AOS-CX 10.08 Fundamentals Guide

8320, 8325, 8360 Switch Series

a Hewlett Packard Enterprise company

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Chapter 1
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:

- Aruba 8320 Switch Series (JL479A, JL579A, JL581A)
- Aruba 8325 Switch Series (JL624A, JL625A, JL626A, JL627A)
- Aruba 8360 Switch Series (JL700A, JL701A, JL702A, JL703A, JL706A, JL707A, JL708A, JL709A, JL710A, JL711A)

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

Command syntax notation conventions

Convention	Usage
`example-text`	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: ■ *<example-text>* ■ <example-text> ■ *example-text* ■ *example-text*	Identifies a placeholder—such as a parameter or a variable—that you must substitute with an actual value in a command or in code: ■ For output formats where italic text cannot be displayed, variables are enclosed in angle brackets (`< >`). 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: ■ 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 83xx Switch Series

- *member*: Always 1. VSF is not supported on this switch.
- *slot*: Always 1. This is not a modular switch, so there are no slots.
- *port*: Physical number of a port on the switch.

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

If using breakout cables, the port designation changes to x:y, where x is the physical port and y is the lane when split to 4 x 10G or 4 x 25G. For example, the logical interface 1/1/4:2 in software is associated with lane 2 on physical port 4 in slot 1 on member 1.

Chapter 2
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 ArubaOS-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 though 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.

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.

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 cable to the out-of-band management port on the switch.

   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.

   
   ;" />

The application attempts to connect to the switch using the switch Bluetooth IP address and the default switch login credentials. The **Home** screen of the application shows the status of the connection to the switch:

- If the login attempt was successful, the Bluetooth icon is displayed and the status message shows the Bluetooth IP address of the switch. In addition, the connection graphic is green. You can continue to the next step.
- If the login attempt was not successful, but a response was received, the Bluetooth icon is displayed, but the status message is: `Login Required`. You can continue to the next step. When you tap one of the tiles, you will be prompted for login credentials.
- If the login attempt did not receive a response, the Bluetooth icon is not displayed, and the status message is: `No Connection`.

4. Create the initial switch configuration:
   - You can deploy an initial configuration to the switch. Through this process, you supply the information required by a configuration template that you choose from a list of templates provided by the application. Then you deploy the configuration to the switch and, optionally, import the switch into NetEdit.

When you deploy a switch configuration, it becomes the running configuration, replacing the entire existing configuration of the switch. All changes previously made to the factory default configuration are overwritten.
If you plan to both deploy a switch configuration and customize the configuration of switch features, deploy the initial configuration first.

To deploy an initial switch configuration, tap: **Initial Config** and follow the instructions in the application.

- Alternatively, you can complete the initial configuration of the switch by tapping **Modify Config** and then selecting the features and settings to configure.
- You can also use the **Modify Config** feature to configure some switch features after the initial configuration is complete. For more information about what you can configure using the Aruba CX mobile app, see the online help for the application.

Troubleshooting Bluetooth connections

Bluetooth connection IP addresses

The Bluetooth connection uses IP addresses in the 192.168.99.0/24 subnet.

Switch

192.168.99.1

Mobile device

192.168.99.10

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 master 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 master 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.
- A JL448A Aruba X2 C2 RJ45 to DB9 console cable.

Procedure

1. Connect the console port on the switch to the serial port on the computer using a console 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.

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`. When configuring a time backward more than five minutes on the Aruba 8320 or 8325 Switch Series, a reboot is recommended to avoid unusual switch behavior.
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!
```

Configuring in-band management on a data port

Prerequisites

- A connection to the CLI via either the console port or the management port
- Ethernet cable

Procedure

1. Use an Ethernet cable to connect a data port to your network.
2. Configure a layer 3 interface on the data port.
3. Enable SSH support on the interface (on the default VRF) with the command `ssh server vrf default`.

   For example:
   ```
   switch# config
   switch(config)# ssh server vrf default
   ```
4. Enable the Web UI on the interface (on the default VRF) with the command `https-server vrf default`.

   For example:
   ```
   switch(config)# https-server vrf default
   ```

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
```

Configuring the hardware forwarding table

Procedure

1. Set the hardware forwarding table mode with the command `profile`.

   The hardware forwarding table profile setting is saved separately and cannot be recovered with a checkpoint restore or configuration download.

2. Reboot the switch for the mode change to take effect with the command `boot system`.

Examples

Optimizing the hardware forwarding table mode for layer 2 forwarding (aggregation layer) on an 8320 switch:

```
switch# config
switch(config)# profile l3-agg
switch(config)# exit
switch# boot system
```

Optimizing the hardware forwarding table mode for layer 3 forwarding (core layer) on an 8320 switch:

```
switch# config
switch(config)# profile l3-core
switch(config)# exit
switch# boot system
```

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
                                 Dload  Upload   Total   Spent    Left  Speed
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 ArubaOS-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:              xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
...

################ 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: ArubaOS-CX
     Version: XL.10.02.0010
    Build Id: ArubaOS-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
8320 8325 8360	`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
8320 8325 8360	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
8320 8325 8360	`config-if-mgmt`	Administrators or local user group members with execution rights for this command.

show interface mgmt

```
show interface mgmt [vsx-peer]
```

Description

Shows status and configuration information for the management interface.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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:fefd: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
8320 8325 8360	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}
    [{ <PLAINTXT-KEY> [trusted] | ciphertext <ENCRYPTED-KEY> }]
no ntp authentication-key <KEY-ID>  {md5 | sha1}
    [{ <PLAINTXT-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.
<PLAINTXT-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 conductor

```
ntp conductor vrf <VRF-NAME> {stratum <NUMBER>]
no ntp conductor vrf <VRF-NAME> {stratum <NUMBER>]
```

Description

Sets the switch as the conductor time source for NTP clients on the specified VRF. By default, the switch operates at stratum level 8. The switch cannot function as both NTP conductor and client on the same VRF.

The `no` form of this command stops the switch from operating as the conductor time source on the specified VRF.

Parameter	Description
`vrf <VRF-NAME>`	Specifies the VRF on which to act as conductor time source.
`stratum <NUMBER>`	Specifies the stratum level at which the switch operates. Range: 1 - 15. Default: 8.

Examples

Setting the switch to act as conductor time source on VRF **primary-vrf** with a stratum level of **9**.

```
switch(config)# ntp conductor vrf primary-vry statum 9
```

Stops the switch from acting as conductor time source on VRF **primary-vrf**.

```
switch(config)# no ntp conductor vrf primary-vry
```

Command History

Release	Modification
10.08	Inclusive language.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325	`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. When specifying an IPv4 address, you can remove leading zeros. For example, the address `192.169.005.100` becomes `192.168.5.100`. 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`.
`key <KEY-NUM>`	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.
`minpoll <MIN-NUM>`	Specifies the minimum polling interval in seconds, as a power of 2. Range: 4 to 17. Default: 6 (64 seconds).
`maxpoll <MAX-NUM>`	Specifies the maximum polling interval in seconds, as a power of 2. Range: 4 to 17. Default: 10 (1024 seconds).
`burst`	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.
`iburst`	Send a burst of six packets when not connected to the server. Useful for reducing synchronization time at startup.
`prefer`	Make this the preferred server.
`version <VER-NUM>`	Specifies the version number to use for all outgoing NTP packets. Range: 3 or 4.

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.

When configuring a time backward more than five minutes on the Aruba 8320 or 8325 Switch Series, a reboot is recommended to avoid unusual switch behavior.

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 switch cannot function as both NTP conductor and client on the same VRF.
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 [vsx-peer]
```

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).

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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 [vsx-peer]
```

Description

Shows the currently defined authentication keys.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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[vsx-peer]
```

Description

Shows all configured NTP servers.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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 [vsx-peer]
```

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.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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 [vsx-peer]
```

Description

Shows the status of NTP on the switch.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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.

Hardware forwarding table commands

profile

8320 switch series

```
profile {l3-agg | l3-core | leaf}
```

8325 switch series

```
profile {l3-agg | l3-core | leaf | spine}
```

Description

Sets the hardware forwarding table profile on an 8320 and 8325 switch series.

The switch must be rebooted for a mode change to take effect.

For the 8320 switch series, prior to release 10.2, the forwarding table mode was configured with the command `platform forwarding-table-mode {3 | 4}`. When upgrading to release 10.02, any existing configuration is converted as follows: table mode `3` is converted to `l3-agg` and table mode `4` is converted to `l3-core`.

Parameter	Description
`l3-agg`	Optimizes the hardware forwarding mode for layer 2 forwarding with more table space allocated to host(ARP/ND) entries.
`l3-core`	Optimizes the hardware forwarding mode for layer 3 forwarding with more table space allocated to route entries. (Default on the 8320 switch series.)
`leaf`	Optimizes the hardware forwarding mode for layer 2 forwarding with more table space allocated to overlay host entries (VXLAN). (Default on the 8325 switch series.)
`spine`	Optimizes the hardware forwarding mode for layer 3 forwarding with more table space allocated to route entries. (8325 switch series only.)

Examples

Optimizing the hardware forwarding table mode for layer 2 forwarding (aggregation layer):

```
switch# config
switch(config)# profile l3-agg
switch(config)# exit
switch# boot system
```

Optimizing the hardware forwarding table mode for layer 3 forwarding (core layer):

```
switch# config
switch(config)# profile l3-core
switch(config)# exit
switch# boot system
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	Manager (#)	Administrators or local user group members with execution rights for this command.

show profiles available

```
show profiles available
```

Description

Shows all available profiles for the 8320, 8325, and 8360.

Examples

Showing all available profiles for an 8320 switch:

```
switch# show profiles available

Available profiles
------------------
L3-agg   98304 L2 entries 120000 Host entries 16384  Route entries

L3-core  32768 L2 entries 14000  Host entries 131064 Route entries (Default)

Leaf     98304 L2 entries 120000 Host entries 16384  Route entries

Spine    32768 L2 entries 14000 Host entries 131064 Route entries
```

Showing all available profiles for an 8325 switch:

```
switch# show profiles available

Available profiles
------------------
L3-agg   98304 L2 entries, 120000 Host entries (8190 unique overlay
          neighbors, 48638 unique underlay neighbors), 29696 Route entries

L3-core  32768 L2 entries, 28000 Host entries (12286 unique overlay
          neighbors, 32766 unique underlay neighbors), 163796 Route entries

Leaf     98304 L2 entries, 120000 Host entries (32766 unique overlay
          neighbors, 12286 unique underlay neighbors), 29696 Route entries
          (Default)

Spine    32768 L2 entries, 28000 Host entries (12286 unique overlay
          neighbors, 32766 unique underlay neighbors), 163796 Route entries
```

Showing all available profiles for an 8360 switch:

```
switch# show profiles available

Available profiles
------------------
Aggregation-Leaf   114688 L2 entries, 163840 Host entries, 65536 Route entries

Core-Spine         32768 L2 entries, 65536 Host entries, 630784 Route entries

Leaf-Extended      212992 L2 entries, 16384 Host entries, 65536 Route entries
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	Manager (#)	Administrators or local user group members with execution rights for this command.

show profile current

```
show profile current
```

Description

Shows current profile for 8320 and 8325 switch series.

Examples

Showing current profile for an 8320 switch:

```
switch# show profile current

Current profile
-------------------
L3-core
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	Manager (#)	Administrators or local user group members with execution rights for this command.

Configuring a layer 2 interface

Procedure

1. Change to the interface configuration context for the interface with the command `interface`.
2. By default, interfaces are layer 3. To create a layer 2 interface, disable routing with the command `no routing`.
3. Set the interface MTU (maximum transmission unit) with the command `mtu`.
4. Review interface configuration settings with the command `show interface`.

Example

```
switch(config)# interface 1/1/1
switch(config-if)# no routing
switch(config-if)# mtu 1900
```

Configuring a layer 3 interface

Procedure

1. Change to the interface configuration context for the interface with the command `interface`.
2. Interfaces are layer 3 by default. If you previously set the interface to layer 2, then enable routing support with the command `routing`.
3. Assign an IPv4 address with the command `ip address`, or an IPv6 address with the command `ipv6 address`.
4. If required, enable support for layer 3 counters with the command `l3-counters`.
5. If required, set the IP MTU with the command `ip mtu`.
6. Review interface configuration settings with the command `show interface`.

Examples

This example creates the following configuration:

- Configures interface **1/1/1** as a layer 3 interface.
- Defines an IPv4 address of **10.10.20.209** with a 24-bit mask.

```
switch# config
switch(config)# interface 1/1/1
switch(config-if)# ip address 10.10.20.209/24
```

This example creates the following configuration:

- Configures interface **1/1/2** as a layer 3 interface.
- Defines an IPv6 address of **2001:0db8:85a3::8a2e:0370:7334** with a 24-bit mask.
- Enables layer 3 transmit and receive counters.

```
switch# config
switch(config)# interface 1/1/2
switch(config-if)# ipv6 address 2001:0db8:85a3::8a2e:0370:7334/24
switch(config-if)# l3-counters tx
switch(config-if)# l3-counters rx
```

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.

The feature is disabled 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`.

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. Only 1G and 10G transceivers are enabled by this command and unsupported transceivers of other speeds will remain disabled.

The `no` form of this command disallows using unsupported transceivers. This is the default.

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-transceiver
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.

Continue (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
All platforms	`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.

flow-control

On the 8320:

```
flow-control rx
no flow-control rx
```

On the 8325:

```
flow-control {rx | [priority <PRIORITY> | <PRIORITY-1, PRIORITY-2>]}
no flow-control {rx | [priority <PRIORITY> | <PRIORITY-1, PRIORITY-2>]}
```

On the 8360:

```
flow-control {rx | rxtx | [priority <PRIORITY> | <PRIORITY-1, PRIORITY-2>]}
no flow-control {rx | rxtx | [priority <PRIORITY> | <PRIORITY-1, PRIORITY-2>]}
```

Description

On 8320 and 8325, enables negotiation of receive flow control on the current interface. The switch advertises RX support to the link partner.

Priority-based flow control (PFC), on the 8325, takes effect after the configuration is saved to startup-config and the switch is restarted.

On 8360, enables negotiation of either receive-only flow control or both receive and transmit flow control on the current interface. The switch advertises either RX or RXTX support to the link partner. The final configuration is determined based on the capabilities of both partners.

Priority-based flow control (PFC), on the 8360, takes effect immediately after configuration. On the JL720A, PFC is not supported on any link speed below 10 Gbps.

A maximum of two PFC priorities can be configured per interface.

On the 8325:

You can only apply three unique combinations of PFC priority configuration across all ports of the device. A unique PFC priority combination is one or two PFC priorities configured on a port.

For example:

```
flow-control priority 3
flow-control priority 4, 5
flow-control priority 4
```

The first three unique combinations configured across all ports sorted in numerical order are accepted and applied. If you attempt to configure a fourth unique priority combination, the following error message is displayed:

```
The number of unique priority-based flow control (PFC) configuration combinations cannot
be more than 3.
```

The `no` form disables flow control support on the current interface.

Parameter	Description
`rx`	Honors received IEEE 802.3x link-level flow control requests.
`rxtx`	Enables the ability to respect and generate IEEE 802.3x link-level pause frames on the current interface.
`priority <PRIORITY> | <PRIORITY-1, PRIORITY-2>`	On the 8325 and 8360, enables IEEE 802.3Q priority-based flow control on the current interface for up to two packet priorities. Range: 0 to 7.

Examples

Enable support for RX flow control:

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

Disable support for RX flow control:

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

Enable support for priority flow control:

```
switch(config)# interface 1/1/1
switch(config-if)# flow-control priority 2
switch(config-if)# flow-control priority 3,4
```

Disable support for priority flow control:

```
switch(config)# interface 1/1/1
switch(config-if)# no flow-control priority 2
switch(config-if)# no flow-control priority 3,4
```

On the 8325:
Enable priority flow control on an interface that requires a reboot before it can be applied in hardware:

```
switch(config)# interface 1/1/1
switch(config-if)# flow-control priority 2

The setting will not be applied until configuration is saved to startup-config and
the switch is rebooted.
```

Enable support for RX and TX flow control:

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

Disable support for RX and TX flow control:

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

Command History

Release	Modification
10.08	Command enhanced to configure two PFC priorities.
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.

flow-control watchdog

```
flow-control watchdog
no flow-control watchdog
```

Description

Enables flow control watchdog on a physical interface.

When an excessive amount of lossless traffic stops transmitting, problematic lossless buffer congestion occurs throughout the network. To prevent the situation, egress lossless queues are monitored to detect when no transmissions have occurred for a globally specified detection timeout. When the condition is detected, the flow control watchdog triggers on the affected queue resulting in the following actions:

- The watchdog timeout counter on the interface is incremented.
- All packets occupying the affected queue are discarded.
- New packet arrivals destined for the affected queue are discarded.

After the configured resume interval has elapsed since the trigger, the queue is returned to normal operation.

The `no` form of this command disables flow control watchdog on a physical interface.

Flow control watchdog is only supported on interfaces configured with PFC. Link-level flow control is not compatible with flow control watchdog.

