP or TFTP. For information on how to format the remote URL, see URL formatting for copy commands.
vrf <VRF-NAME>	[Optional] specify the VRF instance to use for upload.
<STORAGE-URL>	Specifies the name of the patch file to create on the USB storage device. Prefix the filename with usb:/ , for example, usb:/firmware_FL_10_12_0001-0002.patch .

Examples

```
switch# copy hot-patch FL_10_12_0001-0002.patch tftp:172.21.18.170/FL_10_12_0001-0002.patch vrf vrf1
```

Related Commands

Command	Description
copy <REMOTE-URL>	Downloads a hot-patch image from a TFTP or SFTP server.
hot-patch	Apply a hot-patch image or remove it from the switch.

Command History

Release	Modification
10.12	Hot-patch is now supported on all platforms.
10.10	Command introduced

Command Information

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

hot-patch

```
hot-patch apply|remove <name.patch>  
no hot-patch apply <name.patch>
```

Description

Apply hot-patch software or remove it from the switch. The **no** form of the **hot-patch apply** command disables the hot-patch image, but does not remove it from the switch. Rebooting the system after disabling or removing the patch is not required.

Profile names	Description
<code>apply <name.patch></code>	Apply the specified hot-patch image to a standalone switch or VSF stack. AOS-CX hot-patch software images can be obtained from Aruba customer support, and are identified with a .patch extension.
<code>remove <name.patch></code>	Disables the hot-patch image and removes the patch from the switch. This removal will also disable the patch. Once removed, a hot-patch must be downloaded again in order to be applied.

Usage

A hot-patch can be downloaded from a remote server onto a switch then applied without rebooting the switch. When the hot-patch is disabled, the hot-patch will still remain on the system. The disabled hot-patch can be removed from the system without the need for a reboot of the system.

If a checkpoint configuration that does not contain a hot-patch is restored to a running configuration that does have a hot-patch, the patch is not deleted, it remains as not applied but is present in the device memory.

Examples

```
switch(config)# hot-patch apply FL_10_12_0001-0002.patch
```

Related Commands

Command	Description
copy <REMOTE-URL>	Downloads and installs a hot-patch image from a TFTP or SFTP server.
copy hot-patch	Copies a hot-patch software image from a switch to a specified remote URL or storage URL.

Command History

Release	Modification
10.12	Hot-patch is now supported on all platforms.
10.10	Command introduced.

Command Information

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

show hot-patch

```
show hot-patch [detail]
```

Parameter	Description
detail	Displays the detailed status of all hot-patches present on the system.

Description

the **show hot-patch** command displays the status of all hot-patches present on the system. The **show hot-patch detail** command displays detailed information for all hot patches present on the system.

Examples


```
switch# show hot-patch
```

Name	Status
FL_10_12_0001-0002.patch	Applied

```
switch# show hot-patch detail
```

Name	: FL_10_12_0001-0002.patch
Status	: Applied
Version	: FL_10_12_0001-0002.patch
Compatible Version	: FL.10.12.0001
Issues Fixed	: CR1234, CR2345
Patch Date	: 2022-03-29 20:46:15 UTC
Patch ID	: AOS-CX:FL.10.12.0001-sp1-256-gd457e88d39:20220442009
Patch SHA	: a4038d06a2e5fe7e0d457e868d39e526185b

Related Commands

Command	Description
copy <REMOTE-URL>	Downloads a hot-patch image from a TFTP or SFTP server.
hot-patch	Apply a hot-patch image or remove it from the switch.

Command History

Release	Modification
10.12	Command supported on all platforms.
10.10	Command introduced on 6300 Switch series.

Command Information

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

Chapter 9

Dynamic Segmentation

Dynamic Segmentation

For information on dynamic segmentation, view the *Security Guide*.

SNMP

Simple Network Management Protocol (SNMP) is an Internet-standard protocol used for managing and monitoring the devices connected to a network by collecting, organizing and modifying information about managed devices on IP networks.

Configuring SNMP

(The SNMP agent provides read-only access.)

Procedure

1. Enable SNMP on a VRF using the command `snmp-server vrf`.
2. Set the system contact, location, and description for the switch with the following commands:
 - `snmp-server system-contact`
 - `snmp-server system-location`
 - `snmp-server system-description`
3. If required, change the default SNMP port on which the agent listens for requests with the command `snmp-server agent-port`.
4. By default, the agent uses the community string **public** to protect access through SNMPv1/v2c. Set a new community string with the command `snmp-server community`.
5. Configure the trap receivers to which the SNMP agent will send trap notifications with the command `snmp-server host`.
6. Create an SNMPv3 context and associate it with any available SNMPv3 user to perform context specific v3 MIB polling using the command `snmpv3 user`.
7. Create an SNMPv3 context and associate it with an available SNMPv1/v2c community string to perform context specific v1/v2c MIB polling using the command `snmpv3 context`.
8. Review your SNMP configuration settings with the following commands:
 - `show snmp agent-port`
 - `show snmp community`
 - `show snmp system`
 - `show snmpv3 context`
 - `show snmp trap`
 - `show snmp vrf`
 - `show snmpv3 users`
 - `show tech snmp`

Example 1

This example creates the following configuration:

- Enables SNMP on the out-of-band management interface (VRF **mgmt**).
- Sets the contact, location, and description for the switch to: **JaniceM**, **Building2**, **LabSwitch**.
- Sets the community string to **Lab8899X**.

```
switch(config)# snmp-server vrf mgmt
switch(config)# snmp-server system-contact JaniceM
switch(config)# snmp-server system-location Building2
switch(config)# snmp-server system-description LabSwitch
switch(config)# snmp-server community Lab8899X
```

Example 2

This example creates the following configuration:

- Creates an SNMPv3 user named **Admin** using **sha** authentication with the plaintext password **mypassword** and using **des** security with the plaintext password **myprivpass**.
- Associates the SNMPv3 user `Admin` with a context named `newContext`.

```
switch(config)# snmpv3 user Admin auth sha auth-pass plaintext mypassword priv des
priv-pass plaintext myprivpass
switch(config)# snmpv3 user Admin context newContext
```



Refer to the SNMP Guide for SNMP Commands.

Aruba Central integration

The Aruba Central network management solution, a software-as-a-service subscription in the cloud, provides streamlined management of multiple network devices. AOS-CX switches are able to talk to Aruba Central and utilize cloud-based management functionality. Cloud-based management functionality allows for the deployment of network devices at sites with no or few dedicated IT personnel (branch offices, retail stores, and so forth). AOS-CX switches utilize secure communication protocols to connect to the Aruba Central cloud portal, and can coexist with corporate security standards, such as those mandating the use of firewalls.



When Aruba Central manages AOS-CX switches, it functions as the single source of truth and the Web UI operates in read-only mode.

This feature provides:

- Zero-touch provisioning
- Network Management/Remote monitoring
- Events/alerts notification
- Switch Configuration using templates
- Firmware management

Connecting to Aruba Central

AOS-CX switch downloads the location of Aruba Central server using:

- Command-line interface (CLI).
- Aruba Activate server.
- DHCP options provided during ZTP.

DHCP servers are used to connect to Central on-premise management.

If switch is unable to connect to Activate server, it retries to establish connection in exponential back off of 1s, 2s, 8s, 16s, 32s, 64s, 128s, and 256s. After the maximum back off of 256s, switch retries happen for every 5 minutes.

If the Network Time Protocol (NTP) is not enabled on the switch, it will synchronize the system time with the Activate server.



When a switch is able to connect to Aruba Central, but is not registered in the Aruba Central inventory or does not have a proper license, the switch will get disconnected. If the Aruba Central feature is enabled using this command, the switch will then reconnect back to Aruba Central and will get disconnected again. This connect/disconnect process will continue until the switch is properly registered in Aruba Central. To avoid this unnecessary reconnection cycle, best practices is to [disable Aruba Central](#) until the switch is registered in Aruba Central, or a license is obtained for that device.

Custom CA certificate

To use a custom CA certificate to connect to Aruba Central, AOS-CX switch downloads the certificate from the Aruba Activate server.



-
- If there is no custom CA provided by Aruba Activate, the CA certificate present in the device is used.
 - Duplicate CA certificates from Aruba Activate server will be ignored.
 - If CA certificate is absent in consecutive responses from Aruba Activate server, the installed custom CA certificate in device will be removed.
 - Switch will have only one custom CA certificate installed from Aruba Activate Server.
 - The certificate installed from Aruba Activate server will not be displayed in the show commands.
-

Support mode in Aruba Central

When the AOS-CX switch is managed by Aruba Central, the switch configuration cannot be modified using other interfaces such as CLI or Web UI. The following command categories are blocked:

- auto-confirm
- boot
- checkpoint
- copy-in commands
- erase
- erps
- https-server
- mfgread
- mfgwrite
- port-access
- vsf
- All configuration commands except the aruba-central command

In cases where a maintenance or troubleshooting activity requires configuration updates, aruba-central support-mode can be enabled to allow these operations.



The aruba-central support-mode enable or disable operation is effective only in the CLI session where it is executed and does not impact the other CLI sessions.

If the user tries to execute any command that is not allowed, an **Invalid input:** error message is displayed.

One Touch Provisioning

One Touch Provisioning (OTP) allows a switch to be provisioned on Aruba Central with the minimum user configuration.

Configuring One Touch Provisioning

To provision a switch to Aruba Central by using an OTP scenario, you can configure:

- The Aruba Central Location

Following configurations can be done optionally:

- The Domain Name System (DNS) server address.
- The HTTP proxy location.

Configuring Aruba Central location

1. Create the Aruba-Central context.

```
switch(config)# aruba-central
```

2. Configure the Aruba Central server location

```
switch(config-aruba-central)# location-override <LOCATION> vrf <VRF>
```



IPv4 or IPv6 address can be used.

3. Validate the connectivity status to Aruba Central

```
switch# show aruba-central
```

Configuring DNS server address

1. Configure the DNS server address.

```
switch(config)# ip dns server-address <ADDRESS> vrf <VRF>
```



IPv4 or IPv6 address can be used.

2. Validate the DNS server status

```
switch# show ip dns
```

Configuring HTTP proxy location

1. Configure the HTTP Proxy location

```
switch(config)# http-proxy <LOCATION> vrf <VRF>
```



LOCATION can be either a FQDN, IPv4 address or IPv6 address

Limitations for Zero Touch Provisioning

The following are the limitations for OTP when provisioning a switch by using IPv6:

- Support for obtaining the Aruba Central location via Activate.
- Support for obtaining the Aruba Central location via DHCP.
- Support for connectivity to an Aruba Central on-premise instance.

Supportability

Debug logging can be enabled with the following command:



The central debug logs are helpful to determine connectivity issues with Aruba Central.

```
switch# debug central all
```

Aruba commands

aruba-central

```
aruba-central  
no aruba-central
```

Description

Creates or enters the Aruba configuration context (**config-aruba-central**).

Example

Creating the Aruba configuration context:

```
switch(config)# aruba-central  
switch(config-aruba-central)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

aruba-central support-mode

```
aruba-central support-mode  
no aruba-central support-mode
```

Description

Allows the device to be writable for all operations in Aruba lockout mode for troubleshooting. The no form of this command disables this activity.



Support-mode is disabled by default when the switch is managed by Aruba. This command is only effective in the CLI session where it is executed.

Examples

Configuring the device to be writable for all operations in Aruba lockout mode:

```
switch# aruba-central support-mode
switch#
```

Removing the configuration that allows the device to be writable for all operations in Aruba lockout mode:

```
switch# no aruba-central support-mode
switch#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	Manager (#)	Administrators or local user group members with execution rights for this command.

configuration-lockout central managed

```
configuration-lockout central managed
no configuration-lockout central managed
```

Description

Configures the device to only be writable from Aruba. Aruba will be the only agent that can add, modify, or delete configurations on the device. The no form of this command disables this feature.



The no form of this command is only available when the device is disconnected from Aruba.

Usage

The AOS-CX switch connects to Aruba in either of two modes: monitor or managed. When the device is connected in monitor mode, Aruba monitors the configurations on the switch. When the device is connected in managed mode, the **configuration-lockout central managed** command does not allow configuration changes from other interfaces such as CLI or Web UI.

Examples

Configuring the device to only be writable from Aruba :

```
switch(config)# configuration-lockout central managed
switch# show configuration-lockout
configuration lockout
-----
central: managed
switch# sh aruba-central
Central admin state           :enable
Central location              :20.0.0.2:8083
VRF for connection            :default
Central connection status     :connected

Central source                 :cli
Central source connection status :connected
Central source last connected on :Tue Feb 9 17:53:13 UTC 2021

Activate Server URL            :devices-v2.arubanetworks.com
CLI location                   :20.0.2:8083
CLI VRF                        :default
switch(config)# end
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

disable

disable

Description

Disables connection to Aruba server.

When the connection is disabled, the switch does not attempt to connect to the Aruba server or fetch central location from any of the three sources (CLI/Aruba Activate/DHCP). It also disconnects any active connection to the Aruba server.

Example

```
switch(config-aruba-central)# disable
switch(config-aruba-central)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-aruba-central	Administrators or local user group members with execution rights for this command.

enable

enable

Description

Enables connection to Aruba server. When the connection is enabled, the switch attempts to download the location of the Aruba server in one of the following ways at startup and after the connection is lost:

- Using command-line interface (CLI).
- Connecting to Aruba Activate server.
- Using DHCP options provided during ZTP.

DHCP servers provide the options requested by the device to connect to Central, Central On-premise management, or the TFTP server.



When a switch is able to connect to Aruba, but is not registered in the Aruba inventory or does not have a proper license, the switch will get disconnected. If the Aruba feature is enabled using this command, the switch will then reconnect back to Aruba and will get disconnected again. This connect/disconnect process will continue until the switch is properly registered in Aruba. To avoid this unnecessary reconnection cycle, best practices is to [disable Aruba](#) until the switch is registered in Aruba, or a license is obtained for that device.

Examples

```
switch(config-aruba-central) # enable
switch(config-aruba-central) #
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-aruba-central	Administrators or local user group members with execution rights for this command.

location-override

```
location-override <location> [vrf <VRF-NAME>]
no location-override
```

Description

When **location** and **vrf** are configured, the switch overrides existing connections to Aruba. The switch attempts to establish connection to Aruba with the specified location and VRF with highest priority.

Location can take one of the following values:

- A fully qualified domain name (FQDN) along with an optional port number.
- An IPv4 address with an optional port number.
- An IPv6 address with an optional port number.

If the port number is not specified, then port 443 is used by default. If the command is executed without the VRF parameter, the switch uses

the 'default' VRF.

The **no** form of this command removes location override values from the Aruba configuration context.



When you configure an IPv6 address with a port number, specify the address part inside square brackets, optionally followed by the port number, e.g. [2001:0db8:85a3:0000:0000:8a2e:0370:7334]:443.

Parameter	Description
<location>	Specifies one of these values: <ul style="list-style-type: none">■ <FQDN>: a fully qualified domain name.■ <IPv4>: an IPv4 address.■ <IPv6>: an IPv6 address.
vrf <VRF-NAME>	Specifies the VRF name to be used for communicating with the server. If no VRF name is provided, the default VRF named default is used.

Examples

Configuring location override with location and VRF:

```
switch(config-aruba-central)# location-override aruba-central.com vrf default
switch(config-aruba-central)#
switch(config-aruba-central)# location-override aruba-central.com vrf red
switch(config-aruba-central)# location-override 10.0.0.1 vrf red
switch(config-aruba-central)# location-override 10.0.0.1:443 vrf red
switch(config-aruba-central)# location-override
2001:0db8:85a3:0000:0000:8a2e:0370:7334 vrf red
switch(config-aruba-central)# location-override
[2001:0db8:85a3:0000:0000:8a2e:0370:7334]:443 vrf red
```

Configuring location override with location only:

```
switch(config-aruba-central)# location-override aruba-central.com
switch(config-aruba-central)#
```

Removing location override values from the Aruba configuration context:

```
switch(config-aruba-central)# no location-override
switch(config-aruba-central)#
```

Command History

Release	Modification
10.13.1000	Command updated to reflect OTP scenario..
10.07 or earlier	--

Command Information

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

location-override-alternative

```
location-override-alternative <LOCATION> [vrf <VRF>]
no location-override-alternative <LOCATION> [vrf <VRF>]
```

Description

Configures information about Aruba connection when the alternative location is used.

The **no** form of this command removes the **location-override-alternative** configuration.

Parameter	Description
<LOCATION>	Specifies the Aruba location.
vrf <VRF>	Specifies the VRF used to connect to Aruba.

Usage

When the main and alternative Aruba server locations are specified, the switch attempts to connect to the main Aruba server. If there is connectivity failure with the main Aruba server location, it attempts to establish a connection with the alternative server location.

If the alternative location is configured without a main location, the user is prompted for confirmation. In this case, there is no redundancy and the switch attempts to connect to the alternative location.

Location can take one of the following values:

- A fully qualified domain name (FQDN) along with an optional port number.
- An IPv4 address with an optional port number.
- An IPv6 address with an optional port number.

If the port number is not specified, then port 443 is used by default. If the command is executed without the VRF parameter, the switch uses the 'default' VRF.

An Aruba server location can only be a fully qualified domain name (FQDN) or a valid IP address. If the command is entered without the VRF parameter, the switch uses the default VRF.

Examples

Example of configuring with the aruba-central.com location and VRF red:

```
switch(config-aruba-central)# location-override-alternative aruba-central.com vrf red
switch(config-aruba-central)#
```

Example of a configuration with location only:

```
switch(config-aruba-central)# location-override-alternative aruba-central.com
switch(config-aruba-central)#
```

Example of removing the override configuration:

```
switch(config-aruba-central)# no location-override-alternative
switch(config-aruba-central)# location-override-alternative 10.0.0.1 vrf red
switch(config-aruba-central)# location-override-alternative 10.0.0.1:443 vrf red
switch(config-aruba-central)# location-override-alternative
2001:0db8:85a3:0000:0000:8a2e:0370:7334 vrf red
switch(config-aruba-central)# location-override-alternative
[2001:0db8:85a3:0000:0000:8a2e:0370:7334]:443 vrf red
```

Command History

Release	Modification
10.13.1000	Command updated to reflect OTP scenario.
10.12.1000	Command introduced.

Command Information

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

show aruba-central

```
show aruba-central
```

Description

Shows information about Aruba connection and the status of the Activate server connection.

Examples

Example of a switch when the main CLI location is used:

```
switch# show aruba-central
Central admin state      : enabled
Central location        : 10.0.0.1
VRF for connection      : mgmt
```

```

Shared secret                : N/A
Central connection status    : connected
Central source               : cli
Central source connection status : connected
Central source last connected on : Wed Jun 28 23:07:25 UTC 2023
Main location                : 10.0.0.1
Main VRF                     : mgmt
Alternative location         : 20.0.0.1
Alternative VRF              : default
Activate server URL          : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                    : N/A
Source IP Overridden         : False
Central support mode         : disabled

```

Example of a switch when the alternative CLI location is used:

```

switch# show aruba-central
Central admin state          : enabled
Central location             : 20.0.0.1
VRF for connection          : default
Shared secret                : N/A
Central connection status    : connected
Central source               : cli
Central source connection status : connected
Central source last connected on : Wed Jun 28 23:07:25 UTC 2023
Main location                : 10.0.0.1
Main VRF                     : mgmt
Alternative location         : 20.0.0.1
Alternative VRF              : default
Activate server URL          : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                    : N/A
Source IP Overridden         : False
Central support mode         : disabled

```

Example of a switch when the location is obtained from DHCP options:

```

switch# show aruba-central
Central admin state          : enabled
Central location             : central-western-us.arubanetworks.com
VRF for connection          : RED
Shared secret                : N/A
Central connection status    : connected
Central source               : DHCP
Central source connection status : connected
Central source last connected on : Fri Jun 30 20:22:33 UTC 2023
Main location                : central-western-us.arubanetworks.com
Main VRF                     : mgmt
Alternative location         : N/A
Alternative VRF              : N/A
Activate server URL          : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                    : 100.0.0.1
Source IP Overridden         : False
Central support mode         : disabled

```

Example of a switch when Aruba is disabled:

```

switch# show aruba-central
Central admin state           : disabled
Central location              : N/A
VRF for connection            : N/A
Shared secret                 : N/A
Central connection status     : N/A
Central source                : none
Central source connection status : N/A
Central source last connected on : N/A
Main location                 : N/A
Main VRF                      : N/A
Alternative location          : N/A
Alternative VRF               : N/A
Activate server URL           : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                     : N/A
Source IP Overridden          : False
Central support mode          : disabledswitch# show aruba-central
Central admin state           : disabled
Central location              : N/A
VRF for connection            : N/A
Shared secret                 : N/A
Central connection status     : N/A
Central source                : none
Central source connection status : N/A
Central source last connected on : N/A
Main location                 : N/A
Main VRF                      : N/A
Alternative location          : N/A
Alternative VRF               : N/A
Activate server URL           : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                     : N/A
Source IP Overridden          : False
Central support mode          : disabled

```

Example of a switch when Aruba is not reachable:

```

switch# show aruba-central
Central admin state           : enabled
Central location              : N/A
VRF for connection            : N/A
Shared secret                 : N/A
Central connection status     : not-reachable
Central source                : activate
Central source connection status : connected
Central source last connected on : Fri Jun 30 20:22:33 UTC 2023
Main location                 : N/A
Main VRF                      : N/A
Alternative location          : N/A
Alternative VRF               : N/A
Activate server URL           : devices-v2.arubanetworks.com
System time synchronized from Activate : N/A
Source IP                     : N/A
Source IP Overridden          : False
Central support mode          : disabled

```

Command History

Release	Modification
10.12.1000	Enhanced to support more scenarios
10.07 or earlier	--

Command Information

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

show running-config current-context

show running-config current-context

Description

Shows the running configuration for the current-context. If user is in the context of Aruba (**config-aruba-central**), then the Aruba running configuration is displayed.

Examples

Shows the running configuration of Aruba:

```
switch(config-aruba-central)# show running-config current-context
aruba-central
    disable
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	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.

DNS

The Domain Name System (DNS) is the Internet protocol for mapping domain names or hostnames into addresses. DNS allows users to enter more readily memorable and intuitive hostnames, rather than IP addresses, to identify devices connected to a network. It also allows a host to keep the same hostname even if it changes its IP address.

Hostname resolution can be either static or dynamic.

- In static resolution, a local table is defined on the switch that associates hostnames with their IP addresses. Static tables can be used to speed up the resolution of frequently queried hosts.
- Dynamic resolution requires that the switch query a DNS server located elsewhere on the network. Dynamic name resolution takes more time than static name resolution, but requires far less configuration and management.

Configuration

VxLAN IPv4 and IPv6 underlay support the DNS client. To ensure configuration, make sure the following are set up:

- VxLAN overlay
 - Must be configured to establish the VxLAN tunnel.
- VxLAN tunnel
 - Ensure the tunnel is established between the VTEPS via either static or EVPN using the following command: **show interface VxLAN VTEPS**.



For more information, refer to the [AOS-CX VxLAN EVPN Guide](#).

DNS client

The DNS client resolves hostnames to IP addresses for protocols that are running on the switch. When the DNS client receives a request to resolve a hostname, it can do so in one of two ways:

- Forward the request to a DNS name server for resolution.
- Reply to the request without using a DNS name server, by resolving the name using a statically defined table of hostnames and their associated IP addresses.

Configuring the DNS client

Procedure

1. Configure one or more DNS name servers with the command `ip dns server`.
2. To resolve DNS requests by appending a domain name to the requests, either configure a single domain name with the command `ip dns domain-name`, or configure a list of up to six domain names with the command `ip dns domain-list`.
3. To use static name resolution for certain hosts, associate an IP address to a host with the command `ip dns host`.
4. Review your DNS configuration settings with the command `show ip dns`.

Examples

This example creates the following configuration:

- Defines the domain **switch.com** to append to all requests.
- Defines a DNS server with IPv4 address of **1.1.1.1**.
- Defines a static DNS host named **myhost1** with an IPv4 address of **3.3.3.3**.
- DNS client traffic is sent on the default VRF (named **default**).

```
switch(config)# ip dns domain-name switch.com
switch(config)# ip dns server-address 1.1.1.1
switch(config)# ip dns host myhost1 3.3.3.3
switch(config)# exit
switch# show ip dns
```

```
VRF Name : vrf_mgmt
```

Host Name	Address

```
VRF Name : vrf_default
Domain Name : switch.com
DNS Domain list :
Name Server(s) : 1.1.1.1
```

Host Name	Address

myhost1	

DNS client commands

ip dns domain-list

```
ip dns domain-list <DOMAIN-NAME> [vrf <VRF-NAME>]
no ip dns domain-list <DOMAIN-NAME> [vrf <VRF-NAME>]
```

Description

Configures one or more domain names that are appended to the DNS request. The DNS client appends each name in succession until the DNS server replies. Domains can be either IPv4 or IPv6. By default, requests are forwarded on the default VRF.

The **no** form of this command removes a domain from the list.

Parameter	Description
<code>list <DOMAIN-NAME></code>	Specifies a domain name. Up to six domains can be added to the list. Length: 1 to 256 characters.
<code>vrf <VRF-NAME></code>	Specifies a VRF name. Default: default.

Examples

This example defines a list with two entries: **domain1.com** and **domain2.com**.

```
switch(config)# ip dns domain-list domain1.com
switch(config)# ip dns domain-list domain2.com
```

This example removes the entry **domain1.com**.

```
switch(config)# no ip dns domain-list domain1.com
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config</code>	Administrators or local user group members with execution rights for this command.

ip dns domain-name

```
ip dns domain-name <DOMAIN-NAME> [ vrf <VRF-NAME> ]
no ip dns domain-name <DOMAIN-NAME> [ vrf <VRF-NAME> ]
```

Description

Configures a domain name that is appended to the DNS request. The domain can be either IPv4 or IPv6. By default, requests are forwarded on the default VRF. If a domain list is defined with the command `ip dns domain-list`, the domain name defined with this command is ignored.

The **no** form of this command removes the domain name.

Parameter	Description
<code><DOMAIN-NAME></code>	Specifies the domain name to append to DNS requests. Length: 1 to 256 characters.
<code>vrf <VRF-NAME></code>	Specifies a VRF name. Default: default.

Examples

Setting the default domain name to `domain.com`:

```
switch(config)# ip dns domain-name domain.com
```

Removing the default domain name `domain.com`:

```
switch(config)# no ip dns domain-name domain.com
```

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.

ip dns host

```
ip dns host <HOST-NAME> <IP-ADDR> [ vrf <VRF-NAME> ]  
no ip dns host <HOST-NAME> <IP-ADDR> [ vrf <VRF-NAME> ]
```

Description

Associates a static IP address with a hostname. The DNS client returns this IP address instead of querying a DNS server for an IP address for the hostname. Up to six hosts can be defined. If no VRF is defined, the default VRF is used.

The **no** form of this command removes a static IP address associated with a hostname.

Parameter	Description
host <HOST-NAME>	Specifies the name of a host. Length: 1 to 256 characters.
<IP-ADDR>	Specifies an IP address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255, or IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F.
vrf <VRF-NAME>	Specifies a VRF name. Default: default.

Examples

This example defines an IPv4 address of **3.3.3.3** for **host1**.

```
switch(config)# ip dns host host1 3.3.3.3
```

This example defines an IPv6 address of **b::5** for **host 1**.

```
switch(config)# ip dns host host1 b::5
```

This example defines removes the entry for **host 1** with address **b::5**.

```
switch(config)# no ip dns host host1 b::5
```

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.

ip dns server address

```
ip dns server-address <IP-ADDR> [ vrf <VRF-NAME> ]  
no ip dns server-address <IP-ADDR> [ vrf <VRF-NAME> ]
```

Description

Configures the DNS name servers that the DNS client queries to resolve DNS queries. Up to six name servers can be defined. The DNS client queries the servers in the order that they are defined. If no VRF is defined, the default VRF is used.

The **no** form of this command removes a name server from the list.

Parameter	Description
<IP-ADDR>	Specifies an IP address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255, or IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F.
vrf <VRF-NAME>	Specifies a VRF name. Default: default.

Examples

This example defines a name server at **1.1.1.1**.

