AOS-CX 10.14.xxxx Monitoring Guide

8320, 8100, 8325, 8360, 9300, 10000 Switch Series

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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:

- HPE Aruba Networking 8100 Switch Series (R9W94A, R9W95A, R9W96A, R9W97A)
- HPE Aruba Networking 8320 Switch Series (JL479A, JL579A, JL581A)
- HPE Aruba Networking 8325 Switch Series (JL624A, JL625A, JL626A, JL627A)
- HPE Aruba Networking 8360 Switch Series (JL700A, JL701A, JL702A, JL703A, JL706A, JL707A, JL708A, JL709A, JL710A, JL711A, JL700C, JL701C, JL702C, JL703C, JL706C, JL707C, JL708C, JL709C, JL710C, JL711C, JL704C, JL705C, JL719C, JL718C, JL717C, JL720C, JL722C, JL721C)
- HPE Aruba Networking 9300 Switch Series (R9A29A, R9A30A, R8Z96A, S0F81A, S0F82A, S0F83A, S0F84A, S0F85A, S0F86A, S0F87A, S0F88A, S0F95A, S0F96A)
- HPE Aruba Networking 10000 Switch Series (R8P13A, R8P14A)

Latest version available online

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

Command syntax notation conventions

Convention	Usage
`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

Convention	Usage
	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.
{ }	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 Aruba 8xxx, 9300, and 10000 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

Monitoring hardware through visual observation

Diagnosing with the LEDs

For complete information on LED behaviors for your AOS-CX switch, refer to the **Installation and Getting Started Guide** for that switch series, available for download from the Aruba Switch Documentation section of the Aruba Hardware Documentation and Translations Portal.

Chapter 3
IP Flow Information Export

IP Flow Information Export (IPFIX) is an embedded network flow analysis tool that compiles characteristic and measured properties of flows and sends flow reports to internal or external flow collectors. IPFIX is configurable via the command-line or REST interfaces. With IPFIX, customers configure flow records with match (key) fields and collection (non-key) fields. Match fields are the set of fields that define a flow, such as IP address or UDP port. Collection fields are the set of fields that identify information to collect for a flow, such as packet and byte counters.

A flow exporter defines where and how to export flow reports. Flow exporters are created as standalone entities in the **config** context to provide flow monitors the ability to export flow reports.

Compatibility with Traffic Insight

The AOS-CX traffic insight feature allows monitoring of large amount of data that it collects from various flow exporters like IPFIX, and provides the ability to filter, aggregate, and sort the data based on user flow monitor requests. Traffic insight tracks different monitor requests simultaneously and provides monitor reports per request. For more information on configuring the Traffic Insight features, refer to the *AOS-CX Security Guide*.

Flow monitors

A flow monitor is applied to an interface to perform network traffic monitoring. A flow monitor consists of a flow record, a flow cache, and optional flow exporters. A flow record must be created and assigned to the flow monitor for the monitoring process to function. Flow data is compiled from the network traffic on the interface and stored in the flow cache based on the match (key) and collect (non-key) fields in the flow record. Data from the flow cache is exported by the flow exporters assigned to the flow monitor. 8100 and 8360 Switch series support a maximum of sixteen flow monitors with a limit of two flow exporters that can be applied to a single flow monitor. 8325 and 10000 switch series support one flow monitor and only one flow exporter can be applied to the flow monitor.

Flow Records

A flow record on 8100, 8360 and 8325 Switch series defines match (key) fields and collection (non-key) fields. Match fields are the set of fields that define a flow, such as IP address or UDP port. Collection fields are the set of fields that identify information to collect for a flow, such as packet and byte counters. A maximum of sixteen flow records can be created.

There are six mandatory match fields, of which the IP match fields must be of the same type (IPv4 or IPv6).

A flow record is invalid if it does not contain one of the supported sets of match fields.

Flow records and monitors are not supported on 8325 Switch Series.

The supported sets of match fields on 8100 and 8360 Switch series are:

1. IPv4:

- IPv4 version
- IPv4 destination address
- IPv4 protocol
- Transport destination port
- Transport source port

2. IPv6:

- IPv6 version
- IPv6 destination address
- IPv6 protocol
- Transport destination port
- Transport source port

The supported sets of match fields on 8325 Switch series are:

1. IPv4:

- IPv4 source address
- IPv4 destination address
- IPv4 protocol
- Transport destination port
- Transport source port

Flow Exporters

A flow exporter defines where and how to export flow reports. Flow exporters are created as standalone entities in the **config** context to provide flow monitors the ability to export flow reports. 8100 and 8360 Switch series support a maximum of sixteen flow monitors with a limit of two flow exporters that can be applied to a single flow monitor. 8325 and 10000 switch series support one flow monitor and only one flow exporter can be applied to the flow monitor.

Destinations

The destination specifies where flow reports are sent. There are two possible types of destination for a flow exporter:

1. (default) Hostname or IP address of a device with an optional VRF
2. Traffic Insight instance

A flow exporter can only send flow reports to one destination. The destination type specifies which destination to use. If no destination type is specified, the default destination type is the hostname or IP address of a device with an optional VRF supported on 8360 and 8100 Switch series. (If a VRF is not specified, the default VRF will be used.) A destination of each type can be configured, but only the one corresponding to the destination type is used. If there is no destination corresponding to the destination type, then the flow exporter configuration is incomplete. If a new destination of a particular type is configured, it will replace the destination of that type that was previously configured.