When flow control watchdog is enabled, it is active on all lossless queues of the port.

To determine whether the flow control watchdog is enabled on an interface, or to see the number of times the watchdog has been triggered, use the `show interface flow-control` command.

The detection and resume intervals must be configured from the global configuration context.

Examples

Enabling flow control watch on an interface:

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

Disabling flow control watch on an interface:

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

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
8325	`config-if`	Administrators or local user group members with execution rights for this command.

flow-control watchdog timeout resume

```
flow-control watchdog timeout <MILLISECONDS> resume <MILLISECONDS>
no flow-control watchdog timeout <MILLISECONDS> resume <MILLISECONDS>
```

Description

Configures global flow control watchdog parameters, detection time and resume time. The parameters are applied to all interfaces that have flow control watchdog enabled. Refer flow-control watchdog for more information.

The `no` form of this command clears the global configuration parameters for flow control watchdog, restoring timeout and resume time to the platform defaults.

Flow control watchdog must be enabled on specified interfaces.

The configured timing parameters can be rounded to what the hardware can support. See show flow-control to check the applied values.

Parameter	Description
`timeout <MILLISECONDS>`	Specifies the amount of time in milliseconds, that a queue must be paused for watchdog to trigger. Range: 10 to 1500 milliseconds. Default: 100 milliseconds.
`resume <MILLISECONDS>`	Specifies the duration of time in milliseconds, that a queue remains in the triggered state. Range: 1 to 100000 milliseconds. Default: 100 milliseconds.

Examples

Configuring flow control watchdog global parameters:

```
switch(config)# flow-control watchdog timeout 100 resume 60
```

Removing flow control watchdog global parameters:

```
switch(config)# no flow-control watchdog timeout 100 resume 60
```

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
8325	`config`	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
8320 8325 8360	`config`	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. Range: 1 to 4040

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` *<IPV4-ADDR>*`/`*<MASK>* `[secondary]`
`no ip address` *<IPV4-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
<IPV4-ADDR>	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`.
<MASK>	Specifies the number of bits in the address mask in CIDR format (`x`), where `x` is a decimal number from 0 to 128.
`secondary`	Specifies a secondary IP address.

Examples

Setting the IP address on interface **1/1/1** to **192.168.100.1** with a mask of **24** bits:

```
switch(config)# interface 1/1/1
switch(config-if)# ip address 192.168.100.1/24
```

Removing the IP address **192.168.100.1** with a mask of **24** bits from interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# no ip address 192.168.100.1/24
```

Assigning the IP address **192.168.20.1** with a mask of **24** bits to loopback interface **1**:

```
switch(config)# interface loopback 1
switch(config-loopback-if)# ip address 192.168.20.1/24
```

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	`config-if`
	`config-loopback-if`
	`config-if-vlan`
		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.

The `no` form of this command sets the IP MTU to the default value 1500. This command is only allowed when routing is enabled on the interface.

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)# ip mtu 576
```

Setting the IP MTU to the default value:

```
switch(config-if)# no ip mtu
```

Setting the IP MTU value on a subinterface:

```
switch(config)# interface 1/1/1.10
switch(config-subif)# ip mtu 6000
```

Usage

The IP MTU value for subinterface must be less than or equal to the parent MTU for the subinterface. The subinterface uses its IP MTU value and not the parent IP MTU value.

Command History

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

Command Information

Platforms	Command context	Authority

All platforms	`config-if`
	`config-if-vlan`
	`config-subif`
		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 `all` 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.
`interface <IFNAME>`	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.
<IPV4-ADDR>	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 `default` VRF, if the `vrf` option is not used). Specify the address in IPv4 format (`x.x.x.x`), where `x` is a decimal number from 0 to 255.
`vrf <VRF-NAME>`	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
```

Setting the secondary IPv4 address `10.10.10.5` on interface `1/1/1` as the global single source address:

```
switch# config
switch(config)# interface 1/1/1
switch(config-if)# ip address 10.10.10.1/24
switch(config-if)# ip address 10.10.10.5/24 secondary
switch(config)# exit
switch(config)# ip source-interface all 10.10.10.5
```

Setting the address `10.10.10.25` 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)# ip address 10.10.10.25/24
switch(config-if)# exit
switch(config)# ip source-interface sflow interface 1/1/2 vrf sflow-vrf
```

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	`config`	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
`sflow | tftp | radius | tacacs | ntp | syslog | ubt | dhcp-relay | simplivity | dns | all`	Sets a single source IP address for a specific protocol. The `all` option sets a global address that applies to all protocols that do not have an address set.
`interface <IFNAME>`	Specifies the name of the interface from which the specified protocol obtains its source IP address.

Parameter	Description
<IPV6-ADDR>	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 `default` VRF, if the `vrf` option is not used). Specify the IP address in IPv6 format (`xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx`), where `x` is a hexadecimal number from 0 to F.
`vrf` *<VRF-NAME>*	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.

l3-counters

```
l3-counters [rx | tx]
no l3-counters [rx | tx]
```

Description

Enables counters on a layer 3 interface. By default, all interfaces are layer 3. To change a layer 2 interface to layer 3, use the `routing` command.

The `no` form of this command, with no specification, disables both transmit and receive counters on a layer 3 interface. To disable transmit (`tx`) or receive (`rx`) counters only, specify the counter type you want to disable.

Parameter	Description
`rx`	Specifies receive counters.
`tx`	Specifies transmit counters.

Examples

Enabling layer 3 transmit counters on interface **1/1/1**:

```
switch(config)# interface 1/1/1
switch(config-if)# l3-counters tx
```

Disabling layer 3 transmit and receive counters on interface **1/1/2**:

```
switch(config)# interface 1/1/2
switch(config-if)# no l3-counters
```

Layer 3 counters on subinterfaces are only supported on the Aruba 8360 switch series.

Enabling layer 3 counters on subinterface **1/1/1.10**:

```
switch(config)# interface 1/1/1.10
switch(config-subif)# l3-counters
```

Disabling layer 3 counters on subinterface **1/1/1.10**:

```
switch(config)# interface 1/1/1.10
switch(config-subif)# no l3-counters
```

Enabling layer 3 receive counters on subinterface **1/1/1.10**:

```
switch(config)# interface 1/1/1.10
switch(config-subif)# l3-counters rx
```

Disabling layer 3 transmit counters on subinterface **1/1/1.10**:

```
switch(config)# interface 1/1/1.10
switch(config-subif)# no l3-counters tx
```

Command History

Release	Modification
10.08	Added support for l3 counters on subinterfaces
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	`config-if` `config-subif`	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.

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 enabled on all interfaces.

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

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
8320 8325 8360	`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`	Administrators or local user group members with execution rights for this command.

show flow-control

```
show flow-control
```

Description

Displays globally configured flow control parameters.

Examples

Showing flow control system wide summary:

```
switch# show flow-control


Flow Control Watchdog Settings
   Trigger Timeout:   57 milliseconds (actual: 60)
   Resume Time:      450 milliseconds
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8325	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

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

Description

Displays active configurations and operational status information for interfaces.

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

Parameter	Description
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

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

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

Interface 1/1/1 is up
 Admin state is up
 Link state: up for 2 days (since Sun Jun 21 05:30:22 UTC 2020)
 Link transitions: 1
 Description: backup data center link
 Hardware: Ethernet, MAC Address: 70:72:cf:fd:e7:b4
 MTU 1500
 Type 1GbT
 Full-duplex
 qos trust none
 Speed 1000 Mb/s
 Auto-negotiation is on
 Flow-control: off
 Error-control: off
 MDI mode: MDIX
 L3 Counters: Rx Enabled, Tx Enabled
Rate collection interval: 300 seconds

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

 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
 L3 Packets                      0                   0                   0
 L3 Bytes                        0                   0                   0
 Errors                          0                   0                   0
   CRC/FCS                       0                 n/a                   0
   Collision                   n/a                   0                   0
   Runts                         0                 n/a                   0
   Giants                        0                 n/a                   0
   Other                         0                   0                   0
```

When the interface is currently linked at a downshifted speed:

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

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

When the interface is shut down during a VSX split:

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

Interface 1/1/1 is down
 Admin state is up
 State information: Disabled by VSX
 Link state: down for 3 days (since Tue Mar 16 05:20:47 UTC 2021)
 Link transitions: 0
 Description:
 Hardware: Ethernet, MAC Address: 04:09:73:62:90:e7
 MTU 1500
 Type SFP+DAC3
 Full-duplex
 qos trust none
 Speed 0 Mb/s
 Auto-negotiation is off
 Flow-control: off
 Error-control: off
 VLAN Mode: native-untagged
 Native VLAN: 1
 Allowed VLAN List: 1502-1505
 Rate collection interval: 300 seconds

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

 Statistic                       RX                  TX               Total
 --------------- ------------------- ------------------- --------------------
 Packets                          0                   0                   0
   Unicast                        0                   0                   0
   Multicast                      0                   0                   0
   Broadcast                      0                   0                   0
 Bytes                            0                   0                   0
 Jumbos                           0                   0                   0
```

```
Dropped                    0                0                0
Pause Frames               0                0                0
Errors                     0                0                0
  CRC/FCS                  0              n/a                0
  Collision              n/a                0                0
  Runts                    0              n/a                0
  Giants                   0              n/a                0
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

show interface dom

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

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.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show interface dom

-------------------------------------------------------------------------------
Port    Type      Channel  Temperature Voltage  Tx Bias  Rx Power      Tx Power
                           (Celsius)   (Volts)  (mA)     (mW/dBm)      (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 flow-control

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

Description

Displays the flow control configuration, status, and statistics of the specified interface.

If `detail` is not specified, the command displays a summary of all flow controlled interfaces with one interface per line. If `detail` is specified, the command displays details and statistics about flow control in a long form on the specified interfaces.

Parameter	Description
<IFNAME>	Specifies an interface name.
<IFRANGE>	Specifies the port identifier range.
`detail`	Show details and statistics of flow control.

Examples

Showing interfaces with flow control enabled in config or status or with a non-zero watchdog timeout count:

On 8320 and 8360:

```
switch# show interface flow-control
---------------------------------------
            Flow Control  Flow Control
Port        Config        Status
---------------------------------------
1/1/1       rx            rx
1/1/2       rx            off
```

On 8360:

```
switch# show interface flow-control
---------------------------------------
            Flow Control  Flow Control
Port        Config        Status
---------------------------------------
1/1/1       rxtx          rxtx
1/1/2       priority 3,4  priority 3,4
1/1/10      priority 5    off
```

On 8325:

```
switch# show interface flow-control
-------------------------------------------------------------------------
            Flow Control  Flow Control  Watchdog           Watchdog
Port        Config        Status        Status             Timeouts
-------------------------------------------------------------------------
1/1/1       rx            rx
1/1/2       rx            rx            incompatible             0
1/1/10      priority 3,4  priority 3,4  enabled               1234
1/1/12      priority 3,4  priority 3,4  error                    0
1/1/32:4    priority 5    priority 5
```

Showing all interfaces in detail form:

```
switch# show interface flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Flow-control: off
 Flow-control watchdog: disabled

Interface 1/1/2 is up
 Admin state is up
 Flow-control: off
 Flow-control watchdog: disabled

...
```

Showing RX enabled flow control:

On 8320 and 8360:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Flow-control: rx

 Statistics                          RX
 ------------------- --------------------
 Dot3 Pause Frames                    0
```

On 8325:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Flow-control: rx
```

```
 Flow-control watchdog: disabled

 Statistics                            RX
 ------------------- --------------------
 Dot3 Pause Frames                      0
```

Showing RXTX enabled flow control:

On 8360:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Flow-control: rxtx

 Statistics                            RX                   TX
 ------------------- -------------------- --------------------
 Dot3 Pause Frames                      0                    0
```

Showing PFC enabled information:

On 8360:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Flow-control: priority 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         --
```

On 8325:

```
switch# show interface 1/1/1 flow-control detail
Interface 1/1/1 is up
 Admin state is up
 Flow-control: priority 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
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8320 8325 8360	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] [vsx-peer]`

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.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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       MYxxxxxxxx      1990-3657
1/1/2     SFP+ER*        --           --              --
1/2/1     QSFP+SR4       JH233A       MYxxxxxxxx      2005-1234
1/2/2     QSFP+ER4*      --           --              --
```

```
1/3/1     SFP28DAC3      844477-B21   MYxxxxxxxx      77fc-7ce7

* unsupported transceiver
```

Showing detailed transceiver information:

```
switch(config)# show interface transceiver detail
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

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

```
switch# show interface transceiver detail
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:
  Rx loss of signal
```

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 ip interface

`show ip interface <INTERFACE-ID> [vsx-peer]`

Description

Shows status and configuration information for an IPv4 interface.

Parameter	Description
<INTERFACE-ID>	Specifies the name of an interface. Format: `member/slot/port`.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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
 IPv4 address 192.168.1.1/24
 MTU 1500
 RX
          0 packets, 0 bytes
 TX
          0 packets, 0 bytes
```

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 ip source-interface

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

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.

Parameter	Description
`vrf <VRF-NAME>`	Specifies the name of a VRF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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> [vsx-peer]`

Description

Shows status and configuration information for an IPv6 interface.

Parameter	Description
<INTERFACE-ID>	Specifies an interface ID. Format: `member/slot/port`.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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 unicast reverse path forwarding: none
 IPv6 load sharing: none
 RX
          0 packets, 0 bytes
 TX
          0 packets, 0 bytes
```

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 ipv6 source-interface

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

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.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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.

A subinterface is a virtual interface created by dividing one physical interface into multiple logical interfaces. Subinterfaces use the parent physical interface for sending and receiving data.

Supported features

The following features are supported on L3 subinterfaces:

- RoP, L3 LAG and Hydra interface (split cable) support
- IPv4/IPv6 addressing
- ARP/ND
- Static unicast routing (IPv4/IPv6)
- Unicast routing (IPv4/IPv6) - OSPF and VRRP
- Unicast routing (IPv4/IPv6) - BGP and IVRL
- IPv4/IPv6 multicast routing (IGMP and PIM)
- Ingress ACLs
- MTU (maximum transmission unit)
- L3 counters
- VSX keep alive links
- SNMP read
- REST support

Configuring subinterfaces

- Subinterfaces can be configured for physical ports, split children of physical ports and L3 LAG interfaces.
- An L3 interface with subinterfaces must be attached to the default VRF.
- Subinterfaces on multiple ports can be assigned the same VLAN ID (there is no bridging between subinterfaces or between subinterfaces and SVIs). Each subinterface is considered to be in a separate bridge domain.
- The parent interface's IP MTU (maximum transmission unit) can be equal to or greater than the value configured on the child subinterface.

Procedure

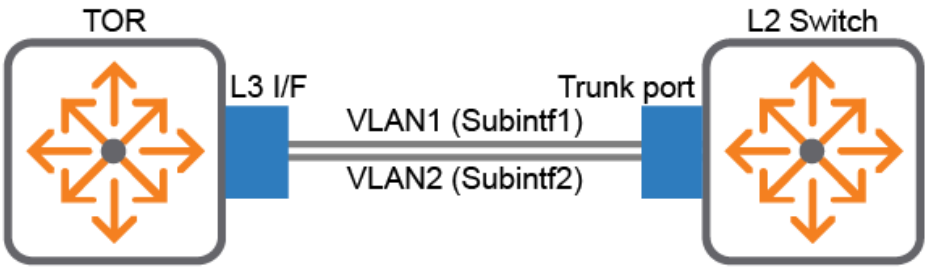
One router with one physical interface needs to be connected to two IP networks:

1. Create two subinterfaces within the physical interface.
2. Assign each subinterface an IP address within each subnet.
3. Route packets between the two subnets.

Limitations

- Subinterfaces can only be configured on L3 ports with routing enabled.
- A subinterface cannot be a member of a LAG.
- An L3 interface with subinterfaces cannot be a member of a LAG.
- An L3 interface with subinterfaces cannot be used for L3 services (for example IP address configuration is not supported on an L3 interface if the interface is configured with subinterfaces).
- On physical interfaces, each subinterface must have a unique encapsulation ID.

Subinterface in a router-on-a-stick deployment



- Top-of-rack switch/router with an L3 interface connected to the trunk port of an L2 switch.
- Routing tables configured to forward outgoing traffic through a subinterface while applying a VLAN ID tag.
- All outgoing traffic from the L3 interface is tagged with a VLAN ID which enables the switch to forward traffic through different VLANs.

Subinterface commands

encapsulation dot1q

```
encapsulation dot1q <VLAN-ID>
no encapsulation dot1q <VLAN-ID>
```

Description

Configures 802.1Q encapsulation on a subinterface.

The `no` form of this command removes 802.1Q encapsulation on a subinterface.

Parameter	Description
<VLAN-ID>	Specifies encapsulation VLAN ID. Range 1 to 4094.

Usage

- Associates an 802.1Q VLAN ID with a subinterface.

Examples

Configuring 802.1Q encapsulation on a subinterface:

```
switch(config)# interface 1/1/1.201
```

```
switch(config-subif)# encapsulation dot1q 10
```

Removing 802.1Q encapsulation on a subinterface:

```
switch(config-subif)# no encapsulation dot1q 10
```

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
8360	`config-subif`	Administrators or local user group members with execution rights for this command.

interface

```
interface <IFNAME>.<ID>
no interface <IFNAME>.<ID>

interface lag <LAGNUM>.<ID>
no interface lag <LAGNUM>.<ID>
```

Description

Creates a subinterface on an L3 interface and enters subinterface configuration mode. The subinterface name consists of the parent interface name (for example, 1/1/1) followed by a period and a unique ID number.

The `no` form of these commands deletes a subinterface from an L3 interface.

Parameter	Description
<IFNAME>	Specifies L3 interface name.
<ID>	Specifies subinterface ID. Range 1 to 4094.
<LAGNUM>	Specifies L3 LAG interface number.

Usage

- To create a LAG subinterface, parent LAG must exist before creating the subinterface.

Examples

Creating a subinterface on L3 interface 1/1/1.201 and entering subinterface configuration mode:

```
switch(config)# interface 1/1/1.201
```

```
switch(config-subif)#
```

Deleting subinterface on L3 interface 1/1/1.201:

```
switch(config)# no interface 1/1/1.201
```

Creating a subinterface on an L3 LAG port and entering subinterface configuration mode:

```
switch(config)# interface lag 1.201
switch(config-subif)#
```

Deleting subinterface on an L3 LAG port :

```
switch(config)# no interface lag 1.201
```

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
8360	config	Administrators or local user group members with execution rights for this command.

show capacities subinterface

```
show capacities subinterface
```

Description

Displays maximum subinterface capacity.

Examples

Showing maximum subinterface capacity:

```
switch# show capacities subinterface

System Capacities: Filter Subinterface
Capacities Name                                                                          Value
-----------------------------------------------------------------------------------------------
Maximum number of LAG subinterfaces for the entire system                                  256
Maximum number of LAG members when the LAG has subinterfaces                                 4
Maximum number of normal subinterfaces for the entire system                              1024
Maximum number of subinterface resources for the entire system (normal+(4*LAG)           1024
```

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
8360	Operator (>) or 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 interface

```
show interface <IFNAME>.<ID>
show interface lag <LAGNUM>.<ID>
```

Description

Displays subinterface configuration.

Parameter	Description
<IFNAME>	Specifies L3 interface name.
<ID>	Specifies subinterface ID. Range 1 to 4094.
<LAGNUM>	Specifies L3 LAG interface number.

Examples

Showing subinterface configuration:

```
switch# show interface 1/1/1.201
Interface 1/1/1.201 is down
Admin state is up
State information: Waiting for link
Description:
Hardware: Ethernet, MAC Address: 38:21:c7:5a:80:80
Encapsulation dot1Q ID: 10
Statistic                          RX                   TX                  Total
---------------- -------------------- -------------------- --------------------
L3 Packets                          0                    0                    0
L3 Bytes                            0                    0                    0
```

Showing subinterface LAG configuration:

```
switch# show interface lag1.1
Interface lag1.1 is down
Admin state is up
Description:
Hardware: Ethernet, MAC Address: 38:21:c7:5a:80:80
Encapsulation dot1Q ID: 2
Statistic                          RX                   TX                  Total
---------------- -------------------- -------------------- --------------------
```

```
L3 Packets                    0                    0                    0
L3 Bytes                      0                    0                    0
```

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
8360	Operator (>) or 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.

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

```
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`
	Selects sFLow.

Parameter	Description

	`simplivity`
	Selects simplivity.
	`syslog`
	Selects syslog.
	`tacacs`
	Selects TACACS.
	`tftp`
	Selects 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 protocl on VRF green :

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

Removing source-interface IPv4 10.1.1.1configuration 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
10.07 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 interface

```
ip source-interface <PROTOCOL> 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 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`
	Selects sFLow.
	`syslog`
	Selects syslog.
	`tacacs`
	Selects TACACS.
	`tftp`
	Selects TFTP.

Parameter	Description
`vrf <VRF-NAME>`	Specifies the VRF name.
`<IFNAME>`	Specifies the interface 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
```

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

```
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

<PROTOCOL>	Specifies the protocol to configure.
	`all`
	Selects all protocols supported by this command.
	`central`
	Selects Aruba Central.
	`ntp`
	Selects NTP.
	`radius`
	Selects radius.
	`sflow`
	Selects sFLow.
	`syslog`
	Selects syslog.
	`tacacs`
	Selects TACACS.
	`tftp`
	Selects TFTP.

<IPV6-ADDR>	Specifies the IPv6 address.
`vrf` *<VRF-NAME>*	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 interface

```
ipv6 source-interface <PROTOCOL> interface <IFNAME> [vrf <VRF-NAME>]
no ipv6 source-interface <PROTOCOL> 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.
	`ntp`
	Selects NTP.
	`radius`
	Selects radius.
	`sflow`
	Selects sFLow.
	`syslog`
	Selects syslog.
	`tacacs`
	Selects TACACS.
	`tftp`
	SelectsTFTP.

<IFNAME>	Specifies the interface name.
`vrf` *<VRF-NAME>*	Specifies the VRF name.

<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
```

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 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.
	`ntp`
	Shows the source interface configuration for NTP.
	`radius`
	Shows the source interface configuration for radius.
	`sflow`
	Shows the source interface configuration for sFLow.
	`syslog`
	Shows the source interface configuration for syslog.

Parameter	Description

	`tacacs`
	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 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
10.07 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

<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.
	`ntp`
	Shows the source interface configuration for NTP.
	`radius`
	Shows the source interface configuration for radius.
	`sflow`
	Shows the source interface configuration for sFLow.
	`syslog`
	Shows the source interface configuration for syslog.
	`tacacs`
	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                                     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                                 2.2.2.2:3.3.3.3       all-vrfs
all                                 1.1.1.1:2.2.2.2       default
all              1/1/1              2::2                  red
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 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.

Chapter 7
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.

Applies only to the Aruba 8360 Switch Series (not supported on JL706A and JL77A).

Precision Time Protocol (PTP) is defined in the IEEE 1588 standard (Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems). PTP synchronizes clocks in packet-based networks that include distributed device clocks of varying precision and stability. On a local area network, it achieves clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems. PTP is currently employed to synchronize financial transactions, mobile phone tower transmissions, and networks that require precise timing but lack access to satellite navigation signals.

PTP clocks

A PTP network consists of PTP-enabled devices and devices that are not using PTP. The PTP-enabled devices typically consist of clock-aware devices such as ordinary clocks (which are usually single-port end-stations) and one or more grandsource clocks, transparent clocks, and boundary clocks (multi-port L2/L3 time-aware devices).

The basic clock node types include:

Grandsource clock—A grandsource clock is the primary source of time for the downstream devices. This is a device with greater clock quality which may have direct access to a reference clock.

Ordinary clock—An ordinary clock is a single port end-station (which can include a GM as the originating PTP time-aware device).

Transparent clock—A transparent clock can have multiple network port connections but it does not act as either a clock-source or a clock-sink. Rather, it updates the correction field within the PTP event messages (`SYNC/FOLLOW_UP`, `DELAY_REQUEST`) to compensate for the transit time delay. Transparent clocks compensate for switch latency and jitter, making network devices appear transparent to other PTP time-aware devices. They help in reducing the end-station time errors and improving synchronization quality. But a transparent clock itself does not synchronize its time. An **End-to-End (E2E) transparent clock** updates the `correctionField` field in the PTP messages with the total time the PTP packet was resident in the network device. This is called resident time correction.

Boundary clock—A boundary clock implements a local PTP clock where one port acts as clock-sink which synchronizes itself with the clock-source while other ports act as clock-source ports to its downstream clock-aware devices. The clock-source port is used to redistribute the clock to another set of clock-sinks. Boundary clocks can also use E2E and can be configured based on the selected PTP profile. The best clock source algorithm is used by the boundary clock to select the best or most precise configured acceptable clock-source clock.

Based on hardware capability, the switch supports either boundary clock, transparent clock, or both modes.

Best clock-source algorithm

The best clock-source algorithm helps in choosing the source of timing on your network. It runs independently on each clock in a domain. This algorithm specifies the way that a local clock can determine which of all the clocks (including itself) is the best. Since it runs continuously, it continually re-adapts to changes in the network or the clocks.

Each clock sends a message to the network describing its own properties. The best clock-source algorithm running in the clock compares these properties to determine the best clock.

The comparisons of attributes happens with the following precedence :

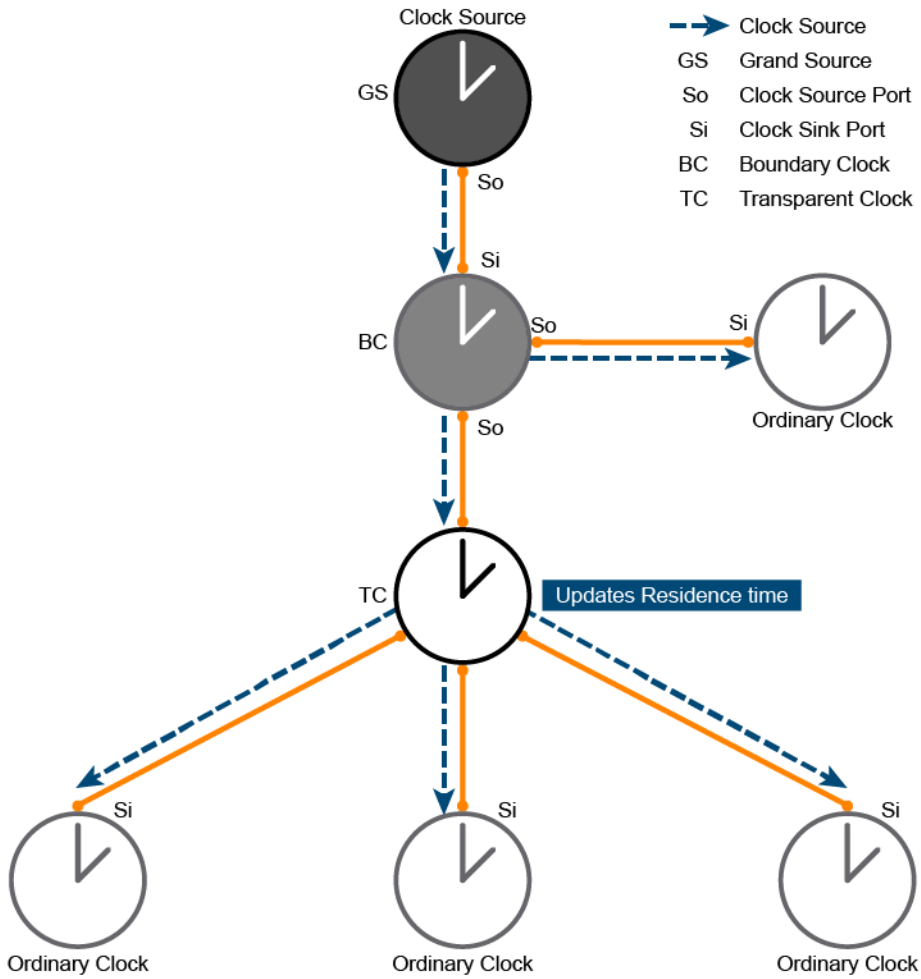
1. Priority1: user configurable absolute priority
2. ClockClass: Attribute defining a clock's TAI traceability
3. Time Source: Attribute defining the accuracy of a clock
4. Variance: An attribute defining the precision of a clock
5. Priority2: This is a user configurable designation that provides finer grained ordering among otherwise equivalent clocks
6. Clock Identity : A tiebreaker consisting of the MAC address of the clock

In addition to this precedence order, the distance measured by the number of boundary clocks between the local clock and the best clock is used when two Announce messages reflect the same best clock. The distance is indicated in the stepsRemoved field of announce messages.

PTP network diagram

The following diagram illustrates how the various PTP clock nodes are connected and how the timing information flows from the origin to the end-stations to achieve the time synchronization. This diagram depicts the PTP clocks in a source-sink hierarchy.

Figure 1 *Example PTP network with clocks in a source-sink hierarchy*



Configuration examples

Configuring a boundary clock

Follow these steps to configure the end-to-end boundary clock:

1. Create the PTP context using the specified profile.

```
switch(config)# ptp profile 1588v2
switch(config-ptp)#
```

2. Configure the mandatory commands:
   a. Configure the PTP mode.
   b. Configure the PTP clock-step mode.
   c. Configure the transport protocol.
   d. Configure PTP globally.

```
switch(config-ptp)# mode boundary end-to-end
switch(config-ptp)# clock-step one-step
switch(config-ptp)# transport-protocol ethernet
switch(config-ptp)# enable
```

3. Configure the optional commands which participate in the best clock source algorithm:
   a. Configure priority1 value.
   b. Configure priority2 value.

```
switch(config-ptp)# priority1 1
switch(config-ptp)# priority2 10
```

4. Enable PTP on the connected interfaces:

```
switch(config)# int 1/1/1
switch(config-if)# ptp enable
switch(config-if)# int 1/1/2
switch(config-if)# ptp enable
```

   Optional: changing packet interval rate for various PTP parameters:

```
switch(config-if)# ptp sync-interval 1588v2 1
switch(config-if)# ptp announce-interval 1588v2 -5
switch(config-if)# ptp announce-timeout 1588v2 4
switch(config-if)# ptp delay-req-interval 1588v2 -3
```

Configuring an end-to-end transparent clock

Follow these steps to configure the E2E transparent clock:

1. Configure the mandatory commands:
   a. Configure the PTP mode and the delay mechanism.
   b. Configure the PTP clock-step mode.

c. Configure the transport protocol.
d. Configure PTP globally.

```
Switch config:
switch(config)# ptp profile 1588v2
switch(config-ptp)# mode transparent end-to-end
switch(config-ptp)# clock-step one-step
switch(config-ptp)# transport-protocol ethernet
switch(config-ptp)# enable
```

2. Enable PTP on the connected interfaces :

```
switch(config)# int 1/1/1
switch(config-if)# ptp enable
switch(config-if)# int 1/1/2
switch(config-if)# ptp enable
```

Hardware considerations

There is no PTP support for breakout cables. QSA transceivers and sub-interfaces are not supported.

PTP commands

clock-domain

```
clock-domain <DOMAIN-NUMBER>
no clock-domain
```

Description

Configures the PTP clock domain to a specified value.

The `no` form of this command removes the PTP domain configuration of the PTP clock.

Parameter	Description
<DOMAIN-NUMBER>	Sets the PTP clock domain. Range: 0 to 255. Value configurable subject to limits established by the PTP profile.

Usage

- The one-step end-to-end transparent clock works across domains.
- For boundary clocks, the clock-domain has to be identical with the domain used in the network.
- All PTP devices must be within same domain to be able to sync with each other.
- This command is only enabled in the PTP profile context.

Examples

Entering the PTP profile context and setting the PTP clock domain value:

```
switch(config)# ptp profile aes-r16
```

```
switch(config-ptp)#
switch(config-ptp)#clock-domain 4
switch(config-ptp)#
```

Removing the PTP clock domain value:

```
switch(config-ptp)# no clock-domain
switch(config-ptp)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-ptp`	Administrators or local user group members with execution rights for this command.

clock-step

```
clock-step {one-step|two-step}
no clock-step
```

Description

Configures the clock step mode that determines whether the egress-time information is sent along with the SYNC message (one-step), or a subsequent follow-up message (two-step) with the egress timestamp of the previously sent SYNC message.

The Aruba 8360 Switch Series supports both one-step and two-step modes for boundary clocks. For transparent clocks, only one-step mode is supported.

The `no` form of this command removes the PTP clock-step configuration of the PTP clock.

Parameter	Description
`one-step`	Sets the PTP clock-step mode to one-step messaging.
`two-step`	Sets the PTP clock-step mode to two-step messaging.

Usage

- Mandatory command to start the PTP clock.
- Both boundary clocks and transparent clocks can inter-operate with different step modes upstream or downstream.
- Two-step mode is currently not supported on the transparent clock.

Example

Setting the clock-step mode to one-step messaging:

```
switch(config-ptp)# clock-step one-step
switch(config-ptp)#
```

Removing the clock-step mode configuration:

```
switch(config-ptp)# no clock-step
switch(config-ptp)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-ptp`	Administrators or local user group members with execution rights for this command.

clear ptp statistics

```
clear ptp statisctics [<IFNAME>]
```

Description

Clears PTP counters for the given interface.

Parameter	Description
<IFNAME>	Optional: Specifies the interface name.

Examples

Clearing PTP counters for the given interface:

```
switch# clear ptp statistics 1/1/8
switch# clear ptp statistics lag1
switch# clear ptp statistics
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	Manager (#)	Administrators or local user group members with execution rights for this command.

enable

```
enable
no enable
```

Description

Enables the PTP profile globally. However, the PTP clock is started only when all the mandatory commands are set.

The no form of this command disables the PTP profile globally.

Usage

Mandatory command to start the PTP clock.