```
switch(config)# ip dns server-address 1.1.1.1
```

This example defines a name server at **a::1**.

```
switch(config)# ip dns server-address a::1
```

This example removes a name server at **a::1**.

```
switch(config)# no ip dns server-address a::1
```

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 ip dns

```
show ip dns [vrf <VRF-NAME>]
```

Description

Shows all DNS client configuration settings or the settings for a specific VRF.

Parameter	Description
vrf <VRF-NAME>	Specifies the VRF for which to show information. If no VRF is defined, the default VRF is used.

Examples

```
switch(config)# ip dns domain-name domain.com
switch(config)# ip dns domain-list domain5.com
switch(config)# ip dns domain-list domain8.com
switch(config)# ip dns server-address 4.4.4.4
switch(config)# ip dns server-address 6.6.6.6
switch(config)# ip dns host host3 5.5.5.5
switch(config)# ip dns host host3 c::12
```

```
switch# show ip dns
VRF Name : default
```

```
Domain Name : domain.com
DNS Domain list : domain5.com, domain8.com
Name Server(s) : 4.4.4.4, 6.6.6.6
```

```
Host Name      Address
-----
host3          5.5.5.5
host3          c::12
```

DNS client arbitration on the MGMT interface on a MGMT VRF can be updated via three different methods.

1. Using the **domain-name** <name> or **nameservers** <servers> commands in the command-line interface.
2. Using the **ip dns domain-name** <DOMAIN-NAME> **vrf MGMT** or **ip dns server-address** <SERVER> **vrf MGMT** commands in the command-line interface.
3. Using the **ip dhcp** command in the command-line interface (dynamic enties).



AOS-CX gives the following priority levels to the these three update mothods.

- Priority 1 - standalone CLI configuration
- Priority 2 - static ip dns configuration
- Priority 3 - Dynamic config

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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.

Device discovery and configuration

The switch supports automatic discovery and configuration of other devices on the network.

Device profiles



Device profiles rely on role configurations. For information on role configurations, see the *Security Guide*.

Device profiles are used to dynamically assign port attributes based on the type of devices connected, without having to create a RADIUS infrastructure. You can map device profiles to device groups. A device group contains various match criteria, which can be obtained from multiple sources, such as LLDP, CDP, and local MAC match. Device profiles contain port attributes to be assigned to the port when a connected device matches a device group.

Device profiles are supported on different scenarios. It can be applied on interfaces that are configured with security (802.1X or MAC authentication), or applied based on L2 port (LLDP, CDP), or applied on standalone ports with the block-until-profile-applied command enabled. All the methods are mutually exclusive of each other. The block-until-profile-applied mode must be configured only when there is a standalone port where no security has been configured and when you want the port to be offline until at least one client is onboarded based on the match and ignore criteria that you configure. Local MAC match is supported when you configure block-until-profile-applied command or device profile with security.



Up to eight device profiles can be configured.

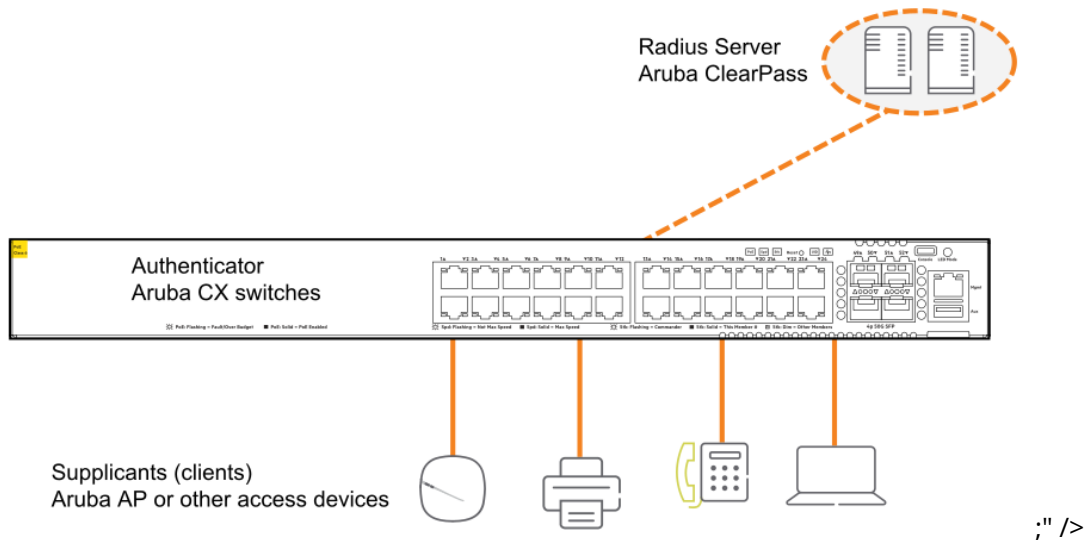
See the *Security Guide* for the following commands:

- The `port-access onboarding-method precedence` command—If you are configuring both security and device profile on the port, and you want to configure the order in which the methods will be executed.
- The `port-access fallback-role` command—If you want to configure a role that must be applied to devices when no other role exists or can be derived for that device.

If you configure a match criteria that matches across multiple device profiles, then the priority considered is LLDP, CDP, and then local MAC match. That is, LLDP precedes over CDP, which in turn precedes over local MAC match.

The following figure displays a simple configuration of device profile and AAA authentication with RADIUS server and Aruba ClearPass Policy Manager. Local MAC match feature is useful when you do not want to afford RADIUS infrastructure or when you want to use local authentication as a backup method in case the RADIUS server is unreachable.

Figure 1 Example of device profile setup along with RADIUS infrastructure



Configuring a device profile for LLDP

Procedure

1. Create an LLDP group with the command `port-access lldp-group`.
2. Define rules for adding devices to an LLDP group with the command `match`.
3. Define rules for ignoring devices so that they are not added to an LLDP group with the command `ignore`.
4. Create a device profile with the command `port-access device-profile`.
5. Add the LLDP group with the command `associate lldp-group`.
6. Add a role to a device profile with the command `associate role`. Make sure that the role is already created. For information on how to create a role, see port access role information in the *Security Guide*.
7. Enable the device profile with the command `enable`.

Configuring a device profile for CDP

1. Create a CDP group with the command `port-access cdp-group`.
2. Define rules for adding devices to a CDP group with the command `match`.
3. Define rules for ignoring devices so that they are not added to a CDP group with the command `ignore`.
4. Create a device profile with the command `port-access device-profile`.
5. Add a CDP group to a device profile with the command `associate cdp-group`.
6. Add a role to a device profile with the command `associate role`. Make sure that the role is already created. For information on how to create a role, see port access role information in the *Security Guide*.
7. Enable a device profile with the command `enable`.

Configuring a device profile for local MAC match

Procedure

1. Create a MAC group with the `mac-group` command.
2. Define rules for adding devices to a MAC group with the `match (for MAC groups)` command.
3. Define rules for ignoring devices so that they are not added to a MAC group with the `ignore (for MAC groups)` command.
4. Create a device profile with the `port-access device-profile` command.
5. Associate a MAC group with a device profile with the `associate mac-group` command.
6. Add a role to a device profile with the `associate role` command. Make sure that the role is already created. For information on how to create a role, see port access role information in the *Security Guide*.
7. Enable a device profile with the `enable` command.

Device Profile Usage Considerations

The following behaviors and limitations should be taken into consideration when configuring a device profile on Link Aggregation Group (LAG) or Multi-chassis Link Aggregation Group (MCLAG).

Device Profiles on LAG and MCLAG

- When using Device profile to onboard a device with multiple interfaces (such as a dual port AP) over a LAG, set the authentication mode in the role applied to the device to **device-mode**. The **multi-domain** authentication mode is not supported with a device profile on a LAG.
- When using Device profile to onboard a device on MCLAG port, set the authentication mode in the role applied to the device to **device-mode** or **proxy-mode**. The **multi-domain** and **client-mode** authentication mode is not supported with device profile on MCLAG.
- It is not recommended to connect different devices to the same LAG when using a device profile on the LAG.
- When updating a LAG membership, all the device profile clients on the LAG are logged off automatically from the switch and from both peers on MCLAG port.
- If you issue the command **aaa authentication port-access allow-cdp-proxy-logoff** on the LAG, a proxy-logoff TLV received on any member interface of the LAG will log off all clients onboarded on the LAG.
- Depending on resource availability or auth/role application status on each peer, the same MAC may be allowed in one peer and denied in another for a MAC learned on MCLAG port.

Security Considerations

- Each individual interface of a LAG must successfully match a Device profile for the corresponding interface to be unblocked on the data plane.
- An onboarded client on the LAG is authorized to send and receive packets on any of the member interface of the LAG that is unblocked on the data plane. This is true even for a different client connected to the same LAG.
- When using LLDP packets to authenticate a device using a device profile on a LAG, issue the command **aaa authentication port-access allow-lldp-auth mac chassis-mac** to set the authentication MAC address as the chassis MAC address
- LLDP BPDUs are blocked by default. Issue the command **aaa authentication port-access allow-lldp-bpdu** to allow the LLDP BPDUs.
- If a Device profile is used to onboard multiple devices connected to the same LAG, the client limit on the LAG must be configured to match the number of clients onboarding the LAG.

- When using LLDP packets to authenticate a Dual Port AP using a device profile on a LAG, issue the command **aaa authentication port-access allow-lldp-auth mac source-mac** to set the authentication MAC address as the port/interface MAC address.

Supported Role Attributes

The following port-access role attributes are supported for clients that onboard via device profile on a LAG.

- Authentication mode
- Client inactivity timeout
- Session timeout
- Access and Trunk VLANs
- Port-Access policy (not supported on MCLAG)
- MTU
- PoE Priority
- PoE Allocate-By
- Private-VLAN
- STP admin edge port
- Trust mode
- GBP role

Device profile commands

aaa authentication port-access allow-cdp-auth

```
aaa authentication port-access allow-cdp-auth
no aaa authentication port-access allow-cdp-auth
```

Description

Use this command to allow or block authentication on the CDP (Cisco Discovery Protocol) BPDU (Bridge Protocol Data Unit) . This is allowed by default. The **no** form of this command prevents authentication on CDP packets received on the port. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

Examples

Allowing authentication on a CDP CPDU on interface 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-cdp-auth
```

Allowing authentication on a CDP CPDU on a LAG port:

```
switch(config)# interface lag 1
switch(config-lag-if)# aaa authentication port-access allow-cdp-auth
```

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if config-lag-if	Administrators or local user group members with execution rights for this command.

aaa authentication port-access allow-cdp-bpdu

```
aaa authentication port-access allow-cdp-bpdu
no aaa authentication port-access allow-cdp-bpdu
```

Description

Allows all packets related to the CDP (Cisco Discovery Protocol) BPDU (Bridge Protocol Data Unit) on a secure port or LAG. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts. The **no** form of this command blocks the CDP BPDU on a secure port. On a nonsecure port, the command has no effect.

Examples

Allowing a CDP BPDU on secure port **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-cdp-bpdu
switch(config-if)# do show running-config
Current configuration:
!
!Version AOS-CX 10.0X.0000
led locator on
!
!
vlan 1
aaa authentication port-access mac-auth
enable
aaa authentication port-access dot1x authenticator
enable
interface 1/1/1
no shutdown

vlan access 1
aaa authentication port-access allow-cdp-bpdu
aaa authentication port-access mac-auth
enable
aaa authentication port-access dot1x authenticator
enable

switch(config-if)# do show port-access device-profile interface all
Port 1/1/1, Neighbor-Mac 00:0c:29:9e:d1:20
  Profile Name      : access_switches
  LLDP Group        :
  CDP Group         : hpe-anw-ap_cdp
```

```
Role           : test_ap_role
Status          : In Progress
Failure Reason  :
```

Blocking LLDP packet on secure port **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no aaa authentication port-access allow-cdp-bpdu
switch(config-if)# do show running-config
Current configuration:
!
!Version AOS-CX 10.0X.0000
led locator on
!
!
vlan 1
aaa authentication port-access mac-auth
enable
interface 1/1/1
no shutdown
vlan access 1
aaa authentication port-access mac-auth
enable
```

Allowing a CDP BPDU on LAG **1**:

```
switch(config)# interface lag 1
switch(config-lag-if)# aaa authentication port-access allow-cdp-bpdu
```

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if config-lag-if	Administrators or local user group members with execution rights for this command.

aaa authentication port-access allow-cdp-proxy-logout

```
aaa authentication port-access allow-cdp-proxy-logout
no aaa authentication port-access allow-cdp-proxy-logout
```

Description

Allows a client to be logged off from the system via a special TLV in the CDP packet. By default, proxy logout via CDP packet support is disabled. When **allow-cdp-proxy-logout** is enabled, TLV received from CDP packets corresponding to logout processing will be read and logout is issued to the clients. This only

works on client authentication enabled ports and **aaa authentication port-access allow-cdp-bpdu** must be enabled to process. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

Examples

Allowing a client to be logged off from the system via a special TLV in the CDP packet:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-cdp-proxy-logoff
switch(config-if)# show running-config interface 1/1/1
interface 1/1/1
  no shutdown

  vlan access 1
  aaa authentication port-access allow-cdp-bpdu
  aaa authentication port-access allow-cdp-proxy-logoff
  aaa authentication port-access allow client-limit 2
  aaa authentication port-access dot1x authenticator
    enable
  aaa authentication port-access mac-auth
    enable
exit
```

The **aaa authentication port-access allow-cdp-proxy-logoff** command can also be issued from a LAG port context

```
switch(config)# interface lag 1
switch(config-lag-if)# aaa authentication port-access allow-cdp-proxy-logoff
```

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.09.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6200	config-if config-lag-if	Administrators or local user group members with execution rights for this command.

aaa authentication port-access allow-lldp-bpdu

```
aaa authentication port-access allow-lldp-bpdu
no aaa authentication port-access allow-lldp-bpdu
```

Description

Allows all packets related to the LLDP BPDU (Bridge Protocol Data Unit) on a secure port. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

The **no** form of this command blocks the LLDP BPDU on a secure port. On a nonsecure port, the command has no effect.

Examples

Allowing an LLDP BPDU on secure port **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# aaa authentication port-access allow-lldp-bpdu
switch(config-if)# do show running-config
Current configuration:
!
!Version AOS-CX 10.0X.0000
led locator on
!
!
vlan 1
aaa authentication port-access mac-auth
enable
interface 1/1/1
no shutdown

vlan access 1
aaa authentication port-access allow-lldp-bpdu
aaa authentication port-access mac-auth
enable

switch(config-if)# do show port-access device-profile interface all
Port 1/1/1, Neighbor-Mac 00:0c:29:9e:d1:20
  Profile Name      : access_switches
  LLDP Group       : 2920-grp
  CDP Group        :
  Role             : local_2920_role
  Status           : Profile Applied
  Failure Reason    :
```

Blocking LLDP BPDU on secure port **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no aaa authentication port-access allow-lldp-bpdu
switch(config-if)# do show running-config
Current configuration:
!
!Version AOS-CX 10.0X.0000led locator on
!
!
vlan 1
aaa authentication port-access mac-auth
enable
interface 1/1/1
no shutdown

vlan access 1
aaa authentication port-access mac-auth
enable
```

Allowing an LLDP BPDU on a LAG port:


```
switch(config)# interface lag 1
switch(config-lag-if)#aaa authentication port-access allow-lldp-bpdu
```

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if config-lag-if	Administrators or local user group members with execution rights for this command.

associate cdp-group

```
associate cdp-group <GROUP-NAME>
no associate cdp-group <GROUP-NAME>
```

Description

Associates a CDP (Cisco Discovery Protocol) group with a device profile. A maximum of two CDP groups can be associated with a device profile.

The **no** form of this command removes a CDP group from a device profile.

Parameter	Description
<GROUP-NAME>	Specifies the name of the CDP group to associate with this device profile. Range: 1 to 32 alphanumeric characters.

Examples

Associating the CDP group **my-cdp-group** with the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# associate cdp-group my-cdp-group
```

Removing the CDP group **my-cdp-group** from the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no associate cdp-group my-cdp-group
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-device-profile	Administrators or local user group members with execution rights for this command.

associate lldp-group

```
associate lldp-group <GROUP-NAME>
no associate lldp-group <GROUP-NAME>
```

Description

Associates an LLDP group with a device profile. A maximum of two LLDP groups can be associated with a device profile

The **no** form of this command removes an LLDP group from a device profile.

Parameter	Description
<GROUP-NAME>	Specifies the name of the LLDP group to associate with the device profile. Range: 1 to 32 alphanumeric characters.

Examples

Associating the LLDP group **my-lldp-group** with the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# associate lldp-group my-lldp-group
```

Removing the LLDP group **my-lldp-group** from the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no associate lldp-group my-lldp-group
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-device-profile	Administrators or local user group members with execution rights for this command.

associate mac-group

```
associate mac-group <GROUP-NAME>
no associate mac-group <GROUP-NAME>
```

Description

Associates a MAC group with a device profile. A maximum of two MAC groups can be associated with a device profile.

The **no** form of this command removes a MAC group from a device profile.

Parameter	Description
<code><GROUP-NAME></code>	Specifies the name of the MAC group to associate with this device profile. Range: 1 to 32 alphanumeric characters.

Examples

Associating the MAC group **mac01-group** with the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# associate mac-group mac01-group
```

Removing the MAC group **mac01-group** from the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no associate mac-group mac01-group
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-device-profile	Administrators or local user group members with execution rights for this command.

associate role

```
associate role <ROLE-NAME>
no associate role <ROLE-NAME>
```

Description

Associates a role with a device profile. Only one role can be associated with a device profile. For information on how to configure a role, see the port access role information in the *Security Guide*.

The **no** form of this command removes a role from a device profile.

Parameter	Description
<code><ROLE-NAME></code>	Specifies the name of the role to associate with the device profile. Range: 1 to 64 alphanumeric characters.

Examples

Associating the role **my-role** with the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# associate role my-role
```

Removing the role **my-role** from the device profile **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no associate role my-role
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-device-profile	Administrators or local user group members with execution rights for this command.

disable

disable
no disable

Description

Disables a device profile.

The **no** form of this command enables a device profile.

Examples

Disabling a device profile:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# disable
```

Enabling a device profile named profile01:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no disable
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-device-profile	Administrators or local user group members with execution rights for this command.

enable

enable
no enable

Description

Enables a device profile.

The **no** form of this command disables a device profile.

Examples

Enabling a device profile:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# enable
```

Disabling a device profile named profile01:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)# no enable
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-device-profile	Administrators or local user group members with execution rights for this command.

ignore (for CDP groups)

```
ignore [seq <SEQ-NUM>] {platform <PLATFORM> | sw-version <SWVERSION> |
voice-vlan-query <VLAN-ID>}
no ignore [seq <SEQ-ID>] {platform <PLATFORM> | sw-version <SWVERSION> |
voice-vlan-query <VLAN-ID>}
```

Description

Defines a rule to ignore devices for a CDP (Cisco Discovery Protocol) group. Up to 64 match/ignore rules can be defined for a group.

The **no** form of this command removes a rule for ignoring devices from a CDP group.

Parameter	Description
<code>seq <SEQ-ID></code>	Specifies the ID of the rule to create or modify. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence.
<code>platform <PLATFORM></code>	Specifies the hardware or model details of the neighbor. Range: 1 to 128 alphanumeric characters.
<code>sw-version <SWVERSION></code>	Specifies the software version of the neighbor. Range: 1 to 128 alphanumeric characters.
<code>voice-vlan-query <VLAN-ID></code>	Specifies the VLAN query value of the neighbor. Range: 1 to 65535.

Examples

Adding a rule to the CDP group **grp01** that ignores a device that transmits **PLATFORM01** in the platform TLV:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# ignore platform PLATFORM01
```

Adding a rule to the CDP group **grp01** that ignores a device that transmits **SWVERSION** in software version TLV:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# ignore sw-version SWVERSION
```

Removing the rule that matches the sequence number **25** from the CDP group named **grp01**.

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# no ignore seq 25
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-cdp-group	Administrators or local user group members with execution rights for this command.

ignore (for LLDP groups)

```
ignore [seq <SEQ-ID>] {sys-desc <SYS-DESC> | sysname <SYS-NAME> |
  vendor-oui <VENDOR-OUI> [type <KEY> [value <VALUE>]]}
```

```
no ignore [seq <SEQ-ID>] {sys-desc <SYS-DESC> | sysname <SYS-NAME> |  
    vendor-oui <VENDOR-OUI> [type <KEY> [value <VALUE>]]}
```

Description

Defines a rule to ignore devices for an LLDP group. Up to 64 match/ignore rules can be defined for a group.

The **no** form of this command removes a rule for ignoring devices from an LLDP group.

Parameter	Description
seq <SEQ-ID>	Specifies the ID of the rule to create or modify. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence.
sys-desc <SYS-DESC>	Specifies the LLDP system description type-length-value (TLV). Range: 1 to 256 alphanumeric characters.
sysname <SYS-NAME>	Specifies the LLDP system name TLV. Range: 1 to 64 alphanumeric characters.
vendor-oui <VENDOR-OUI>	Specifies the LLDP system vendor OUI TLV. Range: 1 to 6 alphanumeric characters.
type <KEY>	Specifies the vendor OUI subtype key. Optional.
value <VALUE>	Specifies the vendor OUI subtype value. Range: 1 to 256 alphanumeric characters.

Examples

Adding a rule to the LLDP group **grp01** that ignores a device that transmits **PLATFORM01** in the system description TLV:

```
switch(config)# port-access lldp-group grp01  
switch(config-lldp-group)# ignore sys-desc PLATFORM01
```

Removing the rule that matches the sequence number **25** from the LLDP group named **grp01**.

```
switch(config)# port-access lldp-group grp01  
switch(config-lldp-group)# no match seq 25
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-lldp-group	Administrators or local user group members with execution rights for this command.

ignore (for MAC groups)

```
[seq <SEQ-ID>] ignore {mac <MAC-ADDR> | mac-mask <MAC-MASK> | mac-oui <MAC-OUI>}
no [seq <SEQ-ID>] ignore {mac <MAC-ADDR> | mac-mask <MAC-MASK> | mac-oui <MAC-OUI>}
```

Description

Defines a rule to ignore devices for a MAC group based on the criteria of MAC address, MAC address mask, or MAC Organizational Unique Identifier (OUI). Up to 64 ignore rules can be defined for a group. The **no** form of this command removes a rule for ignoring devices from a MAC group.

Parameter	Description
seq <SEQ-ID>	Specifies the entry sequence ID of the rule to create or modify a MAC group. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence. Range: 1 to 4294967295 .
mac <MAC-ADDR>	Specifies the MAC address of the device to ignore.
mac-mask <MAC-MASK>	Specifies the MAC address mask to ignore devices in that range. Supported MAC address masks: /32 and /40 .
mac-oui <MAC-OUI>	Specifies the MAC OUI to ignore devices in that range. Supports MAC OUI address of maximum length of 24 bits.

Usage

To achieve the required configuration of matches for devices, it is recommended to first ignore the devices that you do not want to add. Then match the criteria for the rest of the devices that you want to add to the MAC group.

For example, if you want to ignore a specific device but add all the other devices that belong to a MAC OUI, then you must first configure the ignore criteria with a lower sequence number. And then configure match criteria with a higher sequence number.

Examples

Adding a rule to the MAC group **grp01** to ignore a device based on MAC address, but match all other devices belonging to a MAC OUI:

```
switch(config)# mac-group grp01
switch(config-mac-group)# ignore mac 1a:2b:3c:4d:5e:6f
switch(config-mac-group)# match mac-oui 1a:2b:3c
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
```



```

!
!
!
!
ssh server vrf mgmtdefault
!
!
!
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 ignore mac 1a:2b:3c:4d:5e:6f
    seq 20 match mac-oui 1a:2b:3c
...

```

Adding a rule to the MAC group **grp01** to ignore devices based on MAC address mask, but match all other devices belonging to a MAC OUI:

```

switch(config)# mac-group grp01
switch(config-mac-group)# ignore mac-mask 1a:2b:3c:4d/32
switch(config-mac-group)# match mac-oui 1a:2b:3c
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
!
!
ssh server vrf mgmtdefault
!
!
!
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 ignore mac-mask 1a:2b:3c:4d/32
    seq 20 match mac-oui 1a:2b:3c
...

```

Adding a rule to the MAC group **grp01** that ignores a device based on complete MAC address:

```

switch(config)# mac-group grp01
switch(config-mac-group)# ignore mac 1a:2b:3c:4d:5e:6f

```

Adding a rule to the MAC group **grp02** that ignores devices based on MAC mask:

```
switch(config)# mac-group grp01
switch(config-mac-group)# ignore mac-mask 1a:2b:3c:4d:5e/40
switch(config-mac-group)# ignore mac-mask 18:e3:ab:73/32
```

Adding a rule to the MAC group **grp03** that ignores devices based on MAC OUI:

```
switch(config)# mac-group grp03
switch(config-mac-group)# ignore mac-oui 81:cd:93
```

Adding a rule to the MAC group **grp01** that ignores devices with a sequence number and based on MAC address:

```
switch(config)# mac-group grp01
switch(config-mac-group)# seq 10 ignore mac b2:c3:44:12:78:11
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 ignore mac b2:c3:44:12:78:11
...

```

Removing the rule from the MAC group **grp01** based on sequence number:

```
switch(config)# mac-group grp01
switch(config-mac-group)# no ignore seq 10
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
...

```

Adding a rule to the MAC group **grp01** that ignores devices with MAC entry sequence number and based on MAC OUI:

```

switch(config)# mac-group grp01
switch(config-mac-group)# seq 10 ignore mac b2:c3:44:12:78:11
switch(config-mac-group)# seq 20 ignore mac-oui 1a:2b:3c
switch(config-mac-group)# seq 30 ignore mac-mask 71:14:89:f3/32
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 ignore mac b2:c3:44:12:78:11
    seq 20 ignore mac-oui 1a:2b:3c
    seq 30 ignore mac-mask 71:14:89:f3/32
...

```

Removing the rule from the MAC group **grp01** based on sequence number and MAC OUI:

```

switch(config)# mac-group grp01
switch(config-mac-group)# no seq 20 ignore mac-oui 1a:2b:3c
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 ignore mac b2:c3:44:12:78:11
    seq 30 ignore mac-mask 71:14:89:f3/32
...

```

Removing the rule that matches the sequence number **25** from the MAC group named **grp01**.

```

switch(config)# mac-group grp01
switch(config-mac-group)# no ignore seq 25

```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-mac-group	Administrators or local user group members with execution rights for this command.

mac-group

```
mac-group <MAC-GROUP-NAME>
no mac-group <MAC-GROUP-NAME>
```

Description

Creates a MAC group or modifies an existing MAC group. A MAC group is used to classify connected devices based on the MAC address details, such as mask or OUI.

A maximum of 32 MAC groups can be configured on the switch. A maximum of 2 MAC groups can be associated with a device profile. Each group accepts 64 match or ignore commands.

The **no** form of this command removes a MAC group.

Parameter	Description
<MAC-GROUP-NAME>	Specifies the name of the MAC group to create or modify. The maximum number of characters supported is 32.