Configuring IP Flow Information Export on 6300, 6400, 8100, 8360 and 8325 Switches

The following list describes the steps required to configure a IP flow information export (IPFIX) solution:

- Step one: Create flow records
- Step two: Configure flow exporter(s)
- Step three: Configure monitor(s)
- Step four: Apply a flow monitors to interface(s)

Step one: Create Flow Records

Flow Records are used to define the data that will be added to the IPFIX template. This example configures one record for IPv4 and one for IPv6 for an 8360 Switch series.

```
switch(config)# flow record flowRecordv4
switch(config-flow-record)# match ipv4 protocol
switch(config-flow-record)# match ipv4 source add
switch(config-flow-record)# match ipv4 destination add
switch(config-flow-record)# match ipv4 version
switch(config-flow-record)# match transport destination port
switch(config-flow-record)# match transport source port
switch(config-flow-record)# collect counter bytes
switch(config-flow-record)# collect counter packets
switch(config-flow-record)# collect application name
switch(config-flow-record)# collect timestamp absolute first
switch(config-flow-record)# collect timestamp absolute last

switch(config)# flow record flowRecordv6
switch(config-flow-record)# match ipv6 protocol
switch(config-flow-record)# match ipv6 source add
switch(config-flow-record)# match ipv6 destination add
switch(config-flow-record)# match ipv6 version
switch(config-flow-record)# match transport destination port
switch(config-flow-record)# match transport source port
switch(config-flow-record)# collect counter bytes
switch(config-flow-record)# collect counter packets
switch(config-flow-record)# collect application name
switch(config-flow-record)# collect timestamp absolute first
switch(config-flow-record)# collect timestamp absolute last
```

Next, use the **show flow record** command to verify the configuration.

```
switch(config)# show flow record
------------------------------------------------------------------------------
Flow record 'flowRecordv4'
------------------------------------------------------------------------------
Match Fields
ipv4 destination address
ipv4 protocol
ipv4 source address
ipv4 version
transport destination port
transport source port
Collect Fields
application name
counter bytes
```

```
counter packets
timestamp absolute first
timestamp absolute last

-------------------------------------------------------------------------------
Flow record 'flowRecordv6'
-------------------------------------------------------------------------------
Match Fields
ipv6 destination address
ipv6 protocol
ipv6 source address
ipv6 version
transport destination port
transport source port
Collect Fields
application name
counter bytes
counter packets
timestamp absolute first
timestamp absolute last
```

Step two: Configure flow exporter(s)

In this step, you can define an exporter to send to an external destination by hostname or IP address, or to an internal destination such as Traffic Insight. The example below configures IPFIX to export data to an external address/hostname:

```
switch(config)# flow exporter flowExternal
switch(config-flow-exporter)# destination type hostname-or-ip-addr
switch(config-flow-exporter)# destination 11.1.1.1
switch(config-flow-exporter)# show flow exporter
-------------------------------------------------------------------------------
Flow exporter 'flowExternal
-------------------------------------------------------------------------------
Status                  : Accepted
Export Protocol         : ipfix
Destination Type        : Hostname or IP address
Destination             : 11.1.1.1
Transport Configuration
Protocol            : udp
Port                : 4739
```

To configure IPFIX to export to Traffic Insight, first configure Traffic Insight.

```
switch(config)# traffic-insight TI
switch(config-ti-TI)# source ipfix
switch(config-ti-TI)# monitor topN type topN-flows
switch(config-ti-TI)# monitor dns type application-flows
switch(config-ti-TI)# enable
```

Next, configure the flow exporter for Traffic Insight

```
switch(config)# flow exporter flowExpTI
switch(config-flow-exporter)# export-protocol ipfix
switch(config-flow-exporter)# destination type traffic-insight
switch(config-flow-exporter)# destination traffic-insight TI
```

You can use the **show flow exporter** command to verify the flow exporter configuration for Traffic Insight

```
switch(config)# show flow exporter flowExpTI

-------------------------------------------------------------------------------
Flow exporter 'flowExpTI'
-------------------------------------------------------------------------------
Status                  : Accepted
Export Protocol         : ipfix
Destination Type        : Traffic Insight
Destination             : TI
Transport Configuration
Protocol            : udp
Port                : 4739
```

Finally, use the **show run traffic-insight** command to verify the Traffic Insight configuration:

```
switch(config)# show run traffic-insight
traffic-insight TI
enable
source ipfix
!
monitor topN type topN-flows entries 5
monitor appFlow type application-flows
```

Step three: Configure the monitor(s)

First, configure an IPv4 flow monitor.

```
switch(config)# flow monitor flowMonv4
switch(config-flow-monitor)# record flowRecordv4
Switch (config-flow-monitor)# exporter flowExternal
switch(config-flow-monitor)# exit
```

Next, configure an IPv6 flow monitor.

```
switch(config)# flow monitor flowMonv6
switch(config-flow-monitor)# record flowRecordv6
switch(config-flow-monitor)# exporter flowExternal
switch(config-flow-monitor)# exit
```

Once both flow monitors are created, use the **show flow monitor** command to verify the flow monitor configurations.

```
switch(config-flow-monitor)# show flow monitor
-------------------------------------------------------------------------------
Flow monitor 'flowMonv4'
-------------------------------------------------------------------------------
Status                    : Accepted
Flow Record               : flowRecordv4
Flow Exporter(s)          : flowExternal
Cache Configuration
Inactive Timeout     : 30
```

```
Active Timeout       : 1800

------------------------------------------------------------------------------
Flow monitor 'flowMonv6'
------------------------------------------------------------------------------
Status                    : Accepted
Flow Record               : flowRecordv6
Flow Exporter(s)          : flowExternal
Cache Configuration
Inactive Timeout     : 30
```

A collecting process is not configured with IPFIX.

An intermediate collecting process is configured with IPFIX by:

1. Creating a flow collector.
2. Assigning the address of a local loopback interface as the listen address of the collector.
3. Adding any additional information elements to be appended in software to the flow collector with the append keyword.
4. Adding the flow collector to a flow monitor which is applied on a port.

Switch software can act as an intermediate collecting process for flow reports from the hardware to append certain additional IPFIX information elements to the flow reports. When the switch software is configured, acts as an intermediate exporting process to export the augmented flow reports to any flow exporters that are configured.

Natively, the hardware supporting flow monitoring does not generate reports on flows that are dropped. The hardware only produces reports on forwarded flows.