Examples

Enabling the PTP profile:

```
switch(config)# ptp profile 1588v2
switch(config-ptp)# enable
```

Disabling the PTP profile:

```
switch(config)# ptp profile 1588v2
switch(config-ptp)# no enable
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	config-ptp	Administrators or local user group members with execution rights for this command.

ip source-interface

```
ip source-interface {ptp | all} interface <IFNAME> [vrf <VRF-NAME>
ip source-interface {ptp | all} <IPV4-ADDR> [vrf <VRF-NAME>]
no ip source-interface {ptp | all} interface <IFNAME> [vrf <VRF-NAME>
no ip source-interface {ptp | all} <IPV4-ADDR> [vrf <VRF-NAME>]
```

Description

Configures the source IP address to be used when sending PTP messages. Use the `ptp` keyword to set source IP address specific to the PTP feature. If the feature-specific configuration is not available, the source IP address corresponding to the `all` option will be used.

The `no` form of this command removes the configuration of the source IP address used by the PTP feature.

Parameter	Description
`ptp`	Selects the PTP protocol.
`all`	Selects all protocols that can be configured by this command.
`interface <IF-NAME>`	Specifies the name of the interface from which the source IP address is obtained. 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.
`vrf <VRF-NAME>`	Specifies the VRF name.
`<IPV4-ADDR>`	Specifies the source IPv4 address to be used. The IP address must be defined on the switch, and it must exist on the specified VRF (which is the default VRF, if the vrf option is not used). Specify the address in IPv4 format (x.x.x.x), where x is a decimal number from 0 to 255.

Usage

- This command must be configured on the switch when PTP is enabled on VLAN trunk or access ports, and the transport protocol is IPv4.
- In the current version of PTP, only the default VRF is supported.
- This command is not applicable to the end-to-end transparent clock.

Examples

Configuring the source IP address for sending PTP messages:

```
switch(config)# ip source-interface ptp interface 1/1/1
switch(config)# ip source-interface ptp 10.10.10.1
switch(config)# ip source-interface ptp interface vlan10
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config`	Administrators or local user group members with execution rights for this command.

mode

```
mode boundary end-to-end
mode transparent end-to-end
no mode
```

Description

Configures the PTP clock mode in which the device will operate. The device can be in any single specified mode when configured. The device can operate in end-to-end boundary clock mode or in an end-to-end transparent clock mode. A device in transparent-clock mode does not synchronize or syntonize itself to a clock-source.

The `no` form of this command removes the PTP clock mode configuration on the switch.

Parameter	Description
`boundary`	Selects the boundary mode.
`transparent`	Selects the transparent mode.
`end-to-end`	Sets the delay-request mechanism.

Usage

Mandatory command to start the PTP clock.

Examples

Configuring PTP transparent end-to-end clock mode:

```
switch(config)# ptp profile 1588v2
switch(config-ptp)# mode transparent end-to-end
switch(config-ptp)#
```

Configuring PTP boundary end-to-end clock mode:

```
switch(config)# ptp profile 1588v2
switch(config-ptp)# mode boundary end-to-end
switch(config-ptp)#
```

Removing PTP clock mode configuration:

```
switch(config-ptp)# no mode
switch(config-ptp)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-ptp`	Administrators or local user group members with execution rights for this command.

priority1

```
priority1 <PRIORITY>
no priority1
```

Description

Configures the PTP clock `priority1` value of the device. This value is operational when the device is in boundary clock mode and participating in the Best Clock Source Algorithm (BMCA). This value is used to indicate priority to its downstream clock-aware devices.

The `no` form of this command removes the PTP `priority1` configuration of the PTP clock and sets it to the default value of 128.

Parameter	Description
<PRIORITY>	Sets the priority value. Default 128.

Usage

This value can be configured only for the boundary clock.

Examples

Configuring PTP priority1 value:

```
switch(config-ptp)# priority1 129
switch(config-ptp)#
```

Removing PTP priority1 configuration:

```
switch(config-ptp)# no priority1
switch(config-ptp)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-ptp`	Administrators or local user group members with execution rights for this command.

priority2

```
priority2 <PRIORITY>
no priority2 <PRIORITY>
```

Description

Configures the PTP clock `priority2` value of the device. This value is operational when the device is in boundary clock mode and participating in the Best Clock Source Algorithm (BMCA). This value is used to indicate priority to its downstream clock-aware devices.

The `no` form of this command removes the PTP `priority2` configuration of the PTP clock and sets it to the default value of 128.

Parameter	Description
<PRIORITY>	Sets the priority value. Default 128.

Usage

This value can be configured only for the boundary clock.

Examples

Configuring PTP `priority1` value:

```
switch(config-ptp)# priority2 129
switch(config-ptp)#
```

Removing PTP priority2 configuration:

```
switch(config-ptp)# no priority2
switch(config-ptp)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-ptp`	Administrators or local user group members with execution rights for this command.

ptp profile

```
ptp profile {<PROFILE NAME>}
no PTP profile
```

Description

Enters the PTP context to configure the PTP profile in which the device will operate.

Configure PTP profile before configuring mode or other profile-specific parameters. The device can be operating in any one profile at a given point of time.

The `no` form of this command removes the PTP profile configuration in which the device will operate. This command clears the PTP profile and all parameters related to that profile.

Parameter	Description
<PROFILE NAME>	Specifies the profile to be used. Profiles include: ■ 1588v2: Specifies the IEEE 1588-2008 profile to be used. ■ aes-r16: Specifies the IEEE AES-R16-2016 profile to be used. ■ aes67: Specifies the IEEE AES67 profile to be used. ■ smpte: Specifies the IEEE SMPTE-ST-2059-2 profile to be used.

Usage

Configure PTP profile before configuring mode or other profile-specific parameters.

Example

Configuring PTP profiles:

```
switch(config)# ptp profile 1588v2
switch(config-ptp)#
```

Configuring more than one PTP profile:

```
switch(config)# ptp profile 1588v2
switch(config-ptp)# exit
switch(config)# ptp profile smpte
switch(config-ptp)#
The existing profile must be removed using the 'no ptp profile' command before
configuring a different profile.
```

Removing the PTP profile:

```
switch(config-ptp)# no ptp profile
switch(config-ptp)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config`	Administrators or local user group members with execution rights for this command.

ptp announce-interval

```
ptp announce-interval {1588v2| aes67 | aes-r16 | smpte} <LOG-SECONDS>
no ptp announce-interval {1588v2| aes67 | aes-r16 | smpte}
```

Description

Sets the announce message transmit interval on a PTP-enabled interface for a specific PTP profile.

The `no` form of this command removes the announce message transmit interval configuration on a PTP-enabled interface and sets a profile specific default value.

Parameter	Description
`1588v2`	Specifies the PTP 1588v2 profile timers. Default: 1.
`aes67`	Specifies the PTP AES67 profile timers. Default: 1.
`aes-r16`	Specifies the PTP AES-R16 profile timers. Default: 0.
`smpte`	Specifies the PTP SMTPE profile timers. Default: 0.
<LOG-SECONDS>	Sets the announce message interval in log seconds.

For the SMPTE profile, the announce interval default value is set to 0 per the SMPTE ST 2059-2 : 2019 Draft recommendation. Users can modify the announce-interval value to '-2' to support the 2015 version of the same standard.

Usage

This value can be configured only for the boundary clock.

Examples

Setting the PTP AES67 profile timers:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp announce-interval aes67 2
switch(config-if)#
```

Removing the PTP AES67 profile timer configuration:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp announce-interval aes67
switch(config-if)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-if`	Administrators or local user group members with execution rights for this command.

ptp announce-timeout

```
ptp announce-timeout {1588v2| aes67 | aes-r16 | smpte} <COUNT>
no ptp announce-timeout {1588v2| aes67 | aes-r16 | smpte}
```

Description

Sets the announce message receipt timeout on a PTP-enabled interface for a specific PTP profile.

The `no` form of this command resets the announce message receipt timeout configuration on a PTP-enabled interface and sets a profile-specific default value.

Parameter	Description
`1588v2`	Specifies the PTP 1588v2 profile timers. Default: 3.
`aes67`	Specifies the PTP AES67 profile timers. Default: 3.
`aes-r16`	Specifies the PTP AES-R16 profile timers. Default: 3.
`smpte`	Specifies the PTP SMTPE profile timers. Default: 3.
<LOG-SECONDS>	Specifies the number of announcement intervals.

Usage

This value can be configured only for the boundary clock.

Examples

Setting the PTP AES67 profile timer:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp announce-timeout aes67 4
switch(config-if)#
```

Resetting the PTP AES67 profile timer:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp announce-timeout aes67
switch(config-if)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-if`	Administrators or local user group members with execution rights for this command.

ptp delay-req-interval

```
ptp delay-req-interval {1588v2 | aes67 | aes-r16 | smpte} <LOG-SECONDS>
no ptp delay-req-interval {1588v2 | aes67 | aes-r16 | smpte}
```

Description

Sets the delay_req message transmit interval on a PTP-enabled interface for a specific PTP profile.

The `no` form of this command removes the delay_req message transmit interval configuration on a PTP-enabled interface and sets a profile specific default value.

Parameter	Description
`1588v2`	Specifies the PTP 1588v2 profile timers. Default 0.
`aes67`	Specifies the PTP AES67 profile timers. Default 0.
`aes-r16`	Specifies the PTP AES-R16 profile timers. Default 0.
`smpte`	Specifies the PTP SMTPE profile timers. Default -3.
<LOG-SECONDS>	Sets the delay_req message interval in log seconds.

Usage

This value can be configured only for the boundary clock.

Examples

Setting the PTP AES67 profile timers:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp delay-req-interval aes67 1
switch(config-if)#
```

Removing the PTP AES67 profile timer configuration:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp delay-req-interval aes67
switch(config-if)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-if`	Administrators or local user group members with execution rights for this command.

ptp enable

```
ptp enable
no ptp enable
```

Description

Enables PTP on the interface.

The `no` form of this command disables PTP on the interface.

Examples

Enabling PTP on a physical interface:

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

Disabling PTP on the interface context:

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

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-if`	Administrators or local user group members with execution rights for this command.

ptp peer ip

```
ptp peer ip <IP-ADDRESS>
no ptp peer ip <IP-ADDRESS>
```

Description

Configures destination IP addresses for the interfaces in unicast transmission.

The `no` form of this command removes the PTP destination IP address configuration for the interfaces in unicast transmission.

Parameter	Description
`ip <IP-ADDRESS>`	Specifies the peer IPv4 address. Syntax: A.B.C.D

Usage

This command has no effect when configured as a transparent clock.

Example

Configuring `ptp peer ip` on the interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp peer ip 10.0.0.1
```

Removing `ptp peer ip` on the interface:

```
switch(config-if)# no ptp peer ip 10.0.0.1
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-if`	Administrators or local user group members with execution rights for this command.

ptp lag-role

```
ptp lag-role {primary | secondary}
no ptp lag-role
```

Description

Configures the PTP role for the member interfaces of a Link Aggregation (LAG) . When there are two or more member interfaces for a LAG, only one link can be configured as primary and only one other link can be configured as secondary. The primary member interface is used for transmitting the PTP packets generated by the boundary clock. When the primary member goes down, the secondary member is used for PTP packet transmission. If both primary and secondary members go down, PTP does not flip over to the other links of the LAG.

The `no` form of this command removes the PTP role configuration for the LAG member interface.

This command is not supported when configured as a transparent clock.

Parameter	Description
`primary`	Sets the primary PTP lag-role for the LAG member interface.
`secondary`	Sets the secondary PTP lag-role for the LAG member interface.

Usage

- LAG roles must be configured for boundary clock.
- For the primary or secondary LAG roles, ensure that the same link ports are configured on both ends of the LAG.

Examples

Setting the primary PTP lag-role for the LAG member interface:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp lag-role primary
switch(config-if)#
```

Setting the secondary PTP lag-role for the LAG member interface:

```
switch(config)# interface 1/1/2
switch(config-if)# ptp lag-role secondary
switch(config-if)#
```

Removing the PTP lag-role configuration for the LAG member interface:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp lag-role
switch(config-if)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-if`	Administrators or local user group members with execution rights for this command.

ptp sync-interval

```
ptp sync-interval {1588v2| aes67 | smpte} <LOG-SECONDS>
no ptp sync-interval {1588v2 | aes67 | smpte}
```

Description

Sets the sync message transmit interval on a PTP-enabled interface for a specific PTP profile.

The `no` form of this command removes the sync message transmit interval configuration on a PTP enabled interface and sets it to a profile-specific default value.

Parameter	Description
`1588v2`	Specifies the PTP 1588v2 profile timers. Default 0.
`aes67`	Specifies the PTP AES67 profile timers. Default -3.
`smpte`	Specifies the PTP SMTPE profile timers. Default -3
<LOG-SECONDS>	Sets the sync message interval in log seconds.

Examples

Setting the PTP 1588v2 sync interval :

```
switch(config)# interface 1/1/1
switch(config-if)# ptp sync-interval 1588v2 2
switch(config-if)#
```

Setting the PTP AES67 sync interval :

```
switch(config)# interface 1/1/1
switch(config-if)# ptp sync-interval aes67 -2
switch(config-if)#
```

Removing the PTP AES67 sync interval:

```
switch(config)# interface 1/1/1
switch(config-if)# no ptp sync-interval aes67
switch(config-if)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-if`	Administrators or local user group members with execution rights for this command.

ptp vlan

`ptp vlan` *<VLAN-ID>*
`no ptp vlan`

Description

Configures a VLAN for PTP messages. It is necessary when the boundary clock port is a VLAN trunk L2 interface (`no routing`).

The `no` form of this command removes the VLAN configuration for PTP messages.

Parameter	Description
<VLAN-ID>	Specifies a VLAN. Range: 1-4094.

Usage

- This configuration has no bearing on the one-step transparent clock.
- In boundary clock mode, only PTP packets in PTP VLAN are processed; PTP packets from other VLANs are dropped.
- `ptp vlan` should be configured on interfaces only when the specific VLAN is a trunk/tagged member of that port. This configuration should not be performed on an access port.

Examples

Configuring a specific VLAN for PTP messages:

```
switch(config)# interface 1/1/1
switch(config-if)# ptp vlan 4
switch(config)#
```

Removing the VLAN configuration for PTP messages:

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

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-if`	Administrators or local user group members with execution rights for this command.

show ptp clock

`show ptp clock`

Description

Shows PTP clock-related information.

Example

Showing PTP boundary clock information:

```
switch # show ptp clock
```

```
PTP Profile                          : aes67
PTP Mode                             : boundary
Delay Mechanism                      : end-to-end
Clock Identity                       : 00:fd:45:ff:fe:68:f3:00
Network Transport Protocol           : ipv4
Clock Step                           : Two
Clock Domain                         : 0
Number of PTP Ports                  : 3
Priority1                            : 128
Priority2                            : 128

Clock Quality :
  Class                              : 248
  Accuracy                           : 49
  Offset (log variance)              : 52592

Offset From Clock-Source             : - 0.000000006  (s)
Mean Delay                           : + 0.000000277  (s)
Steps Removed                        : 1
```

Showing PTP transparent clock information:

```
switch# show ptp clock
PTP Profile                          : smpte
PTP Mode                             : transparent
Delay Mechanism                      : end-to-end
Clock Identity                       : NA
Network Transport Protocol           : ipv4
Clock Step                           : One
Clock Domain                         : NA
Number of PTP Ports                  : 1
Priority1                            : NA
Priority2                            : NA
Clock Quality :
  Class                              : NA
  Accuracy                           : NA
  Offset (log variance)              : NA
Offset From Clock-Source             : NA
Mean Delay                           : NA
Steps Removed                        : NA
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	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 ptp foreign-clock-sources

```
show ptp foreign-clock-sources
```

Description

Shows the priority1, priority2, class, accuracy, offset-scaled-log-variance (OSLV), and steps removed information for foreign clock-source nodes.