Examples

Creating a MAC group named **grp01**:

```
switch(config)# mac-group grp01
switch(config-mac-group)# exit
```

Removing a MAC group named **grp01**:

```
switch(config)# no mac-group grp01
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

match (for CDP groups)

```
match [seq <SEQ-ID>] {platform <PLATFORM> | sw-version <SWVERSION> |
voice-vlan-query <VLAN-ID>}
```

```
no match [seq <SEQ-ID>] {platform <PLATFORM> | sw-version <SWVERSION> |  
voice-vlan-query <VLAN-ID>}
```

Description

Defines a rule to match devices for a CDP group. A maximum of 32 CDP groups can be configured on the switch. Up to 64 match or ignore rules can be defined for each group.

The **no** form of this command removes a rule for adding devices to a CDP group.

Parameter	Description
seq <SEQ-ID>	Specifies the ID of the rule to create or modify. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence.
platform <PLATFORM>	Specifies the hardware or model details of the neighbor. Range: 1 to 128 alphanumeric characters.
sw-version <SWVERSION>	Specifies the software version of the neighbor. Range: 1 to 128 alphanumeric characters.
voice-vlan-query <VLAN-ID>	Specifies the VLAN query value of the neighbor. Range: 1 to 65535.

Examples

Adding rules to match a Cisco device with a specific software version on VLAN **512** to the CDP group **grp01**:

```
switch(config)# port-access cdp-group grp01  
switch(config-cdp-group)# match platform CISCO  
switch(config-cdp-group)# match sw-version 11.2(12)P  
switch(config-cdp-group)# match voice-vlan-query 512  
switch(config-cdp-group)# match seq 50 platform cisco sw-version 11.2(12)P voice-  
vlan-query 512  
switch(config-cdp-group)# exit  
switch(config)# do show running-config  
  
Current configuration:  
!  
!Version AOS-CX Virtual.10.0X.000  
!export-password: default  
led locator on  
!  
!  
vlan 1  
port-access cdp-group grp01  
    seq 10 match platform CISCO  
    seq 20 match sw-version 11.2(12)P  
    seq 30 match voice-vlan-query 512  
    seq 50 match platform cisco sw-version 11.2(12)P voice-vlan-query 512
```

Removing a rule that matches the sequence number **25** from the CDP group named **grp01**:

```
switch(config)# port-access cdp-group grp01  
switch(config-cdp-group)# no match seq 25
```

Adding a rule that matches the value of vendor-OUI **000b86** to the CDP group named **grp01**:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# match vendor-oui 000b86
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-cdp-group	Administrators or local user group members with execution rights for this command.

match (for LLDP groups)

```
match [seq <SEQ-ID>] {sys-desc <SYS-DESC> | sysname <SYS-NAME> |
    vendor-oui <VENDOR-OUI> [type <KEY> [value <VALUE>]]}
no match [seq <SEQ-ID>] {sys-desc <SYS-DESC> | sysname <SYS-NAME> |
    vendor-oui <VENDOR-OUI> [type <KEY> [value <VALUE>]]}
```

Description

Defines a rule to match devices for an LLDP group. Up to 64 match/ignore rules can be defined for a group.

The **no** form of this command removes a rule.

Parameter	Description
seq <SEQ-ID>	Specifies the ID of the rule to create or modify. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence.
sys-desc <SYS-DESC>	Specifies the LLDP system description type-length-value (TLV). Range: 1 to 256 alphanumeric characters.
sysname <SYS-NAME>	Specifies the LLDP system name TLV. Range: 1 to 64 alphanumeric characters.
vendor-oui <VENDOR-OUI>	Specifies the LLDP system vendor OUI TLV. Range: 1 to 6 alphanumeric characters.
type <KEY>	Specifies the vendor OUI subtype key.
value <VALUE>	Specifies the vendor OUI subtype value. Range: 1 to 256 alphanumeric characters.

Examples

Adding rules that match the LLDP system description **HPE-ANWSwitch** and system name **HPE-ANW** to the LLDP group named **grp01**:

```

switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# match sys-desc HPE-ANWSwitch
switch(config-lldp-group)# match sysname HPE-ANW
switch(config)# do show running-config

Current configuration:
!
!Version AOS-CX Virtual.10.0X.000
!export-password: default
led locator on
!
!
vlan 1
port-access lldp-group grp01
    seq 10 match sys-desc HPE-ANWSwitch
    seq 20 match sysname HPE-ANW

```

Removing a rule that matches the sequence number **25** from an LLDP group named **grp01**:

```

switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# no match seq 25

```

Adding a rule that matches the value of vendor-OUI **000b86** with type of **1** to the LLDP group named **grp01**:

```

switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# match vendor-oui 000b86 type 1

```

Adding a rule that matches the value of vendor-OUI **000c34** to the LLDP group named **grp01**:

```

switch(config)# port-access lldp-group grp01
switch(config-lldp-group)# match vendor-oui 000c34

```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-lldp-group	Administrators or local user group members with execution rights for this command.

match (for MAC groups)

```

[seq <SEQ-ID>] match {mac <MAC-ADDR> | mac-mask <MAC-MASK> | mac-oui <MAC-OUI>}
no [seq <SEQ-ID>] match {mac <MAC-ADDR> | mac-mask <MAC-MASK> | mac-oui <MAC-OUI>}

```

Description

Defines a rule to match devices for a MAC group based on the criteria of MAC address, MAC address mask, or MAC Organizational Unique Identifier (OUI). Up to 64 match rules can be defined for a group.

You must not configure the following special MAC addresses:

- Null MAC—For example, 00:00:00:00:00:00 or 00:00:00/32
- Multicast MAC
- Broadcast MAC—For example, ff:ff:ff:ff:ff:ff
- System MAC

Although the switch accepts these addresses, it will not process these addresses for the local MAC match feature.

The **no** form of this command removes a rule for adding devices to a MAC group.

The number of clients that can onboard based on the match criteria is configured in the **aaa authentication port-access client-limit** command. For information about this command, see the *Security Guide* for your switch.

Parameter	Description
<code>seq <SEQ-ID></code>	Specifies the entry sequence ID of the rule to create or modify a MAC group. If no ID is specified when adding a rule, an ID is automatically assigned in increments of 10 in the order in which rules are added. When more than one rule matches the command entered, the rule with the lowest ID takes precedence. Range: 1 to 4294967295 .
<code>mac <MAC-ADDR></code>	Specifies the MAC address of the device.
<code>mac-mask <MAC-MASK></code>	Specifies the MAC address mask to add devices in that range. Supported MAC address masks: /32 and /40 .
<code>mac-oui <MAC-OUI></code>	Specifies the MAC OUI to add devices in that range. Supports MAC OUI address of maximum length of 24 bits.

Examples

Adding a device to the MAC group **grp01** based on complete MAC address:

```
switch(config)# mac-group grp01
switch(config-mac-group)# match mac 1a:2b:3c:4d:5e:6f
switch(config-mac-group)# exit
```

Adding devices to the MAC group **grp02** based on MAC mask:

```
switch(config)# mac-group grp01
switch(config-mac-group)# match mac-mask 1a:2b:3c:4d:5e/40
switch(config-mac-group)# match mac-mask 18:e3:ab:73/32
switch(config-mac-group)# exit
```

Adding devices to the MAC group **grp03** based on MAC OUI:


```
switch(config)# mac-group grp03
switch(config-mac-group)# match mac-oui 81:cd:93
switch(config-mac-group)# exit
```

Adding devices to the MAC group **grp01** with MAC entry sequence number and based on MAC address:

```
switch(config)# mac-group grp01
switch(config-mac-group)# seq 10 match mac b2:c3:44:12:78:11
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 match mac b2:c3:44:12:78:11
...

```

Removing devices from the MAC group **grp01** based on sequence number:

```
switch(config)# mac-group grp01
switch(config-mac-group)# no match seq 10
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
...

```

Adding devices to the MAC group **grp01** with MAC entry sequence number and based on MAC address, MAC address mask, and MAC OUI:

```
switch(config)# mac-group grp01
switch(config-mac-group)# seq 10 match mac b2:c3:44:12:78:11
switch(config-mac-group)# seq 20 match mac-oui 1a:2b:3c
switch(config-mac-group)# seq 30 match mac-mask 71:14:89:f3/32
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:

```

```

!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 match mac b2:c3:44:12:78:11
    seq 20 match mac-oui 1a:2b:3c
    seq 30 match mac-mask 71:14:89:f3/32
...

```

Removing devices from the MAC group **grp01** based on MAC OUI:

```

switch(config)# mac-group grp01
switch(config-mac-group)# no seq 20 match mac-oui 1a:2b:3c
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp
mac-group grp01
    seq 10 match mac b2:c3:44:12:78:11
    seq 30 match mac-mask 71:14:89:f3/32
...

```

Adding devices to the MAC group **grp03** with MAC entry sequence number and based on MAC address mask:

```

switch(config)# mac-group grp03
switch(config-mac-group)# seq 10 match mac-mask 10:14:a3:b7:55/40
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
    no shutdown
    ip dhcp

```

```
mac-group grp03
  seq 10 match mac-mask 10:14:a3:b7:55/40
  ...
```

Removing devices from the MAC group **grp03** based on MAC address mask:

```
switch(config)# mac-group grp03
switch(config-mac-group)# no seq 10 match mac-mask 10:14:a3:b7:55/40
switch(config-mac-group)# exit
switch(config)# do show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.0X.0001
!export-password: default
led locator on
!
!
vlan 1
interface mgmt
  no shutdown
  ip dhcp
  mac-group grp03
  ...
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-mac-group	Administrators or local user group members with execution rights for this command.

port-access cdp-group

```
port-access cdp-group <CDP-GROUP-NAME>
no port-access cdp-group <CDP-GROUP-NAME>
```

Description

Creates a CDP (Cisco Discovery Protocol) group or modifies an existing CDP group. A CDP Group is used to classify connected devices based on the CDP packet details advertised by the device. A maximum of 32 CDP groups can be configured on the switch. Each group accepts 64 match/ignore commands.

The **no** form of this command removes a CDP group.

Parameter	Description
<CDP-GROUP-NAME>	Specifies the name of the CDP group to create or modify. The maximum number of characters supported is 32. Required.

Examples

Creating a CDP group named grp01:

```
switch(config)# port-access cdp-group grp01
switch(config-cdp-group)# match platform CISCO
switch(config-cdp-group)# match sw-version 11.2(12)P
switch(config-cdp-group)# match voice-vlan-query 512
switch(config-cdp-group)# seq 50 match platform cisco sw-version 11.2(12)P voice-
vlan-query 512
switch(config-cdp-group)# exit
switch(config)# do show running-config

Current configuration:
!
!Version AOS-CX Virtual.10.0X.000
!export-password: default
led locator on
!
!
vlan 1
port-access cdp-group grp01
    seq 10 match platform CISCO
    seq 20 match sw-version 11.2(12)P
    seq 30 match voice-vlan-query 512
    seq 50 match platform cisco sw-version 11.2(12)P voice-vlan-query 512
```

Removing a CDP group named grp01:

```
switch(config)# no port-access cdp-group grp01
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

port-access device-profile

```
port-access device-profile <DEVICE-PROFILE-NAME>
no port-access device-profile <DEVICE-PROFILE-NAME>
```

Description

Creates a new device profile and switches to the **config-device-profile** context. A maximum of 32 device profiles can be created. This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts.

The **no** form of this command removes a device profile.

Parameter	Description
<DEVICE-PROFILE-NAME>	Specifies the name of a device profile. Range: 1 to 32 alphanumeric characters.

Examples

Creating a device profile named **profile01**:

```
switch(config)# port-access device-profile profile01
switch(config-device-profile)#
```

Removing a device profile named **profile01**:

```
switch(config)# no port-access device-profile profile01
```

Creating a device profile named **profile02** on a LAG port:

```
switch(config)#interface lag 1
switch(config-lag-if)# port-access device-profile profile01
switch(config-device-profile)#
```

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config config-if config-lag-if	Administrators or local user group members with execution rights for this command.

port-access device-profile mode block-until-profile-applied



You must configure this mode in device profile only on standalone ports where there is no security configured and when you not want the port to be offline until one client is onboarded.

```
port-access device-profile mode block-until-profile-applied
no port-access device-profile mode block-until-profile-applied
```

Description

Configures the switch to block the port until a profile match occurs for a device. This configuration is required when no security feature is enabled on the port.

You must enable this mode or security on the port for local MAC match feature to operate. You must not enable both features on the same port at the same time.



You must not combine any other AAA configurations with the block-until-profile-applied mode.

This command can be issued from the interface (**config-if**) or Link Aggregation Group (**config-lag-if**) contexts. The **no** form of this command removes a rule for adding devices to a MAC group.

Example

Configuring block-until-profile applied mode on port 1/1/1:

```
switch(config)# interface 1/1/1
switch(config-if)# port-access device-profile
switch(config-if-deviceprofile)# mode block-until-profile-applied
switch(config-if-deviceprofile)# end
```

Command History

Release	Modification
10.13	This command can be issued from a Link Aggregation Group (LAG) context.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if config-if-deviceprofile config-lag-if	Administrators or local user group members with execution rights for this command.

port-access lldp-group

```
port-access lldp-group <LLDP-GROUP-NAME>
no port-access lldp-group <LLDP-GROUP-NAME>
```

Description

Creates an LLDP group or modifies an existing LLDP group. An LLDP group is used to classify connected devices based on the LLDP type-length-values (TLVs) advertised by the device. A maximum of 32 LLDP groups can be configured on the switch. Each group accepts 64 match/ignore commands.

The **no** form of this command removes an LLDP group.

Parameter	Description
<LLDP-GROUP-NAME>	Specifies the name of the LLDP group to create or modify. The maximum number of characters supported is 32. Required.

Examples

Creating an LLDP group named grp01:

```
switch(config)# port-access lldp-group grp01
switch(config-lldp-group)#
```

Removing an LLDP group named grp01:

```
switch(config)# no port-access lldp-group grp01
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

show port-access device-profile

```
show port-access device-profile [[interface {all | <INTERFACE-ID>}
[client-status <MAC-ADDR>]] | name <DEVICE-PROFILE-NAME>]
```

Description

Shows the client status for a specific MAC address or profile name.

Parameter	Description
interface {all <INTERFACE-ID>}	Select all for all interfaces or specify the name of an interface in the format: member/slot/port .
client-status <MAC-ADDR>	Specifies a MAC address (xx:xx:xx:xx:xx:xx), where x is a hexadecimal number from 0 to F.
name <DEVICE-PROFILE-NAME>	Specifies the name of the device profile.

Examples

Showing the applied state of the device profiles:

```
switch# show port-access device-profile

Profile Name      : accesspoints
LLDP Groups       : 2920-grp
CDP Groups        :
MAC Groups        : 2920-mac-grp1,2920-iot-grp2
Role              : local_role_1
State             : Enabled

Profile Name      : access_switches
LLDP Groups       : 2920-grp
```

```

CDP Groups      :
MAC Groups      :
Role            : local_2920_role
State           : Enabled

Profile Name     : iot_devices
LLDP Groups      :
CDP Groups      :
MAC Groups      : iot_camera-grp1,iot_sensors-grp1
Role            : local_2920_role
State           : Enabled

Profile Name     : lobbyaps
LLDP Groups      :
CDP Groups      : lobby_ap_cdp_grp
MAC Groups      :
Role            : test_ap_role
State           : Disabled

```

Showing the applied state of the device profile on interface 1/1/3:

```

switch# show port-access device-profile interface 1/1/3 client-status
00:0c:29:9e:d1:20

Port 1/1/3, Neighbor-Mac 00:0c:29:9e:d1:20
  Profile Name      : lobbyaps
  LLDP Group        :
  CDP Group         : aruba-ap_cdp
  MAC Group         :
  Role              : test_ap_role
  Status            : Failed
  Failure Reason    : Failed to apply MAC based VLAN

```

Showing the applied state of a specific device profile:

```

switch# show port-access device-profile name lldp-group

Profile Name       : lldp-group
LLDP Groups        :
CDP Groups         :
MAC Groups         : pc-behind-phone, lldp
Role               : auth_role
State              : Enabled

```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	Manager (#)	Administrators or local user group members with execution rights for this command.

LLDP

The IEEE 802.1AB Link Layer Discovery Protocol (LLDP) provides a standards-based method for network devices to discover each other and exchange information about their capabilities. An LLDP device advertises itself to adjacent (neighbor) devices by transmitting LLDP data packets on all interfaces on which outbound LLDP is enabled, and reading LLDP advertisements from neighbor devices on ports on which inbound LLDP is enabled. Inbound packets from neighbor devices are stored in a special LLDP MIB (management information base). This information can then be queried by other devices through SNMP.

LLDP information is used by network management tools to create accurate physical network topologies by determining which devices are neighbors and through which interfaces they connect. LLDP operates at layer 2 and requires an LLDP agent to be active on each interface that sends and receives LLDP advertisements. LLDP advertisements can contain a variable number of TLV (type, length, value) information elements. Each TLV describes a single attribute of a device such as: system capabilities, management IP address, device ID, port ID.

Packet boundaries

When multiple LLDP devices are directly connected, an outbound LLDP packet travels only to the next LLDP device. An LLDP-capable device does not forward LLDP packets to any other devices, regardless of whether they are LLDP-enabled.

An intervening hub or repeater forwards the LLDP packets it receives in the same manner as any other multicast packets it receives. Therefore, two LLDP switches joined by a hub or repeater handle LLDP traffic in the same way that they would if directly connected.

Any intervening 802.1D device or Layer-3 device that is either LLDP-unaware or has disabled LLDP operation drops the packet.

LLDP-MED

LLDP-MED (ANSI/TIA-1057/D6) extends the LLDP (IEEE 802.1AB) industry standard to support advanced features on the network edge for Voice Over IP (VoIP) endpoint devices with specialized capabilities and LLDP-MED standards-based functionality. LLDP-MED in the switches uses the standard LLDP commands described earlier in this section, with some extensions, and also introduces new commands unique to LLDP-MED operation. The show commands described elsewhere in this section are applicable to both LLDP and LLDP-MED operation. LLDP-MED enables:

- Configure Voice VLAN and advertise it to connected MED endpoint devices.
- Power over Ethernet (PoE) status and troubleshooting support via SNMP.

LLDP agent

When you enable LLDP on the switch, it is automatically enabled on all data plane interfaces. You can customize this behavior by manually enabling/disabling support on each interface.

Supported standards

The LLDP agent supports the following standards: IEEE 802.1AB-2005, Station, and Media Access Control Connectivity Discovery.

Supported interfaces

LLDP is supported on interfaces mapped to a physical port, and the Out-Of-Band Management (OOBM) port. It is not supported on logical interfaces, such as loopback, tunnels, and SVIs.

Operating modes

When LLDP is enabled, the switch periodically transmits an LLDP advertisement (packet) out each active port enabled for outbound LLDP transmissions and receives LLDP advertisements on each active port enabled to receive LLDP traffic.

The LLDP agent can operate in one of the following modes:

- **Transmit and receive (TxRx):** This is the default setting on all ports. It enables a given port to both transmit and receive LLDP packets and to store the data from received (inbound) LLDP packets in the switch's MIB.
- **Transmit only (Tx):** Enables a port to transmit LLDP packets that can be read by LLDP neighbors. However, the port drops inbound LLDP packets from LLDP neighbors without reading them. This prevents the switch from learning about LLDP neighbors on that port.
- **Receive only (Rx):** Enables a port to receive and read LLDP packets from LLDP neighbors and to store the packet data in the switch's MIB. However, the port does not transmit outbound LLDP packets. This prevents LLDP neighbors from learning about the switch through that port.
- **Disabled:** Disables LLDP packet transmissions and reception on a port. In this state, the switch does not use the port for either learning about LLDP neighbors or informing LLDP neighbors of its presence.

An LLDP agent operating in TxRx mode or Tx mode sends LLDP frames to its directly connected devices both periodically and when the local configuration changes.

Sending LLDP frames

Each time the LLDP operating mode of an LLDP agent changes, its LLDP protocol state machine reinitializes. A configurable reinitialization delay prevents frequent initializations caused by frequent changes to the operating mode. If you configure the reinitialization delay, an LLDP agent must wait the specified amount of time to initialize LLDP after the LLDP operating mode changes.

Receiving LLDP frames

An LLDP agent operating in TxRx mode or Rx mode confirms the validity of TLVs carried in every received LLDP frame. If the TLVs are valid, the LLDP agent saves the information and starts an aging timer. The initial value of the aging timer is equal to the TTL value in the Time To Live TLV carried in the LLDP frame. When the LLDP agent receives a new LLDP frame, the aging timer restarts. When the aging timer decreases to zero, all saved information ages out.

TLV support

By default, the agent sends and receives the following mandatory TLVs on each interface:

- Port ID
- Chassis ID
- TTL

By default, the following ANSI/TIA-1057 TLVs for LLDP Media Endpoint Discovery (MED) are enabled on an agent. Sending them depends on the configuration and reception of any MED TLVs:

- **MAC/PHY status.** Includes the bit rate and auto negotiation status of the link.
- **Power Via MDI:** Includes Power Over Ethernet related information for supported interfaces.
- Port description
- System name
- System description
- Management address

- System capabilities
- Port VLAN ID

By default, the agent sends and receives the following ANSI/TIA-1057 TLVs for LLDP Media Endpoint Discovery (MED):

- Capabilities: Indicates MED TLV capability.
- Power Via MDI: Includes Power Over Ethernet related information.
- Network Policy: Includes the VLAN configuration for voice application.
- Location: Location identification information.
- Extended Power Via MDI: Power Over Ethernet related information

TLV advertisements

The LLDP agent transmits the following:

- Chassis-ID: Base MAC address of the switch.
- Port-ID: Port number of the physical port.
- Time-to-Live (TTL): Length of time an LLDP neighbor retains advertised data before discarding it.
- System capabilities: Identifies the primary switch capabilities (bridge, router). Identifies the primary switch functions that are enabled, such as routing.
- System description: Includes switch model name and running software version, and ROM version.
- System name: Name assigned to the switch.
- Management address: Default address selection method unless an optional address is configured.
- Port description: Physical port identifier.
- Port VLAN ID: On an L2 port, contains access or native VLAN ID. On an L3 port, contains a value of 0. Trunk allowed VLANs information are not advertised as part of the Port VLAN ID TLV. (Not supported on the OOBM interface)
- Port VLAN Name: Access or native VLAN name. Enabled by default.
- Port MFS: Maximum Frame Size. Enabled by default.

LLDP MED support

LLDP-MED interoperates with directly connected IP telephony (endpoint) clients and provides the following features:

- Advertisement of the voice VLAN configured on the interface which is used by connected IP telephony (endpoint) clients.
- Advertisement of the configured location on the switch that can be used by the connected endpoint.
- Support for the fast-start capability



LLDP-MED is intended for use with VoIP endpoints and is not designed to support links between network infrastructure devices (such as switch-to-switch or switch-to-router links).

LLDP EEE

Energy Efficient Ethernet (EEE) is a mechanism defined by IEEE 802.3az, which is an extension of 802.3 IEEE standards. EEE defines support for the device to operate in the Low Power Idle (LPI) mode during

low link utilization. This allows both sides of a link to disable or turn off respective transmit/receive circuitry to save power. EEE uses LLDP for exchanging optimal set of parameters for both devices.

Guidelines

- An LLDP must not contain more than one EEE TLV.
- LLDP may or may not be enabled on the interfaces supporting EEE. If LLDP is not enabled, it might not be in the optimal operational mode.
- EEE TLV should not be exchanged until it negotiates from L1 and it detects peer EEE capabilities.
- EEE TLV is disabled by default and enabled only when EEE is active.
- EEE and EEE TLV exchange can be enabled or disabled at the interface level.

Configuring the LLDP agent

Procedure

1. By default, the LLDP agent is enabled on all active interfaces. If LLDP was disabled, enable it with the command `lldp`.
2. By default, the LLDP agent transmits and receive on all interfaces. To customize LLDP behavior on a specific interface, use the commands `lldp transmit` and `lldp receive`.
3. By default, the LLDP agent sets the management address in all TLVs in the following order:
 - a. LLDP management IP address.
 - b. Loopback interface IP.
 - c. ROP (L3 ports) or SVI (L2 ports).
 - d. OOBM (Management interface IP).
 - e. Base MAC.

On the OOBM port, the following order is used:

- a. LLDP management IP address,
- b. IP address of the management interface (OOBM port).
- c. IP address of the loopback interface.
- d. Base MAC address of the switch.

To specify a different address, use the commands `lldp management-ipv4-address` and `lldp management-ipv6-address`

4. By default, all supported TLVs are sent and received. To customize the list, use the command `lldp select-tlv`.
5. By default, support for the LLDP-MED TLV is enabled. To customize settings, use the commands `lldp med` and `lldp med-location`.
6. If required, adjust LLDP timer, holdtime, reinitialization delay, and transmit delay from their default values with the commands `lldp timer`, `lldp holdtime`, `lldp reinit`, and `lldp txdelay`.

Example

This example creates the following configuration:

- Enables LLDP support.
- Disables LLDP transmission on interface **1/1/1**.

```
switch(config)# lldp
switch(config)# interface 1/1/1
switch(config-copp)# no lldp transmit
```

LLDP commands

clear lldp neighbors

```
clear lldp neighbors
```

Description

Clears all LLDP neighbor details.

Examples

Clearing all LLDP neighbor details:

```
switch# clear lldp neighbors
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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.

clear lldp statistics

```
clear lldp statistics
```

Description

Clears all LLDP neighbor statistics.

Examples

Clearing all LLDP neighbor statistics:

```
switch# clear lldp statistics
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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.

lldp

```
lldp
no lldp
```

Description

Enables LLDP support globally on all active interfaces. By default, LLDP is enabled.

The **no** form of this command disables LLDP support globally on all active interfaces. It does not remove any LLDP configuration settings.

Examples

Enabling LLDP:

```
switch(config)# lldp
```

Disabling LLDP:

```
switch(config)# no lldp
```

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.

lldp dot3

```
lldp dot3 {poe | macphy}
no lldp dot3 {poe | macphy}
```

Description

Sets the 802.3 TLVs to be advertised. By default, advertisement of both POE and MAC/PHY TLVs is enabled. Not supported on the OOBM interface.

The **no** form of this command disables advertisement of 802.3 TLVs.

Parameter	Description
poe	Specifies advertisement of power over Ethernet data link classification.
macphy	Specifies advertisement of media access control and physical layer information.

Examples

Enabling advertisement of the POE TLV:

```
switch(config-if) # lldp dot3 poe
```

Disabling advertisement of the POE TLV:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

lldp dot3 eee

```
lldp dot3 eee
no lldp dot3 eee
```

Description

Sets the 802.3 TLVs for Energy-Efficient Ethernet (EEE) to be advertised. By default, advertisement of EEE TLVs is enabled. Not supported on the OOBM interface.

The **no** form of this command disables advertisement of 802.3 TLVs.

Parameter	Description
eee	Specifies advertisement of 802.3 TLVs for EEE.

Examples

Enabling advertisement of the EEE TLVs:

```
switch(config-if) # lldp dot3 eee
```

Disabling advertisement of the EEE TLVs:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config-if	Administrators or local user group members with execution rights for this command.

lldp dot3 mfs

```
lldp dot3 mfs  
no lldp dot3 mfs
```

Description

Enables the 802.3 TLV list in LLDP to advertise for maximum frame size (MFS). Enabled by default. The **no** form of this command disables the advertisement of maximum frame size TLVs.

Examples

Enabling advertisement of maximum frame size TLVs:

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

Disabling advertisement of maximum frame size TLVs:

```
switch(config)# interface 1/1/1  
switch(config-if)# no lldp dot3 mfs
```

Command History

Release	Modification
10.11	Command introduced

Command Information

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

lldp holdtime-multiplier

```
lldp holdtime-multiplier <multiplier>
no lldp holdtime-multiplier
```

Description

Sets the holdtime TTL multiplier value that is used to calculate the LLDP Time-to-Live value. Time-to-Live defines the length of time that neighbors consider LLDP information sent by this agent as valid. When Time-to-Live expires, the information is deleted by the neighbor. Time-to-live is calculated by multiplying holdtime by the value of **lldp timer**.

The **no** form of this command sets the holdtime TTL multiplier to its default value of 4.

Parameter	Description
<multiplier>	Specifies the TTL multiplier in the range of 2 to 10. Default: 4.