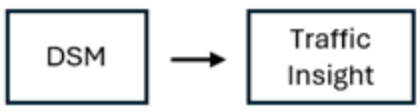
The collecting process enables the switch to provide flow monitoring reports in the IPFIX format for flows that are dropped and provides the reason for this drop. For more information on how to configure monitoring for dropped flows, refer to configuration information in the **configure-flow-collector-append-fields** command regarding forwarding-status.

Configuring IP Flow Information Export on 10000 Switch Series

With IPFIX on the 10000 Switch series, the following three distinct processes are involved:

- **Metering Process:** This process monitors an observation point within the network for flows and generates flow reports for the flows. An observation point is a location in the network where packets can be observed. The metering process passes the flow reports to the exporting process.
- **Exporting Process:** This process sends flow reports generated by the metering process to a collecting process.
- **Collecting Process:** This process receives flow reports from the exporting process and stores it or further processes it.

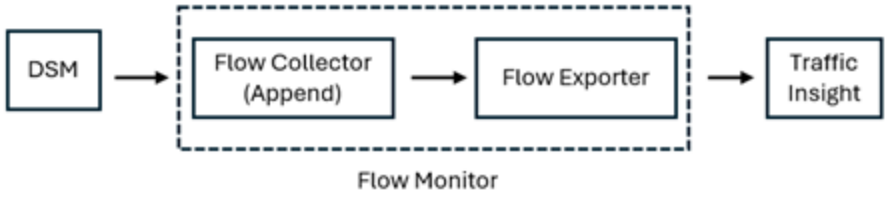
Figure 1 *IPFIX to Traffic Insight Workflow*



Metering and exporting processes are configured through AMD Pensando Policy and Services Manager (PSM), a cloud native application, that is connected to the device. IPFIX must be enabled under the DSM context and IP source-interface must be specified for IPFIX via the CLI or REST interface. The information for PSM and DSM configuration can be found in the DSS guide. For more information about configuration commands, see AMD-PENSANDO DSS configuration guide.

The switch may optionally act as an intermediate collecting process for flow reports from DSMs to append certain additional IPFIX information elements to the flow reports. The switch will then act as an intermediate exporting process to export the augmented flow reports to any configured flow exporters.

Figure 2 *IPFIX Flow Collector Workflow*



Hardware supporting flow monitoring does not generate reports on flows that are dropped, and instead only produces reports on forwarded flows. The collecting process enables the switch to provide flow monitoring reports in the IPFIX format for flows that are dropped along with the reason for this drop.

Refer to the **Configure flow collector append fields** section in this guide for more information on how to configure monitoring for dropped flows and forwarding status.

To configure an intermediate collecting process on a 10000 Switch series with IPFIX, perform the following steps:

- Create a flow collector.
- Assign the address of a local loopback interface as the collector's **listen** address.
- Configure PSM with an export policy destined to the address of the local loopback interface.
- Add any additional information elements to be appended to the flow collector with the **append** keyword.

To configure an intermediate exporting process with IPFIX, perform the following steps:

- Create a flow exporter.
- Configure the flow exporter with a destination of a traffic insight instance.
- Assign the flow exporter to the previously-created flow monitor.

Finally, apply the collecting and exporting processes to the DSM by performing the following steps:

- Create a flow monitor.
- Assign the flow collector and flow exporter to the flow monitor.
- Apply the flow monitor within the DSM context on the switch.

Compatibility with Traffic Insight

The AOS-CX traffic insight feature allows monitoring of large amount of data that it collects from various flow exporters like IPFIX, and provides the ability to filter, aggregate, and sort the data based on user flow monitor requests. Traffic insight tracks different monitor requests simultaneously and provides

monitor reports per request. For more information on configuring these features, refer to the *AOS-CX Security Guide*.

FAQs and Troubleshooting

- On 8325 Switch series, IPFIX does monitor unresolved IP unicast traffic or ICMP traffic. Any traffic still being ARP or neighbor-resolved that is received on an interface with IPFIX monitoring will not be learned and flow reports will not be generated for that traffic. Once the traffic has sbeen resolved, IPFIX will start reporting those flows. Any ICMP traffic currently being received on an interface where IPFIX monitoring has been applied will not be learned and flow reports will not be generated.
- The following messages are displayed to indicate an illegal argument:
  - % The flow exporter <EXPORTER-NAME> does not exist.
  - % The flow record <RECORD-NAME> does not exist.
  - % The flow monitor <MONITOR-NAME> does not exist.
  - Invalid destination IP address or hostname entered.
  - Unable to create the flow exporter. The maximum allowed number of flow exporters (<max>) has been reached.
  - Unable to create the flow record. The maximum allowed number of flow records (<max>) has been reached.
  - Unable to create the flow monitor. The maximum allowed number of flow monitors (<max>) has been reached.
  - Flow monitor cannot be applied while interface is part of LAG <LAG-NAME>.
  - Flow monitor could not be applied.
  - Flow monitor could not be unapplied

Flow monitoring commands

diag-dump ipfix basic

```
diag-dump ipfix basic
```

Description

Displays diagnostic information for IPFIX.

Examples

```
diag-dump ipfix basic
================================================================================
[Start] Feature ipfix Time : Tue Apr 11 02:23:03 2023
================================================================================
--------------------------------------------------------------------------------
[Start] Daemon ipfixd
--------------------------------------------------------------------------------
- IPFIX Record Cache dump -
- IPFIX Record ipfix -

....

:- IPFIX Monitor v6ti completed -
```

```
- End of IPFIX Monitor Cache dump -
--------------------------------------------------------------------------------
[End] Daemon ipfixd
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
[Start] Daemon ops-switchd
--------------------------------------------------------------------------------
Key format: <traffic_type>_<coalescence_id>_<agent_id>_<asic_port>
Key                              TCAM Entry ID    Count
-------------------------------- ---------------- -----
1_1532781829_3_20                0xffff7c7e7a00   1
1_3217499901_1_12                0xffff91187580   1
1_3217499901_1_13                0xffff91183d80   1
1_3217499901_1_14                0xffff91186e80   1

....

--------------------------------------------------------------------------------
[End] Daemon ops-switchd
--------------------------------------------------------------------------------
================================================================================
[End] Feature ipfix
================================================================================
Diagnostic-dump captured for feature ipfix
```

Command History

Release	Modification
10.14	Command introduced on 8325 and 10000 Switch series.
10.11	Command introduced on 6300, 6400, 8100 and 8360 Switch series.