Example

Showing PTP foreign clock-source information:

```
switch(config-if)# show ptp foreign-clock-sources
P1=Priority1, P2=Priority2, C=Class, A=Accuracy,
OSLV=Offset-scaled-log-variance, SR=Steps-removed

---------- -------------------------------- ------------------------ ---- ---- ---- ---- ------ --
-
Interface  Foreign Port ID                  Clock Source ID          P1   P2   C    A    OSLV   SR
---------- -------------------------------- ------------------------ ---- ---- ---- ---- ------ --
-
1/1/4      00:00:00:00:00:00:00:01(0x0001)  00:00:00:00:00:00:00:01  0    0    6    35   0      1
1/1/5      b4:99:ba:ff:fe:54:2b:00(0x0002)  00:00:00:00:00:00:00:01  0    0    6    35   0      2
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	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 ptp interface

```
show ptp interface [<IFNAME> | [brief]
```

Description

Shows PTP port-related information.

Parameter	Description
<IFNAME>	Specifies the interface name.
brief	Shows information in a brief format.

Examples

Showing PTP port information (when the switch is acting as a boundary clock):

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

```
Interface : 1/1/1
Port Identity                          : 88:3a:30:ff:fe:05:c9:80 (port: 0x0002)
Port Number                            : 2
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ethernet
Port State                             : Clock Source
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : 0

switch# show ptp interface lag1
Port Identity                          : 00:fd:45:ff:fe:68:f3:00 (port: 0x0002)
Port Number                            : 2
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Clock Source
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : -3
Primary Interface                      : 1/1/5
Secondary Interface                    : 1/1/6

switch # show ptp interface
Interface lag20:
Port Identity                          : 00:fd:45:ff:fe:68:f3:00 (port: 0x0002)
Port Number                            : 2
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Clock Source
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : -3
Primary Interface                      : 1/1/5
Secondary Interface                    : 1/1/6

Member Interface 1/1/5:
Port Identity                          : 00:fd:45:ff:fe:68:f3:00 (port: 0x0002)
Port Number                            : 2
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Running
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : -3

Member Interface 1/1/6:
```

```
Port Identity                          : 00:fd:45:ff:fe:68:f3:00 (port: 0x0003)
Port Number                            : 3
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Not Running
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : -3

Interface 1/1/15:
Port Identity                          : 00:fd:45:ff:fe:68:f3:00 (port: 0x0001)
Port Number                            : 1
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Clock Sink
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : 0
Announce Receipt Timeout               : 3
Sync Interval (log mean)               : -3
Sync Timeout                           : NA
Delay Request Interval (log mean)      : -3
```

Showing PTP port information (when the switch is acting as a transparent clock):

```
switch # show ptp interface 1/1/1
Port Identity                          : NA
Port Number                            : NA
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : Running
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : NA
Announce Receipt Timeout               : NA
Sync Interval (log mean)               : NA
Sync Timeout                           : NA
Delay Request Interval (log mean)      : NA
switch#

switch # show ptp interface lag20
Port Identity                          : NA
Port Number                            : NA
PTP Version                            : 2
PTP Enable                             : Enabled
Transport of PTP                       : ipv4
Port State                             : NA
Delay Mechanism                        : end-to-end
Announce Interval (log mean)           : NA
Announce Receipt Timeout               : NA
Sync Interval (log mean)               : NA
Sync Timeout                           : NA
Delay Request Interval (log mean)      : NA
switch#
```

Showing PTP port information in brief format:

```
switch# show ptp interface brief
Interface    PTP State
-------------------------
1/1/11       Clock Source
1/1/12       Clock Sink
1/1/13       Passive
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	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 ptp parent

```
show ptp parent
```

Description

Shows parent node information for the PTP device.

Example

Showing PTP parent node information:

```
switch# show ptp parent
PTP Parent Properties

Parent Clock
----------------------------
Parent Clock Identity                  : 00:00:00:00:00:00:00:01
Parent Port Number                     :  0x0001
Observed Parent Offset (log variance)  : 65535
Observed Parent Clock Phase Change Rate: 2147483647

Grandsource Clock
----------------------------
Grandsource Clock Identity             : 00:00:00:00:00:00:00:01
Grandsource Clock Quality
  Class                                : 6
  Accuracy                             : 35
  Offset (log variance)                : 0
Priority1                              : 0
Priority2                              : 0
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	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 ptp statistics

```
show ptp statistics [<IFNAME>]
```

Description

Shows PTP port statistics.

Parameter	Description
<IFNAME>	Optional. Specifies the interface name.

Examples

Showing PTP port statistics:

```
switch# show ptp statistics

PTP Interface Statistics

                  Received Packets    Sent Packets    Discarded Packets    Lost
Packets
Interface: 1/1/15
    Announce                     0            1019                    0
0
    Sync                         0            2038                    0
0
    Signaling                    0               0                    0
0
    DelayReq                     0               0                    0
0
    DelayResp                    0               0                    0
0
    FollowUp                     0               0                    0
0
    Management                   0               0                    0
0

                  Received Packets    Sent Packets    Discarded Packets    Lost
Packets
Interface: 1/1/16
    Announce                     0            1019                    0
0
    Sync                         0            2038                    0
```

```
0
    Signaling                   0               0                   0
0
    DelayReq                    0               0                   0
0
    DelayResp                   0               0                   0
0
    FollowUp                    0               0                   0
0
    Management                  0               0                   0
0
```

Showing PTP port statistics for the specified interface:

```
switch# show ptp statistics 1/1/15

PTP Interface Statistics

                 Received Packets    Sent Packets    Discarded Packets    Lost
Packets
Interface: 1/1/15
    Announce                    0            1024                    0
0
    Sync                        0            2048                    0
0
    Signaling                   0               0                    0
0
    DelayReq                    0               0                    0
0
    DelayResp                   0               0                    0
0
    FollowUp                    0               0                    0
0
    Management                  0               0                    0
0
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	Manager (#)	Administrators or local user group members with execution rights for this command.

show ptp time-property

```
show ptp time-property
```

Description

Shows PTP clock-time properties for the PTP device.

Example

Showing PTP clock time properties:

```
switch # show ptp time-property
PTP Clock Time Property
---------------------------
Current UTC Offset Valid  : FALSE
Current UTC Offset        : 37
Leap59                    : FALSE
Leap61                    : FALSE
Time Traceable            : FALSE
Frequency Traceable       : FALSE
PTP Timescale             : FALSE
Synchronization Uncertain : FALSE
Time Source               : 160
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	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.

transport-protocol

```
transport-protocol {ethernet | ipv4}
no transport-protocol
```

Description

Sets the transport protocol for PTP packets. In the case of IPv4, the UDP check-sum is reset.

There is no default transport-protocol. The `no` form of this command disconnects the clock from its source.

Parameter	Description
`ethernet`	Specifies the Ethernet (Layer 2) transport protocol.
`ipv4`	Specifies the IPv4 transport protocol.

Usage

Mandatory command to start the PTP clock.

Example

Setting the Ethernet transport protocol for PTP packets:

```
switch(config-ptp)# transport-protocol ethernet
```

```
switch(config-ptp)#
```

Removing the transport protocol for PTP packets:

```
switch(config-ptp)# no transport-protocol
switch(config-ptp)#
```

Command History

Release	Modification
10.08	Command introduced.

Command Information

Platforms	Command context	Authority
8360	`config-ptp`	Administrators or local user group members with execution rights for this command.

Recommendations for configuration

PTP CoPP class configuration recommendations

Configuration recommendations for a boundary clock

The PTP CoPP class must be adjusted based on the number of clients associated with the boundary clock and the configured packet rate. For example, if there are 1000 clients with a configured packet rate of 2pps, and a default CoPP limit of 1000, packet drops will be observed. In such instances the CoPP limit should be increased to more than 2000.

The `show copp statistics class ptp` command can be used to monitor whether the CoPP policy must be adjusted. For example:

```
Statistics for CoPP policy 'default':
Class: ptp
Description: Precision Time Protocol (PTP) .
    priority             : 5
    rate (pps)           : 1000
    burst size (pkts)    : 250

    packets passed   : 611153             packets dropped  : 0
```

QoS prioritization configuration recommendation for transparent clock

```
class ip PTP
    10 match udp any any eq 319 count
policy PTP-POL
    10 class ip PTP action local-priority 6
policy test
```

```
interface lag 240
    apply policy PTP-POL in
interface 1/1/26
    apply policy PTP-POL in
interface 2/1/26
    apply policy PTP-POL in
```

PTP Event messages carrying a critical timestamp use UDP port 319.

General guidelines for PTP IPv4 multicast

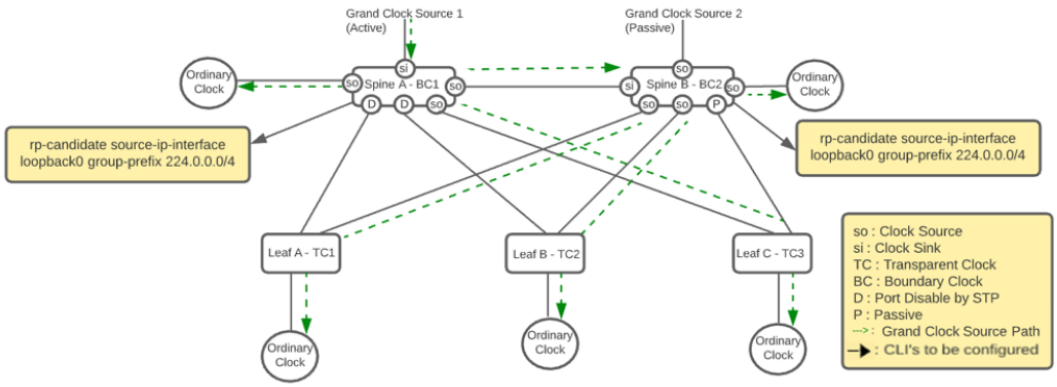
- For IP multicast-based PTP time distribution, it is recommended to use PIM Sparse-Mode.
- When connecting Transparent Clock (TC) and Boundary Clock (BC), ensure that the TC becomes the DR by setting the DR priority.
- Ensure the mroutes are programmed on TCs so that there is reachability for PTP streams from the upstream.
- Configure static-igmp groups on TCs if the clients themselves cannot send IGMP joins for the PTP multicast group.
- The `QoS trust dscp` command needs to be explicitly configured on all non-BC switches in the network to ensure that the incoming DSCP value of PTP traffic is honored.

Use cases

The use cases provide additional PTP configuration recommendations.

Use case 1: PTP – IPv4 over L2 – Spine Leaf Topology

Figure 2 *Grand clock source connected to boundary clock (spines), followed by transparent clock leaves*



The following considerations and best practices are recommended for the topology in :

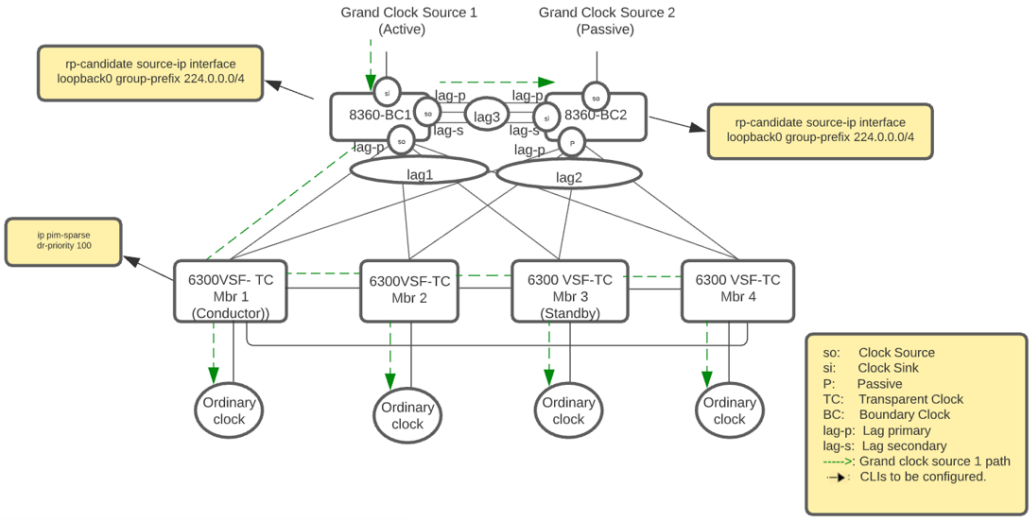
- Configure candidate-RP on switches that are connected to a grand clock source. In the above topology, the candidate-RP needs to be configured on the BC1 Spine A and BC2 Spine B.
- When the PTP clients are not capable of sending IGMP joins, be sure to configure `ip igmp snooping static-group 224.0.1.12` on the VLAN interface of a TC, where PTP is configured.

In this case, it is an L2 switch in leaf so `ip igmp snooping enable` also needs to be configured on the transparent clock VLAN interface.

- Ensure that `ip source-interface ptp <ip | interface information>` is configured on both BC switches. (VLAN interface where PTP is configured.)
- Ensure that `spanning tree` is configured in the above topology to avoid the loop. On the Aruba 6300 TC Switches, `spanning tree` is enabled by default; it needs to be explicitly configured on the Aruba 8360 BC Switches.
- It is recommended to have VRRP on boundary clock 8360 switches to have L3 redundancy for PTP end clients.

Use case 2: PTP – BC and TC (VSF) topology connected via LAG

Figure 3 *Grand clock source connected to a boundary clock serving time to other boundary clocks and VSF transparent clocks in the network*



The following considerations and best practices are recommended for the topology in :

- Configure candidate-RP on switches that are connected to a grand clock source. In this topology, the Candidate-RP needs to be configured on the BC1 and BC2 switches. Each candidate-RP controls multicast traffic forwarding for one or more multicast groups.
- When the PTP clients are not capable of sending IGMP joins, ensure that `ip igmp static-group 224.0.1.129` is configured on all PTP-enabled interfaces of a TC.

`igmp static-group` config is not needed on boundary clock switches. In this case, it is an L3 network so `ip igmp enable` also needs to be configured on all PTP enabled L3 interfaces of the transparent clock.

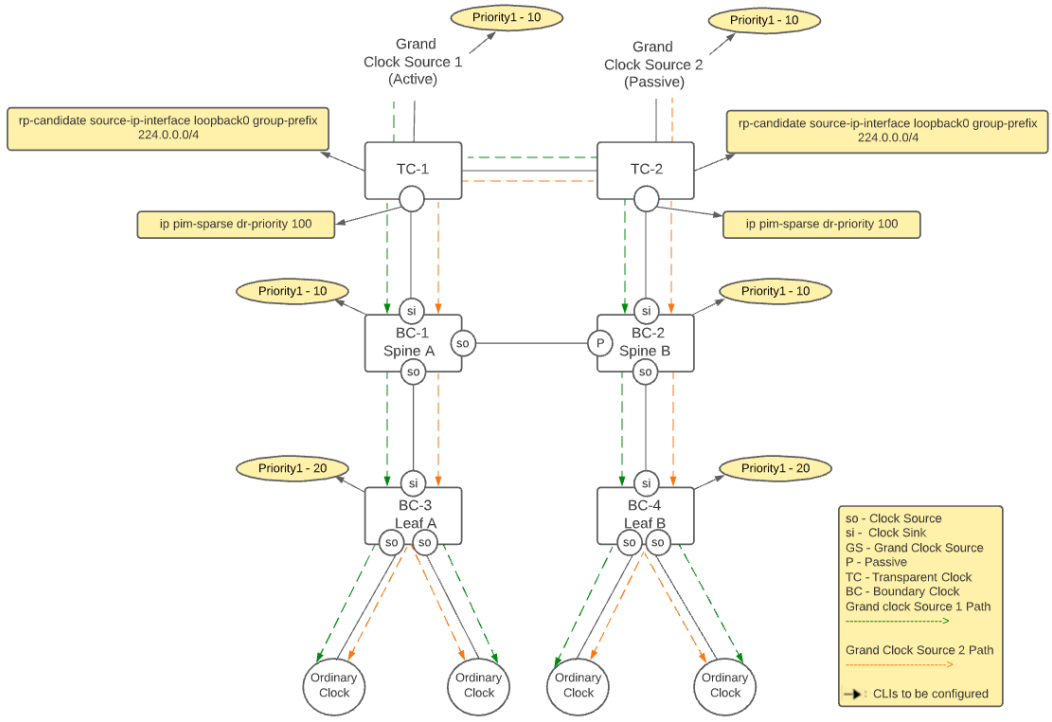
- For the primary or secondary LAG roles, ensure that the same link ports are configured on both ends of the LAG across BC (this command is applicable only on BC switches).

When both the primary and secondary LAG role links are down, PTP packets will not be forwarded even if other LAG links are up.

- Configure `ip pim-sparse dr-priority <value>` in order to configure higher dr-priority on the links originating from the VSF (which are facing the BC switches).

Use case 3: PTP – L3 spine leaf topology

Figure 4 *Grand clock source connected to transparent clock, followed by boundary clock spines and boundary clock leaves*



The following considerations and best practices are recommended for the topology in :

- Configure candidate-RP on switches which are connected to a grand clock source. In this topology, candidate-RP needs to be configured on TC1 and TC2. Each candidate-RP controls multicast traffic forwarding for one or more multicast groups.
- Configure higher DR priority on switches in which candidate-RP is configured. In this topology, the DR priority needs to be configured on the TC1 and TC2 on the BC facing ports.
- When the PTP clients are not capable of sending IGMP joins, ensure that `ip igmp static-group 224.0.1.129` is configured on all PTP-enabled interfaces of a TC.
- The `igmp static-group` configuration is not needed on BC switches. In this case, it is an L3 network so `ip igmp enable` also needs to be configured on all PTP-enabled L3 interfaces of the TC.

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	▪ CLI ▪ JSON ▪ Checkpoint
Startup configuration	▪ 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
<TIME-LAPSE-INTERVAL>	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<YYYYMMDDHHMMSS>`. 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<YYYYMMDDHHMMSS>`. 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 ArubaOS-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 ArubaOS-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
```

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 | sftp}://*<IP-ADDRESS>*[:*<PORT-NUMBER>*] [;blocksize=*<BLOCKSIZE-VALUE>*]/*<FILE-NAME>*
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
<CHECKPOINT-NAME>	Specifies the name of an existing checkpoint.
`{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.