Formula

$TTL = \text{Holdtime-multiplier} \times \text{lldp timer}$

where:

TTL = Time-to-Live

Holdtime-multiplier = Multiplying holdtime value

lldp timer = Message transmission interval

Examples

Setting the holdtime to 8 times of the value of lldp timer:

```
switch(config)# lldp holdtime-multiplier 8
```

Setting the holdtime to the default value of 4 times of the value of lldp timer:

```
switch(config)# no lldp holdtime-multiplier
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config</code>	Administrators or local user group members with execution rights for this command.

lldp management-address vlan

```
lldp management-address vlan <VLAN-ID>
no lldp management-address vlan <VLAN-ID>
```

Description

Sets the VLAN whose IPv4 or IPv6 address is advertised as the LLDP management authority.

The **no** form of this command removes the VLAN whose IPv4 or IPv6 address is advertised as the LLDP management authority.

The following is the precedence for the management IP address TLV in the LLDP packet (in order):

- LLDP management-IP-address and management-ipv6-address, if configured.
- LLDP management VLAN's IPv4 and IPv6 address, if configured.
- Loopback IP address from the smallest configured loopback interface identifier.
- Route-only-port IP address (Layer-3 interface) or IP address of the SVI (Layer-2 interface).
- OOBM IP address.
- Base MAC address of the switch.

Parameter	Description
<VLAN-ID>	Specifies the VLAN ID.

Examples

Setting the management authority for VLAN 10:

```
switch(config)# lldp management-address vlan 10
```

Removing the management authority for VLAN 10:

```
switch(config)# no lldp management-address vlan 10
```

Command History

Release	Modification
10.12	Command introduced.

Command Information

Platforms	Command context	Authority
All platforms	<code>config</code>	Administrators or local user group members with execution rights for this command.

lldp management-ip-address

```
lldp management-ip-address <IPV-ADDR>  
no lldp management-ip-address
```

Description

Defines the IP management address of the switch which is sent in the management address TLV. One IPv4 and one IPv6 management address can be configured.

If you do not define an LLDP management address, then LLDP uses one of the following (in order):

- IP address of the port
- IP address of the management interface
- Base MAC address of the switch

The **no** form of this command removes the IPv4 management address of the switch.

Parameter	Description
<i><IPV4-ADDR></i>	Specifies the management address of the switch as an IPv4 format (x.x.x.x), where x is a decimal value from 0 to 255.

Examples

Setting the management address to **10.10.10.2**:

```
switch(config)# lldp management-ip-address 10.10.10.2
```

Removing the management address:

```
switch(config)# no lldp management-ip-address
```

Command History

Release	Modification
10.14	The management-ipv4-address keyword is deprecated and replaced with management-ip-address .
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.

lldp management-ipv6-address

```
lldp management-ipv6-address <IPV6-ADDR>  
no lldp management-ipv6-address
```

Description

Defines the IPv6 management address of the switch. The management address is encapsulated in the management address TLV.

If you do not define an LLDP management address, then LLDP uses one of the following (in order):

- IP address of the port
- IP address of the management interface
- Base MAC address of the switch

The **no** form of this command removes the IPv6 management address of the switch.

Parameter	Description
<code><IPV6-ADDR></code>	Specifies an IP address in IPv6 format (xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx), where x is a hexadecimal number from 0 to F.

Examples

Setting the management address to 2001:db8:85a3::8a2e:370:7334:

```
switch(config)# lldp management-ipv6-address 2001:0db8:85a3::8a2e:0370:7334
```

Removing the management address:

```
switch(config)# no lldp management-ipv6-address
```

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.

lldp med

```
lldp med [poe [priority-override] | capability | network-policy]  
no med [poe [priority-override] | capability | network-policy]
```

Description

Configures support for the LLDP-MED TLV. LLDP-MED (media endpoint devices) is an extension to LLDP developed by TIA to support interoperability between VoIP endpoint devices and other networking end-devices. The switch only sends the LLDP MED TLV after receiving a MED TLV from and connected endpoint device.

Not supported on the OOBM interface.

The **no** form of this command disables support for the LLDP MED TLV.

Parameter	Description
<code>poe [priority-override]</code>	Specifies advertisement of power over Ethernet data link classification. The priority-override option overrides user-configured port priority for Power over Ethernet. When both lldp dot3 poe and lldp med poe are enabled, the lldp dot3 poe3 setting takes precedence. Default: enabled.
<code>capability</code>	Specifies advertisement of supported LLDP MED TLVs. The capability TLV is always sent with other MED TLVs, therefore it cannot be disabled when other MED TLVs are enabled. Default: enabled.
<code>network-policy</code>	Network policy discovery lets endpoints and network devices advertise their VLAN IDs, and IEEE 802.1p (PCP and DSCP) values for voice applications. This TLV is only sent when a voice VLAN policy is present. Default: enabled.

Examples

Enabling advertisement of the network policy TLV:

```
switch(config-if)# lldp med network-policy
```

Disabling advertisement of the network policy TLV:

```
switch(config-if)# no lldp med network-policy
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config-if</code>	Administrators or local user group members with execution rights for this command.

lldp med location

```
lldp med location {civic-addr elin-addr }
no med location {civic-addr elin-addr }
```

Description

Configures support for the LLDP-MED TLV. Supports only civic address and emergency location information number (ELIN). Coordinate-based location is not supported.

The **no** form of this command disables support for the LLDP MED TLV.

Parameter	Description
<code>civic-addr</code>	Configures the LLDP MED civic location TLV.
<code>elin-addr</code>	Configures support for the LLDP MED emergency location TLV. This feature is intended for use in ECS applications to support class 3 LLDP-MED VoIP telephones connected to a switch in an MLTS infrastructure. An ELIN is a valid NANP format telephone number assigned to MLTS operators in North America by the appropriate authority. The ELIN is used to route emergency (E911) calls to a PSAP. (Range: 1-15 numeric characters)

The **lldp med location civic-addr** command requires a minimum of one type/value pair, but typically includes multiple type/value pairs as needed to configure a complete set of data describing a given location.

- **CA-TYPE:** This is the first entry in a type/value pair and is a number defining the type of data contained in the second entry in the type/value pair (CA-VALUE.) Some examples of CA-TYPE specifiers include: 3=city 6=street (name) 25=building name (Range: 0 - 255)
- **CA-VALUE:** This is the second entry in a type/value pair and is an alphanumeric string containing the location information corresponding to the immediately preceding CA-TYPE entry. Strings are delimited by either blank spaces, single quotes (' ... '), or double quotes ("... ".) Each string should represent a specific data type in a set of unique type/value pairs comprising the description of a location, and each string must be preceded by a CA-TYPE number identifying the type of data in the string.

The following LLDP-MED TLV values are supported. For details on these value types, refer to [RFC 4776](#)

- 1: national subdivisions (state, canton, region, province, prefecture)
- 2: county, parish, gun (JP), district (IN)
- 3: city, township, shi (JP)
- 4: city division, borough, city district, ward, chou (JP)
- 5: neighborhood, block
- 6: group of streets below the neighborhood level
- 16: leading street direction N
- 17: trailing street suffix SW
- 18: street suffix or type
- 19: house number
- 20: house number suffix
- 21: landmark or vanity
- 22: location
- 23: name
- 24: postal/zip code
- 25: building (structure)
- 26: unit (apartment, suite)
- 27: floor
- 28: room
- 29: type of place

- 30: postal community name
- 31: post office box
- 32: additional code 13203000003
- 33: seat (desk, cubicle workstation)
- 34: primary road name 35 road section
- 36: branch road name
- 37: sub-branch road name
- 38: street name pre-modifier
- 39: street name post-modifier

Examples

Enabling support for the LLDP MED emergency location TLV:

```
switch(config-if)# lldp med location elin-addr 408-555-1212
```

Disabling support for the LLDP MED emergency location TLV:

```
switch(config-if)# no lldp med location elin-addr 408-555-1212
```

Enabling support for the LLDP MED civic address TLV:

```
switch(config-if)# lldp med location civic-addr US 1 19 123 6 Fake 18 Street
```

Disabling support for the LLDP MED civic address TLV:

```
switch(config-if)# no lldp med location civic-addr US 1 19 123 6 Fake 18 Street
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

lldp receive

```
lldp receive
no lldp receive
```

Description

Enables reception of LLDP information on an interface. By default, LLDP reception is enabled on all active interfaces, including the OOBM interface.

The **no** form of this command disables reception of LLDP information on an interface.

Examples

Enabling LLDP reception on interface **1/1/1**:

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

Disabling LLDP reception on interface **1/1/1**:

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

Enabling LLDP reception on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# lldp receive
```

Disabling LLDP reception on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# no lldp receive
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

lldp reinit

```
lldp reinit <TIME>
no lldp reinit
```

Description

Sets the amount of time (in seconds) to wait before performing LLDP initialization on an interface. The **no** form of this command sets the reinitialization time to its default value of 2 seconds.

Parameter	Description
<TIME>	Specifies the reinitialization time in seconds. Range: 1 to 10. Default: 2 seconds.

Examples

Setting the reinitialization time to 5 seconds:

```
switch(config)# lldp reinit 5
```

Setting the reinitialization time to the default value of 2 seconds:

```
switch(config)# no lldp reinit
```

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.

lldp select-tlv

```
lldp select-tlv <TLV-NAME>  
no lldp select-tlv <TLV-NAME>
```

Description

Selects a TLV that the LLDP agent will send and receive. By default, all supported TLVs are sent and received.

The **no** form of this command stops the LLDP agent from sending and receiving a specific TLV.

LLDP supports Organization Unique Identifiers (OUIs) with the following Organization-specific TLVs:

- IEEE 802.1 (DOT1) (oui:0x00, 0x80, 0xc2)
- IEEE 802.3 (DOT3) (oui:0x00, 0x12, 0x0f)
- Aruba, a Hewlett Packard Enterprise Company (oui:0x88, 0x3a, 0x30)



Parameter	Description
select-tlv <TLV-NAME>	<p>Specifies the TLV name to send. The following TLV names are supported:</p> <ul style="list-style-type: none">■ management-address: Selection is based on priority in the following list (for example if first TLV name isn't selected, the next will be, progressing through this list until a selection is made):<ol style="list-style-type: none">1. IPv4 or IPV6 management address.

Parameter	Description
	<ol style="list-style-type: none"> IP address of the lowest configured loopback interface. If layer 3, then the route-only port IP address. If layer 2, the IP address of the SVI. OOBM interface IP address. Base MAC address of the switch. <ul style="list-style-type: none"> port-description: Select port-description TLV. port-vlan-id: Select port-vlan-id TLV. port-vlan-name: Select port-vlan-name TLV. system-capabilities: Select system-capabilities TLV. system-description: Select system-description TLV. system-name: Select system-name TLV.

Examples

Stopping the LLDP agent from sending the **port-description** TLV:

```
switch(config)# no lldp select-tlv port-description
```

Enabling the LLDP agent to send the **port-description** TLV:

```
switch(config)# lldp select-tlv oui
```

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.

lldp timer

```
lldp timer <TIME>
no lldp timer
```

Description

Sets the interval (in seconds) at which local LLDP information is updated and TLVs are sent to neighboring network devices by the LLDP agent. The minimum setting for this timer must be four times the value of **lldp txdelay**.

For example, this is a valid configuration:

- **lldp timer** = 16
- **lldp txdelay** = 4

And, this is an invalid configuration:

- **lldp timer** = 5
- **lldp txdelay** = 2

When copying a saved configuration to the running configuration, the value for **lldp timer** is applied before the value of **lldp txdelay**. This can result in a configuration error if the saved configuration has a value of **lldp timer** that is not four times the value of **lldp txdelay** in the running configuration.

For example, if the saved configuration has the settings:

- **lldp timer** = 16
- **lldp txdelay** = 4



And the running configuration has the settings:

- **lldp timer** = 30
- **lldp txdelay** = 7

Then you will see an error indicating that certain configuration settings could not be applied, and you will have to manually adjust the value of **lldp txdelay** in the running configuration.

The **no** form of this command sets the update interval to its default value of 30 seconds.

Parameter	Description
<code><TIME></code>	Specifies the update interval (in seconds). Range: 5 to 32768. Default: 30.

Examples

Setting the update interval to 7 seconds:

```
switch(config)# lldp timer 7
```

Setting the update interval to the default value of 30 seconds:

```
switch(config)# no lldp timer
```

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.

lldp tlv-enable

```
lldp tlv-enable basic-tlv management-address-tlv {ip <X.X.X.X>}|{ipv6 <X:X::X:X>}
no lldp select-tlv <TLV-NAME>
```

Description

A **TLV** is an information element that contains the type, length, and value fields. This command configures the IPv4/IPv6 address to be advertised in the management address TLV. This configured value will take the highest precedence in the selection logic the switch uses to identify the IP address to be advertised in the management address TLV.

Parameter	Description
<code>ip <X.X.X.X></code>	Specify an IP address in IPv4 format (X.X.X.X), where X is a decimal number from 0 to 255.
<code>ipv6 <X:X::X:X></code>	Specify an IP address in IPv6 format (x:x::x:x), where X is a hexadecimal number from 0 to F .

Examples

Configuring an IP address in IPv4 format:

```
switch(config)# interface 1/3/1
switch(config-if)# lldp tlv-enable basic-tlv management-address-tlv ip 10.0.0.1
```

Configuring an IP address in IPv6 format:

```
switch(config)# interface 1/3/1
switch(config-if)# lldp tlv-enable basic-tlv management-address-tlv ipv6
2001:db8:85a3::8a2e:370:7334
```

Command History

Release	Modification
10.14.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6200	config-if	Administrators or local user group members with execution rights for this command.

lldp transmit

```
lldp transmit
no lldp transmit
```

Description

Enables transmission of LLDP information on specific interface. By default, LLDP transmission is enabled on all active interfaces, including the OOBM interface.

The **no** form of this command disables transmission of LLDP information on an interface.

Examples

Enabling LLDP transmission on interface **1/1/1**:

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

Disabling LLDP transmission on interface **1/1/1**:

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

Enabling LLDP transmission on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# lldp transmit
```

Disabling LLDP transmission on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# no lldp transmit
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

lldp txdelay

```
lldp txdelay <TIME>
no lldp txdelay
```

Description

Sets the amount of time (in seconds) to wait before sending LLDP information from any interface. The maximum value for **txdelay** is 25% of the value of **lldp tx timer**.

The **no** form of this command sets the delay time to its default value of 2 seconds.

Parameter	Description
<TIME>	Specifies the delay time in seconds. Range: 0 to 10. Default: 2.

Examples

Setting the delay time to 8 seconds:

```
switch(config)# lldp txdelay 8
```

Setting the delay time to the default value of 2 seconds:

```
switch(config)# no lldp txdelay
```

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.

lldp trap enable

```
lldp trap enable
no lldp trap enable
```

Description

Enables sending SNMP traps for LLDP related events from a particular interface. LLDP trap generation is enabled by default on all the interfaces and has to be disabled for interfaces on which traps are not required to be generated.

The **no** form of this command disables the LLDP trap generation.



LLDP trap generation is disabled by default at the global level and must be enabled before any LLDP traps are sent.

Examples

Enabling LLDP trap generation on global level:

```
switch(config)# lldp trap enable
```

Enabling LLDP trap generation on interface level:

```
switch(config-if)# lldp trap enable
```

Disabling LLDP trap generation on global level:

```
switch(config)# no lldp trap enable
```

Disabling LLDP trap generation on interface level:

```
switch(config-if)# no lldp trap enable
```

Displaying LLDP global configuration:

```
switch# show lldp configuration
```

```
LLDP Global Configuration
```

```
=====
```

```
LLDP Enabled           : No
LLDP Transmit Interval : 30
LLDP Hold Time Multiplier : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval : 2
LLDP Trap Enabled      : No
```

```
TLVs Advertised
```

```
=====
```

```
Management Address
Port Description
Port VLAN-ID
System Description
System Name
```

```
LLDP Port Configuration
```

```
=====
```

PORT	TX-ENABLED	RX-ENABLED	INTF-TRAP-ENABLED
1/1/1	Yes	Yes	Yes
1/1/2	Yes	Yes	Yes
1/1/3	Yes	Yes	Yes
1/1/4	Yes	Yes	Yes
1/1/5	Yes	Yes	Yes
1/1/6	Yes	Yes	Yes
.....			
.....			
mgmt	Yes	Yes	Yes

Displaying LLDP Configuration for the interface:

```
switch# show lldp configuration 1/1/1
```

```
LLDP Global Configuration
```

```
=====
```

```
LLDP Enabled           : Yes
LLDP Transmit Interval : 30
LLDP Hold Time Multiplier : 4
```

```
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval   : 2
LLDP Trap Enabled            : No
```

LLDP Port Configuration

```
=====
```

PORT	TX-ENABLED	RX-ENABLED	INTF-TRAP-ENABLED
1/1/1	Yes	Yes	Yes

Displaying LLDP Configuration for the management interface:

```
switch# show lldp configuration mgmt
```

LLDP Global Configuration

```
=====
```

```
LLDP Enabled           : Yes
LLDP Transmit Interval  : 30
LLDP Hold Time Multiplier : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval : 2
LLDP Trap Enabled       : Yes
```

LLDP Port Configuration

```
=====
```

PORT	TX-ENABLED	RX-ENABLED	INTF-TRAP-ENABLED
mgmt	Yes	Yes	Yes

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

show lldp configuration

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

Description

Shows LLDP configuration settings for all interfaces or a specific interface.

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

Example

Showing configuration settings for all interfaces:

```
switch# show lldp configuration

LLDP Global Configuration
=====
LLDP Enabled           : No
LLDP Transmit Interval : 30
LLDP Hold Time Multiplier : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval : 2
LLDP Trap Enabled      : No

TLVs Advertised
=====
Management Address
Port Description
Port VLAN-ID
System Description
System Name

LLDP Port Configuration
=====
PORT                TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
-----
1/1/1                Yes                    Yes                  Yes
1/1/2                Yes                    Yes                  Yes
1/1/3                Yes                    Yes                  Yes
1/1/4                Yes                    Yes                  Yes
1/1/5                Yes                    Yes                  Yes
1/1/6                Yes                    Yes                  Yes
.....
.....
mgmt                 Yes                    Yes                  Yes
```

This example shows configuration settings for interface **1/1/1**.

```
switch# show lldp configuration 1/1/1

LLDP Global Configuration
=====
LLDP Enabled           : Yes
LLDP Transmit Interval : 30
LLDP Hold Time Multiplier : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval : 2
LLDP Trap Enabled      : No

LLDP Port Configuration
=====
Auto Flush On Link Down : Yes
Management IPv4 Address : 10.1.1.1
Management IPv6 Address : 3001:1::1:1
Med Priority Override    : Yes
Med Location Civic-addr : US 1 4 ret 6 tyu 7 tiyuo
Med Location Elin-addr  : gher
PORT                TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
-----
1/1/1                Yes                    Yes                  Yes
```

Command History

Release	Modification
10.14.1000	When displaying the LLDP configuration for a specific interface, the output of this command displays any configured management IP addresses.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 configuration mgmt

show lldp configuration mgmt

Description

Shows LLDP configuration settings for the OOBM interface.

Example

Showing configuration settings for all interfaces:

```
switch# show lldp configuration mgmt
```

```
LLDP Global Configuration
```

```
=====
```

```
LLDP Enabled           : Yes
LLDP Transmit Interval : 30
LLDP Hold Time Multiplier : 4
LLDP Transmit Delay Interval : 2
LLDP Reinit Timer Interval : 2
LLDP Trap Enabled      : Yes
```

```
LLDP Port Configuration
```

```
=====
```

```
PORT          TX-ENABLED      RX-ENABLED      INTF-TRAP-ENABLED
```

```
-----
```

```
mgmt          Yes             Yes             Yes
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	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 local-device

show lldp local-device

Description

Shows global LLDP information advertised by the switch, as well as port-based data. If VLANs are configured on any active interfaces, the VLAN ID is only shown for trunk native or untagged VLAN IDs on access interfaces.

Example

Showing global LLDP information only (all ports including OOBM port are administratively down):

```
switch# show lldp local-device

Global Data
=====

Chassis-ID           : 1c:98:ec:e3:45:00
System Name          : switch
System Description    : HPE ANW JL375A 8400X XL.01.01.0001
Management Address    : 192.168.10.1
Capabilities Available : Bridge, Router
Capabilities Enabled   : Bridge, Router
TTL                   : 120
```

Showing all ports except **1/1/11** and OOBM as administratively down:

```
switch# show lldp local-device

Global Data
=====

Chassis-ID           : 1c:98:ec:e3:45:00
System Name          : switch
System Description    : Aruba
Management Address    : 192.168.10.1
Capabilities Available : Bridge, Router
Capabilities Enabled   : Bridge, Router
TTL                   : 120

Port Based Data
=====

Port-ID              : 1/1/11
Port-Desc             : "1/1/11"
Port Mgmt-Address     : 164.254.21.220
Port VLAN ID          : 1

Port-ID              : mgmt
```

```
Port-Desc          : "mgmt"  
Port Mgmt-Address  : 164.254.21.220
```

In this example, all the ports except **1/1/11** are administratively down, and VLAN ID 100 is configured on this access interface.

```
switch# show lldp local-device  
  
Global Data  
=====
```

Chassis-ID	: 1c:98:ec:e3:45:00
System Name	: switch
System Description	: Aruba
Management Address	: 192.168.10.1
Capabilities Available	: Bridge, Router
Capabilities Enabled	: Bridge, Router
TTL	: 120

```
  
Port Based Data  
=====
```

Port-ID	: 1/1/11
Port-Desc	: "1/1/11"
Port VLAN ID	: 100
Parent Interface	: interface 1/1/11

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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-info

```
show lldp neighbor-info [<INTERFACE-NAME>]
```

Description

Displays information about neighboring devices for all interfaces or for a specific interface. The information displayed varies depending on the type of neighbor connected and the type of TLVs sent by the neighbor.

Parameter	Description
<INTERFACE-NAME>	Specifies the interface for which to show information for neighboring devices. Use the format member/slot/port (for example, 1/3/1).

Examples

Showing LLDP information for all interfaces:

```
switch# show lldp neighbor-info

LLDP Neighbor Information
=====

Total Neighbor Entries      : 3
Total Neighbor Entries Deleted : 0
Total Neighbor Entries Dropped : 0
Total Neighbor Entries Aged-Out : 0
```

LOCAL-PORT	CHASSIS-ID	PORT-ID	PORT-DESC	TTL	SYS-NAME
1/1/1	70:72:cf:a4:7d:50	1/1/1	1/1/1	32	switch
1/1/2	48:0f:cf:af:73:80	1/1/2	1/1/2	120	switch
1/1/46	48:0f:cf:af:73:80	1/1/46	1/1/46	120	switch
mgmt	48:0f:cf:af:73:80	mgmt	mgmt	120	switch

Showing information for interface **1/3/1** when it has only one switch connected as a neighbor:

```
switch# show lldp neighbor-info 1/3/1

Port                : 1/1/1
Neighbor Entries    : 1
Neighbor Entries Deleted : 0
Neighbor Entries Dropped : 0
Neighbor Entries Aged-Out : 0
Neighbor Chassis-Name : HP-3800-24G-PoEP-2XG
Neighbor Chassis-Description : HP J9587A 3800-24G-PoE+-2XG Switch, revision...
Neighbor Chassis-ID : 10:60:4b:39:3e:80
Neighbor Management-Address : 192.168.1.1
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled : Bridge
Neighbor Port-ID : 1/1/1
Neighbor Port-Desc : 1/1/1
Neighbor Port VLAN ID : 1
Neighbor Port VLAN Name : DEFAULT_VLAN_1
Neighbor Port MFS : 1500
TTL : 120
```

Showing information for interface **1/3/10** when the neighbor sends a DOT3 power TLV:

```
switch# show lldp neighbor-info 1/3/10

Port                : 1/3/10
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   : WLAN
Neighbor Port-ID              : 84:d4:7e:ce:5d:68
Neighbor Port-Desc            : eth0
TTL                           : 120
Neighbor Port VLAN ID         : 1
Neighbor Port VLAN Name       : DEFAULT_VLAN_1
Neighbor Port MFS              : 1500
Neighbor PoE information      : DOT3
Neighbor Power Type            : TYPE2 PD
Neighbor Power Priority        : Unkown
Neighbor Power Source          : Primary
PD Requested Power Value      : 25.0 W
PSE Allocated Power Value: 25.0 W
Neighbor Power Supported      : Yes
Neighbor Power Enabled        : Yes
Neighbor Power Class          : 5
Neighbor Power Paircontrol    : No
PSE Power Pairs               : Signal

```

Showing information for interface **1/1/1** when it has multiple neighbors (displays a maximum of four):

```

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

Port                : 1/1/1
Neighbor Entries     : 4
Neighbor Entries Deleted : 0
Neighbor Entries Dropped : 0
Neighbor Entries Aged-Out : 0
Neighbor Chassis-Name : switch
Neighbor Chassis-Description : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID : 1c:98:ec:fe:25:00
Neighbor Management-Address : 10.1.1.2
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled : Bridge, Router
Neighbor Port-ID : 1/1/1
Neighbor Port-Desc : 1/1/1
Neighbor Port VLAN ID : 1
Neighbor Port VLAN Name : DEFAULT_VLAN_1
Neighbor Port MFS : 1500
TTL : 120
Neighbor Chassis-Name : switch
Neighbor Chassis-Description : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID : 1c:98:ec:fe:25:01
Neighbor Management-Address : 10.1.1.3
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled : Bridge, Router
Neighbor Port-ID : 1/1/1
Neighbor Port-Desc : 1/1/1
Neighbor Port VLAN ID : 1
Neighbor Port VLAN Name : DEFAULT_VLAN_1
Neighbor Port MFS : 1500
TTL : 120

```

```

Neighbor Chassis-Name      : switch
Neighbor Chassis-Description : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID        : 1c:98:ec:fe:25:02
Neighbor Management-Address : 10.1.1.4
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled  : Bridge, Router
Neighbor Port-ID           : 1/1/1
Neighbor Port-Desc         : 1/1/1
Neighbor Port VLAN ID      : 50
Neighbor Port VLAN Name    : VLAN_50
Neighbor Port MFS          : 1500
TTL                        : 120
Neighbor Chassis-Name      : switch
Neighbor Chassis-Description : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID        : 1c:98:ec:fe:25:03
Neighbor Management-Address : 10.1.1.5
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled  : Bridge, Router
Neighbor Port-ID           : 1/1/1
Neighbor Port-Desc         : 1/1/1
Neighbor Port VLAN ID      : 100
Neighbor Port VLAN Name    : VLAN_100
Neighbor Port MFS          : 1500
TTL                        : 120

```

Showing neighbor information for interface 1/3/2 when it has EEE enabled and successfully auto-negotiated:

```

switch# show lldp neighbor-info 1/3/2

Port                : 1/3/2
Neighbor Entries     : 1
Neighbor Entries Deleted : 1
Neighbor Entries Dropped : 0
Neighbor Entries Aged-Out : 1
Neighbor Chassis-Name : BLDG01-F1-6300
Neighbor Chassis-Description : Aruba JL668A FL.10.07.0001BN
Neighbor Chassis-ID : 88:3a:30:92:a5:c0
Neighbor Management-Address : 10.6.9.15
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled  : Bridge, Router
Neighbor Port-ID           : 1/1/1
Neighbor Port-Desc         : 1/1/1
Neighbor Port VLAN ID      : 1
Neighbor Port VLAN Name    : DEFAULT_VLAN_1
Neighbor Port MFS          : 1500
TTL                        : 120

Neighbor Mac-Phy details
Neighbor Auto-neg Supported : true
Neighbor Auto-Neg Enabled   : true
Neighbor Auto-Neg Advertised : 1000 BASE_TFD, 100 BASE_T4, 10 BASE_TFD
Neighbor MAU type           : 1000 BASE_TFD

Neighbor EEE information    : DOT3
Neighbor TX Wake time       : 17 us
Neighbor RX Wake time       : 17 us
Neighbor Fallback time       : 17 us

```

```
Neighbor TX Echo time      : 17 us
Neighbor RX Echo time     : 17 us
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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-info detail

```
show lldp neighbor-info detail
```

Description

Shows detailed LLDP neighbor information for all LLDP neighbor connected interfaces.

Examples

Showing detailed LLDP information for all interfaces:

```
switch# show lldp neighbor-info detail

LLDP Neighbor Information
=====

Total Neighbor Entries      : 6
Total Neighbor Entries Deleted : 2
Total Neighbor Entries Dropped : 0
Total Neighbor Entries Aged-Out : 2

-----

Port                        : 1/1/1
Neighbor Entries           : 1
Neighbor Entries Deleted   : 0
Neighbor Entries Dropped   : 0
Neighbor Entries Aged-Out  : 0
Neighbor Chassis-Name      : 6300
Neighbor Chassis-Description : Aruba ...
Neighbor Chassis-ID        : 38:11:17:1a:d5:00
Neighbor Management-Address : 38:11:17:1a:d5:00
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled  : Bridge, Router
Neighbor Port-ID           : 1/1/4
Neighbor Port-Desc         : 1/1/4
Neighbor Port VLAN ID      : 1
Neighbor Port VLAN Name    : DEFAULT_VLAN_1
Neighbor Port MFS          : 1500
```