Command Information

Platforms	Command context	Authority
8100 8325 8360 10000	Manager (#)	Administrators or local user group members with execution rights for this command.

flow collector

```
[no] flow collector <name>
   [no] listen <IPv4 address> [vrf <VRF-name>]
   [no] append egress interface
   [no] append egress queue
   [no] append forwarding-status
```

Description

Creates or modifies a flow collector.

A flow collector allows switch software to act as an intermediate collecting process for flows provided by hardware, appending additional information elements in these flows and then acting as an intermediate exporting process to export the augmented flow reports to any configured flow exporters. The **no** form of the command deletes the flow collector.

The AOS-CX 10000 series switches contain embedded Distributed Services Modules (DSMs) which can be configured via PSM to export flows. A flow collector allows the switch to act as an intermediate collecting process for flows, append additional information elements in these flows, and then act as an intermediate exporting process to export the augmented flow reports to any configured flow exporters.

A maximum of one flow collector can be configured.

If no software augmentation of flows is required, there is no need to configure a flow collector or flow monitor.

Parameter	Description
`<name>`	Name of the flow collector, up to 64 characters. The special characters allowed in the name are **.**, **_**, and **-**.
`listen <IPv4 address>`	Configure the IP address to listen for flow reports from an embedded/hardware metering process, such as DSM, in the "**config-flow-collector**" context. A flow collector can receive flow reports from only one listening address with an optional VRF.
`vrf [VRF-name]`	Name of the VRF. If a VRF is not specified, then the default VRF will be used.
`append egress interface` `append egress queue`	Configure fields which will be added to the collected flow reports. **NOTE:** Only one append field can be specified per line in a configuration.
`forwarding-status`	Configure flow forwarding-status to be appended in software.

Examples

The following example creates a flow exporter configuration named **collector-1**.

```
switch(config)# flow collector collector-1
```

The following example displays an error message when more than one flow collector is configured.

```
switch(config)# flow collector collector-2
No more than 1 flow collector can be configured. Another flow collector must be
removed first.
```

The following example configures an interface to listen for flows.

```
switch(config)# flow collector collector-1
switch(config-flow-collector)# listen 1.2.3.4 vrf vrf2
```

The following example adds egress interface to **collector-1** as an append field

```
switch(config)# flow collector collector-1
switch(config-flow-collector)# append egress interface
```

The following example displays an error message when more than one append field is configured.

```
switch(config)# flow collector collector-1
switch(config-flow-collector)# append egress interface
switch(config-flow-collector)# append egress queue
Remove an egress interface append field from flow collector **collector-1**
```

The append forwarding-status option is only available on the 8325 Switch Series.

The following example displays how to add forwarding-status to flow collector **flow-collector-1** as an append field

```
switch(config)# flow collector flow-collector-1
switch(config-flow-collector)# append forwarding-status
```

The following example displays how to remove a forwarding-status append field from flow collector **flow-collector-1**

```
switch(config)# flow collector flow-collector-1
switch(config-flow-collector)# no append forwarding-status
```

Command History

Release	Modification
10.14	Command introduced.

Command Information

Platforms	Command context	Authority
8325 10000	config config-flow-collector	Administrators or local user group members with execution rights for this command.

flow exporter

```
flow exporter <name>
   destination
      <hostname> [vrf vrfname]
      <ipaddr> [vrf vrfname]
      <ip6addr>  [vrf vrfname]
      type {hostname-or-ip-addr | traffic-insight
      traffic-insight <name>
   no ..
```

Description

A flow exporter is the part of the IP Flow Information Export (IPFIX) feature that defines how a flow monitor exports flow reports. You can assign the same flow exporter configuration to more than one flow monitor. Each flow exporter includes a destination setting that identifies the device to which the flow reports are sent. Aruba 8100 and 8360 Switch series support a maximum of sixteen flow monitors with a limit of two flow exporters that can be applied to a single flow monitor. Aruba 8325 and 10000 Switch series support one flow monitor, and only one flow exporter can be applied to the flow monitor.

Parameter	Description
`<name>`	Name of the flow exporter, up to 64 characters.
`export-protocol ipfix`	Define an export protocol for the flow exporter.The default **ipfix** protocol is the only protocol currently available.
`description <description>`	A description of the flow exporter, up to 256 characters and spaces.
`destination <hostname>|<IPaddr>|<ip6addr>`	The exporter sends flow records to this destination. The destination can be defined as a hostname, or an IPv4 or IPv6 IP address. 8325 exporter can be configured only with IPV4 addresses.
`[vrf vrfname]`	You can optionally include the name of the destination VRF in the destination definition.
`destination type {hostname-or-ip-addr | traffic-insight}`	The exporter sends flow reports to a traffic insight destination.
`destination traffic-insight <name>`	The exporter sends flow reports to a specific traffic insight destination.
`no ..`	Negate any configured parameter.
`template data timeout <timeout>`	A flow exporter template describes the format of exported flow reports. Therefore, flow reports cannot be decoded properly without the corresponding templates. This setting defines how often the flow exporter will resend templates to the flow monitor. The supported range is 1-86400 seconds, and the default is 600 seconds.
`transport udp <port>`	Transport protocol and port for sending flow record reports. The default port is port 4739,

Examples

The following example creates a flow exporter configuration named **exporter-1**.

```
switch(config)# flow exporter exporter-1
switch(config-flow-exporter)# destination type traffic-insight
switch(config-flow-exporter)# destination traffic-insight instance-1
```