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
<CHECKPOINT-NAME>	Specifies the name of the checkpoint to copy. The checkpoint name can be alphanumeric. It can also contain underscores (_) and dashes (-).
<STORAGE-URL>>	Specifies the name of the target file on the USB drive using the following syntax: `usb:/<FILE>` 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
<REMOTE-URL>	Specifies a remote file using the following syntax: {tftp | sftp}://*<IP-ADDRESS>*[:*<PORT-NUMBER>*] [;blocksize=*<BLOCKSIZE-VALUE>*]/*<FILE-NAME>*>
<CHECKPOINT-NAME>	Specifies the name of the target checkpoint. The checkpoint name can be alphanumeric. It can also contain underscores (_) and dashes (-). Required. **NOTE:** Do not start the checkpoint name with CPC because it is used for system-generated checkpoints.
vrf *<VRF-NAME>*	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
<REMOTE-URL>	Specifies a remote file with the following syntax: `{tftp | sftp}://`*<IP-ADDRESS>*`[:`*<PORT-NUMBER>*`] [;blocksize=`*<BLOCKSIZE-VALUE>*`]/`*<FILE-NAME>*
`{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.
```

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 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

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 | sftp}://`*`<IP-ADDRESS>`*`[:`*`<PORT-NUMBER>`*`] [;blocksize=`*`<BLOCKSIZE-VALUE>`*`]/`*`<FILE-NAME>`*
`{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> 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 {checkpoint <*CHECKPOINT-NAME*> | startup-config | all}

```
erase {checkpoint <CHECKPOINT-NAME> | startup-config | all}
```

Description

Deletes an existing checkpoint, startup configuration, or all checkpoints.

Parameter	Description
`checkpoint` *<CHECKPOINT-NAME>*	Specifies the name of a checkpoint.
startup-config	Specifies the startup configuration.
all	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 ArubaOS-CX PL.10.07.0000K-75-g55e5193
!export-password: default
lacp system-priority 65535
user admin group administrators password ciphertext
AQBapQjwipebv36io0jFfde7ZzrHckncal1D+3n8XFTZKQdmYgAAADEtYOeHSme93xzdD0uz6Vr9Kl+XBzB+
2GB0UBxSF7rvgN2x8KSgkqv7iqXVQ0Te6LkSMnH4BdNaT3Bf25qyvOqmr4YakO1V3rg8zAOADkPktQD8joTH
XflzwomoIzcmv/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
<START-DATE>	Specifies the starting date for the range of saved checkpoints to show. Format: `YYYY-MM-DD`.
<END-DATE>	Specifies the endingdate 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 `show checkpoint list date <START-DATE> <END-DATE>` is replaced with `show checkpoint date <START-DATE> <END-DATE>`
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
`[cli | json]`	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.
```

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

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

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

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

Canceling a system reboot:

```
switch# boot system

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

show boot-history

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

Description

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

Parameter	Description
`all`	Shows boot information for the active management module and all available line modules.

Usage

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

`Index`
The position of the boot in the history file. Range: 0 to3.

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

Current Boot, up for *<SECONDS>* seconds
For the current boot, the `show boot-history` command shows the number of seconds the module has been running on the current software.

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

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

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

`Reboot requested through database`
The reboot occurred because of a request made through the CLI or other API.

`Uncontrolled reboot`
The reason for the reboot is not known.

Examples

Showing the boot history of the active management module:

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

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

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

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

Index : 0
Boot ID : 23da2b0e26d048d7b3f4b6721b69c110
```

```
07 Aug 18 13:00:46 : Reboot requested through database
switch#
```

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

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

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

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

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

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

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 or TFTP. For information on how to format the remote URL, see URL formatting for copy commands.
`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

Parameter	Description
<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> {primary | secondary} [vrf <VRF-NAME>]`

Description

Downloads and installs a 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:
	`tftp://<IP-ADDR>[:<PORT-NUM>] [;blocksize=<Value>]/<FILENAME>`
	SFTP format:
	`sftp://<USERNAME>@<IP-ADDR> [:<PORT-NUM>]/<FILENAME>`

`{primary | secondary}`	Selects the primary or secondary image profile for receiving the downloaded firmware. Required.
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

TFTP usage

To specify a URL with:

- an IPv4 address: `tftp://1.1.1.1/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://1.1.1.1:12/a.txt`
- the blocksize in the URL: `tftp://1.1.1.1;blocksize=1462/a.txt`
  The valid blocksize range is 8 to 65464.
- the port number of the server and blocksize in the URL: `tftp://1.1.1.1:12;blocksize=1462/a.txt`

To specify a file in a directory of URL: `tftp://1.1.1.1/dir/a.txt`

SFTP usage

To specify:

- A URL with an IPv4 address: `sftp://user@1.1.1.1/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@1.1.1.1:12/a.txt`

- A file in a directory of URL: `sftp://user@1.1.1.1/dir/a.txt`
- To specify a file with absolute path in the URL: `sftp://user@1.1.1.1//home/user/a.txt`

Examples

TFTP download:

```
switch#  copy tftp://192.10.12.0/ss.10.00.0002.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/ss.10.00.0002.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
10.07 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:MyI1xbdKnehYut0NLfL69gDpNzCmZqBVvBaRR46m7o8.
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> {primary | secondary}`

Description

Copies, verifies, and installs a 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>*
{primary | secondary}	Selects the primary or secondary image profile for receiving the copied firmware.

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:/11.10.00.0002.swi primary
The primary 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.

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.

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.

Custom CA certificate

To use custom CA certificate to connect to Aruba Central, AOS-CX switch downloads the certificate from 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
- 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.

Aruba Central commands

aruba-central

```
aruba-central
no aruba-central
```

Description

Creates or enters the Aruba Central configuration context (`config-aruba-central`).

Example

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

Creating the Aruba Central configuration context:

```
switch(config)# aruba-central
switch(config-aruba-central)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	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 Central 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 Central. 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 Central lockout mode:

```
switch# aruba-central support-mode
switch#
```

Removing the configuration that allows the device to be writable for all operations in Aruba Central lockout mode:

```
switch# no aruba-central support-mode
switch#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	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 Central. Aruba Central 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 Central.

Usage

The AOS-CX switch connects to Aruba Central in either of two modes: monitor or managed. When the device is connected in monitor mode, Aruba Central 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 Central :

```
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
8320 8325 8360	`config`	Administrators or local user group members with execution rights for this command.

disable

`disable`

Description

Disables connection to Aruba Central server.

When the connection is disabled, the switch does not attempt to connect to the Aruba Central server or fetch central location from any of the three sources (CLI/Aruba Activate/DHCP). It also disconnects any active connection to the Aruba Central 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
8320 8325 8360	`config-aruba-central`	Administrators or local user group members with execution rights for this command.

enable

`enable`

Description

Enables connection to Aruba Central server. When the connection is enabled, the switch attempts to download the location of the Aruba Central 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 managment, or the TFTP server.

Examples

```
switch(config-aruba-central)# enable
switch(config-aruba-central)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	`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 Central. The switch attempts to establish connection to Aruba Central with the specified location and VRF with highest priority.

The `no` form of this command removes location override values from the Aruba Central configuration context.

Parameter	Description
<location>	Specifies one of these values: ■ *<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)#
```

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 Central configuration context:

```
switch(config-aruba-central)# no location-override
switch(config-aruba-central)#
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	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 Central connection and the status of the Activate server connection.

Examples

Example of a switch that has the Aruba Central connection:

```
switch# show aruba-central
Central admin state                    :enabled
Central location                       : N/A
VRF for connection                     : N/A
Central connection status              : N/A
Central source                         : dhcp
Central source connection status       : connection_failure
Central source last connected on       : N/A
System time synchronized from Activate : True
Activate server URL                    : 172.17.0.1
CLI location                           : N/A
CLI VRF                                : N/A
Source IP                              : N/A
Source IP Overridden                   : false
Central support mode                   : disabled
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	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 current-context

`show running-config current-context`

Description

Shows the running configuration for the current-context. If user is in the context of Aruba-Central(`config-aruba-central`), then Aruba Central running configuration is displayed.

Examples

Shows the running configuration of Aruba Central:

```
switch(config-aruba-central)# show running-config current-context
aruba-central
       disable
```

Command History

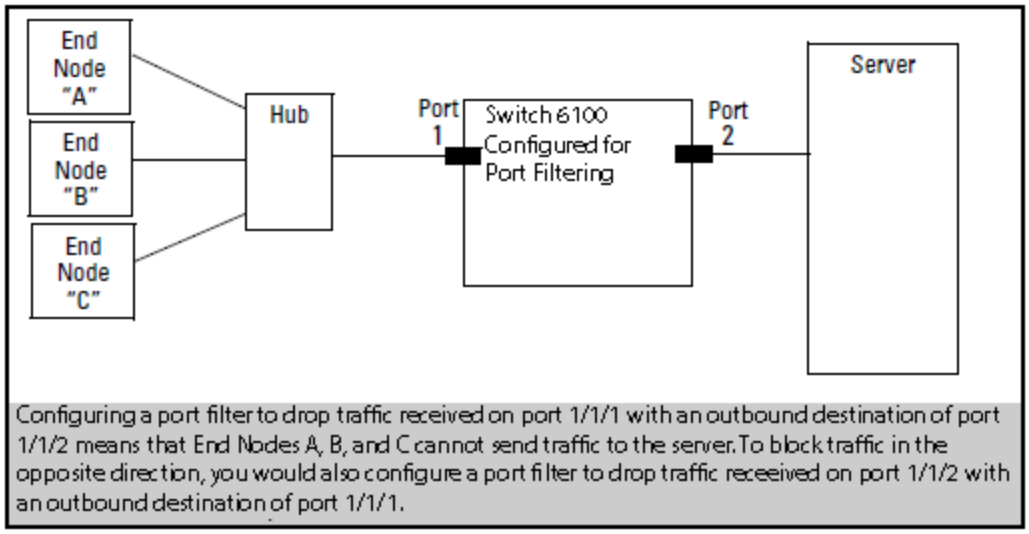
Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	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.

Port filtering is a feature in which packets that are ingressed through a source port can be blocked for egressing on a specific set of ports.

Figure 5 *Port Filter Application*



;" />

Port filtering commands

portfilter

```
portfilter <INTERFACE-LIST>
no portfilter [<INTERFACE-LIST>]
```

Description

Configures the specified ports so they do not egress any packets that were received on the source port specified in interface context.

The `no` form of this command removes the port filter setting from one or more ingress ports/LAGs.

Parameter	Description
<INTERFACE-LIST>	Specifies a list of ports/LAGs to be blocked for egressing. Specify a single interface or LAG, or a range as a comma-separated list, or both. For example: `1/1/1`, `1/1/3-1/1/6`,`lag2`, `lag1-lag4`.

Usage

When a port filter configuration is applied on the same ingress physical port/LAG, the configuration is updated with the new sets of egress ports/LAGs that are to be blocked for egressing and that are not a part of its previous configuration. Duplicate updates on an existing port filter configuration are ignored.

When egress ports/LAGs are removed from the existing port filter configuration of an ingress port/LAG, egressing is allowed again on those egress ports/LAGs for all packets originating from the ingress port/LAG.

The `no portfilter [<IF-NAME-LIST>]` command removes port filter configurations from the egress ports/LAGs listed in the *<IF-NAME-LIST>* parameter only. All other egress ports/LAGs in the port filter configuration of the ingress port/LAG remain intact.

If no physical ports or LAGs are provided for the `no portfilter` command, the command removes the entire port filter configuration for the ingress port/LAG.

Examples

Creating a filter that prevents packets received on port **1/1/1** from forwarding to ports **1/1/3-1/1/6** and to LAGs **1** through **4**:

```
switch(config)# interface 1/1/1
switch(config-if)# portfilter 1/1/3-1/1/6,lag1-lag4
```

Creating a filter that prevents packets received on LAG **1** from forwarding to ports **1/1/6** and LAGs **2** and **4**:

```
switch(config)# interface lag 1
switch(config-lag-if)# portfilter 1/1/6,lag2,lag4
```

Removing filters from an existing configuration that allows back packets received on port **1/1/1** to forward to ports **1/1/6** and LAGs **3** and **4**:

```
switch(config)# interface 1/1/1
switch(config-if)# no portfilter 1/1/6,lag3,lag4
```

Removing all filters from an existing configuration that allows back packets received on LAG **1** to forward to all the ports and LAGs:

```
switch(config)# interface lag 1
switch(config-lag-if)# no portfilter
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

show portfilter

`show portfilter [<IFNAME>][vsx-peer]`

Description

Displays filter settings for all interfaces or a specific interface.

Parameter	Description
<IFNAME>	Specifies the ingress interface name. Specifies one of these values: ■ *<FQDN>*: a fully qualified domain name. ■ *<IPV4>*: an IPv4 address. ■ *<IPV6>*: an IPv6 address.
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Displaying all port filter settings on the switch:

```
switch# show portfilter
Incoming   Blocked
Interface  Outgoing Interfaces
-------------------------------------------------------------------------------
1/1/1      1/1/3-1/1/6,lag1-lag2
1/1/3      1/1/1,1/1/5,1/1/7,1/1/9,1/1/11,1/1/13,1/1/15,1/1/17,1/1/19,1/1/21,
           1/1/23,1/1/25,1/1/27,1/1/29,1/1/31,1/1/33,1/1/35
lag2       1/1/1,1/1/3-1/1/6
```

Displaying the port filter settings for port **1/1/1**:

```
switch# show portfilter 1/1/1
Incoming   Blocked
Interface  Outgoing Interfaces
-------------------------------------------------------------------------------
1/1/1      1/1/3-1/1/6,lag1-lag2
```

Displaying the port filter settings for **LAG2**:

```
switch# show portfilter lag2
Incoming   Blocked
Interface  Outgoing Interfaces
-------------------------------------------------------------------------------
lag2       1/1/1,1/1/3-1/1/6
```

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.

The Domain Name System (DNS) is the Internet protocol for mapping a hostname to its IP address. 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.

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
```

This example creates the following configuration:

- Defines three domains to append to DNS requests **domain1.com**, **domain2.com**, **domain3.com** with traffic forwarding on VRF **mainvrf**.
- Defines a DNS server with an IPv6 address of **c::13**.
- Defines a DNS host named **myhost** with an IPv4 address of **3.3.3.3**.

```
switch(config)# ip dns domain-list domain1.com vrf mainvrf
switch(config)# ip dns domain-list domain2.com vrf mainvrf
switch(config)# ip dns domain-list domain3.com vrf mainvrf
switch(config)# ip dns server-address c::13
switch(config)# ip dns host myhost 3.3.3.3 vrf mainvrf
switch(config)# quit
switch# show ip dns mainvrf

VRF Name : mainvrf
Domain Name :
DNS Domain list : domain1.com, domain2.com, domain3.com
Name Server(s) : c::13

Host Name                                                                    Address
-------------------------------------------------------------------------------------
myhost                                                                       3.3.3.3
```

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
`list <DOMAIN-NAME>`	Specifies a domain name. Up to six domains can be added to the list. Length: 1 to 256 characters.
`vrf <VRF-NAME>`	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 defines a list with two entries, **domain2.com** and **domain5.com**, with requests being sent on **mainvrf**.

```
switch(config)# ip dns domain-list domain2.com vrf mainvrf
switch(config)# ip dns domain-list domain5.com vrf mainvrf
```

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	`config`	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
<DOMAIN-NAME>	Specifies the domain name to append to DNS requests. Length: 1 to 256 characters.
`vrf` *<VRF-NAME>*	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>][vsx-peer]`

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.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

These examples define DNS settings and then show how they are displayed with the `show ip dns` command.

```
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 host2 2.2.2.2
switch(config)# ip dns host host3 c::12
switch(config)# ip dns domain-name reddomain.com vrf red
switch(config)# ip dns domain-list reddomain5.com vrf red
switch(config)# ip dns domain-list reddomain8.com vrf red
switch(config)# ip dns server-address 4.4.4.5 vrf red
switch(config)# ip dns server-address 6.6.6.7 vrf red
switch(config)# ip dns host host3 5.5.5.6 vrf red
switch(config)# ip dns host host2 2.2.2.3 vrf red
switch(config)# ip dns host host3 c::13 vrf red
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
------------------------------
host2            2.2.2.2
host3            5.5.5.5
host3            c::12

VRF Name : red

Domain Name : reddomain.com
DNS Domain list : reddomain5.com, reddomain8.com
Name Server(s) : 4.4.4.5, 6.6.6.7

Host Name    Address
------------------------------
host2            2.2.2.3
host3            5.5.5.6
host3            c::13
```

```
switch(config)# ip dns domain-name domain.com vrf red
switch(config)# ip dns domain-list domain5.com vrf red
switch(config)# ip dns domain-list domain8.com vrf red
switch(config)# ip dns server-address 4.4.4.4 vrf red
switch(config)# ip dns server-address 6.6.6.6 vrf red
switch(config)# ip dns host host3 5.5.5.5 vrf red
switch(config)# no ip dns host host2 2.2.2.2 vrf red
switch(config)# ip dns host host3 c::12 vrf red

switch# show ip dns vrf red
VRF Name : red

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
```

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.

The switch provides support for LLDP and CDP to enable automatic discovery and configuration of other devices on the network.

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)

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).