```

TTL                                : 120

Neighbor Mac-Phy details
Neighbor Auto-neg Supported        : true
Neighbor Auto-Neg Enabled          : true
Neighbor Auto-Neg Advertised       : 1000 BASE_TFD, 100 BASE_T4, 10 BASET_FD
Neighbor MAU type                   : 1000 BASETFD

```

```

-----

```

```

Port                               : 1/1/2
Neighbor Entries                   : 1
Neighbor Entries Deleted           : 0
Neighbor Entries Dropped           : 0
Neighbor Entries Aged-Out          : 0
Neighbor Chassis-Name              : 6300
Neighbor Chassis-Description       : Aruba ...
Neighbor Chassis-ID                : 38:11:17:1a:d5:00
Neighbor Management-Address        : 38:11:17:1a:d5:00
Chassis Capabilities Available     : Bridge, Router
Chassis Capabilities Enabled       : Bridge, Router
Neighbor Port-ID                   : 1/1/5
Neighbor Port-Desc                 : 1/1/5
Neighbor Port VLAN ID              : 1
Neighbor Port VLAN Name            : DEFAULT_VLAN_1
Neighbor Port MFS                  : 1500
TTL                                : 120

```

```

Neighbor Mac-Phy details
Neighbor Auto-neg Supported        : true
Neighbor Auto-Neg Enabled          : true
Neighbor Auto-Neg Advertised       : 1000 BASE_TFD, 100 BASE_T4, 10 BASET_FD
Neighbor MAU type                   : 1000 BASETFD

```

```

-----

```

```

Port                               : 1/1/3
Neighbor Entries                   : 1
Neighbor Entries Deleted           : 0
Neighbor Entries Dropped           : 0
Neighbor Entries Aged-Out          : 0
Neighbor Chassis-Name              : 6300
Neighbor Chassis-Description       : Aruba ...
Neighbor Chassis-ID                : 38:11:17:1a:d5:00
Neighbor Management-Address        : 38:11:17:1a:d5:00
Chassis Capabilities Available     : Bridge, Router
Chassis Capabilities Enabled       : Bridge, Router
Neighbor Port-ID                   : 1/1/6
Neighbor Port-Desc                 : 1/1/6
Neighbor Port VLAN ID              : 1
Neighbor Port VLAN Name            : DEFAULT_VLAN_1
Neighbor Port MFS                  : 1500
TTL                                : 120

```

```

Neighbor Mac-Phy details
Neighbor Auto-neg Supported        : true
Neighbor Auto-Neg Enabled          : true
Neighbor Auto-Neg Advertised       : 1000 BASE_TFD, 100 BASE_T4, 10 BASET_FD
Neighbor MAU type                   : 1000 BASETFD

```

```

-----

```

```

Port : 1/1/46
Neighbor Entries : 1
Neighbor Entries Deleted : 0
Neighbor Entries Dropped : 0
Neighbor Entries Aged-Out : 0
Neighbor Chassis-Name : 6300
Neighbor Chassis-Description : Aruba ...
Neighbor Chassis-ID : 38:11:17:1a:d5:00
Neighbor Management-Address : 38:11:17:1a:d5:00
Chassis Capabilities Available : Bridge, Router
Chassis Capabilities Enabled : Bridge, Router
Neighbor Port-ID : 1/1/19
Neighbor Port-Desc : 1/1/19
Neighbor Port VLAN ID : 1
Neighbor Port VLAN Name : DEFAULT_VLAN_1
Neighbor Port MFS : 1500
TTL : 120

Neighbor Mac-Phy details
Neighbor Auto-neg Supported : true
Neighbor Auto-Neg Enabled : true
Neighbor Auto-Neg Advertised : 1000 BASE_TFD, 100 BASE_T4, 10 BASE_TFD
Neighbor MAU type : 1000 BASE_TFD

```

```

-----
Port : 1/1/47
Neighbor Entries : 1
Neighbor Entries Deleted : 0
Neighbor Entries Dropped : 0
Neighbor Entries Aged-Out : 0
Neighbor Chassis-Name : 6300
Neighbor Chassis-Description : Aruba ...
Neighbor Chassis-ID : 38:11:17:1a:d5:00
Neighbor Management-Address : 38:11:17:1a:d5:00
Chassis Cap

```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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-info mgmt

show lldp neighbor-info mgmt

Description

Displays information about neighboring devices connected to the OOBM interface.

Examples

Showing LLDP information for the OOBM interface:

```
switch# show lldp neighbor-info mgmt

Port                               : mgmt
Neighbor Entries                   : 1
Neighbor Entries Deleted           : 0
Neighbor Entries Dropped           : 0
Neighbor Entries Aged-Out          : 0
Neighbor Chassis-Name              : HP-3800-24G-PoEP-2XG
Neighbor Chassis-Description       : HP J9587A 3800-24G-PoE+-2XG Switch, revision...
Neighbor Chassis-ID                : 10:60:4b:39:3e:80
Neighbor Management-Address        : 192.168.1.1
Chassis Capabilities Available     : Bridge, Router
Chassis Capabilities Enabled       : Bridge
Neighbor Port-ID                   : mgmt
Neighbor Port-Desc                 : mgmt
TTL                                : 120
```

Showing LLDP information for the OOBM interface when there are four neighbors:

```
switch# show lldp neighbor-info mgmt

Port                               : mgmt
Neighbor Entries                   : 4
Neighbor Entries Deleted           : 0
Neighbor Entries Dropped           : 0
Neighbor Entries Aged-Out          : 0
Neighbor Chassis-Name              : switch
Neighbor Chassis-Description       : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID                : 1c:98:ec:fe:25:00
Neighbor Management-Address        : 10.1.1.2
Chassis Capabilities Available     : Bridge, Router
Chassis Capabilities Enabled       : Bridge, Router
Neighbor Port-ID                   : 1/1/1
Neighbor Port-Desc                 : 1/1/1
TTL                                : 120

Neighbor Chassis-Name              : switch
Neighbor Chassis-Description       : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID                : 1c:98:ec:fe:25:01
Neighbor Management-Address        : 10.1.1.3
Chassis Capabilities Available     : Bridge, Router
Chassis Capabilities Enabled       : Bridge, Router
Neighbor Port-ID                   : 1/1/1
Neighbor Port-Desc                 : 1/1/1
TTL                                : 120

Neighbor Chassis-Name              : switch
Neighbor Chassis-Description       : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID                : 1c:98:ec:fe:25:02
Neighbor Management-Address        : 10.1.1.4
Chassis Capabilities Available     : Bridge, Router
Chassis Capabilities Enabled       : Bridge, Router
Neighbor Port-ID                   : 1/1/1
Neighbor Port-Desc                 : 1/1/1
TTL                                : 120

Neighbor Chassis-Name              : switch
Neighbor Chassis-Description       : Aruba JL375A 8400X XL.01.01.0001
Neighbor Chassis-ID                : 1c:98:ec:fe:25:03
```

```
Neighbor Management-Address      : 10.1.1.5
Chassis Capabilities Available   : Bridge, Router
Chassis Capabilities Enabled     : Bridge, Router
Neighbor Port-ID                 : 1/1/1
Neighbor Port-Desc               : 1/1/1
TTL                              : 120
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	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 statistics

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

Description

Shows global LLDP statistics or statistics for a specific interface.

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

Example

Showing global statistics for all interfaces:

```
switch# show lldp statistics
LLDP Global Statistics
=====

Total Packets Transmitted      : 19
Total Packets Received        : 19
Total Packets Received And Discarded : 0
Total TLVs Unrecognized       : 0

LLDP Port Statistics
=====

PORT-ID      TX-PACKETS  RX-PACKETS  RX-DISCARDED  TLVS-UNKNOWN
-----
1/1/1        7           7           0             0
1/1/2        7           7           0             0
1/1/3        0           0           0             0
1/1/4        0           0           0             0
```

1/1/5	0	0	0	0
...				
mgmt	5	5	0	0
...				

Showing statistics for interface **1/1/1**:

```
switch# show lldp statistics 1/1/1

LLDP Statistics
=====

Port Name                : 1/1/1
Packets Transmitted      : 159
Packets Received         : 163
Packets Received And Discarded : 0
Packets Received And Unrecognized : 0
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 statistics mgmt

```
show lldp statistics mgmt
```

Description

Shows LLDP statistics for the OOBM interface.

Example

Showing LLDP statistics for the OOBM interface:

```
switch# show lldp statistics mgmt

LLDP Statistics
=====

Port Name                : mgmt
Packets Transmitted      : 20
Packets Received         : 23
Packets Received And Discarded : 0
Packets Received And Unrecognized : 0
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	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 tlv

show lldp tlv

Description

Shows the LLDP TLVs that are configured for send and receive.

Example

```
switch# show lldp tlv

TLVs Advertised
=====

Management Address
Port Description
Port VLAN-ID
System Capabilities
System Description
System Name
VLAN Name
MFS
OUI
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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.

Cisco Discovery Protocol (CDP)

Cisco Discovery Protocol (CDP) is a proprietary layer 2 protocol supported by most Cisco devices. It is used to exchange information, such as software version, device capabilities, and voice VLAN information, between directly connected devices, such as a VoIP phone and a switch.

CDP support

By default, CDP is enabled on each active switch port. This is a read-only capability, which means the switch can receive and store information about adjacent CDP devices, but does not generate CDP packets (except when communicating with Cisco IP phones.)

The switch supports CDPv2 only and does not support SNMP MIB traps.

When a CDP-enabled port receives a CDP packet from another CDP device, it enters data for that device into the CDP Neighbors table, along with the port number on which the data was received. It does not forward the packet. The switch also periodically purges the table of any entries that have expired. (The holdtime for any data entry in the switch CDP Neighbors table is configured in the device transmitting the CDP packet and cannot be controlled in the switch receiving the packet.) A switch reviews the list of CDP neighbor entries every three seconds and purges any expired entries.

Support for legacy Cisco IP phones

Autoconfiguration of legacy Cisco IP phones for tagged voice VLAN support requires CDPv2.

On initial boot-up, and sometimes periodically, a Cisco phone queries the switch and advertises information about itself using CDPv2. When the switch receives the VoIP VLAN Query TLV (type 0x0f) from the phone, the switch immediately responds with the voice VLAN ID in a reply packet using the VoIP VLAN Reply TLV (type 0x0e). This enables the Cisco phone to boot properly and send traffic on the advertised voice VLAN ID.

The switch CDP packet includes these TLVs:

- CDP Version: 2
- CDP TTL: 180 seconds
- Checksum
- Capabilities (type 0x04): 0x0008 (is a switch)
- Native VLAN: The PVID of the port
- VoIP VLAN Reply (type 0xe): voice VLAN ID (same as advertised by LLDP-MED)
- Trust Bitmap (type 0x12): 0x00
- Untrusted port CoS (type 0x13): 0x00

CDP commands

cdp

cdp

Description

Configures CDP support globally on all active interfaces or on a specific interface. By default, CDP is enabled on all active interfaces.

When CDP is enabled, the switch adds entries to its CDP Neighbors table for any CDP packets it receives from neighboring CDP devices.

When CDP is disabled, the CDP Neighbors table is cleared and the switch drops all inbound CDP packets without entering the data in the CDP Neighbors table.

The **no** form of this command disables CDP support globally on all active interfaces or on a specific interface.

Examples

Enabling CDP globally:

```
switch(config)# cdp
```

Disabling CDP globally:

```
switch(config)# no cdp
```

Enabling CDP on interface **1/1/1**:

```
switch(config)# interface 1/1/1s
switch(config-if)# cdp
```

Disabling CDP on interface **1/1/1**:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

clear cdp counters

```
clear cdp counters
```

Description

Clears CDP counters.

Examples

Clearing CDP counters:

```
switch(config) clear cdp counters
```

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.

clear cdp neighbor-info

```
clear cdp neighbor-info
```

Description

Clears CDP neighbor information.

Examples

Clearing CDP neighbor information:

```
switch(config) clear neighbor-info
```

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 cdp

```
show cdp
```

Description

Shows CDP information for all interfaces.

Examples

Showing CDP information:

```
switch(config)# show cdp
CDP Global Information
=====
CDP           : Enabled
CDP Mode      : Rx only
CDP Hold Time : 180 seconds

Port          CDP
-----
1/1/1         Enabled
1/1/2         Enabled
```

1/1/3	Enabled
1/1/4	Enabled
1/1/5	Enabled
1/1/6	Enabled
1/1/7	Enabled
1/1/8	Enabled
1/1/9	Enabled
1/1/10	Enabled

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 cdp neighbor-info

show cdp neighbor-info <INTERFACE-ID>

Description

Shows CDP information for all neighbors or for CDP information on a specific interface.

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

Examples

Showing all CDP neighbor information:

```
switch(config)# show cdp neighbor-info
Total Neighbor Entries : 1
Port      Device ID                Platform      Capability
-----
1/1/1     HPE-ANW-3810M-24G-1-slot... Aruba Sw      S
```

Showing CDP information for interface **1/1/1**:

```
switch(config)# show cdp neighbor-info 1/1/1
Local Port      : 1/1/1
MAC             : 70:10:6f:86:78:7f
Device ID       : HPE-ANW-3810M-24G-1-slot(70106f-867800)
Address         : 127.0.0.1
Platform        : HPE ANW Sw
Duplex          : half
```

```
Version           : Revision KB.16.07.0002, ROM KB.16.01....
Capability        : switch
Native VLAN       : 1
Voice VLAN Support : No
Neighbor Port-ID  : 1
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 cdp traffic

show cdp traffic

Description

Shows CDP statistics for each interface.

Examples

Showing CDP traffic statistics:

```
switch(config)# show cdp traffic
CDP Statistics
=====
Port          Transmitted Frames   Received Frames   Discarded Frames
-----
1/1/1         0                    4                0
1/1/2         0                    0                0
1/1/3         0                    2                0
1/1/4         0                    0                0
1/1/5         0                    0                0
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 cdp voice-vlan mode

```
show cdp voice-vlan mode
```

Description

Shows CDP voice-vlan and mode.

Examples

Showing CDP voice-vlan and mode:

```
switch(config)# show cdp voice-vlan mode
CDP voice VLAN mode
=====
Port          Voice VLAN      Mode
-----
1/1/1         N/A            Rx only
1/1/2         N/A            Rx only
1/1/3         N/A            Rx only
1/1/4         N/A            Rx only
1/1/5         N/A            Rx only
1/1/6         N/A            Rx only
1/1/7         N/A            Rx only
1/1/8         N/A            Rx only
1/1/9         N/A            Rx only
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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.

Zero Touch Provisioning

Zero Touch Provisioning (ZTP) enables the auto-configuration of factory default switches without a network administrator onsite.

When a switch is booted from its factory default configuration, ZTP autoprovisions the switch by automatically downloading and installing a firmware file, a configuration file, or both. With ZTP, even a nontechnical user (for example: a store manager in a retail chain or a teacher in a school) can deploy devices at a site.

ZTP support

The switch supports standards-based Zero Touch Provisioning (ZTP) operations as follows:

- The switch must be running the factory default configuration.
- ZTP operations are supported over IPv4 connections only. IPv6 connections are not supported for ZTP operations.
- You must configure the DHCP server to provide a standards-based ZTP server solution. Options and features that are specific to Network Management Solution (NMS) tools, such as AirWave, are not supported.
 - Aruba Central on-premise can manage AOS-CX switches on supported models through DHCP ZTP using two approaches:
 - On the DHCP server, configure DHCP option-60 as "ArubaInstantAP" 90 and provide the value in option-43 in the format `<group-details>, <aruba-central-on-prem-ip-or-fqdn>, <shared-token>`.
 - On the DHCP server, configure DHCP option-60 as HPE vendor VCI and provide the value in option-43 in the tag-length-value (TLV) format. Next, enter the Aruba Central on-premise fully qualified domain name (FQDN) or IPv4 address as the value for sub-option code 146 using the format: `<group-details>, <aruba-central-on-prem-ip-or-fqdn>, <shared-token>`.
 - Supported DHCP options are:

DHCP option	Description
43	Vendor Specific Information
43 suboption 144	Name of the configuration file
43 suboption 145	Name of the firmware image file
43 suboption 146	FQDN or IPv4 address of the Aruba Central on-premise server
43 suboption 148	FQDN or IPv4 address of the HTTP Proxy
60	Vendor Class Identifier (VCI)

DHCP option	Description
66	IPv4 address of the TFTP server (Specifying a host name instead of an IP address is not supported.)
67	Name of the configuration file (Option 43 suboption 144 takes precedence over this option.)

- The configuration file is a text file or JSON file that becomes the startup and running configuration on the switch after the ZTP operation is complete. The configuration can be in CLI or in JSON format.
- When the switch is started using the factory default configuration, the ZTP operation is started automatically and is active until any running configuration of the switch is modified. There is no CLI command required to start the operation.

The switch supports the following standards:

- [RFC 2131](#), *Dynamic Host Configuration Protocol*.
- [RFC 2132](#), *DHCP Options and BOOTP Vendor Extensions*. Support is limited to the options listed in the table "Supported DHCP options for ZTP on AOS-CX."

Hewlett Packard Enterprise recommends that you implement ZTP in a secure and private environment. Any public access can compromise the security of the switch, as follows:

- ZTP is enabled only in the factory default configuration of the switch, DHCP snooping is not enabled. The Rogue DHCP server must be manually managed.
- The DHCP offer is in plain data without encryption.

Setting up ZTP on a trusted network

The following procedure is an overview of setting up a Zero Touch Provisioning (ZTP) environment to provision newly installed switches automatically. The procedure is intended for network administrators who are familiar with automatically provisioning switches in a network, and does not provide detailed information about configuring or managing switches.

Procedure

1. For each switch model to be provisioned using ZTP, do the following:
 - a. Obtain the switch firmware image file.
 - b. Prepare the switch configuration file. The configuration file becomes the running configuration and the startup configuration on the switch.
2. Set up a TFTP server and record its IP address. The address is required when you set up the DHCP server. The switch must be able to reach the TFTP server and DHCP server, either on the same subnet, or on a remote subnet via DHCP relay.

Switches support provisioning through a network connected to a data port or through a network connected to the management port.
3. Publish the configuration files and image files to the TFTP server. You need to know the locations of the files and the IP address of the TFTP server when you set up the vendor class options on the DHCP server.
4. On the DHCP server, set up vendor classes for each switch model you plan to provision. To do this you need the following information:

- The IP address of the TFTP server. Using a host name is not supported.
- The path to the switch configuration and firmware image files on the TFTP server.
- The vendor class identifier (VCI) for each switch model.

You can obtain the VCI by entering the `show dhcp client vendor-class-identifier` command from a switch CLI command prompt in the manager context. The VCI is the text string in the response that starts with `Aruba`.

For example:

```
switch# show dhcp client vendor-class-identifier
Vendor Class Identifier:  Aruba xxxxx xxxxx
```

Where x indicates the switch model number.

5. At the installation site, provide the switch installer with a Cat6 network cable connected to the network that includes the DHCP and TFTP servers, and information about the switch port to use. The switch installer plugs the cable into the data port you specify.

The ZTP operation begins when power is applied to the switch after the network cable is installed.

6. Assuming the downloaded configuration includes a way to access the CLI of the switch, you can enter the following command to show the options offered by the DHCP server and the status of the ZTP operation:

```
show ztp information
```

ZTP process during switch boot

1. The switch boots up with the factory default configuration.

If the ZTP operation detects that the switch configuration is different from the factory default configuration, the ZTP operation ends. The switch must be configured at the installation site.

2. The switch sends out a DHCP discovery from the management port.

On switches that support ZTP operations on data ports, the switch also sends out a DHCP discovery from all data ports in the default VLAN.

The switch waits to receive DHCP options indefinitely or until the running configuration is modified. If a DHCP IP address is received but no DHCP options are received, the switch waits an additional minute before ending the ZTP operation.

On switches that support ZTP operations on data ports, DHCP options received on the management port have priority over DHCP options received on data ports:

- If DHCP options are received on the management port before being received on a data port, the switch processes those options immediately.
- If DHCP options are received on a data port, the switch waits an additional 30 seconds for options to be received on the management port. If no DHCP options are received on the management port during those 30 seconds, the switch processes the DHCP options it received on the data port.

After the ZTP operation ends, there is no automatic retry. You can either attempt to boot the switch with the factory default configuration again, configure the switch at the installation site, or use the ZTP force-provision CLI to trigger the ZTP process, ignoring the present running configuration of the switch.

- Once force-provision is enabled, new DHCP requests are sent from the switch. Disabling force-provision does not stop the DHCP already in progress, but only changes the switch configuration status of force-provision.
 - If ZTP fails while force-provision is enabled, there is no automatic retry. To retry, `ztp force-provision` should be disabled and re-enabled to clear the current ZTP state and send a new DHCP request. When `ztp force-provision` is already enabled on the switch, re-enabling it results in no operation.
 - If the DHCP server is configured to provide both ZTP image and configuration options and there is a non-default startup configuration present on the switch, clearing the non-default startup configuration before triggering `ztp force-provision` is recommended. If an image is downloaded via ZTP, the switch reboots once the image download is complete and ZTP force-provision configuration is lost, causing ZTP to enter into a failed state. ZTP force-provision will need to be enabled again to continue the process.
3. The DHCP server responds with an offer containing the following:
 - The IPv4 address of the TFTP server
 - One or both of the following:
 - The name of the firmware image file
 - The name of the configuration file
 - Aruba Central Location (optional) including the shared token value for the on-premise server
 - HTTP Proxy Location (optional)
 4. If a firmware image file is offered, the ZTP operation downloads the image file from the TFTP server to the switch. If the current switch image and downloaded firmware image version do not match, then the switch boots with the downloaded image:
 - If the image upgrade fails, the switch retains its original firmware image and the ZTP operation ends with a failed status.
 - If the image upgrade succeeds, the ZTP operation is started again after the switch reboots. Because the downloaded image file matches the image file installed on the switch, the ZTP operation continues, and checks if a configuration file is offered.
 5. If a configuration file is offered, the ZTP operation downloads the configuration file copies the file to the running-config and then to the startup-config of the switch:
 - If the startup configuration update fails, the switch retains its factory-default running configuration and the ZTP operation ends with a failed status.
 - If the copy operation fails, the ZTP operation ends with a failed status.
 - If the copy operation succeeds, the ZTP operation ends successfully.

ZTP VSF switchover support

ZTP status is not synced in the VSF stack. When the VSF stack is formed, configuration changes are applied on the conductor switch, which is then synced to standby switch. When the switchover is performed on the VSF stack, the standby becomes the new conductor switch.

As part of the switchover process, the ZTP daemon starts on the new conductor. The status of the ZTP is failed because there are configuration changes present.

ZTP commands

show ztp information


```
show ztp information
```

Description

Shows information about Zero Touch Provisioning (ZTP) operations performed on the switch.

Usage

When a switch configured to use ZTP is booted from a factory default configuration, the switch contacts a DHCP server, which offers options for obtaining files used to provision the switch:

- The IP address of the TFTP server
- The name of the image file
- The name of the configuration file
- The Aruba FDQN or IPv4 address
- The HTTP proxy FDQN or IPv4 address

The **show ztp information** command shows the options offered by the DHCP server and the status of the ZTP operation.

The status of the ZTP operation is one of the following:

Success

The ZTP operation succeeded.

One of the following is true:

- Both the running configuration and the startup configuration were updated.
- The IP address of the TFTP server was received, but the offer did not include a configuration file or a firmware image file.
- Any combination of vendor encapsulated DHCP options are received as configured, along with the firmware image and switch configuration file.
- Only vendor encapsulated DHCP options are configured and are received accordingly.

Failed - Custom startup configuration detected

The switch was booted from a configuration that is not the factory default configuration. For example, the administrator password has been set.

Failed - Timed out while waiting to receive ZTP options

Either the switch received the DHCP IPv4 address but no ZTP options were received within 1 minute or ZTP force-provision is triggered and no ZTP options are received within 3 minutes.

Failed - Detected change in running configuration

The running configuration was modified by a user while the ZTP operation was in progress.

Failed - TFTP server unreachable

The TFTP server is not reachable at the specified IP address.

Failed - TFTP server information unavailable

The image file name or config file name is provided without the TFTP server location to fetch the files from and ZTP enters failed state.

Failed - Invalid configuration file received

Either the file transfer of the configuration file failed, or the configuration file is invalid (an error occurred while attempting to apply the configuration).

Failed - Invalid image file received

Either the file transfer of the firmware image file failed, or the firmware image file is invalid (an error occurred while verifying the image).



In the case of reconnection, connect with a main or alternative location to the COP instance as a user. The current connection is shown in the **Central location** field.

Scenario 1: If the location the device is currently connected on is updated, the system reconnects in order to connect with the new location.

Scenario 2: If the location in which the device is not currently connected on is updated, the DUT does not go through the reconnection process.

Examples

Showing switch image download in progress after receiving ZTP options:

```
switch# show ztp information
TFTP Server           : 10.0.0.2
Image File            : TL_10_02_0001.swi
Configuration File     : config_file
ZTP Status            : In-progress - Image download and verification
Aruba Location        : secure.arubanetworks.com
Alternative Aruba Location: NA
Aruba Shared Token     : aruba123
Force-Provision       : Disabled
HTTP Proxy Location    : http.proxy.arubanetworks.com
```

Showing switch image download failure after receiving ZTP options:

```
switch# show ztp information
TFTP Server           : 10.0.0.2
Image File            : TL_10_02_0001.swi
Configuration File     : config_file
ZTP Status            : Failed - Unable to download image
Aruba Location        : secure.arubanetworks.com
Alternative Aruba Location: NA
Aruba Shared Token     : aruba123
Force-Provision       : Disabled
HTTP Proxy Location    : http.proxy.arubanetworks.com
```

Showing switch configuration download in progress after receiving ZTP options:

```
switch# show ztp information
TFTP Server           : 10.0.0.2
Image File            : TL_10_02_0001.swi
Configuration File     : config_file
ZTP Status            : In-progress - Configuration download
Aruba Location        : secure.arubanetworks.com
Alternative Aruba Location: NA
Aruba Shared Token     : aruba123
Force-Provision       : Disabled
HTTP Proxy Location    : http.proxy.arubanetworks.com
```

Showing switch configuration download failure after receiving ZTP options:

```
switch# show ztp information
```

```
TFTP Server          : 10.0.0.2
Image File           : TL_10_02_0001.swi
Configuration File    : config_file
ZTP Status           : Failed - Unable to download configuration
Aruba Location        : secure.arubanetworks.com
Alternative Aruba Location : NA
Aruba Shared Token     : aruba123
Force-Provision       : Disabled
HTTP Proxy Location   : http.proxy.arubanetworks.com
```

Showing switch failure to update start-up configuration after downloading configuration received from ZTP options:

```
switch# show ztp information
TFTP Server          : 10.0.0.2
Image File           : TL_10_02_0001.swi
Configuration File    : config_file
ZTP Status           : Failed - Could not copy to start-up configuration
Aruba Location        : secure.arubanetworks.com
Alternative Aruba Location : NA
Aruba Shared Token     : aruba123
Force-Provision       : Disabled
HTTP Proxy Location   : http.proxy.arubanetworks.com
```

In the following example, the ZTP operation succeeded, and both an image file and a configuration file were provided.

```
VSF-10-Mbr# show ztp information
TFTP Server          : 10.1.84.160
Image File           : FL_10_06_0001CK.swi
Configuration File    : 102720-new-setup-config-updated.txt
Status               : Success
Aruba Location        : NA
Alternative Aruba Location : NA
Aruba Shared Token     : aruba123
Force-Provision       : Disabled
HTTP Proxy Location   : NA
VSF-10-Mbr#
```

In the following example, the ZTP option succeeded. A configuration file was not provided, but an image file was provided.

```
VSF-10-Mbr# show ztp information
TFTP Server          : 10.1.84.160
Image File           : TL_10_02_0001.swi
Configuration File    : NA
Status               : Success
Aruba Location        : NA
Alternative Aruba Location : NA
Aruba Shared Token     : aruba123
Force-Provision       : Disabled
HTTP Proxy Location   : NA
VSF-10-Mbr#
```

In the following example, the ZTP operation failed because the TFTP server was unreachable.

```

VSF-10-Mbr# show ztp information
TFTP Server           : 10.1.84.160
Image File            : TL_10_02_0001.swi
Configuration File     : 102720-new-setup-config-updated.txt
Status                : Failed - TFTP server unreachable
Aruba Location        : NA
Alternative Aruba Location: NA
Aruba Shared Token     : NA
Force-Provision       : Disabled
HTTP Proxy Location    : NA
VSF-10-Mbr#

```

In the following example, the ZTP operation was stopped because the switch did not receive any options from the DHCP server for ZTP within 1 minute of receiving the IP address from the server.

```

VSF-10-Mbr## show ztp information
TFTP Server           : NA
Image File            : NA
Configuration File     : NA
Status                : Failed - Timed out while waiting to receive ZTP
options
Aruba Location        : NA
Alternative Aruba Location: NA
Aruba Shared Token     : NA
Force-Provision       : Disabled
HTTP Proxy Location    : NA
VSF-10-Mbr#

```

In the following example, the ZTP operation was stopped because the switch was booted from a configuration that was not the factory default configuration.

```

switch# show ztp information
TFTP Server           : 10.0.0.2
Image File            : TL_10_02_0001.swi
Configuration File     : ztp.cfg
Status                : Failed - Custom startup configuration detected
Aruba Location        : NA
Alternative Aruba Location: NA
Aruba Shared Token     : NA
Force-Provision       : Disabled
HTTP Proxy Location    : NA

```

In the following example, the switch received the image file and the TFTP-server and config file from the DHCP server for ZTP was successful:

```

switch# show ztp information
TFTP Server           : 10.0.0.2
Image File            : TL_10_02_0001.swi
Configuration File     : ztp.cfg
ZTP Status            : Success
Aruba Location        : NA
Alternative Aruba Location: NA
Aruba Shared Token     : NA
Force-Provision       : Disabled
HTTP Proxy Location    : NA

```

In the following example, the switch received the image file and the TFTP-server and config file from the DHCP server entered the failed state as the TFTP server was not reachable:

```
switch# show ztp information
TFTP Server           : 10.0.0.2
Image File            : TL_10_02_0001.swi
Configuration File     : ztp.cfg
ZTP Status            : Failed - TFTP server unreachable
Aruba Location        : NA
Alternative Aruba Location: NA
Aruba Shared Token     : NA
Force-Provision       : Disabled
HTTP Proxy Location   : NA
```

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.

ztp force provision

```
ztp force-provision
no ztp force-provision
```

Description

Starts on-demand ZTP.