The following example creates a flow exporter configuration named **exporter-1**.

```
switch(config)# flow exporter exporter-1
switch(config-flow-exporter)# dscp 34
switch(config-flow-exporter)# destination 192.0.2.1 vrf VRF1
switch(config-flow-exporter)# template data timeout 1200
switch(config-flow-exporter)# description Exports flows to 192.0.2.1
```

The following example creates more than the maximum number of allowed flow exporters

```
switch(config)# flow exporter exporter-1
switch(config)# flow exporter exporter-2
No more than 1 flow exporter can be configured. Another flow exporter
must be removed first.
```

The following example sets a Traffic Insight instance as the destination for a flow exporter

```
switch(config)# flow exporter exporter-3
switch(config-flow-exporter)# destination type traffic-insight
switch(config-flow-exporter)# destination traffic-insight instance-1
```

Following example adds a destination of each possible type and set **hostname-or-ip-addr** as the type to use:

```
switch(config)# flow exporter exporter-4
switch(config-flow-exporter)# destination collector-1
switch(config-flow-exporter)# destination traffic-insight instance-1
switch(config-flow-exporter)# destination type hostname-or-ip-addr
```

Following example removes the destination of type **traffic-insight** from a flow exporter

```
switch(config)# flow exporter exporter-3
switch(config-flow-exporter)# no destination traffic-insight
```

Following example removes the destination of type **hostname-or-ip-addr** from a flow exporter

```
switch(config)# flow exporter exporter-1
switch(config-flow-exporter)# no destination
```

Following example removes the destination type from a flow exporter

```
switch(config)# flow exporter exporter-1
switch(config-flow-exporter)# no destination type
```

Command History

Release	Modification
10.14	Command introduced on 10000 and 8325 Switch series.
10.11	Command introduced on 6300, 6400, 8100 and 8360 Switch series.

Command Information

Platforms	Command context	Authority
8100 8325 8360 10000	`config` `config-flow-exporter`	Administrators or local user group members with execution rights for this command.

flow monitor

```
flow monitor <name>
   exporter <name>
   ctor <name>
   cache timeout active|inactive <timeout>
   description <description>
   record <name>
```

Description

On Aruba 8325, 8100, and 8360 Switch series, a flow monitor is the part of the IP Flow Information Export (IPFIX) feature that performs network monitoring for the selected interface. A flow monitor configuration consists of a flow record, a flow cache, and one or more associated flow exporters. A flow monitor compiles data from the network traffic on the interface and stores it in the flow cache in a format defined by the flow record. The flow exporters associated with the monitor then export data from the flow cache to the flow exporter destination.

On an Aruba 10000 Switch series, a flow monitor is applied to the system to define an intermediate collecting and exporting process for flow reports generated by the Distributed Services Module (DSM). A flow monitor consists of a flow collector and flow exporter. Flow reports are collected from the flow collector's listen address, appended with fields defined in the flow collector, and exported by the flow exporter assigned to the flow monitor.

Aruba 8100 and 8360 Switch series support a maximum of sixteen flow monitors with a limit of two flow exporters that can be applied to a single flow monitor. Aruba 8325 and 10000 Switch series support one flow monitor and only one flow exporter can be applied to the flow monitor. If no software augmentation of flows is required, there is no need to configure a flow collector or flow monitor.

Parameter	Description
`<name>`	Name of the flow monitor , up to 64 characters.
`cache timeout active|inactive <timeout>`	Use the cache timeout parameter to define an active or inactive timeout for the flow monitor. A flow monitor closes a flow session that is active for longer than the active timeout or inactive for longer than the inactive timeout. For 8325 Switch Series, the supported timeout range for the inactive timeout is 30-120 seconds, and the default is 30 seconds. For 8100, and 8360 Switch Series, the active timeout range is 30-604800. The default active time out value is 1800 and inactive timeout value is 30. **NOTE**: This parameter is not supported on the

Parameter	Description
	Aruba10000 Switch series. The Aruba 8325 Switch series supports an inactive cache timeout period only.
`description`	A description up to 256 characters long, including spaces.
`exporter <name>`	Assign a flow exporter to a flow monitor. Each flow monitor supports a maximum of two different flow exporters, sending flow records to up to two destinations. Each flow monitor supports only one exporter and one destination.
`collector <name>`	(For Aruba 8325 and 10000 Switch series) Assign a flow collector to a flow monitor. This command will override any configuration of "**traffic-insight flow-collector**" on the associated interface. Only one flow collector can be applied to each flow monitor. **NOTE:** A flow collector can be assigned to be a flow monitor only when a valid **listen address** is configured.
`record <name>`	(For Aruba 8325, 8100 and 8360 Switch series) Assigns a flow record to a flow monitor.

Examples

The following example creates a flow monitor configuration named **monitor-1**.

```
switch(config)# flow monitor monitor-1
switch(config-flow-monitor)# description Monitor for analyzing basic ipv4 traffic
switch(config-flow-monitor)# exporter flow-exporter-1
switch(config-flow-monitor)# exporter flow-exporter-2
switch(config-flow-monitor)# record flow-record-1
switch(config-flow-monitor)# cache timeout inactive 120
switch(config-flow-monitor)# cache timeout active 1500
```

The following example assigns **collector-1** as the collector associated with this monitor.

```
switch(config)# flow monitor monitor-1
switch(config-flow-monitor)# collector collector-1
```

The following workflow changes the flow record assigned to a flow monitor.

```
switch(config)# flow monitor flow-monitor-1
switch(config-flow-monitor)# record flow-record-2
```

Command History

Release	Modification
10.14	Command introduced on 8325 and 10000 Switch series.
10.11	Command introduced on 6400, 6400, 8200 and 8360 Switch series.