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 holdtime

```
lldp holdtime <TIME>
no lldp holdtime
```

Description

Sets the holdtime 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 to its default value of 4.

Parameter	Description
<TIME>	Specifies the holdtime in seconds. Range: 2 to 10. Default: 4.

Examples

Setting the holdtime to 8 seconds:

```
switch(config)# lldp holdtime 8
```

Setting the holdtime to the default value of 4 seconds:

```
switch(config)# no lldp holdtime
```

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 management-ipv4-address

```
lldp management-ipv4-address <IPV4-ADDR>
no lldp management-ipv4-address
```

Description

Defines the IPv4 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
<IPV4-ADDR>	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-ipv4-address 10.10.10.2
```

Removing the management address:

```
switch(config)# no lldp management-ipv4-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 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
<IPV6-ADDR>	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
`poe [priority-override]`	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.
`capability`	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.
`network-policy`	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	`config-if`	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
`civic-addr`	Configures the LLDP MED civic location TLV.
`elin-addr`	Configures support for the LLDP MED emergency location TLV.

Examples

Enabling support for the LLDP MED emergency location TLV:

```
switch(config-if)# lldp med-location elin-addr gher
```

Disabling support for the LLDP MED emergency location TLV:

```
switch(config-if)# no lldp med-location elin-addr gher
```

Enabling support for the LLDP MED civic address TLV:

```
switch(config-if)# lldp med-location civic-addr US 1 4 ret 6 tyu 7 tiyuo
```

Disabling support for the LLDP MED civic address TLV:

```
switch(config-if)# no lldp med-location civic-addr US 1 4 ret 6 tyu 7 tiyuo
```

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.

Parameter	Description
`select-tlv` *<TLV-NAME>*	Specifies the TLV name to send. The following TLV names are supported: ■ `management-address`: Selected as follows: 1. IPv4 or IPV6 management address. 2. IP address of the lowest configured loopback interface. 3. If layer 3, then the route-only port IP address. If layer 2, the IP address of the SVI. 4. OOBM interface IP address. 5. Base MAC address of the switch. ■ `port-description`: A description of the port. ■ `port-vlan-id`: VLAN ID assigned to the port. ■ `system-capabilities`: Identifies the primary switch functions that are enabled, such as routing. ■ `system-description`: Description of the system, comprised of the following information: hardware serial

Parameter	Description
	number, hardware revision number, and firmware version. ■ `system-name`: Host name assigned to the switch.

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 port-description
```

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
<TIME>	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 transmit

```
lldp transsmit
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 transsmit
```

Disabling LLDP transmission on interface **1/1/1**:

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

Enabling LLDP transmission on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# lldp transsmit
```

Disabling LLDP transmission on the OOBM interface:

```
switch(config)# interface mgmt
switch(config-if)# no lldp transsmit
```

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>][vsx-peer]`

Description

Shows LLDP configuration settings for all interfaces or a specific interface.

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

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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
=======================
PORT            TX-ENABLED          RX-ENABLED          INTF-TRAP-ENABLED
-------------------------------------------------------------------------
1/1/1           Yes                 Yes                 Yes
```

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 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
8320 8325 8360	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[vsx-peer]
```

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.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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      : Aruba 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      : 0

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>][vsx-peer]`

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`).
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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          :
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          :
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          :
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          :
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
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
TTL                            : 120
```

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 [vsx-peer]
```

Description

Shows detailed LLDP neighbor information for all LLDP neighbor connected interfaces.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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
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
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
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
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                            : 1/1/47
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
Neighbor Port VLAN ID           :
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
Neighbor Port VLAN ID           :
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          :
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          :
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          :
TTL                            : 120
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	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>][vsx-peer]`

Description

Shows global LLDP statistics or statistics for a specific interface.

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

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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
8320 8325 8360	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[vsx-peer]
```

Description

Shows the LLDP TLVs that are configured for send and receive.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

```
switch# show lldp tlv

TLVs Advertised
===============

Management Address
Port Description
Port VLAN-ID
System Capabilities
System Description
System Name
```

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 1/1/1
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`	Administrators or local user group members with execution rights for this command.

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
Port        Device ID               Platform                Capability
--------------------------------------------------------------------------------
1/1/1       myswitch                cisco WS-C2950-12       SI
```

Showing CDP information for interface **1/1/1**:

```
switch(config)# show cdp neighbor-info 1/1/1
Local Port : 1/1/1
MAC                : 3c:a8:2a:7b:6b:2b
Device ID          : SEPd4adbd2a30d6
Address            : 2.71.0.230
Platform           : Cisco IP Phone 3905
Duplex             : full
Capability         : host
Voice VLAN Support : Yes
Neighbor Port-ID   : Port 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 cdp traffic

`show cdp neighbor-info`

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

DCBx is a discovery and capability exchange protocol to discover peers and negotiate Data Center Bridging configuration. DCBx is specified as part of IEEE 802.1Qaz-2011. DCBx uses LLDP as the underlying protocol for exchange of parameters with the peer. The DCBx parameters are exchanged as LLDP TLVs.

There are two main versions of DCBx: IEEE DCBx and CEE DCBx. AOS-CX switches support the IEEE DCBx version which uses an OUI of 0x0080c2.

DCBx supports VSX synchronization. For more information about enabling VSX synchronization, see the *Virtual Switching Extension (VSX) Guide* for your switch and software version.

DCBx LLDP TLVs supported by AOS-CX:

- PFC (Priority Flow Control) TLV with subtype 0x0b.
  - Advertises priorities that are configured in the switch as lossy/lossless.
  - PFC TLVs are symmetrical which means they have to match between peers.
  - If a peer PFC priority configuration does not match switch configuration, a misconfiguration error is displayed by the command `show dcbx interface`.
- ETS (Enhanced Transmission Selection) configuration TLV with subtype 0x09.
  - Advertises the configured bandwidth reservation and the transmission algorithm used for each traffic class.
  - This is an asymmetric TLV which means the configuration does not have to match between peers.
- ETS (Enhanced Transmission Selection) recommendation TLV with subtype 0x0a.
  - If the peer device is willing to accept switch ETS configuration, then the contents of this TLV can be used by peer to configure itself.
  - The switch sends the current ETS configuration as the ETS recommended values.
- Application priority TLV with subtype 0x0c.
  - This is an informational TLV that tells the peer to map certain application traffic to a priority.
  - The user has to correctly configure this information using the application priority command.
  - This allows the peer to map applications to appropriate lossless priority configured on the switch.

DCBx guidelines

- DCBx is disabled by default.
- LLDP must be enabled on the interfaces supporting DCBx.
- DCBx is only supported on physical interfaces and not on management or logical interfaces, similar to how LLDP behaves.
- AOS-CX supports only the IEEE 802.1Qaz 2011 version of DCBx with an OUI of 0x0080c2.
- AOS-CX advertises DCBx with 'willing bit' set to 0 in all TLVs. This tells the peer that the switch is not willing to change its configuration to match the peer's configuration.
- When a peer switch does not support IEEE DCBx, a misconfiguration error will be displayed in the `show dcbx interface` output.

DCBx commands

lldp dcbx

```
lldp dcbx [ version { cee | ieee } ]
no lldp dcbx [ version { cee | ieee } ]
```

Description

Globally enables advertisement of the DCBx TLVs in LLDP packets. By default, DCBx is disabled in the switch.

The `no` form of this command disables DCBx advertisement.

Parameter	Description
`version { cee | ieee }`	Configures the DCBx version in either CEE (Converged Enhanced Ethernet) or IEEE (IEEE 802.1Qaz). Default version: IEEE

Examples

Enabling DCBx globally with default version:

```
switch(config)# lldp dcbx
```

Disabling DCBx globally:

```
switch(config)# no lldp dcbx
```

Enabling DCBx globally with the CEE version:

```
switch(config)# lldp dcbx version cee
```

Command History

Release	Modification
10.08	Added a parameter `version`
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	`config`	Administrators or local user group members with execution rights for this command.

lldp dcbx (per interface)

```
lldp dcbx [ version { cee | ieee } ]
no lldp dcbx [ version { cee | ieee } ]
```

Description

Enables DCBx on an interface. By default, an interface follows the global DCBx configuration. DCBx must be enabled globally for the interface configuration to take effect.

The `no` form of this command disables DCBx on the interface.

Parameter	Description
`version { cee | ieee }`	Configures the DCBx version in either CEE (Converged Enhanced Ethernet) or IEEE (IEEE 802.1Qaz). Default version: IEEE

Usage

If the interface command specifies a different version than the global configuration, it overrides the globally configured DCBx version. If the command is executed without specifying a version, the IEEE version is configured.

Examples

Enabling DCBx on interface 1/1/1:

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

Disabling DCBx on interface 1/1/1:

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

Enabling DCBx on interface 1/1/1 with the CEE version:

```
switch(config)# interface 1/1/1
switch(config-if)# lldp dcbx version cee
```

Enabling DCBx and configuring PFC for priority 4 on interface 1/1/1.

Priority Flow Control (PFC) commands are only supported on the 8325 and 8360.

```
switch(config)# interface 1/1/1
switch(config-if)# lldp dcbx
switch(config-if)# flow-control priority 4
```

Command History

Release	Modification
10.08	Added a parameter 'version'
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	`config-if`	Administrators or local user group members with execution rights for this command.

dcbx application

```
dcbx application {iscsi | tcp-sctp <PORT-NUM> | tcp-sctp-udp <PORT-NUM> | tcp-udp <PORT-NUM>
                 | udp <PORT-NUM> | ether <ETHERTYPE>} priority <PRIORITY>
no dcbx application
```

Description

Configures application to priority map that gets advertised in DCBx application priority messages. This tells the DCBx peer to send the application traffic with the configured priority so that the traffic is treated as lossless. Multiple applications can be configured in this manner. PFC lossless priority configured on the switch should be the same as this priority.

Priority Flow Control (PFC) commands are only supported on the 8325 and 8360.

The `no` form of this command removes the existing configuration.

Parameter	Description
`iscsi`	Specifies a physical port on the switch. TCP ports 860 and 3260.
`tcp-sctp <PORT-NUM>`	Specifies the traffic for a specified TCP or SCTP port. Range: 1 to 65535.
`tcp-sctp-udp <PORT-NUM>`	Specifies the traffic for a specified TCP or SCTP or UDP port. Range: 1 to 65535.
`tcp-udp <PORT-NUM>`	Specifies the traffic for a specified TCP or UDP port. Range: 1 to 65535.
`udp <PORT-NUM>`	Specifies the traffic for a specified UDP port. Range: 1 to 65535.
`<ETHERTYPE>`	Specifies the traffic for a specific Ethernet type. Range: 1536 to 65535.
`<PRIORITY>`	Specifies the application priority. Range: 0 to 7.

Usage

- In CEE DCBx version, the following traffic type configurations are sent using application TLVs:
  - Ethertype
  - iSCSI
  - TCP-UDP
- In IEEE DCBx version, the following traffic type configurations are sent using application TLVs:
  - Ethertype
  - iSCSI

- TCP-SCTP
- TCP-SCTP-UDP
- UDP

Examples

Mapping iSCSI traffic to priority 5.

```
switch(config)# dcbx application iscsi priority 5
```

Mapping TCP or SCTP traffic with port 860 to priority 3.

```
switch(config)# dcbx application tcp-sctp 860 priority 3
```

Command History

Release	Modification
10.08	Added a parameter option `tcp-udp`.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	`config`	Administrators or local user group members with execution rights for this command.

show dcbx interface

`show dcbx interface <IFNAME> [peer | vsx-peer]`

Description

Shows the current DCBx status and the configuration of PFC, ETS, and application priority applied on the interface and the status of the TLVs received from the peer.

Parameter	Description
`interface <IFNAME>`	Specifies the interface name.
`peer`	Shows peer DCBx information.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing DCBx on interface 1/1/1 with default DCBx version:

```
switch# show dcbx interface 1/1/1
 DCBx admin state           : enabled
 DCBx operational state     : active
 DCBx version               : local = IEEE, remote = IEEE
 PFC operational state      : active

 Mismatch  Advertisement                Local           Peer
 --------- ---------------------------- --------------- ----
 Priority Flow Control (PFC)
       ->  Willing:                     No              Yes
           MACsec Bypass Capability:    Yes             Yes
           Max PFC Traffic Classes:     1               1
           Priority 0:                  False           False
           Priority 1:                  False           False
           Priority 2:                  False           False
           Priority 3:                  False           False
           Priority 4:                  True            True
           Priority 5:                  False           False
           Priority 6:                  False           False
           Priority 7:                  False           False

 Enhanced Transmission Selection (ETS)
       ->  Willing:                     No              Yes
           Credit-Based Shaper:         No              No
           Max Traffic Classes:         8               8
           Priority 0:                  Class 1         Class 1
           Priority 1:                  Class 0         Class 0
           Priority 2:                  Class 2         Class 2
           Priority 3:                  Class 3         Class 3
           Priority 4:                  Class 4         Class 4
           Priority 5:                  Class 5         Class 5
           Priority 6:                  Class 6         Class 6
           Priority 7:                  Class 7         Class 7
           Class 0:                     ETS 5           ETS 5
           Class 1:                     ETS 30          ETS 30
           Class 2:                     ETS 10          ETS 10
       ->  Class 3:                     ETS 10          ETS 25
       ->  Class 4:                     ETS 25          ETS 10
           Class 5:                     ETS 10          ETS 10
           Class 6:                     ETS 10          ETS 10
           Class 7:                     Strict          Strict

 Application Priority Map:
 Mismatch  Protocol     Protocol ID     Local     Peer
                                        Priority  Priority
 --------- ------------ --------------- --------- ---------
       ->  iscsi                                  5
           tcp-sctp     1001 (0x03E9)   1         1
       ->  tcp-sctp     1002 (0x03EA)   2         7
           EtherType    2000 (0x07D0)   6         6
```

Showing DCBx on interface 1/1/1 with CEE version:

```
switch# show dcbx interface 1/1/1
 DCBx admin state           : enabled
 DCBx operational state     : active
 DCBx version               : local = CEE, remote = CEE
 PFC operational state      : active

 Mismatch  Advertisement                Local           Peer
 --------- ---------------------------- --------------- ----
```

```
Control
          Operating Version:           0               0
          Max Version:                 0               0
          Sequence Number:             1               1
      ->  Acknowledgement Number:      1               0

Priority Flow Control (PFC)
          Operating Version:           0               0
          Max Version:                 0               0
          Enabled:                     Yes             Yes
      ->  Willing:                     No              Yes
          Error:                       No              No
          Max PFC Traffic Classes:     8               8
          Priority 0:                  False           False
          Priority 1:                  False           False
          Priority 2:                  False           False
          Priority 3:                  False           False
          Priority 4:                  True            True
          Priority 5:                  False           False
          Priority 6:                  False           False
          Priority 7:                  False           False

Priority Group
          Operating Version:           0               0
          Max Version:                 0               0
      ->  Enabled:                     Yes             No
      ->  Willing:                     No              Yes
          Error:                       No              No
          Max Traffic Classes:         8               8
          Priority 0:                  PGID 1          PGID 1
          Priority 1:                  PGID 0          PGID 0
          Priority 2:                  PGID 2          PGID 2
          Priority 3:                  PGID 3          PGID 3
          Priority 4:                  PGID 4          PGID 4
          Priority 5:                  PGID 5          PGID 5
          Priority 6:                  PGID 6          PGID 6
          Priority 7:                  PGID 7          PGID 7
      ->  PG0 Percentage:              5               10
      ->  PG1 Percentage:              10              25
          PG2 Percentage:              30              30
          PG3 Percentage:              30              30
          PG4 Percentage:              30              30
          PG5 Percentage:              30              30
          PG6 Percentage:              30              30
          PG7 Percentage:              30              30

Application Protocol
          Operating Version:           0               0
          Max Version:                 0               0
          Enabled:                     Yes             Yes
      ->  Willing:                     No              Yes
          Error:                       No              No

Application Priority Map:
Mismatch  Protocol     Protocol ID     Local     Peer
                                       Priority  Priority
--------- ------------ --------------- --------- ---------
      ->  iscsi                                  5
          tcp/udp      1001 (0x03E9)   1         1
      ->  tcp/udp      1002 (0x03EA)   2         7
          EtherType    2000 (0x07D0)   6         6
```

Showing DCBx on interface 1/1/1 with mismatched version:

```
switch# show dcbx interface 1/1/1
 DCBx admin state           : enabled
 DCBx operational state     : version_mismatch
 DCBx version               : local = IEEE, remote = CEE
 PFC operational state      : active
```

Showing DCBx peer connected to an interface 1/1/1 with running CEE version:

```
switch# show dcbx interface 1/1/1 peer
 DCBx version: CEE
 Control
       Operating Version      : 0
       Max Version            : 0
       Sequence Number        : 1
       Acknowledgement Number : 1

 Priority Flow Control (PFC)
       Operating Version      : 0
       Max Version            : 0
       Enabled                : Yes
       Willing                : No
       Error                  : No
       Max PFC Traffic Classes: 8
       Priority 0             : False
       Priority 1             : False
       Priority 2             : False
       Priority 3             : False
       Priority 4             : True
       Priority 5             : False
       Priority 6             : False
       Priority 7             : False

 Priority Group
       Operating Version      : 0
       Max Version            : 0
       Enabled                : No
       Willing                : Yes
       Error                  : No
       Max Traffic Classes    : 8
       Priority 0             : PGID 1
       Priority 1             : PGID 0
       Priority 2             : PGID 2
       Priority 3             : PGID 3
       Priority 4             : PGID 4
       Priority 5             : PGID 5
       Priority 6             : PGID 6
       Priority 7             : PGID 7
       PG0 Percentage         : 25
       PG1 Percentage         : 25
       PG2 Percentage         : 10
       PG3 Percentage         : 10
       PG4 Percentage         : 5
       PG5 Percentage         : 5
       PG6 Percentage         : 10
       PG7 Percentage         : 10

 Application Protocol
       Operating Version      : 0
       Max Version            : 255
       Enabled                : Yes
       Willing                : No
```

```
      Error                  : No

Application Priority Map:
      Protocol       Protocol ID     Priority
      -------------- --------------- --------
      iscsi                          5
      tcp/udp        1001 (0x03E9)   1
      tcp/udp        1002 (0x03EA)   7
      EtherType      2000 (0x07D0)   6
```

Command History

Release	Modification
10.08	Updated the output to show the DCBx version enhancement.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	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.

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.
- The switch can connect to the DHCP server from the OOBM management port.
- 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-secret>.*
    - 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 with sub-option code of 146 as the Aruba Central on-premise FQDN or IPv4 address.
  - 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	Aruba Central FQDN or IPv4 address
43 suboption 148	HTTP Proxy FQDN or IPv4 address
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.

   For switches that do not support ZTP connections through a data port, use the management port and management network.
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 xxxx
```

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.