Usage

DHCP options received are processed independent of the current state of configuration on the switch. Previous ZTP TFTP Server, Image File, Configuration File, Aruba Central Location, and HTTP Proxy location options are cleared and the switch sends a DHCP request.

Examples

In the following example, force-provision is enabled.

```
switch# configure terminal
switch(config)# ztp force-provision
```

In the following example, force-provision status is checked while enabled.

```
switch# show ztp information
TFTP Server           : 10.0.0.2
```

```
Image File           : TL_10_02_0001.swi
Configuration File    : ztp.cfg
Status               : Success
Aruba Central Location : NA
Aruba Central Shared Token : NA
Force-Provision      : Enabled
HTTP Proxy Location   : NA
```

In the following example, force-provision is disabled.

```
switch# configure terminal
switch(config)# no ztp force-provision
```

In the following example, force-provision status is checked while disabled.

```
switch# show ztp information
TFTP Server          : 10.0.0.2
Image File           : TL_10_02_0001.swi
Configuration File    : ztp.cfg
Status               : Success
Aruba Central Location : NA
Aruba Central Shared Token : NA
Force-Provision      : Disabled
HTTP Proxy Location   : NA
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

vSphere agent

The HPE Aruba Networking CX vSphere agent allows administrators to trace how Virtual Machines are connected to the physical switches. The ability to visualize how a Virtual Machine connects to a CX port helps to resolve connectivity issues. This functionality helps operators in several troubleshooting scenarios, such as diagnosing a connectivity issue, or ensuring adequate distribution of VMs across the physical infrastructure.

You can install the vSphere agent on one or many of the switches in the fabric. You can perform the following tasks, from any switch where the agent is installed:

1. Run the `show VMs` command to list all the VMs managed by the vCenter Appliance integrated with the agent. This functionality also helps to view VMs connections to the ports on other switches on the fabric.
2. Search for a specific VM by name. To find the connection between the VM and a switch port, attach the switch to at least one host managed by the integrated vCenter.

For more information about cloud capabilities of vSphere agent, refer to [vSphere Integration](#).



The **show neighbors** command examines the LLDP data that is advertised from any switch to a distributed virtual switch and provides connection details for third-party switches.

Installation of vSphere agent

To install a container, perform the following steps:

1. Download the vSphere agent from ASP and select the arm vs. x86_64 architecture for the switch platform. Refer to the list of supported switches mentioned earlier to select the corresponding architecture.
2. Host the agent on a local network that can be accessed using the HTTP protocol. Usage of the https protocol is a limitation of the container framework. The directory where the images of the agents are placed will be set in step 3.d. The HTTP server must be reachable on the mgmt vrf - or otherwise configured vrf. Any simple HTTP server helps to accomplish this step.

Configure the CLI using the following commands:

1. To enter the config mode, run the `container vsphere` command.
2. To set the management vrf as the communication path for the container, run the `vrf mgmt` command. The vrf is mgmt by default, or you can specify any other non-default vrf configured by the user. mgmt is the only supported vrf currently.
3. To limit memory usage of the container, run the `restrict memory` command. Set 1GB for vSphere instance.
4. To set the installation path to the path accessible by the HTTP protocol noted in Step 2, run the `image location` command.

5. To pass attributes to be configured for the container from CX CLI, run the env command. Use the following format to pass the attributes to establish the configuration instance:
 - a. VSPHERE_VCENTER_N, where N takes value in the range 1–4.
 - b. The encrypted plaintext command with arguments in the form of vSphere credentials, for example: user@<domain>:password@<fqdn of vcenter>

The following example displays a valid running config:

```
container vsphere
image-location http://X.X.X.X:8000//vsphere-agent.img vrf mgmt restrict
cpu 20
restrict memory 512 vrf mgmt
env VSPHERE_VCENTER_1 encrypted plaintext
USER@vsphere.local:PASSWORD@X.X.X.X
```

Show commands

There are four top-level show commands.

- vms - shows virtual machine connection information.
- connection-status - shows information about configured vSphere vCenters.
- neighbors - shows learned neighbor information (Note: This information is learned from LLDP on vCenter distributed vswitches, not the switch).
- help - shows agent version, description, and configurable environment variables.

show vms

The following show command describes the status of the connection to vSphere, and show the VMs that are attached to switches:

At least one command parameter must be used if the parameters are available.

For example, with the show vms command, we force use of the brief option so the user is aware of all available options.

If not specified, all commands default to brief.

```
igor-sw-02# container vsphere exec show vms brief Hypervisor VM Name Physical
Switch Connections Interface

laser-02-esxi.lab.plexxi.com vm4 laser-sw-01 (b8:d4:e7:d9:af:00) 1/1/3 vm2 laser-
sw-02 (b8:d4:e7:da:40:00) 1/1/4
laser-sw-02 (b8:d4:e7:da:40:00) 1/1/3 vm5 laser-sw-02 (b8:d4:e7:da:40:00) 1/1/4
laser-sw-02 (b8:d4:e7:da:40:00) 1/1/3 laser-sw-01 (b8:d4:e7:d9:af:00) 1/1/3
laser-01-esxi.lab.plexxi.com vm1 laser-sw-01 (b8:d4:e7:d9:af:00) 1/1/1 vm3 laser-
sw-01 (b8:d4:e7:d9:af:00) 1/1/2
laser-sw-02 (b8:d4:e7:da:40:00) 1/1/1
igor-sw-02# container vsphere exec show vms vm-name vm4 Hypervisor VM Name
Physical Switch Connections Interface

laser-02-esxi.lab.plexxi.com vm4 laser-sw-01 (b8:d4:e7:d9:af:00) 1/1/3 igor-sw-02#
container vsphere exec show vms vm-name vm4 detailed VM Name : vm4
Hypervisor : laser-02-esxi.lab.plexxi.com Vendor : vmware
Hostname : vm4
OS : CentOS 4/5 or later (64-bit) VM status : on
Virtual NIC : Network adapter 2 IP Address : 172.20.12.204
```



```
MAC Address : 00:50:56:89:3c:bf Virtual Switch : dvs4
Port Group : dp4 Vlan : 0
Physical Switch Connections Interface : 1/1/3
Chassis ID : b8:d4:e7:d9:af:00 Switch Name : laser-sw-01
Switch Description : Aruba JL635A GL10.12.0001G Management Address :
172.20.11.253
```

Container exec commands are top-level, and can be run in any CLI context.

```
igor-sw-02# container vsphere exec show connection-status brief Hypervisor Last
Sync Connection State
```

```
laser-vcsa.lab.plexxi.com 2023-03-17 23:30:03 connected igor-sw-02# config
igor-sw-02(config)# container vsphere exec show connection-status brief Hypervisor
Last Sync Connection State
```

```
laser-vcsa.lab.plexxi.com 2023-03-17 23:30:07 connected igor-sw-02(config)#
interface 1/1/1
igor-sw-02(config-if)# container vsphere exec show connection-status brief
Hypervisor Last Sync Connection State
```

```
laser-vcsa.lab.plexxi.com 2023-03-17 23:30:15 connected
```

show vms

This command displays the connectivity status for the vSphere agent.

The connection timestamp is updated whenever a successful connection is made with the vSphere agent. The sync timestamp is updated whenever a full sync, event poll, or event process occurs.

```
igor-sw-02(config-container-vsphere)# container vsphere exec show connection-
status brief Hypervisor Last Sync Connection State
```

```
laser-vcsa.lab.plexxi.com 2023-03-18 02:36:06 connected
igor-sw-02(config-container-vsphere)# container vsphere exec show connection-
status detailed Hypervisor : laser-vcsa.lab.plexxi.com
Connection State : connected Last Sync : 2023-03-18 02:35:08
Last Connection : 2023-03-18 02:35:09
igor-sw-02(config-container-vsphere)# container vsphere exec show connection-
status detailed Hypervisor : laser-vcsa.lab.plexxi.com
Connection State : disconnected Last Sync : 2023-03-18 02:04:05
Last Connection : 2023-03-18 02:09:30
Connection Failure Reason : Could Not Resolve Hostname
```

show neighbors

show neighbors command displays the virtual network adapter neighbor information.

Neighbors are pulled from distributed virtual switches of the vSphere and cached locally. Neighbors are used to map VMs to physical switch ports.

If you do not see a neighbor on the port, you will not see any VM connectivity on that port either.

detailed and brief options are available. Filtering can be done on switch-name and/or interface.

```
igor-sw-02(config-container-vsphere)# container vsphere exec show neighbors brief
Chassis ID Switch Name Interface
```

```
b8:d4:e7:da:40:00 laser-sw-02 1/1/1 1/1/2
b8:d4:e7:d9:af:00 laser-sw-01 1/1/1 1/1/2
```

```
igor-sw-02(config-container-vsphere)# container vsphere exec show neighbors
detailed Chassis ID : b8:d4:e7:da:40:00
Switch Name : laser-sw-02
Switch Description : Aruba JL635A GL.10.10.1000 Management Address : 192.168.200.1
Interface : 1/1/1 Advertisement Type : lldp TTL : 102
Interface : 1/1/2 Advertisement Type : lldp TTL : 102
Chassis ID : b8:d4:e7:d9:af:00 Switch Name : laser-sw-01
Switch Description : Aruba JL635A GL.10.10.1000 Management Address : 192.168.200.0
Interface : 1/1/1 Advertisement Type : lldp TTL : 102
Interface : 1/1/2 Advertisement Type : lldp TTL : 102
```

Supported switches

The following switch platforms are validated for data center. The agent itself has no context about the switch that it is installed on, except that the chipset architecture must be either x86_64 or arm:

- 8100 (x86_64)
- 8320 (x86_64)
- 8325 (x86_64)
- 8360 (arm)
- 9300 (x86_64)
- 10000 (x86_64)



The HPE Aruba Networking CX vSphere agent is a containerized agent developed for data center applications. The plugin consumes memory and CPU that would otherwise be allocated to the switch. Thus, the targeted platforms have higher system resources. Those resources are capped to prevent its interference with performance of the switch.



The solution was tested and qualified on the platforms listed here. Other platforms may work at low scale, but they are not recommended outside of the labor test environments due to the resource requirements for vSphere.

Troubleshooting

Overview

In data center networking, the most advanced step in troubleshooting often involves directly accessing the closest physical device related to the issue at hand. This trouble shooting mechanism allows the diagnosis of problems with connected endpoints. While administrators can use management tools to avoid accessing the physical device, there are scenarios where the tools are not utilized. The lack of utilization is either due to their absence, do not have of familiarity, or some of the administrators prefer device interaction. To address this, it is important to embrace these variations and aim for better integration between device-based approaches and management tools, rather than viewing them as conflicting options.

The complexity of troubleshooting the devices is multiplied by the dynamically varying endpoints within the data center. To troubleshoot, admins might extensively research endpoint metadata before beginning the process. Customers use different methods to store inventory data about their endpoints. This method can result in searching for incorrect or outdated information, causing confusion.

Additionally, admins may struggle to identify the correct network device to start with or make mistakes in the process.

Understanding the reasons behind entering the "Troubleshooting of last resort" scenario is essential for developing more effective solutions. Often, this scenario arises either due to reported connectivity problems or when admins attempt to establish connectivity for a new device or service. Interestingly, the first step in this scenario is to resort to the last option is asking a series of questions about MAC addresses, IP addresses, switches, ports, and more. Users frequently do not have this information and must look it up from spreadsheets, paper records, or outdated inventory systems.

Troubleshooting Tools

Admins can use MAC tables, ARP tables, and ping and trace tools to troubleshoot the issues. You can run the show mac-address-table command to troubleshoot:

```
cedar-sw-01# show mac-address-table MAC age-time : 300 seconds Number of
MAC addresses : 15
```

MAC Address	VLAN	Type	Port
f4:03:43:d3:be:b8	1	dynamic	1/1/4
f4:03:43:c0:e1:38	1	dynamic	lag256
f4:03:43:c0:e1:30	1	dynamic	lag2
00:50:56:5e:7a:69	1	dynamic	lag1
00:50:56:5b:a0:40	1	dynamic	lag1
04:90:81:00:08:a2	10	dynamic	lag256

The MAC address table helps you to check if you have seen the MAC address of the endpoint in the last 5 minutes. If the user does not report a problem or share the MAC address, find out the MAC address used by the endpoint. However, if the device has many virtual network parts such as switches, it can be unclear which MAC it is using.

You can also run the show arp command to troubleshoot the issue.

```
show arp
cedar-sw-01# show arp all-vrfs
```

IPv4 Address	MAC	Port	Physical Port	State	VRF
10.10.3.23	00:50:56:ac:3d:c6	vlan30		lag1	reachable default
1.1.1.12	04:90:81:00:08:a2	vlan99		lag256	reachable default
1.1.1.1	04:90:81:00:08:a2	1/1/48		1/1/48	reachable default

For the following MAC address 04:90:81:00:08:a2, the output shows that there was an ARP request for this MAC address. The device with IPV4 address 1.1.1.1 is the VSX keepalive interface on the peer switch.

Endpoint metadata

Solving the issue involves getting the metadata right down to the switch. When users use specific commands, we can add extra details to the responses using metadata. For instance, if we know that the IP address 1.1.1.1 corresponds to a user VM named "Simon," we must include that information in the output.

```
show arp (decoration)
cedar-sw-01# show arp all-vrfs
```

IPv4 Address	MAC	Port	Physical Port	State	VRF
10.10.3.23	00:50:56:ac:3d:c6	vlan30		lag1	reachable default
1.1.1.12	04:90:81:00:08:a2	vlan99		lag256	reachable default
1.1.1.1 (simons-vm)	04:90:81:00:08:a2	1/1/48			1/1/48 reachable default

The previous example is generic, to show the value of extra meta-data on standard switch screens, but in the vSphere context we have to research further to get more useful results.

VMware Use Cases

If you focus only on physical devices, you must figure out the specific switch to which your endpoint is connected. Other switches in the network might not have complete data about the endpoint, so they might not provide any information. In this scenario, more advanced data and perspectives become valuable for our administrators. By using VMware vSphere data as a foundation for your metadata, you gain a broader range of information beyond individual switches. You acquire a comprehensive set of data about topology of the fabric and endpoints. Operators use this information without requiring them to know the precise location of the endpoints.

Following queries that users might perform to gather more information about the endpoint:

Where can I find this endpoint (whether it is a virtual machine, VMkernel, or host)?

You might have a differing set of data on the endpoint, depending on their situation, and they want to know where it resides based on the limited information they have.

Create this query with a flexible set of data:

- VMs name, DNS name (can be different from VM name), VMs IP (more than one IP is possible), VMs NIC name (VMs version, not ESXi), VMs MAC
- VMkernel looks like a VM in some ways, just a virtual interface used for some important VMware control functions such as vMotion
- ESXi name, DNS name (often the same as ESXi name), IP, vmnic, vmnic MAC

What does the user want in response to their query?

- Switch, LAG , or Interface endpoint last seen
- When it was last seen
- Previous location (can be useful for detecting loops), will move if vMotion or depending on vmware load balancing

What additional data is available for this endpoint?

There is additional metadata for vSphere on the endpoint that can be useful for the customer. For a complete integration and for full visualization and automation, this data is used and is applied to Switch CLI.

For VMs

- The basic inventory data on this VM
 - VMs name, DNS name (often different from VM name), VMs IP (they can have more than one), VMs NIC name (VMs version, not ESXi), VMs MAC
 - The VMs association with the Virtual network in ESXi/vsphere
 - Portgroup (VLAN, VLAN type), vSwitch, ESXi Host, ESXi Host NIC (name, IP, and MAC)

- For VMkernel
 - Basic inventory data on this VMkernel
 - Name, IP, MAC
 - The VMKs association with the Virtual network in ESXi or vsphere
 - Portgroup (VLAN, VLAN type), vSwitch, ESXi Host, ESXi Host NIC (name, IP, and MAC)
- For ESXi
 - The basic inventory data on this
 - ESXi name, DNS name, ESXi IP, ESXi Nics, and MACs
 - For each ESXi NIC, the association with vSwitch

What devices are connected to this port?

You can run `show mac-table-address interface x/t/z` command, to display active MACs.

The advantage of using VM metadata is that you can find out the location of the VM without active MACs. You can find out the portgroup or vSwitch location through LLDP from the host, and from the VM association you can find out the location of the switch port.

To this end, the `show VMs` interface `x/t/z` could respond with a mix of active and inactive VMs.

Switch system and hardware commands

Switch system and hardware commands

bluetooth disable

```
bluetooth disable
no bluetooth disable
```

Description

Disables the Bluetooth feature on the switch. The Bluetooth feature includes both Bluetooth Classic and Bluetooth Low Energy (BLE). Bluetooth is enabled by default.

The **no** form of this command enables the Bluetooth feature on the switch.

Example

Disabling Bluetooth on the switch. <XXXX> is the switch platform and <NNNNNNNNNN> is the device identifier.

```
switch(config)# bluetooth disable
switch# show bluetooth
Enabled           : No
Device name       : <XXXX>--<NNNNNNNNNN>

switch(config)# show running-config
...
bluetooth disabled
...
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

bluetooth enable

```
bluetooth enable
no bluetooth enable
```

Description

This command enables the Bluetooth feature on the switch. The Bluetooth feature includes both Bluetooth Classic and Bluetooth Low Energy (BLE).

Default: Bluetooth is enabled by default.

The **no** form of this command disables the Bluetooth feature on the switch.

Usage

The default configuration of the Bluetooth feature is `enabled`. The output of the `show running-config` command includes Bluetooth information only if the Bluetooth feature is disabled.

The Bluetooth feature includes both Bluetooth Classic and Bluetooth Low Energy (BLE).

The Bluetooth feature requires the USB feature to be enabled. If the USB feature has been disabled, you must enable the USB feature before you can enable the Bluetooth feature.

Examples

```
switch(config)# bluetooth enable
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

clear events

```
clear events
```

Description

Clears up event logs. Using the `show events` command will only display the logs generated after the `clear events` command.

Examples

Clearing all generated event logs:

```
switch# show events
-----
show event logs
-----
2018-10-14:06:57:53.534384|hpe-sysmond|6301|LOG_INFO|MSTR|1|System resource
utilization poll interval is changed to 27
2018-10-14:06:58:30.805504|lldpd|103|LOG_INFO|MSTR|1|Configured LLDP tx-timer to
36
2018-10-14:07:01:01.577564|hpe-sysmond|6301|LOG_INFO|MSTR|1|System resource
utilization poll interval is changed to 49
```

```

switch# clear events

switch# show events
-----
show event logs
-----
2018-10-14:07:03:05.637544|hpe-sysmond|6301|LOG_INFO|MSTR|1|System resource
utilization poll interval is changed to 34

```

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.

clear ip errors

```
clear ip errors
```

Description

Clears all IP error statistics.

Example

Clearing and showing ip errors:

```

switch# clear ip errors
switch# show ip errors
-----
Drop reason                Packets
-----
Malformed packets          0
IP address errors          0
...

```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	Manager (#)	Administrators or local user group members with execution rights for this command.

console baud-rate

```
console baud-rate <SPEED>
no console baud-rate <SPEED>
```

Description

Sets the console serial port speed.

The no form of this command resets the console port speed to its default of 115200 bps.

Parameter	Description
<SPEED>	Selects the console port speed in bps, either 9600 or 115200.

Usage

The speed change occurs immediately for the active console session. The console will be inaccessible until the client terminal settings are updated to match the console port speed that you set. After the command is executed you will be prompted to log in again.

Examples

Setting the console port speed to 9600 bps:

```
switch(config)# console baud-rate 9600
This command will configure the baud rate immediately for the active serial
console session. After the command is executed the user will be prompted to
re-login. The serial console will be inaccessible until the terminal client
settings are updated to match the baud rate of the switch.
Continue (y/n)? y
```

Resetting the console port to its default speed 115200 bps:

```
switch(config)# no console baud-rate
```

Command History

Release	Modification
10.08	Command introduced

Command Information

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

domain-name

domain-name <NAME>
no domain-name [<NAME>]

Description

Specifies the domain name of the switch.

The **no** form of this command sets the domain name to the default, which is no domain name.

Parameter	Description
<NAME>	Specifies the domain name to be assigned to the switch. The first character of the name must be a letter or a number. Length: 1 to 32 characters.

Examples

Setting and showing the domain name:

```
switch# show domain-name

switch# config
switch(config)# domain-name example.com
switch(config)# show domain-name
example.com
switch(config)#
```

Setting the domain name to the default value:

```
switch(config)# no domain-name
switch(config)# show domain-name

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.

front-panel-security factory-reset

front-panel-security factory-reset
no front-panel-security factory-reset

Description

Enable the **front-panel factory-reset** feature to allow a factory reset via the reset button on the front panel of the switch, without console access. Once the feature is enabled, this setting will be saved across reboots, until a factory-reset is performed. The **no** form of this command disables the front-panel factory-reset feature after it has been enabled. This feature is disabled by default.

Usage

If you enable front-panel factory-reset feature:

- pressing the reset button and releasing it before 5 seconds will reboot the system.
- pressing the reset button and releasing it between 5 to 20 seconds will start a hard reset of the system
- pressing the reset button and releasing it between 20 to 25 seconds will start a hard reset of the system, and the system will undergo the factory reset process.
- pressing the reset button for more than 25 seconds will not trigger any action.

If the front-panel factory-reset feature is left at its default disabled setting in the running configuration :

- pressing the reset button and releasing it before 5 seconds will reboot the system.
- pressing the reset button and releasing it between 5 to 20 seconds mark will start a hard reset of the system.
- pressing the reset button for more than 20 seconds will not trigger any action.

For more information about the LED indicators on this switch, refer to the [Installation Guide](#) for your switch.

Example

```
switch(config)# front-panel-security factory-reset
This command will enable front-panel factory reset capability, where user can
trigger factory-reset via reset button. This feature will remain enabled until
it is disabled, or a factory-reset is performed.

Continue (y/n)?
```

Command History

Release	Modification
10.14.1000	Command supported on 4100 and 6200 Switch Series.

Command Information

Platforms	Command context	Authority
6200	config	Administrators or local user group members with execution rights for this command.

hostname

```
hostname <HOSTNAME>
no hostname [<HOSTNAME>]
```

Description

Sets the host name of the switch.

The **no** form of this command sets the host name to the default value, which is `switch`.

Parameter	Description
<code><HOSTNAME></code>	Specifies the host name. The first character of the host name must be a letter or a number. Length: 1 to 32 characters. Default: <code>switch</code>

Examples

Setting and showing the host name:

```
switch# show hostname
switch
switch# config
switch(config)# hostname myswitch
myswitch(config)# show hostname
myswitch
```

Setting the host name to the default value:

```
myswitch(config)# no hostname
switch(config)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config</code>	Administrators or local user group members with execution rights for this command.

mtrace

```
mtrace <IPV4-SRC-ADDR> <IPV4-GROUP-ADDR> [lhr <IPV4-LHR-ADDR>] [ttl <HOPS>]
[vrf <VRF-NAME>]
```

Description

Traces the specified IPv4 source and group addresses.

Parameter	Description
<i>IPV4-SRC-ADDR</i>	Specifies the source IPv4 address to trace.
<i>IPV4-GROUP-ADDR</i>	Specifies the group IPv4 address to trace.
<i>lhr</i> < <i>IPV4-LHR-ADDR</i> >	Specifies the last hop router address from which to start the trace.
<i>ttl</i> < <i>HOPS</i> >	Specifies the Time-To-Live duration in hops. Range: 1 to 255 hops. Default: 8 hops.
<i>vrf</i> < <i>VRF-NAME</i> >	Specifies the name of the VRF. If a name is not specified the default VRF will be used.

Examples

Tracing with source, group, and LHR addresses and TTL:

```
(switch)# mtrace 20.0.0.1 239.1.1.1 lhr 10.1.1.1 ttl 10

Type escape sequence to abort.
Mtrace from 10.0.0.1 for Source 20.0.0.1 via Group 239.1.1.1
From destination(?) to source (?)...
Querying ful reverse path...
0 10.0.0.1
-1 30.0.0.1 PIM 0 ms
-2 40.0.0.1 PIM 2 ms
-3 50.0.0.1 PIM 100 ms
-4 60.0.0.1 PIM 156 ms
-5 20.0.0.1 PIM 123 ms
```

Tracing with source and group addresses:

```
(switch)# mtrace 200.0.0.1 239.1.1.1

Type escape sequence to abort.
Mtrace from self for Source 200.0.0.1 via Group 239.1.1.1
From destination(?) to source (?)...
Querying ful reverse path...
0 10.0.0.1
-1 30.0.0.1 PIM 0 ms
-2 40.0.0.1 PIM 2 ms
-3 50.0.0.1 PIM 100 ms
-4 60.0.0.1 PIM 156 ms
-5 200.0.0.1 PIM 123 ms
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	Manager (#)	Administrators or local user group members with execution rights for this command.

power consumption-average-period

`power consumption-average-period <PERIOD-IN-SECONDS>`

Description

Configures a time period for average power consumption in seconds.

Parameter	Description
<code><PERIOD-IN-SECONDS></code>	Specifies the period in seconds for average power consumed. Range: 60-3600. Default: 600

Example

Configuring a time period of 60 seconds for average power consumption:

```
switch(config)# power consumption-average-period 60
```

Command History

Release	Modification
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6200	<code>config</code>	Administrators or local user group members with execution rights for this command.

show bluetooth

`show bluetooth`

Description

Shows general status information about the Bluetooth wireless management feature on the switch.