Command Information

Platforms	Command context	Authority
8100 8325 8360 10000	`config` `config-flow-monitor`	Administrators or local user group members with execution rights for this command.

flow record

```
flow record <name>
   match
      ip|ipv6 {protocol|version}|{source|destination address}
      transport {source|destination} port
   collect
      counter {packets|bytes}
      timestamp absolute {first|last}
      description <description>
```

Description

Define data to be included in a flow record by configuring flow record match and collect fields.

A flow record defines match (key) fields and collection (non-key) fields. Customers configure flow records with **match** (key) fields and **collect** (non-key) fields. Match fields are the set of fields that define a flow, such as IP address or UDP port. Collect fields are the set of fields that identify information to collect for a flow, such as packet and byte counters.

Traffic with matching attributes (for example, traffic coming from the same interface, sent to the same destination with the same protocol) are classified as a single flow. Information for some or all of the matched settings can be collected and exported to a destination defined by the flow exporter assigned to the flow monitor.

Traffic must match a match rule definition before it can be collected and sent. You cannot collect and send data that is not matched.

A maximum of one flow record can be created for 8325 Switch Series, whereas for 8360 and 8100 a maximum of 16 flow records can be created.

Parameter	Description
`<name>`	Name of the flow monitor, up to 64 characters.
`match`	match traffic according to one or more of the following key attributes:

Parameter	Description
	▪ **ip**: match traffic on an IPv4 network ▪ **ipv6**: match traffic on an IPv6 network ▪ **protocol**: Match traffic using the same IP protocol ▪ **version**: Match traffic using the same IP version ▪ **source**: Match traffic from the same source ▪ **destination**: Match traffic to the same destination ▪ **address**: Match traffic by source or destination IP address ▪ **transport**: Match traffic by source or destination transport type ▪ **port**: Match traffic by source or destination transport port **NOTE:** The Aruba 8325 Switch series does not support **IPv4** or **Version** match fields.
`description`	A description for the flow record up to 256 characters long, including spaces.
`collect`	Configures data fields to be included a flow record. ▪ **counter packets**: Collect counter data for packets in the flow ▪ **counter bytes**: Collect counter data for bytes in the flow ▪ **timestamp absolute first**: Collect absolute timestamp of the first packet observed. ▪ **timestamp absolute last**: Collect absolute timestamp of the last packet observed.

Examples

Adding IPv4 and transport match fields to **flow-record-1:**

```
switch(config)# flow record flow-record-1
switch(config-flow-record)# match ip source address
switch(config-flow-record)# match ip destination address
switch(config-flow-record)# match ip protocol
switch(config-flow-record)# match transport source port
switch(config-flow-record)# match transport destination port
switch(config-flow-record)# description Record used for basic ipv4 traffic
analysis
```

Removing the IPv4 destination match field from the **flow-record-1**:

```
switch(config)# flow record flow-record-1
switch(config-flow-record)# no match ip destination address
```

Adding counter and timestamp collect fields to **flow-record-1**:

```
switch(config)# flow record flow-record-1
switch(config-flow-record)# collect counter packets
switch(config-flow-record)# collect counter bytes
switch(config-flow-record)# collect timestamp absolute first
switch(config-flow-record)# collect timestamp absolute last
```

Related Commands

Command	Description
flow exporter	Define how a flow monitor exports the flow reports.
flow monitor	Define a flow monitor configuration, including the flow exporter and flow record associated to that monitor.
show flow record	Display flow record configuration and status.

Command History

Release	Modification
10.14	The **ipv4** parameter is deprecated and replaced with **ip**. Command introduced on the 8325 Switch series.
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
8100 8325 8360	`config` `config-flow-record`	Administrators or local user group members with execution rights for this command.

ip-all flow monitor

```
[no] ip-all flow monitor <name>
```

Description

Enables flow monitoring for all flows passing through Distributed Services Modules (DSMs) in the DSM configuration context. The flow reports arriving from DSM on the monitor's associated collector will be processed by the monitor and the appended fields specified in the monitor's collector will be added. Finally, it will be exported by the monitor's exporter.

The **[no]** form of command disables the flow monitoring.

Examples

The following example enables a flow monitor.

```
switch(config)# dsm
switch(config-dsm)# ip-all flow monitor flow-monitor-1
```

Command History

Release	Modification
10.14	Command introduced.

Command Information

Platforms	Command context	Authority
10000	`config`	Administrators or local user group members with execution rights for this command.

ipv4|ipv6 flow monitor (interface)

```
[no] ip|ipv6 flow monitor <name> in
```

Description

Enable flow monitoring on inbound and outbound interfaces by assigning a flow monitor to that interface. Only physical interfaces and LAG interfaces can be monitored. A flow monitor cannot be applied to an interface that is part of a LAG. If an unsupported application is attempted, an error message will be displayed.

The **[no]** form of command disables the flow monitoring.

Examples

Associate a flow monitor configuration named **flow-monitor-1** and **flow-monitor-2** for IPv4 or IPv6 traffic respectively on physical interface.

```
switch(config)# interface 1/1/1
switch(config-if)# ip flow monitor flow-monitor-1 in
switch(config-if)# ipv6 flow monitor flow-monitor-2 in
```

Associate a flow monitor configuration named **flow-monitor-3** and **flow-monitor-4** for IPv4 or IPv6 traffic respectively on a Lag interface.

```
switch(config)# interface lag 1
switch(config-lag-if)# ip flow monitor flow-monitor-3 in
switch(config-lag-if)# ipv6 flow monitor flow-monitor-4 in
```

Related Commands

Command	Description
flow exporter	Define how a flow monitor exports the flow reports.
flow record	Define data to be included in a flow record by configuring flow record match and collect fields
flow monitor	Define a flow monitor configuration, including the flow exporter and flow record associated to that monitor.

Command History

Release	Modification
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
8100 8360	`config` `config-flow-monitor`	Administrators or local user group members with execution rights for this command.

ipv4|ipv6 flow monitor (role)

```
[no] ip|ipv6 flow monitor <name>
```

Description

Enable flow monitoring on a role. The authorization status of a client does not depend on the flow monitor status for the client in hardware. The client will be authorized even if the system is not able to apply the flow monitor configuration in the role.