   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.

   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)
   - 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 master switch, which is then synced to standby switch. When the switchover is performed on the VSF stack, the standby becomes the new master switch.

As part of the switchover process, the ZTP daemon starts on the new master. 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 `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).

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 Central Location   : secure.arubanetworks.com
```

```
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 Central Location   : secure.arubanetworks.com
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 Central Location   : secure.arubanetworks.com
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 Central Location   : secure.arubanetworks.com
Force-Provision          : Disabled
HTTP Proxy Location      : http.proxy.arubanetworks.com
```

Showing switch failure to update start-up confriguration 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 Central Location   : secure.arubanetworks.com
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 Central Location  : NA
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 Central Location  : NA
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 Central Location  : 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 Central Location  : 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 Central Location : 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 he 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
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
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.

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
8320 8325 8360	`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
8320 8325 8360	`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
8320 8325 8360	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.

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
<HOSTNAME>	Specifies the host name. The first character of the host name must be a letter or a number. Length: 1 to 32 characters. Default: `switch`

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

led locator

```
led locator {on | off | slow_blink | flashing | fast_blink | half_bright}
no led locator {on | off | slow_blink | flashing | fast_blink | half_bright}
```

Description

Sets the state of the locator LED.

Parameter	Description
`on`	Turns on the LED.
`off`	Turns off the LED, which is the default value.
`slow_blink`	Sets the LED to slow blink on and off.
`flashing`	Sets the LED to blink on and off repeatedly.
`fast_blink`	Sets the LED to fast blink on and off.
`half_bright`	Sets the LED intensity to half bright.

Example

Setting the state of the locator LED:

```
switch# led locator flashing
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	Manager (#)	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
IPV4-SRC-ADDR	Specifies the source IPv4 address to trace.
IPV4-GROUP-ADDR	Specifies the group IPv4 address to trace.
`lhr` *<IPV4-LHR-ADDR>*	Specifies the last hop router address from which to start the trace.
`ttl` *<HOPS>*	Specifies the Time-To-Live duration in hops. Range: 1 to 255 hops. Default: 8 hops.

Parameter	Description
`vrf <VRF-NAME>`	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
8320 8325 8360	Manager (#)	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>-<NNNNNNNNNN>
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
8320 8325 8360	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 capacities

```
show capacities <FEATURE> [vsx-peer]
```

Description

Shows system capacities and their values for all features or a specific feature.

Parameter	Description
<FEATURE>	Specifies a feature. For example, `aaa` or `vrrp`.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

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 BGP:

```
switch# show capacities bgp

System Capacities: Filter BGP
Capacities Name                                                                    Value
-----------------------------------------------------------------------------------------
Maximum number of AS numbers in as-path attribute                                     32
...
```

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> [vsx-peer]`

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.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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
...
```

Showing the system capacities status for BGP:

```
switch# show capacities-status bgp

System Capacities Status: Filter BGP
Capacities Status Name                                                     Value Maximum
-------------------------------------------------------------------------------------
Number of aspath-lists configured                                          0      64
Number of community-lists configured                                       0      64
Number of neighbors configured across all VRFs                             0      50
Number of peer groups configured across all VRFs                           0      25
Number of prefix-lists configured                                          0      64
Number of route-maps configured                                            0      64
Number of routes in BGP RIB                                                0  256000
Number of route reflector clients configured across all VRFs               0      16
```

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
================================================================================
```

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 domain-name

`show domain-name` [vsx-peer]

Description

Shows the current domain name.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

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 [vsx-peer]`

Description

Shows the status information for all fans and fan trays (if present) in the system.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

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 [vsx-peer]
```

Description

Shows state and status information for all the configurable LEDs in the system.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing state and status for LED:

```
switch# show environment led
Name            State     Status
---------------------------------
locator         flashing  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-supply

```
show environment power-supply [vsx-peer]
```

Description

Shows status information about all power supplies in the switch.

Parameter	Description
`vsf`	Shows output from the VSF member-id on switches that support VSF.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

The following information is provided for each power supply:

`Mbr/PSU`
Shows the member and slot number of the power supply.

`Product Number`
Shows the product number of the power supply.

`Serial Number`
Shows the serial number of the power supply, which uniquely identifies the power supply.

`PSU Status`

The status of the power supply. Values are:

`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

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] [vsx-peer]
```

Description

Shows the temperature information from sensors in the switch that affect fan control.

Parameter	Description
`detail`	Shows detailed information from each temperature sensor.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

Temperatures are shown in Celsius.

Valid values for status are the following:

`normal`
Sensor is within nominal temperature range.
`min`
Lowest temperature from this sensor.
`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 this sensor.

Examples

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 {alert | crit | debug | emer | err | info | notice | warn} |
    -r | -a | -n <count> |
    -c {lldp | ospf | ... | } |
    -d {lldpd | hpe-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 {alert | crit | debug | emer | err | info | notice | warn}`	Shows the event logs for the specified severity. Select the severity from the following list: ■ `alert`: Displays event logs with severity alert and above. ■ `crit`: Displays event logs with severity critical and above. ■ `debug`: Displays event logs with all severities. ■ `emer`: Displays event logs with severity emergency only. ■ `err`: Displays event logs with severity error and above. ■ `info`: Displays event logs with severity info and above. ■ `notice`: Displays event logs with severity notice and above. ■ `warn`: Displays event logs with severity warning and above.
`-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.
`-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 | hpe-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 the DHCP relay agent:

```
switch# show events -c dhcp-relay
2016-05-31:06:26:27.363923|hpe-relay|110001|LOG_INFO|DHCP Relay Enabled
2016-05-31:07:08:51.351755|hpe-relay|110002|LOG_INFO|DHCP Relay Disabled
```

Showing event logs related to the DHCPv6 relay agent:

```
switch# show events -c dhcpv6-relay
2016-05-31:06:26:27.363923|hpe-relay|109001|LOG_INFO|DHCPv6 Relay Enabled
2016-05-31:07:08:51.351755|hpe-relay|109002|LOG_INFO|DHCPv6 Relay Disabled
```

Showing event logs related to IRDP:

```
switch# switch# show events -c irdp
2016-05-31:06:26:27.363923|hpe-rdiscd|111001|LOG_INFO|IRDP enabled on interface %s
2016-05-31:07:08:51.351755|hpe-rdiscd|111002|LOG_INFO|IRDP disabled on interface %s
```

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 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|vrfmgrd|5401|LOG_INFO|AMM|-|Created a vrf entity
42cc3df7-1113-412f-b5cb-e8227b8c22f2
2018-03-21:06:12:17.904008|vrfmgrd|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 hostname

```
show hostname [vsx-peer]
```

Description

Shows the current host name.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Setting and showing the host name:

```
switch# show hostname
switch
switch# config
switch(config)# hostname myswitch
myswitch(config)# show hostname
myswitch
```

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 [vsx-peer]
```

Description

Shows information about the software in the primary and secondary images.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing the primary and secondary images on a 8320 switch:

```
switch# show images
--------------------------------------------------------------------------------
ArubaOS-CX Primary Image
```

```
--------------------------------------------------------------------------------
Version : TL.10.05.0001I
Size    : 405 MB
Date    : 2020-04-23 02:49:04 PDT
SHA-256 : 7efe86a445e87e40f47de156add25720b7277cae1a8db2f9c4ea5f49e74f2a5a

--------------------------------------------------------------------------------
ArubaOS-CX Secondary Image
--------------------------------------------------------------------------------
Version : TL.10.05.0001I
Size    : 405 MB
Date    : 2020-04-23 02:49:04 PDT
SHA-256 : 7efe86a445e87e40f47de156add25720b7277cae1a8db2f9c4ea5f49e74f2a5a

Default Image : primary

------------------------------------------------------
Management Module 1/1 (Active)
------------------------------------------------------
Active Image       : primary
Service OS Version : TL.01.05.0002-internal
BIOS Version       : TL-01-0013
```

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 [vsx-peer]
```

Description

Shows IP error statistics for packets received by the switch since the switch was last booted.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

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 are 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 ip error statistics for packets received by the switch:

```
switch# show ip errors
-----------------------------------
Drop reason                Packets
-----------------------------------
Malformed packets                1
IP address errors               10
...
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8320 8325 8360	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 [vsx-peer]
```

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.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

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:

```
switch(config)# show module

Management Modules
==================

     Product                                          Serial
```

```
Name Number  Description                              Number     Status
---- ------- ---------------------------------------- ---------- ----------------
1/1  JL581A  8320 Mgmt Mod                            TW87KCW00X Ready


Line Modules
============

     Product                                          Serial
Name Number  Description                              Number     Status
---- ------- ---------------------------------------- ---------- ----------------
1/1  JL581A  8320                                     TW87KCW00X 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] [vsx-peer]`

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 `show running-config` command, followed by a space, followed by a question mark (?). When the `json` parameter is used, the `vsx-peer` parameter is not applicable.
all	Shows all default values for the current running configuration.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing the current running configuration:

```
switch> show running-config
```

```
Current configuration:
!
!Version ArubaOS-CX 10.0X.XXXX
!
lldp enable
linecard-module LC1 part-number JL363A
vrf green
!
!
!
!
!
!
aaa authentication login default local
aaa authorization commands default none
!
!
!
!
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 ArubaOS-CX Virtual.10.04.0000-6523-gbb15c03~dirty
led locator on
!
!
!
!
!
!
!
!
!
vlan 1
switch(config)# show running-config all
Current configuration:
!
!Version ArubaOS-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 ArubaOS-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 ArubaOS-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
vsx-sync qos vlans
    no shutdown
    description Example interface
    no routing
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)#
```

Showing the running configuration for a context that does not have instances:

```
switch(config-vsx)# show run current-context
vsx
    inter-switch-link 1/1/1
```

```
    role secondary
    vsx-sync sflow time
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
All platforms	`config` or a child of `config`. 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
`json`	Display output in JSON format.

Examples

Showing the startup-configuration in non-JSON format for an 8320 switch:

```
Leaf2(config)# show startup-config
Startup configuration:
!
!Version ArubaOS-CX TL.xx.xx.xxxx
hostname Leaf2
user admin group administrators password ciphertext

AQBapaGi+KZp4g8gw63UqK+zCtvO5zigFLv2DFBEH+lztqjdYgAAABwrJ+5GayUWArgv9tVFo9AzMY6gmI7
x/

KBEkGBJDXjpFson2qM83CXBUI673qWHDQ0pEIZXeuig0XogCVuId4oZiQVZlOe2MfxnqZL+E9hXaMNVowBwb
D0
cli-session
    timeout 0
!
!
!
ssh server vrf mgmt
```

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 [vsx-peer]
```

Description

Shows general status information about the system.

Parameter	Description
vsx-peer	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Usage

CPU utilization represents the average utilization across all the CPU cores.

System Contact, System Location, and System Description can be set with the `snmp-server` command.

Examples

Showing system information for the VSX primary and secondary (peer) switch on an 8320:

```
vsx-primary# show system
Hostname           : vsx-primary
```

```
System Description : TL.10.xx.xxxxx
System Contact     :
System Location    :

Vendor             : Aruba
Product Name       : JL479A 8320
Chassis Serial Nbr : TW82K7200Q
Base MAC Address   : 98f2b3-68792e
ArubaOS-CX Version : TL.10.xx.xxxxx

Time Zone          : UTC

Up Time            : 19 hours, 51 minutes
CPU Util (%)       : 50
Memory Usage (%)   : 36

vsx-primary# show system vsx-peer
Hostname           : vsx-secondary
System Description : TL.10.xx.xxxxx
System Contact     :
System Location    :

Vendor             : Aruba
Product Name       : JL479A 8320
Chassis Serial Nbr : TW73JQH024
Base MAC Address   : e0071b-cb72e4
ArubaOS-CX Version : TL.10.xx.xxxxx

Time Zone          : UTC

Up Time            : 21 hours, 23 minutes
CPU Util (%)       : 14
Memory Usage (%)   : 36
```

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 system resource-utilization

`show system resource-utilization [daemon <DAEMON-NAME>] [vsx-peer]`

Description

Shows information about the usage of system resources such as CPU, memory, and open file descriptors.

Parameter	Description
`daemon <DAEMON-NAME>`	Shows the filtered resource utilization data for the process specified by `<DAEMON-NAME>` only.
`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. **NOTE:** For a list of daemons that log events, enter `show events -d ?` from a switch prompt in the manager (#) context.
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Examples

Showing all system resource utilization data:

```
switch# show system resource-utilization
System Resources:
Processes: 70
CPU usage(%): 20
Memory usage(%): 25
Open FD's: 1024

Process              CPU Usage(%)          Memory Usage(%)     Open FD's
-------------------------------------------------------------------------
pmd                     2                       1                14
hpe-sysmond             1                       2                11
hpe-mgmdd               0                       1                5
...
```

Showing the resource utilization data for the pmd process:

```
switch# show system resource-utilization daemon pmd
Process              CPU Usage          Memory Usage     Open FD's
-------------------------------------------------------------------------
pmd                      2                1              14
```

Showing resource utilization data when system resource utilization polling is disabled:

```
switch# show system resource-utilization
System resource utilization data poll is currently disabled
```

Showing resource utilization data for a line module:

```
switch# show system resource-utilization module 1/1
System Resource utilization for line card module: 1/1
CPU usage(%): 0
```

```
Memory usage(%): 35
Open FD's: 512
```

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 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
`basic`	Specifies showing a basic set of information.
<FEATURE>	Specifies the name of a feature. For a list of feature names, enter the `show tech` command, followed by a space, followed by a question mark (?).
`local-file`	Shows the output of the `show tech` 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 [vsx-peer]
```

Description

Shows the USB port configuration and mount settings.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

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 [vsx-peer]
```

Description

Shows version information about the network operating system software, service operating system software, and BIOS.

Parameter	Description
`vsx-peer`	Shows the output from the VSX peer switch. If the switches do not have the VSX configuration or the ISL is down, the output from the VSX peer switch is not displayed. This parameter is available on switches that support VSX.

Example

Showing version information for an 8320 switch:

```
switch(config)# show version
--------------------------------------------------------------------------------
ArubaOS-CX
(c) Copyright 2017-2020 Hewlett Packard Enterprise Development LP
--------------------------------------------------------------------------------
Version      : TL.xx.xx.xxxx
Build Date   : 2020-08-20 10:56:02 PDT
Build ID     : ArubaOS-CX:xx.xx.xxxx:feb590a400a5:201908201736
Build SHA    : feb590a400a57ed818b01614f92010d74fbc9a4b
Active Image : secondary

Service OS Version : TL.01.03.0008
BIOS Version       : TL-01-0013
```

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	`config`	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
`mount`	Enables the inserted USB drive.

Parameter	Description
`unmount`	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.

Accessing Aruba Support

Aruba Support Services	https://www.arubanetworks.com/support-services/
Aruba Support Portal	https://asp.arubanetworks.com/
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:

Airheads social forums and Knowledge Base	https://community.arubanetworks.com/
Software licensing	https://lms.arubanetworks.com/
End-of-Life information	https://www.arubanetworks.com/support-services/end-of-life/
Aruba software and documentation	https://asp.arubanetworks.com/downloads

Accessing Updates

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

Aruba Support Portal

https://asp.arubanetworks.com/downloads

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

My Networking

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

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

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

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

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

To subscribe to eNewsletters and alerts:

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

Warranty Information

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

Regulatory Information

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

Additional regulatory information

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