Usage

This command shows status information about the following:

- The USB Bluetooth adapter
- Clients connected using Bluetooth
- The switch Bluetooth feature.

The output of the **show running-config** command includes Bluetooth information only if the Bluetooth feature is disabled.

The device name given to the switch includes the switch serial number to uniquely identify the switch while pairing with a mobile device.

The management IP address is a private network address created for managing the switch through a Bluetooth connection.

Examples

Example output when Bluetooth is enabled but no Bluetooth adapter is connected. <XXXX> is the switch platform and <NNNNNNNNNN> is the device identifier.

```
switch# show bluetooth
Enabled           : Yes
Device name       : <XXXX>--<NNNNNNNNNN>
Adapter State     : Absent
```

Example output when Bluetooth is enabled and there is a Bluetooth adapter connected:

```
switch# show bluetooth
Enabled           : Yes
Device name       : <XXXX>--

Adapter State     : Ready
Adapter IP address : 192.168.99.1
Adapter MAC address : 480fcf-af153a

Connected Clients
-----
Name              MAC Address      IP Address      Connected Since
-----
Mark's iPhone     089734-b12000    192.168.99.10   2018-07-09 08:47:22 PDT
```

Example output when Bluetooth is disabled:

```
switch# show bluetooth
Enabled           : No
Device name       : <XXXX>--<NNNNNNNNNN>
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	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 boot-history

```
show boot-history [all|{vsf member <1-10>}]
```

Description

Shows boot history information. When no parameters are specified, shows the most recent information about the current boot operation, and the three previous boot operations for the switch. When the **all** parameter is specified, the output of this command shows the boot information for the active management module.

.



To view boot-history on a standby, the command must be sent on the conductor console.

Parameter	Description
all	Optional. Shows boot information for the active management module.
vsf member <1-10>	Optional. Display boot history for the specified VSF member

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.

The output of this command includes the following information:

Parameter	Description
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 <time>	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	<p>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:</p> <ul style="list-style-type: none">▪ <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.▪ Uncontrolled reboot: The reason for the reboot is not known.▪ Reboot requested through database: The

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

Examples

Showing the boot history of the active management module:

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

Index : 2
Boot ID : c34a2c2499004a02bbeeff4992elfdbd
Current Boot, up for 1 days 13 hrs 13 mins 27 secs

Index : 1
Boot ID : bfba9bc486304e57904ac717a0ccbdcd
02 Sep 23 02:55:33 : CPU request reset with 0x20201, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:55:33 : Switch boot count is 2

Index : 0
Boot ID : a88a71b7ca9a4574af7e3b811ddfdc7e
02 Sep 23 02:49:26 : Reboot requested by user, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:50:02 : Switch boot count is 1

Index : 3
Boot ID : f00ba10c8c44457f83fee303d014a89a
25 Aug 23 10:27:42 : Power on reset with 0x1, Version: FL.10.14.0000-1465-
g9df95249d06b0~dirty
25 Aug 23 10:28:18 : Switch boot count is 3
25 Aug 23 10:29:02 : Primary overtemperature fault detected with 0x2 in PSU 1/1
```

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

```
switch#
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
...

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
...

```

The following example displays the boot history for the VSF member 2.

```

switch# show boot-history vsf member 2

Member-2
=====

Index : 0
Boot ID : df99026c194a44f1944a3e7685fb4d90
Current Boot, up for 3 hrs 31 mins 39 secs

Index : 3
Boot ID : 7bf4104903fe4ad1ba4bce40e8099c76
10 Aug 17 10:02:24 : Reboot requested through database
10 Aug 17 10:02:13 : Switch boot count is 2

```

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 capacities

show capacities <FEATURE>

Description

Shows system capacities and their values for all features or a specific feature.

Parameter	Description
<FEATURE>	Specifies a feature. For example, aaa .

Usage

Capacities are expressed in user-understandable terms. Thus they may not map to a specific hardware or software resource or component. They are not intended to define a feature exhaustively.

Examples

Showing all available capacities for mirroring:

```
switch# show capacities mirroring

System Capacities: Filter Mirroring
Capacities Name                                     Value
-----
-
Maximum number of Mirror Sessions configurable in a system
4
Maximum number of enabled Mirror Sessions in a system
4
```

Showing all available capacities for MSTP:

```
switch# show capacities mstp

System Capacities: Filter MSTP
Capacities Name                                     Value
-----
-
Maximum number of mstp instances configurable in a system
64
```

Showing all available capacities for VLAN count:

```
switch# show capacities vlan-count

System Capacities: Filter VLAN Count
Capacities Name                                     Value
-----
-
Maximum number of VLANs supported in the system
4094
```

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 capacities-status

show capacities-status <FEATURE>

Description

Shows system capacities status and their values for all features or a specific feature.

Parameter	Description
<FEATURE>	Specifies the feature, for example aaa or vrrp for which to display capacities, values, and status. Required.

Examples

Showing the system capacities status for all features:

```
switch# show capacities-status

System Capacities Status
Capacities Status Name                               Value Maximum
-----
Number of active gateway mac addresses in a system    0           16
Number of aspath-lists configured                     0           64
Number of community-lists configured                  0           64
...
```

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 console

```
show console
```

Description

Shows the serial console port current speed.

Examples

Showing the console port current speed:

```
switch# show console
Baud Rate: 9600
```

Command History

Release	Modification
10.08	Command introduced

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 core-dump

```
show core-dump all
```

Description

Shows core dump information about the specified module. When no parameters are specified, shows only the core dumps generated in the current boot of the management module. When the **all** parameter is specified, shows all available core dumps.

Parameter	Description
all	Shows all available core dumps.

Usage

When no parameters are specified, the **show core-dump** command shows only the core dumps generated in the current boot of the management module. You can use this command to determine when any crashes are occurring in the current boot.

If no core dumps have occurred, the following message is displayed: **No core dumps are present**

To show core dump information for the standby management module, you must use the **standby** command to switch to the standby management module and then execute the **show core-dump** command.

In the output, the meaning of the information is the following:

Daemon Name

Identifies name of the daemon for which there is dump information.

Instance ID

Identifies the specific instance of the daemon shown in the **Daemon Name** column.

Present

Indicates the status of the core dump:

Yes

The core dump has completed and available for copying.

In Progress

Core dump generation is in progress. Do not attempt to copy this core dump.

Timestamp

Indicates the time the daemon crash occurred. The time is the local time using the time zone configured on the switch.

Build ID

Identifies additional information about the software image associated with the daemon.

Examples

Showing core dump information for the current boot of the active management module only:

```
switch# show core-dump
=====
Daemon Name      | Instance ID | Present      | Timestamp                | Build ID
=====
hpe-fand         1399        Yes          2017-08-04 19:05:34      1246d2a
hpe-sysmond      957         Yes          2017-08-04 19:05:29      1246d2a
=====
Total number of core dumps : 2
=====

=====
Daemon Name      | Instance ID | Present      | Timestamp                | Build ID
=====
hpe-fand         1399        Yes          2017-08-04 19:05:34      1246d2a
hpe-sysmond      957         Yes          2017-08-04 19:05:29      1246d2a
=====
Total number of core dumps : 2
=====
```

Showing all core dumps:

```
switch# show core-dump all
=====
Management Module core-dumps
=====
Daemon Name      | Instance ID | Present      | Timestamp                | Build ID
=====
hpe-sysmond      513         Yes          2017-07-31 13:58:05      e70f101
hpe-tempd        1048        Yes          2017-08-13 13:31:53      e70f101
hpe-tempd        1052        Yes          2017-08-13 13:41:44      e70f101
=====
Line Module core-dumps
=====
Line Module : 1/1
=====
dune_agent_0     18958       Yes          2017-08-12 11:50:17      e70f101
dune_agent_0     18842       Yes          2017-08-12 11:50:09      e70f101
=====
Total number of core dumps : 5
=====
```

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 deprecated commands

`show deprecated-commands [<feature>]`

Description

Shows the list of CLI commands that will be deprecated in a future release along with the new form of the same command which is recommended for use.

Both the command options will be supported until a certain release, after which only the newer replacement command will be supported.

Parameter	Description
<code>feature</code>	Optional. Specify feature name. The list of features for which you can view deprecated commands are:

Examples

Check the deprecated CLI commands for a specific feature:

```
switch# show deprecated-commands
-----
The following commands with ipv4 keyword will be replaced with ip
-----

Deprecated:  vrrp <1-255> address-family (ipv4 | ipv6)
Replacement: vrrp <1-255> address-family (ip | ipv6)

Deprecated:  show bgp ipv4 unicast
Replacement: show bgp ip unicast
...

switch# show deprecated-commands vrrp
-----
The following commands with ipv4 keyword will be replaced with ip
-----

Deprecated:  vrrp <1-255> address-family (ipv4 | ipv6)
Replacement: vrrp <1-255> address-family (ip | ipv6)
```

```
Deprecated: show vrrp (ipv4 | ipv6 | brief | detail) (<1-255>)
Replacement: show vrrp (ip | ipv6 | brief | detail) (<1-255>)
...

switch# show deprecated-commands vsf
Feature vsf has no deprecated commands.
```

Command History

Release	Modification
10.14	Command introduced.

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 domain-name

show domain-name

Description

Shows the current domain name.

Usage

If there is no domain name configured, the CLI displays a blank line.

Example

Setting and showing the domain name:

```
switch# show domain-name

switch# config
switch(config)# domain-name example.com
switch(config)# show domain-name
example.com
switch(config)#
```

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 environment fan

```
show environment fan [vsf]
```

Description

Shows the status information for all fans and fan trays (if present) in the system.

Parameter	Description
vsf	Shows output from the VSF member-id on switches that support VSF.

Usage

For fan trays, **Status** is one of the following values:

- **ready**:The fan tray is operating normally.
- **fault**:The fan tray is in a fault event. The status of the fan tray does not indicate the status of fans.
- **empty**:The fan tray is not installed in the system.

For fans:

Speed :Indicates the relative speed of the fan based on the nominal speed range of the fan. Values are:

Slow:The fan is running at less than 25% of its maximum speed.
Normal:The fan is running at 25-49% of its maximum speed.
Medium:The fan is running at 50-74% of its maximum speed.
Fast:The fan is running at 75-99% of its maximum speed.
Max:The fan is running at 100% of its maximum speed.
N/A:The fan is not installed.

Direction: The direction of airflow through the fan. Values are:

front-to-back:Air flows from the front of the system to the back of the system.
N/A:The fan is not installed.

Status: Fan status. Values are:

uninitialized:The fan has not completed initialization.
ok: The fan is operating normally.
fault: The fan is in a fault state.
empty: The fan is not installed.

Examples

Showing output for a system without a fan tray:

```
switch# show environment fan
```

```
Fan information
```

```
-----
Fan   Serial Number  Speed  Direction      Status      RPM
-----
1     SGXXXXXXXXXX    slow   front-to-back  ok           6000
```

2	SGXXXXXXXXXX	normal	front-to-back	ok	8000
3	SGXXXXXXXXXX	medium	front-to-back	ok	11000
4	SGXXXXXXXXXX	fast	front-to-back	ok	14000
5	SGXXXXXXXXXX	max	front-to-back	fault	16500
6	N/A	N/A	N/A	empty	
...					

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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 environment led

show environment led <MEMBER-ID>

Description

Shows state and status information for all the configurable LEDs in the system.

Parameter	Description
<MEMBER-ID>	Shows output from the specified VSF member ID on switches that support VSF.

Example

Showing state and status for LED:

```
switch# show environment led
Mbr/Name      State      Status
-----
1/locator     off        ok
```

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 environment power-consumption

```
show environment power-consumption <DETAIL>
show environment power-consumption member <MEMBER-ID>
```

Description

Displays power consumption information.

Parameter	Description
<DETAIL>	Displays detailed power consumption information.
<MEMBER-ID>	For VSF supported platforms only. Displays the power consumption information for the specified VSF member. Range: 1-10.

Usage

Power consumed values are updated every 5 seconds. The total power consumed is the total power used in a chassis. The power consumed average is calculated from the total power consumed as a running average over a period of time. The average period has a default of 10 minutes. The period can be configured using **power-consumption-average-period**.

On chassis where power input is not supported, power consumed is displayed as Power Usage and PSU Output Power is displayed as N/A.

The following information is provided for a summary of power consumption:

- line module: power used by line module
- management module: power used by management module
- fabric module: power used by fabric module
- chassis module: power used by chassis module
- fan module: power used by fan module
- power total: total power consumption
- average power: average for total power consumption that is calculated over a given period
- average period: time to calculate power average

Example

Showing the power consumption for a 1RU switch:

```
switch# show environment power-consumption

Power Consumption Averaging Period : 600 seconds
```

Name	Description	Power Usage (W)		PSU Output (W)	
		Instant	Average	Instant	Average
1	8360-32Y4C v2 Switch	120.00	111.16	111.00	102.62

Showing the power consumption for a VSF stack:

```
switch# show environment power-consumption
```

Power Consumption Averaging Period : 600 seconds

Name	Description	Power Usage (W)		PSU Output (W)	
		Instant	Average	Instant	Average
1	6200M 24G 4SFP+ Sw	350.00	349.62	300.00	311.50
2	6200M 24G 4SFP+ Sw	300.00	299.50	280.00	275.50

Showing the power consumption for a switch where input reading is not supported:

```
switch# show environment power-consumption
```

Power Consumption Averaging Period : 600 seconds

Name	Description	Power Usage (W)		PSU Output (W)	
		Instant	Average	Instant	Average
1	6200M 24G 4SFP+ Sw	321.00	330.30	N/A	N/A

Showing the power consumption for a switch with multiple line cards, in brief:

```
switch# show environment power-consumption
```

Power Consumption Averaging Period : 600 seconds

Name	Description	Power Usage (W)		PSU Output (W)	
		Instant	Average	Instant	Average
1	6410 v2 Chassis	900.00	905.62	798.00	803.23

Showing the power consumption for a switch with multiple line cards, in detail:

```
switch# show environment power-consumption detail
```

Power Consumption Averaging Period : 600 seconds

Name	Module Type	Power Usage (W)		PSU Output (W)	
		Instant	Average	Instant	Average
1	chassis total	1495.00	1499.99	1307.00	1300.67
1/3	line	97.00			
1/4	line	95.00			
1/5	line	90.00			
1/6	line	58.00			
1/7	line	90.00			
1/8	line	93.00			
1/9	line	96.00			
1/10	line	92.00			
1/11	line	100.00			

```

1/12 line          99.00
1/1  management    14.00
1/2  management    13.00
     other         370.00

```

Showing the power consumption for 4 member stack, in detail:

```

switch# show environment power-consumption detail

Power Consumption Averaging Period : 600 seconds

Name Module Type          Power Usage (W)      PSU Output (W)
Instant   Average      Instant   Average
-----
1  chassis total         930.00    905.17    830.00    803.40
2  chassis total         900.00    920.00    875.00    880.25
3  chassis total         850.00    857.25    802.00    805.00
4  chassis total        1200.00   1100.56    921.00    950.00

Total Power Consumption      3428.00

```

Showing the power consumption for VSF member 2:

```

switch# show environment power-consumption member 2

Power Consumption Averaging Period : 600 seconds

Name Description          Power Usage (W)      PSU Output (W)
Instant   Average      Instant   Average
-----
2  6200M 24G 4SFP+ Sw      300.00    299.50    280.00    275.50

```

Showing the power consumption for VSF invalid member:

```

switch# show environment power-consumption member 5
Member 5 is not present

```

Command History

Release	Modification
10.14.1000	Introduced enhancement to power consumption and power consumption average.
10.13	Command introduced.

Command Information

Platforms	Command context	Authority
6200	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show environment power-consumption power-over-ethernet

```
show environment power consumption power-over-ethernet
show environment power-consumption power-over-ethernet detail <DETAIL>
show environment power-consumption power-over-ethernet member <MEMBER-ID>
show environment power-consumption power-over-ethernet interface <INTERFACE>
```

Description

Displays the PoE power consumption information.

Parameter	Description
<DETAIL>	Displays detailed PoE power consumption information.
<ARG-1>	For VSF supported platforms only. Displays the VSF member command.
<ARG-2>	For VSF supported platforms only. Displays the power consumption information for the specified VSF member. Range: 1-10.
INTERFACE	Displays the interface name with PoE capability.
<MEMBER>	For VSF supported platforms only. Displays the PoE power consumption for a stack member.

Usage

For each PoE capable module, the PoE power consumed is displayed. PoE power consumed values are collected once every sampling period and the average value is calculated over the average period. The total power consumed is the total power of the PoE devices in a chassis. The average PoE power consumed is calculated from the total PoE power consumed as a running average over a period of time. The default average period is 10 minutes. The minimum average period can be set to 60 seconds and maximum to 3600 seconds. The average period can be configured using **power consumption-average-period**. For VSF platforms, this command displays the PoE power consumed for all members.

The following information is provided for summary of power consumption:

- line module - PoE power used by line module
- chassis module - PoE power used by chassis module
- PoE Power total - total PoE power consumption
- PoE Power average - average for total PoE power consumption that is calculated over a given period
- average period - time to calculate power average

Example

Showing the POE instantaneous power consumption for a switch, in brief:

```
switch# show environment power-consumption power-over-ethernet

Power Consumption Averaging Period : 600 seconds
```

Name	Description	PoE Average Usage (W)
1	6300M 48SR10 CL8 PoE 4p100G Sw	401.41

Showing the POE power consumption for a VSF stack, in brief:

```
switch# show environment power-consumption power-over-ethernet
```

Power Consumption Averaging Period : 120 seconds

Name	Description	PoE Average Usage (W)
1	6300M 24SR5 CL6 PoE 4SFP56 Swc	23.86
2	6300M 48G CL4 PoE 4SFP56 Swch	11.27
3	6300F 24G CL4 PoE 4SFP56 Sw	197.60

Showing the POE power consumption for a chassis, in brief:

```
switch# show environment power-consumption power-over-ethernet
```

Power Consumption Averaging Period : 600 seconds

Name	Description	PoE Average Usage (W)
1	6405 Chassis	120.11

Showing the POE power consumption for a standalone switch, in detail:

```
switch# show environment power-consumption power-over-ethernet detail
```

Power Consumption Averaging Period : 600 seconds

Name	Description	PoE Average Usage (W)
1	6300M 48SR10 CL8 PoE 4p100G Sw	432.23

PoE Port	Instantaneous Power (W)	Average Power (W)
1/1/1	0.00	0.00
1/1/2	0.00	0.00
...		
1/1/47	16.27	16.27
1/1/48	16.76	16.76

Showing the POE power consumption for a chassis, in detail:

```
switch# show environment power-consumption power-over-ethernet detail
```

Power Consumption Averaging Period : 600 seconds

Name	Description	PoE Average Usage (W)
1	6405 Chassis	542.49

PoE Port	Instantaneous Power (W)	Average Power (W)
1/3/1	0.00	0.00
1/3/2	15.56	15.56
...		
1/7/23	1.59	1.59
1/7/24	0.00	0.00

Showing the POE power consumption for 3 member VSF stack, in detail:

```
switch# show environment power-consumption power-over-ethernet detail
```

Power Consumption Averaging Period : 120 seconds

Name	Description	PoE Average Usage (W)
1	6300M 24SR5 CL6 PoE 4SFP56 Swc	24.09
2	6300M 48G CL4 PoE 4SFP56 Swch	11.26
3	6300F 24G CL4 PoE 4SFP56 Sw	197.60

PoE Port	Instantaneous Power (W)	Average Power (W)
1/1/1	1.54	1.54
1/1/2	0.00	0.00
...		
2/1/1	3.21	3.21
2/1/2	0.00	0.00

Showing the POE power consumption for VSF member 3:

```
switch# show environment power-consumption power-over-ethernet member 3
```

Power Consumption Averaging Period : 120 seconds

Name	Description	PoE Average Usage (W)
3	6300F 24G CL4 PoE 4SFP56 Sw	197.60

PoE Port	Instantaneous Power (W)	Average Power (W)
3/1/1	14.07	14.07
3/1/2	14.44	14.44
...		
3/1/23	0.00	0.00
3/1/24	0.00	0.00

Showing the POE power consumption for VSF invalid member:

```
switch# show environment power-consumption power-over-ethernet member 5
Member 5 is not present
```

Showing the interface specifics:

```
switch# show environment power-consumption power-over-ethernet interface 3/1/1

Power Consumption Averaging Period : 60 seconds

PoE      Instantaneous      Average
Port      Power (W)      Power (W)
-----
3/1/1      14.07      14.07
```

Showing the range of interfaces:

```
switch# show environment power-consumption power-over-ethernet interface 3/1/1-3/1/3,3/1/15

Power Consumption Averaging Period : 60 seconds

PoE      Instantaneous      Average
Port      Power (W)      Power (W)
-----
3/1/1      14.07      14.07
3/1/2      14.44      14.44
3/1/3      14.09      14.09
3/1/15     14.44      14.44
```

Command History

Release	Modification
10.14.1000	Command introduced.

Command Information

Platforms	Command context	Authority
6200	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show environment power-supply

```
show environment power-supply [vsf]
```

Description

Shows status information about all power supplies in the switch.

Parameter	Description
<code>vsf</code>	Shows output from the VSF member-id on switches that support VSF.

Usage

The following information is provided for each power supply:

Parameter	Description
<code>Mbr/PSU</code>	Shows the member and slot number of the power supply.
<code>Product Number</code>	Shows the product number of the power supply.
<code>Serial Number</code>	Shows the serial number of the power supply, which uniquely identifies the power supply.
<code>PSU Status</code>	<p>The status of the power supply. Values are:</p> <ul style="list-style-type: none"> ▪ OK:Power supply is operating normally. ▪ OK*: Power supply is operating normally, but it is the only power supply in the chassis. One power supply is not sufficient to supply full power to the switch. When this value is shown, the output of the command also shows a message at the end of the displayed data. ▪ Absent: No power supply is installed in the specified slot. ▪ Input fault: The power supply has a fault condition on its input. ▪ Output fault: The power supply has a fault condition on its output. ▪ Warning: The power supply is not operating normally. ▪ Wattage Maximum: Shows the maximum amount of wattage that the power supply can provide.

Example

Showing the output when only one power supply is installed in the switch:

```
switch# show environment power-supply
      Product  Serial      PSU      Wattage
Mbr/PSU Number  Number      Status      Maximum
-----
1/1      N/A     N/A         OK         500
```

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 environment temperature

`show environment temperature [detail] [vsf]`

Description

Shows the temperature information from sensors in the switch that affect fan control.

Parameter	Description
detail	Shows detailed information from each temperature sensor.
vsf	Shows output from the VSF member-id on switches that support VSF

Usage

Temperatures are shown in Celsius.

Valid values for status are the following: \

Parameter	Description
normal	Sensor is within nominal temperature range.
max	Highest temperature from this sensor.
low_critical	Lowest threshold temperature for this sensor.
critical	Highest threshold temperature for this sensor.
fault	Fault event for this sensor.
emergency	Over temperature event for Over temperature event for this sensor.

Examples

Showing detailed temperature information for a 6200 switch:

```
switch# show environment temperature
Temperature information
```

```
-----
Mbr/Slot-Sensor      Module Type      Current
                    temperature     Status
-----
1/1-PHY-01-08        line-card-module 51.00 C         normal
1/1-PHY-09-16        line-card-module 48.00 C         normal
1/1-PHY-17-24        line-card-module 50.00 C         normal
1/1-PHY-25-32        line-card-module 52.00 C         normal
```

1/1-PHY-33-40	line-card-module	53.00 C	normal
1/1-PHY-41-48	line-card-module	54.00 C	normal
1/1-Switch-ASIC-Internal	line-card-module	63.25 C	normal
1/1-CPU	management-module	47.56 C	normal
1/1-CPU-Zone-0	management-module	46.00 C	normal
1/1-CPU-Zone-1	management-module	46.00 C	normal
1/1-CPU-Zone-2	management-module	46.00 C	normal
1/1-CPU-Zone-3	management-module	47.00 C	normal
1/1-CPU-Zone-4	management-module	47.00 C	normal
1/1-DDR	management-module	37.75 C	normal
1/1-DDR-Inlet	management-module	30.69 C	normal
1/1-Inlet-Air	management-module	22.00 C	normal
1/1-Switch-ASIC-Remote	management-module	64.06 C	normal

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 events

```
show events [ -e <EVENT-ID> |
    -s {emergency | alert | critical | error | warning | notice | info | debug} |
    -r |
    -a |
    -n <COUNT> |
    -i <MEMBER-SLOT> |
    -m {active | standby} |
    -c {lldp | ospf | ...} |
    -d {lldpd | bgpd | fand | ...}]
```

Description

Shows event logs generated by the switch modules since the last reboot.

Parameter	Description
-e <EVENT-ID>	Shows the event logs for the specified event ID. Event ID range: 101 through 99999.
-s {emergency alert critical error warning notice info debug}	Shows the event logs for the specified severity. Select the severity from the following list: <ul style="list-style-type: none"> emergency: Displays event logs with severity emergency only. alert: Displays event logs with severity alert and above.

Parameter	Description
	<ul style="list-style-type: none"> critical: Displays event logs with severity critical and above. error: Displays event logs with severity error and above. warning: Displays event logs with severity warning and above. notice: Displays event logs with severity notice and above. info: Displays event logs with severity info and above. debug: Displays event logs with all severities.
-r	Shows the most recent event logs first.
-a	Shows all event logs, including those events from previous boots.
-n <COUNT>	Displays the specified number of event logs.
-i <MEMBER-SLOT>	On a 6200: Shows the event logs for the specified VSF member ID.
-m {active standby}	On a 6200: Shows the event logs for the specified role. Selecting active displays the event log for the VSF conductor role and standby displays event logs for the VSF standby role.
-c {lldp ospf ...}	Shows the event logs for the specified event category. Enter show event -c for a full listing of supported categories with descriptions.
-d {lldpd bgpd fand ...}	Shows the event logs for the specified process. Enter show event -d for a full listing of supported daemons with descriptions.

Examples

Showing event logs:

```
switch# show events
-----
show event logs
-----
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
    70:72:cf:51:50:7c
2016-12-01:12:37:31.734541|intfd|4001|INFO|AMM|1|Interface port_admin set to
    up for bridge_normal interface
2016-12-01:12:37:32.583256|switchd|24002|ERR|AMM|1|Failed to create VLAN 1
    in Hardware
```

Showing the most recent event logs first:

```
switch# show events -r
-----
show event logs
-----
2016-12-01:12:37:32.583256|switchd|24002|ERR|AMM|1|Failed to create VLAN 1
    in Hardware
```

```
2016-12-01:12:37:31.734541|intfd|4001|INFO|AMM|1|Interface port_admin set to
up for bridge_normal interface
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
70:72:cf:51:50:7c
```

Showing all event logs:

```
switch# show events -a
-----
show event logs
-----
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
70:72:cf:51:50:7c
2016-12-01:12:37:31.734541|intfd|4001|INFO|AMM|1|Interface port_admin set to
up for bridge_normal interface
2016-12-01:12:37:32.583256|switchd|24002|ERR|AMM|1|Failed to create VLAN 1
in Hardware
```

Showing event logs related to LACP:

```
switch# show events -c lacp
-----
show event logs
-----
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
70:72:cf:51:50:7c
```

Showing event logs as per the specified member/slot ID:

```
switch# show events -i 1/1
-----
show event logs
-----
2017-08-17:22:32:25.743991|hpe-sysmond|6301|LOG_INFO|LC|1/1|System resource
utilization poll interval is changed to 313
2017-08-17:22:33:01.692860|hpe-sysmond|6301|LOG_INFO|LC|1/1|System resource
utilization poll interval is changed to 23
2017-08-17:22:33:06.181436|hpe-sysmond|6301|LOG_INFO|LC|1/1|System resource
utilization poll interval is changed to 512
2017-08-17:22:33:06.181436|systemd-coredump|1201|LOG_CRIT|LC|1/1|hpe-sysmond
crashed due to signal:11
```

Showing event logs as per the specified process:

```
switch# show events -d lacpd
-----
show event logs
-----
2016-12-01:12:37:31.733551|lacpd|15007|INFO|AMM|1|LACP system ID set to
70:72:cf:51:50:7c
```

Displaying the specified number of event logs:

```
switch# show events -n 5
-----
show event logs
-----
2018-03-21:06:12:15.500603|arpmgrd|6101|LOG_INFO|AMM|-|ARPMGRD daemon has started
2018-03-21:06:12:17.734405|lldpd|109|LOG_INFO|AMM|-|Configured LLDP tx-delay to 2
2018-03-21:06:12:17.740517|lacpd|1307|LOG_INFO|AMM|-|LACP system ID set to
70:72:cf:d4:34:42
2018-03-21:06:12:17.743491|vrfgmgrd|5401|LOG_INFO|AMM|-|Created a vrf entity
42cc3df7-1113-412f-b5cb-e8227b8c22f2
2018-03-21:06:12:17.904008|vrfgmgrd|5401|LOG_INFO|AMM|-|Created a vrf entity
4409133e-2071-4ab8-adfe-f9662c06b889
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

show front-panel-security status

show front-panel-security status

Description

Displays the configuration status of the front panel factory reset feature and the time stamp of the first occurrence of factory reset using the reset button.

Example

Displays the status of the front panel factory reset feature:

```
switch# show front-panel-security status
Front panel factory reset           : enabled
First occurrence of front-panel factory reset : Wed 2023-09-06 02:57:50 +08
```

Displays the status of the front panel factory reset feature:

```
switch# show front-panel-security status
Front panel factory reset           : enabled but unsupported
First occurrence of front-panel factory reset : NA
```

If the status of the feature is displayed as **enabled but unsupported**, then users should issue the **allow-unsafe-updates** command and reboot the switch.