In case of multiple clients onboard to a port with varied flow monitor configurations, the flow monitor associated with the first authenticated client on the port will be applied for all the traffic on the port.

The **[no]** form of command removes the flow monitor from the role.

Parameter	Description
`<name>`	Name of the flow monitor , up to 64 characters.

Examples

Enable an IPv4 flow monitor on a role named role01

```
switch# config terminal
switch(config)# port-access role role01
switch(config-pa-role)# ip flow monitor flow-monitor-1
```

Enable an IPv6 flow monitor on a role named role01

```
switch# config terminal
switch(config)# port-access role role01
switch(config-pa-role)# ipv6 flow monitor flow-monitor-2
```

Related Commands

Command	Description
flow exporter	Define how a flow monitor exports the flow reports.
flow record	Define data to be included in a flow record by configuring flow record match and collect fields
flow monitor	Define a flow monitor configuration, including the flow exporter and flow record associated to that monitor.

Command History

Release	Modification
10.14	Command introduced.

Command Information

Platforms	Command context	Authority
8100 8360	`config` `config-flow-monitor`	Administrators or local user group members with execution rights for this command.

show flow collector

show flow collector <name>

Description

Displays flow collector configuration and status. If no collector name is specified, the output of this command displays information for all flow collectors.

The output of this command can indicate the following status types:

- Accepted
- Rejected (Internal error: failed to process collector)
- Rejected (The configured listen address is missing or invalid)
- Rejected (The configured listen address not associated with a local interface)

Parameter	Description
`<name>`	Name of the flow collector.

Examples

The following example displays the configuration of a flow collector named **collector-1**.

```
switch# show flow collector collector-1
------------------------------------------------------------------------------
Flow collector 'collector-1'
------------------------------------------------------------------------------
Description             : Collects flows from DSM
Status                  : Accepted
Listen Address          : 1.1.1.1
Append Fields
   egress interface
   egress queue
```

The following example displays the configuration of all flow collectors:

```
switch# show flow collector
------------------------------------------------------------------------------
Flow collector 'collector-1'
------------------------------------------------------------------------------
Description             : Collects flows from hardware
Status                  : Accepted
Listen Address          : 1.1.1.1
Append Fields
forwarding-status
```

The following example displays the configuration of a flow collector with no listen address configured:

```
switch# show flow collector collector-1
------------------------------------------------------------------------------
Flow collector 'collector-1'
------------------------------------------------------------------------------
Description             : Collects flows from hardware
Status                  : Rejected (The configured listen address is missing or
invalid)
Listen Address          :
Append Fields
forwarding-status
```

Release	Modification
10.14	Command introduced.

Command Information

Platforms	Command context	Authority
8325 10000	config config-flow-collector	Administrators or local user group members with execution rights for this command.

show flow exporter

```
show flow exporter [<name>] [statistics]
```

Description

Displays flow exporter statistics, configuration and status. When no exporter name is specified, the output of this command displays information for all flow exporters.

The output of this command can indicate the following status types:

- Accepted
- Rejected (Internal error: exporter does not exist)
- Rejected (Internal error: destination type does not exist)
- Rejected (Destination type is hostname or IP address, but no destination is specified)
- Rejected (Destination type is hostname or IP address, but the specified hostname or IP address is invalid)
- Rejected (Destination type is Traffic Insight, but no destination is specified)
- Rejected (Destination type is Traffic Insight, but the specified Traffic Insight instance does not exist)
- Rejected (Destination type is Traffic Insight, but the specified Traffic Insight instance is not enabled)
- Rejected (Destination type is Traffic Insight, but the specified Traffic Insight instance source is not IPFIX)
- Rejected (Internal error: destination type is Traffic Insight, but the specified Traffic Insight instance is invalid)
- Pending (Route Resolution for destination in progress)
- Pending (Destination MAC Resolution in progress)
- Pending (Source interface Resolution in progress)

- Pending (Source Vlan resolution in progress)
- Rejected (Internal error: route resolution for destination failed)

Parameter	Description
`<name>`	Name of the flow exporter.
`statistics`	The `statistics` parameter adds statistical information about the flow exporter to the output.

Examples

Display the configuration of a flow exporter named **exporter-1**.

```
switch# show flow exporter exporter-1
--------------------------------------------------------------------------------
Flow exporter 'exporter-1'
--------------------------------------------------------------------------------
Description             : Exports to the first collector
Status                  : Accepted
Export Protocol         : ipfix
Destination Type        : Hostname or IP address
Destination             : 192.168.0.1
Transport Configuration
    Protocol            : UDP
    Port                : 9995
```

Display statistics information for all flow exporters

```
switch# show flow exporter exporter-1 statistics

--------------------------------------------------------------------------------
Flow exporter 'exporter-1'
--------------------------------------------------------------------------------
Reports sent            : 14961
--------------------------------------------------------------------------------
Flow exporter 'exporter-2'
--------------------------------------------------------------------------------
Reports sent            : 5
```

Display the configuration of all flow exporters:

```
switch# show flow exporter
--------------------------------------------------------------------------------
Flow exporter 'exporter-1'
 -------------------------------------------------------------------------------
Reports sent            : 0
```

Related Commands

Command	Description
flow exporter	Define how a flow monitor exports the flow reports.

Command History

Release	Modification
10.14	Command supported on 10000 Switch Series.
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
8100 8360 10000	`config` `config-flow-exporter`	Administrators or local user group members with execution rights for this command.

show flow monitor

```
show flow monitor [<name>][statistics]
```

Description

Displays flow monitor configuration and status. When no monitor name is specified, the output of this command displays information for all flow monitors.

The output of this command can indicate the following status types:

- Accepted
- Rejected (Internal error: monitor does not exist)
- Rejected (A record must be assigned to the monitor, but no record is assigned)
- Rejected (The state of the assigned record is rejected)
- Rejected (The state of the assigned flow collector is rejected)
- Rejected (Internal error: failure in processing the record configuration)
- Rejected (The state of one or more of the assigned flow exporters is rejected)

Parameter	Description
`<name>`	Name of the flow monitor.
`statistics`	Display additional flow and cache statistics.