```
switch# config  
switch(config)# allow-unsafe-updates 30
```

This command will enable non-failsafe updates of programmable devices for the next 30 minutes. You will first need to wait for all line and fabric modules to reach the ready state, and then reboot the switch to begin applying any needed updates. Ensure that the switch will not lose power, be rebooted again, or have any modules removed until all updates have finished and all line and fabric modules have returned to the ready state.

WARNING: Interrupting these updates may make the product unusable!

Continue (y/n)? **y**

Unsafe updates : allowed (less than 30 minute(s) remaining)

Command History

Release	Modification
10.14.1000	Command supported on 4100 and 6200 Switch Series.

Command Information

Platforms	Command context	Authority
6200	Manager (#)	Administrators or local user group members with execution rights for this command.

show hostname

```
show hostname
```

Description

Shows the current host name.

Example

Setting and showing the host name:

```
switch# show hostname  
switch  
switch# config  
switch(config)# hostname myswitch  
myswitch(config)# show hostname
```

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 images

show images

Description

Shows information about the software in the primary and secondary images.

Example

Showing the primary and secondary images on a 6200 switch:

```
switch(config)# show images
-----
AOS-CX Primary Image
-----
Version : ML.10.06.0001AAE-54-g89a7618
Size    : 446 MB
Date    : 2020-04-27 16:50:39 PDT
SHA-256 : 2e6261e26591f9a6b94be28b0890de521f0869a9dbc378659fc33d7c40fd12fc
-----
AOS-CX Secondary Image
-----
Version : ML.10.06.0001AAE-54-g89a7618
Size    : 446 MB
Date    : 2020-04-27 16:50:39 PDT
SHA-256 : 2e6261e26591f9a6b94be28b0890de521f0869a9dbc378659fc33d7c40fd12fc

Default Image : primary
-----
Management Module 1/1 (Active)
-----
Active Image      : primary
Service OS Version : ML.01.05.0001-internal
BIOS Version      : FL.01.0003
```

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 ip errors

```
show ip errors [{vrf <vrf-name>}]all-vrfs]
```

Description

Shows hardware and software IP error statistics for packets received by the switch since the switch was last booted. If none of the optional VRF parameters are included, the **show ip errors** command displays the current system-wide hardware IP error counters and the default VRF's software IP error counters on the switch

Parameter	Description
vrf <vrf-name>	Optional. Display hardware and software IP error counters for a specific VRF.
all-vrfs	Optional. Display hardware and software IP error counters for all VRFs

Usage

IP error info about received packets is collected from each active line card on the switch and is preserved during failover events. Error counts are cleared when the switch is rebooted.

Drop reasons may include the following:

■ Malformed packet

The packet does not conform to TCP/IP protocol standards such as packet length or internet header length.

A large number of malformed packets can indicate that there are hardware malfunctions such as loose cables, network card malfunctions, or that a DOS (denial of service) attack is occurring.

■ IP address error

The packet has an error in the destination or source IP address. Examples of IP address errors include the following:

- The source IP address and destination IP address are the same.
- There is no destination IP address.
- The source IP address is a multicast IP address.
- The forwarding header of an IPv6 address is empty.
- There is no source IP address for an IPv6 packet.

■ Invalid TTLs

The TTL (time to live) value of the packet reached zero. The packet was discarded because it traversed the maximum number of hops permitted by the TTL value.

TTLs are used to prevent packets from being circulated on the network endlessly.

Example

Showing the current system-wide hardware IP error counters and the default VRF's software IP error counters on the switch:

```
switch# show ip errors
System-wide (hardware) IP errors
```

```

-----
Drop reason                                Packets
-----
Malformed packets                          1
IP address errors                          10
Per-VRF (software) IP errors
-----
VRF
Drop reason                                Packets
-----
default
IPv4 maximum transmission unit              3
IPv4 time to live                           0
IPv6 maximum transmission unit              0
IPv6 hop limit                             6
-----
Malformed packets                          1

...

```

Showing the current system-wide hardware IP error counter and the software IP error counter for all VRFs on the switch.

```

switch# show ip errors all-vrfs
System-wide (hardware) IP errors
-----
Drop reason                                Packets
-----
Malformed packets                          1
IP address errors                          10
Per-VRF (software) IP errors
-----
VRF
Drop reason                                Packets
-----
default
IPv4 maximum transmission unit              3
IPv4 time to live                           0
IPv6 maximum transmission unit              0
IPv6 hop limit                             6
red
IPv4 maximum transmission unit              3
IPv4 time to live                           7
IPv6 maximum transmission unit              0
IPv6 hop limit                             6
blue
IPv4 maximum transmission unit              0
IPv4 time to live                           1
IPv6 maximum transmission unit              0
IPv6 hop limit                             6
...

```

Command History

Release	Modification
10.14.1000	Command updated to display both hardware and software IP

Release	Modification
	errors in the command output.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
6200	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 module

show module

Description

Shows information about installed line modules and management modules.



Although this switch does not have removable modules, this command will still return information about the switch, referring to management modules and line modules.

Usage

Identifies and shows status information about the line modules and management modules that are installed in the switch.

To show the configuration information—if any—associated with that line module slot, use the **show running-configuration** command.

Status is one of the following values:

Active

This switch is the active management module.

Standby

This switch is the standby management module.

Deinitializing

The switch is being deinitialized.

Diagnostic

The switch is in a state used for troubleshooting.

Down

The switch is physically present but is powered down.

Empty

The switch hardware is not installed in the chassis.

Failed

The switch has experienced an error and failed.

Failover

This switch is a fabric module or a line module, and it is in the process of connecting to the new active management module during a management module failover event.

Initializing

The switch is being initialized.

Present

The switch hardware is installed in the chassis.

Ready

The switch is available for use.

Updating

A firmware update is being applied to the switch.

Examples

Showing all installed modules on a 6200 switch:

```
switch# show module
```

Management Modules

=====

Name	Product Number	Description	Serial Number	Status
1/1	JL727A	6200F 48G CL4 4SFP+370W Swch	SG0ZKW600P	Active (local)

Line Modules

=====

Name	Product Number	Description	Serial Number	Status
1/1	JL727A	6200F 48G CL4 4SFP+370W Swch	SG0ZKW600P	Ready

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 running-config

```
show running-config [<FEATURE>] [all]
```

Description

Shows the current nondefault configuration running on the switch. No user information is displayed.

Parameter	Description
<FEATURE>	Specifies the name of a feature. For a list of feature names, enter the <code>show running-config</code> command, followed by a space, followed by a question mark (?).
all	Shows all default values for the current running configuration.

Examples

Showing the current running configuration:

```
switch> show running-config
Current configuration:
!
!Version AOS-CX 10.0X.XXXX
!
lldp enable
linecard-module LC1 part-number JL363A
vrf default
!
!
!
!
!
!
aaa authentication login default local
aaa authorization commands default none
!
!
!
!
router ospf 1 vrf green
    area 0.0.0.0
router pim vrf green
    enable
    rp-address 30.0.0.4
vlan 1
    no shutdown
vlan 20
    no shutdown
vlan 30
    no shutdown
interface 1/1/1
    no shutdown
    no routing
    vlan access 30
interface 1/1/32
    no shutdown
    no routing
    vlan access 20
interface bridge_normal-1
    no shutdown
interface bridge_normal-2
    no shutdown
interface vlan20
    no shutdown
    vrf attach green
    ip address 20.0.0.44/24
    ip ospf 1 area 0.0.0.0
    ip pim-sparse enable

interface vlan30
    no shutdown
    vrf attach green
    ip address 30.0.0.44/24
    ip ospf 1 area 0.0.0.0
    ip pim-sparse enable

    ip pim-sparse hello-interval 100
```

Showing the current running configuration in json format:

```

switch> show running-config json
Running-configuration in JSON:
{
  "Monitoring_Policy_Script": {
    "system_resource_monitor_mm1.1.0": {
      "Monitoring_Policy_Instance": {
        "system_resource_monitor_mm1.1.0/system_resource_monitor_
mm1.1.0.default": {
          "name": "system_resource_monitor_mm1.1.0.default",
          "origin": "system",
          "parameters_values": {
            "long_term_high_threshold": "70",
            "long_term_normal_threshold": "60",
            "long_term_time_period": "480",
            "medium_term_high_threshold": "80",
            "medium_term_normal_threshold": "60",
            "medium_term_time_period": "120",
            "short_term_high_threshold": "90",
            "short_term_normal_threshold": "80",
            "short_term_time_period": "5"
          }
        }
      }
    },
    ...
    ...
    ...
    ...

```

Show the current running configuration without default values:

```

switch(config)# show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.04.0000-6523-gbb15c03~dirty
led locator on
!
!
!
!
!
!
!
!
!
vlan 1
switch(config)# show running-config all
Current configuration:
!
!Version AOS-CX Virtual.10.04.0000-6523-gbb15c03~dirty
led locator on
!
!
!
!
!
!
!
!
!
vlan 1
switch(config)#

```

Show the current running configuration with default values:

```
switch(config)# snmp-server vrf mgmt
switch(config)# show running-config
Current configuration:
!
!Version AOS-CX Virtual.10.04.0000-6523-gbb15c03~dirty
led locator on
!
!
!
!
snmp-server vrf mgmt
!
!
!
!
!
vlan 1
switch(config)#
switch(config)#
switch(config)# show running-config all
Current configuration:
!
!Version AOS-CX Virtual.10.04.0000-6523-gbb15c03~dirty
led locator on
!
!
!
!
!
snmp-server vrf mgmt
snmp-server agent-port 161
snmp-server community public
!
!
!
!
!
vlan 1
switch(config)#
```

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 running-config current-context

show running-config current-context

Description

Shows the current non-default configuration running on the switch in the current command context.

Usage

You can enter this command from the following configuration contexts:

- Any child of the global configuration (`config`) context. If the child context has instances—such as interfaces—you can enter the command in the context of a specific instance. Support for this command is provided for one level below the `config` context. For example, entering this command for a child of a child of the `config` context not supported. If you enter the command on a child of the `config` context, the current configuration of that context and the children of that context are displayed.
- The global configuration (`config`) context. If you enter this command in the global configuration (`config`) context, it shows the running configuration of the entire switch. Use the `show running-configuration` command instead.

Examples

Showing the running configuration for the current interface:

```
switch(config-if)# show running-config current-context
interface 1/1/1
    no shutdown
    description Example interface
vlan access 1
    exit
```

Showing the current running configuration for the management interface:

```
switch(config-if-mgmt)# show running-config current-context
interface mgmt
    no shutdown
    ip static 10.0.0.1/24
    default-gateway 10.0.0.8
    nameserver 10.0.0.1
```

Showing the running configuration for the external storage share named `nasfiles`:

```
switch(config-external-storage-nasfiles)# show running-config current-context
external-storage nasfiles
    address 192.168.0.1
    vrf default
    username nasuser
    password ciphertext
    AQBapalKj+XMsZumHEwIc9OR6YcOw5Z6Bh9rV+9ZtKDKzvbaBAAAAB1CTrM=
    type scp
    directory /home/nas
    enable
switch(config-external-storage-nasfiles)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config</code> or a child of <code>config</code> . See Usage.	Administrators or local user group members with execution rights for this command.

show startup-config

`show startup-config [json]`

Description

Shows the contents of the startup configuration.



Switches in the `factory-default` configuration do not have a startup configuration to display.

Parameter	Description
<code>json</code>	Display output in JSON format.

Examples

Showing the startup-configuration in non-JSON format for a 6200 switch:

```
switch# show startup-config
Startup configuration:
!
!Version AOS-CX ML.10.05.0001L
!export-password: default
no lldp
user admin group administrators password ciphertext
AQBapeGVVYk45m4sYxZDE6ufzB2CWmH2wDncy5Can9iEFZjmYgAAAMl3lOWIxEwNwi3xahHktOL681amYg
/yg2ezRrlbMUtlU7fVlASiVbmIq8gVUj01Q4STp9/su3pnopopuWPxwk765zqofKyhL0E0Gj9yhoxCeZfy
NeNpNbm6upKjC5LrfZt9
cli-session
    timeout 0
!
!
```

Showing the startup-configuration in JSON format:

```
switch# show startup-config json
Startup configuration:
{
  "AAA_Server_Group": {
    "local": {
      "group_name": "local"
    },
    "none": {
      "group_name": "none"
    }
  },
  ...
}
```

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 system

`show system [serviceos password-prompt]`

Description

Shows general status information about the system.

Parameter	Description
<code>serviceos password-prompt</code>	Shows the Service OS password prompt status.

Usage

CPU utilization represents the average utilization across all the CPU cores.

System Description, System Contact, and System Location can be set with the `snmp-server` command.

Examples

Showing system information:

```
switch# show system
Hostname           : switch
System Description  : switch description
System Contact     : contact
System Location    : location

Vendor             : Aruba
Product Name       : XXXXXX ...
Chassis Serial Nbr : XXXXXXXXXXXX
Base MAC Address   : xxxxxx-xxxxxx
AOS-CX Version     : XX.99.99.9999

Time Zone          : UTC

Up Time            : 1 week, 5 hours, 28 minutes
CPU Util (%)       : 5
CPU Util (% avg 1 min) : 11
CPU Util (% avg 5 min) : 10
Memory Usage (%)   : 35
```

Showing the Service OS password prompt status:

```
switch# show system serviceos password-prompt
password-prompt: disabled
```

Command History

Release	Modification
10.12	Added CPU Util (% avg 1 min) and CPU Util (% avg 5 min).
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 system resource-utilization

```
show system resource-utilization [all | daemon <DAEMON-NAME>] |
standby | member <MEMBER-NUM>]
```

Description

Shows the system resource utilization data.

Parameter	Description
all	Shows the resource utilization data for the entire switch.
daemon <DAEMON-NAME>	Shows only the resource utilization data for the process identified by <DAEMON-NAME>.
standby	Shows only the resource utilization data for the standby management module.
member <MEMBER-NUM>	Shows only the resource utilization data for the VSF member identified by <MEMBER-NUM>.

Usage

For a list of daemons that log events, enter `show events -d ?` from a switch prompt in the manager (#) context.

Examples

Showing system resource utilization data:

```

switch# show system resource-utilization
System Resources:
Processes                : 144
CPU usage(%)             : 10
CPU usage(% average over 1 minute) : 11
CPU usage(% average over 5 minute) : 15
Memory usage(%)          : 22
Open FD's                : 1358
Storage 1: Endurance utilization = 10-20% (mmc-type-a), 0-10% (mmc-type-b),
Health = normal

Data written to various partitions since boot
Nos      : 5 MB
Log      : 1 MB
Coredump : 23 MB
Security : 2 MB
Selftest : 405 KB
Swap     : 14 MB

Storage partition usage(%)
Nos      : 5
Log      : 60
Coredump : 23
Security : 2
Selftest : 1
Swap     : 0

```

Process	CPU Usage(%)	Memory Usage(%)	Open FD's
hpe-sysmond	1	2	11
hpe-mgmdd	0	1	5
...			

Attempting to show resource utilization data when system resource utilization polling is disabled:

```

switch# show system resource-utilization
System resource utilization data poll is currently disabled

```

Showing the resource utilization data for a particular process:

```

switch# show system resource-utilization daemon hpe-sysmond
Process                CPU Usage(%)    Memory Usage(%)  Open FD's
-----
hpe-sysmond            1                2                11

```

Showing resource utilization data for all VSF members:

```

aaa

```

Showing resource utilization data for a particular VSF member:

```

switch# show system resource-utilization member 2
-----
Resource utilization data for vsf member 2
-----

System Resources:
Processes                : 244
CPU usage(%)             : 10
CPU usage(% average over 1 minute) : 11
CPU usage(% average over 5 minute) : 15
Memory usage(%)          : 11
Open FD's                : 1854
Storage 1: Endurance utilization = 0-10% (mmc-type-a), 0-10% (mmc-type-b),
Health = normal

Data written to various partitions since boot
Nos      : 15 MB
Log      : 1 MB
Coredump : 23 MB
Security : 2 MB
Selftest : 0 KB
Swap     : 0 MB

Storage partition usage(%)
Nos      : 5
Log      : 60
Coredump : 23
Security : 2
Selftest : 1
Swap     : 0

Process                CPU Usage(%)    Memory Usage(%)    Open FD's
-----
(sd-pam)                0                0                7
agetty                  0                0                4
ata_sff                  0                0                0
...

```

```

switch# show system resource-utilization all
-----
Resource utilization data for vsf member 1
-----

System Resources:
Processes                : 244
CPU usage(%)             : 10
CPU usage(% average over 1 minute) : 11
CPU usage(% average over 5 minute) : 15
Memory usage(%)          : 11
Open FD's                : 1854
Storage 1: Endurance utilization = 0-10% (mmc-type-a), 0-10% (mmc-type-b),
Health = normal

Data written to various partitions since boot
Nos      : 15 MB
Log      : 1 MB
Coredump : 23 MB
Security : 2 MB
Selftest : 405 KB
Swap     : 14 MB

```

```

Storage partition usage(%)
Nos      :   5
Log      :  60
Coredump :  23
Security :   2
Selftest :   1
Swap     :   0

Process                CPU Usage(%)    Memory Usage(%)    Open FD's
-----
(sd-pam)                0                0                7
aaa
utilspamcfg             0                1                10
-----

Resource utilization data for vsf member 2
-----

System Resources:
Processes                :  244
CPU usage(%)             :  10
CPU usage(% average over 1 minute) :  11
CPU usage(% average over 5 minute) :  15
Memory usage(%)          :  11
Open FD's                : 1854
Storage 1: Endurance utilization = 0-10% (mmc-type-a), 0-10% (mmc-type-b),
Health = normal

Data written to various partitions since boot
Nos      :  15 MB
Log      :   1 MB
Coredump :  23 MB
Security :   2 MB
Selftest :   0 KB
Swap     :   0 MB

Storage partition usage(%)
Nos      :   5
Log      :  60
Coredump :  23
Security :   2
Selftest :   1
Swap     :   0

Process                CPU Usage(%)    Memory Usage(%)    Open FD's
-----
(sd-pam)                0                0                7
agetty                  0                0                4
ata_sff                  0                0                0

```

Command History

Release	Modification
10.12	The output of this command includes CPU usage(% average over 1 minute) and CPU usage(% average over 5 minute) .
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 tech

```
show tech [basic | <FEATURE>] [local-file]
```

Description

Shows detailed information about switch features by automatically running the `show` commands associated with the feature. If no parameters are specified, the `show tech` command shows information about all switch features. Technical support personnel use the output from this command for troubleshooting.

Parameter	Description
<code>basic</code>	Specifies showing a basic set of information.
<code><FEATURE></code>	Specifies the name of a feature. For a list of feature names, enter the <code>show tech</code> command, followed by a space, followed by a question mark (?).
<code>local-file</code>	Shows the output of the <code>show tech</code> command to a local text file.

Usage

To terminate the output of the `show tech` command, enter **Ctrl+C**.

If the command was not terminated with **Ctrl+C**, at the end of the output, the `show tech` command shows the following:

- The time consumed to execute the command.
- The list of failed `show` commands, if any.

To get a copy of the local text file content created with the `show tech` command that is used with the `local-file` parameter, use the `copy show-tech local-file` command.

Example

Showing the basic set of system information:

```
switch# show tech basic
=====
Show Tech executed on Wed Sep  6 16:50:37 2017
=====
[Begin] Feature basic
=====

*****
Command : show core-dump all
*****
no core dumps are present
```



```

...
=====
[End] Feature basic
=====

=====
1 show tech command failed
=====
Failed command:
  1. show boot-history
=====
Show tech took 3.000000 seconds for execution

```

Directing the output of the **show tech basic** command to the local text file:

```

switch# show tech basic local-file
Show Tech output stored in local-file. Please use 'copy show-tech local-file'
to copy-out this file.

```

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 usb

show usb

Description

Shows the USB port configuration and mount settings.

Examples

If USB has not been enabled:

```

switch> show usb
Enabled: No
Mounted: No

```

If USB has been enabled, but no device has been mounted:

```

switch> show usb
Enabled: Yes
Mounted: No

```

If USB has been enabled and a device mounted:

```
switch> show usb
Enabled: Yes
Mounted: Yes
```

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 usb file-system

show usb file-system [<PATH>]

Description

Shows directory listings for a mounted USB device. When entered without the <PATH> parameter the top level directory tree is shown.

Parameter	Description
<PATH>	Specifies the file path to show. A leading "/" in the path is optional.

Usage

Adding a leading "/" as the first character of the <PATH> parameter is optional.

Attempting to enter '..' as any part of the <PATH> will generate an invalid path argument error. Only fully-qualified path names are supported.

Examples

Showing the top level directory tree:

```
switch# show usb file-system
/mnt/usb:
'System Volume Information'  dir1'

/mnt/usb/System Volume Information':
IndexerVolumeGuid  WPSettings.dat

/mnt/usb/dir1:
dir2  test1
```

```
/mnt/usb/dir1/dir2:
test2
```

Showing available path options from the top level:

```
switch# show usb file-system /
total 64
drwxrwxrwx 2 32768 Jan 22 16:27 'System Volume Information'
drwxrwxrwx 3 32768 Mar  5 15:26 dir1
```

Showing the contents of a specific folder:

```
switch# show usb file-system /dir1
total 32
drwxrwxrwx 2 32768 Mar  5 15:26 dir2
-rwxrwxrwx 1      0 Feb  5 18:08 test1

switch# show usb file-system dir1/dir2
total 0
-rwxrwxrwx 1 0 Feb  6 05:35 test2
```

Attempting to enter an invalid character in the path:

```
switch# show usb file-system dir1/../../
Invalid path argument
```

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 version

```
show version
```

Description

Shows version information about the network operating system software, service operating system software, and BIOS.

Example

Showing version information for a 6200 switch:

```
switch(config)# show version
```

AOS-CX

```
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```

```
Version       : ML.xx.xx.xxxx  
Build Date    : 2022-05-27 17:00:46 PDT  
Build ID      : AOS-CX:ML.xx.xx.xxxx:85c3c2f3d59e:201910222335  
Build SHA     : 85c3c2f3d59ec8318ba97178fad387aecb671b33  
Active Image  : secondary
```

```
Service OS Version : ML.01.05.0001  
BIOS Version       : ML.01.0001
```

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.

system resource-utilization poll-interval

```
system resource-utilization poll-interval <SECONDS>
```

Description

Configures the polling interval for system resource information collection and recording such as CPU and memory usage.

Parameter	Description
<SECONDS>	Specifies the poll interval in seconds. Range: 10-3600. Default: 10.

Example

Configuring the system resource utilization poll interval:

```
switch(config)# system resource-utilization poll-interval 20
```

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.

top cpu

top cpu

Description

Shows CPU utilization information.

Example

Showing top CPU information:

```
switch# top cpu
top - 09:42:55 up 3 min, 3 users, load average: 3.44, 3.78, 1.70
Tasks: 76 total, 2 running, 74 sleeping, 0 stopped, 0 zombie
%Cpu(s): 31.4 us, 32.7 sy, 0.5 ni, 34.4 id, 04. wa, 0.0 hi, 0.6 si, 0.0 st
KiB Mem : 4046496 total, 2487508 free, 897040 used, 661948 buff/cache
KiB Swap: 0 total, 0 free, 0 used, 2859196 avail Mem

  PID USER      PRI  NI   VIRT   RES   SHR S  %CPU  %MEM     TIME+ COMMAND
...
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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.

top memory

top memory

Description

Shows memory utilization information.

Example

Showing top memory:

```

switch> top memory
top - 09:42:55 up 3 min, 3 users, load average: 3.44, 3.78, 1.70
Tasks: 76 total, 2 running, 74 sleeping, 0 stopped, 0 zombie
%Cpu(s): 31.4 us, 32.7 sy, 0.5 ni, 34.4 id, 04. wa, 0.0 hi, 0.6 si, 0.0 st
KiB Mem : 4046496 total, 2487508 free, 897040 used, 661948 buff/cache
KiB Swap: 0 total, 0 free, 0 used, 2859196 avail Mem

  PID USER      PRI  NI   VIRT   RES   SHR S  %CPU  %MEM     TIME+ COMMAND
...

```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	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.

usb

usb
no usb

Description

Enables the USB ports on the switch. This setting is persistent across switch reboots and management module failovers. Both active and standby management modules are affected by this setting.

The **no** form of this command disables the USB ports.

Example

Enabling USB ports:

```
switch(config)# usb
```

Disabling USB ports when a USB drive is mounted:

```
switch(config)# no usb
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	<code>config</code>	Administrators or local user group members with execution rights for this command.

usb mount | unmount

`usb {mount | unmount}`

Description

Enables or disables the inserted USB drive.

Parameter	Description
<code>mount</code>	Enables the inserted USB drive.
<code>unmount</code>	Disables the inserted USB drive in preparation for removal.

Usage

If USB has been enabled in the configuration, the USB port on the active management module is available for mounting a USB drive. The USB port on the standby management module is not available. An inserted USB drive must be mounted each time the switch boots or fails over to a different management module.

A USB drive must be unmounted before removal.

The supported USB file systems are FAT16 and FAT32.

Examples

Mounting a USB drive in the USB port:

```
switch# usb mount
```

Unmounting a USB drive:

```
switch# usb unmount
```

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.

Support and Other Resources

Accessing HPE Aruba Networking Support

HPE Aruba Networking Support Services	https://www.arubanetworks.com/support-services/
AOS-CX Switch Software Documentation Portal	https://www.arubanetworks.com/techdocs/AOS-CX/help_portal/Content/home.htm
HPE Aruba Networking Support Portal	https://networkingsupport.hpe.com/home
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	https://www.arubanetworks.com/support-services/contact-support/

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:

HPE Aruba Networking Developer Hub	https://developer.arubanetworks.com/hpe-aruba-networking-aoscx/docs/about
Airheads social forums and Knowledge Base	https://community.arubanetworks.com/

HPE Aruba Networking Hardware Documentation and Translations Portal	https://www.arubanetworks.com/techdocs/hardware/DocumentationPortal/Content/home.htm
HPE Aruba Networking software	https://networkingsupport.hpe.com/downloads
Software licensing and Feature Packs	https://lms.arubanetworks.com/
End-of-Life information	https://www.arubanetworks.com/support-services/end-of-life/

Accessing Updates

You can access updates from the HPE Aruba Networking Support Portal at <https://networkingsupport.hpe.com>.

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://networkingsupport.hpe.com/notifications/subscriptions> (requires an active HPE Aruba Networking Support Portal account to manage subscriptions). Security notices are viewable without an HPE Aruba Networking Support Portal 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

HPE Aruba Networking 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/>.

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(docsfeedback-switching@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.