The possible statistics for a flow monitor are:

Statistics name	Meaning
`Current Entries`	Current number of flows in the flow cache for this flow monitor.
`Flows Added`	Total number of flows added to the flow cache for this flow monitor since it was created
`Total Flows Terminated`	Total number of flows removed from the flow cache for this flow monitor since it was created due to any flow end reason
`Flows Aged`	Number of flows removed from the flow cache for this flow monitor since it was created due to active or inactive timeout

Examples

Display the configuration of a flow moitor named **flow-monitor-1**.

```
switch# show flow monitor monitor-1
--------------------------------------------------------------------------------
Flow monitor 'monitor-1'
--------------------------------------------------------------------------------
Description             : Used for IPv4 traffic analysis
Status                  : Accepted
Flow Record             : record-1
Flow Collector          : collector-1
Flow Exporter(s)        : exporter-1, exporter-2
Cache Configuration
    Inactive Timeout    : 1800
    Active Timeout      : 300
```

The flow monitor statistics counters will be reset to zero after VSF ISSU switchover.

```
switch# show flow monitor
--------------------------------------------------------------------------------
Flow monitor 'monitor-1'
--------------------------------------------------------------------------------
Description             : Used for IPv4 traffic analysis
Status                  : Accepted
Flow Record             : record-1
Flow Exporter(s)        : exporter-1, exporter-2

Flow Record             : record-1
Flow Collector          : collector-1
Flow Exporter(s)        : exporter-1


Flow Collector          : collector-1
Flow Exporter(s)        : exporter-1
Cache Configuration
    Inactive Timeout    : 1800
    Active Timeout      : 300
Flow monitor 'monitor-2'
--------------------------------------------------------------------------------
Description             : Used for IPv6 traffic analysis
Status                  : Rejected (The state of one or more of the specified flow
exporters is rejected)
Flow Record             : record-2
Flow Exporter(s)        : exporter-1
Cache Configuration
    Inactive Timeout    : 18000
    Active Timeout      : 2400
```

Display information with no flow monitors configured

```
switch# show flow monitor
No flow monitors configured.
switch# show flow monitor statistics
No flow monitors configured.
```

Display statistics for all flow monitors

```
switch# show flow monitor statistics
-------------------------------------------------------------------------------
Flow monitor 'monitor-1'
-------------------------------------------------------------------------------
Current Entries          : 2
Flows Added              : 6
Total Flows Terminated   : 4
  Flows Aged             : 2
    Active Timeout       : 1
    Inactive Timeout     : 1

Total Flows Terminated   : 2
  Flows Aged             : 2
    Inactive Timeout     : 2

  End of Flow Detected   : 2
  Forced End             : 0
-------------------------------------------------------------------------------
Flow monitor 'monitor-2'
-------------------------------------------------------------------------------
Current Entries          : 6
Flows Added              : 12
Total Flows Terminated   : 6
  Flows Aged             : 4
    Active Timeout       : 3
    Inactive Timeout     : 1
  End of Flow Detected   : 2
  Forced End             : 0
```

Related Commands

Command	Description
flow monitor	Define a flow monitor configuration, including the flow exporter and flow collector record associated to that monitor.

Command History

Release	Modification
10.14	Command supported on 10000 Switch Series.
10.11	Command introduced.

Command Information

Platforms	Command context	Authority
8100 8360 10000	config config-flow-exporter	Administrators or local user group members with execution rights for this command.

show flow record

show flow record [<name>]

Description

Display flow record configuration and status. When no record name is specified, the output of this command displays information for all flow records.

The output of this command can indicate the following status types:

- Accepted
- Rejected (Internal error: failed to process record)
- Rejected (Mix of IPv4 and IPv6 match fields is not allowed. Specify match fields of the same IP version (IPv4 or IPv6))
- Rejected (Incomplete match fields. The mandatory match fields are: version, source address, destination address protocol, transport destination port, and transport source port)

Parameter	Description
`<name>`	Name of the flow record.

Examples

Display the configuration of a flow record named **flow-record-1**.

```
switch# show flow record record-1
------------------------------------------------------------------------------
Flow record  'record-1'
------------------------------------------------------------------------------
Description             : Used for IPv4 traffic analysis
Status                  : Accepted
Match Fields
    ipv4 destination address
    ipv4 protocol
    ipv4 source address
    ipv4 version
    transport destination port
    transport source port
Collect Fields
    counter bytes
    counter packets
```

Display the information of a specific flow record.

```
switch# show flow record record-1
------------------------------------------------------------------------------
Flow record  'record-1'
------------------------------------------------------------------------------
Description             : Used for IPv4 traffic analysis
Status                  : Accepted
Match Fields
    ipv4 destination address
    ipv4 protocol
    ipv4 source address
    ipv4 version
    transport destination port
    transport source port
```

```
Collect Fields

    counter bytes
    counter packets
```

Display information for all flow records

```
switch# show flow record
--------------------------------------------------------------------------------
Flow record  'record-1'
--------------------------------------------------------------------------------
Description             : Used for IPv4 traffic analysis
Status                  : Accepted
Match Fields
        ipv4 destination address
        ipv4 protocol
        ipv4 source address
        ipv4 version
        transport destination port
        transport source port
Collect Fields
        counter bytes
        counter packets
--------------------------------------------------------------------------------
Flow record  'record-2'
--------------------------------------------------------------------------------
Description             : Used for IPv6 traffic analysis
Status                  : Accepted
Match Fields
        ipv6 destination address
        ipv6 protocol
        ipv6 source address
        ipv6 version
        transport destination port
        transport source port
Collect Fields
        application name
        counter bytes
        counter packets
```

Display information with no flow records configured

```
switch# show flow record
No flow records configured
```

Related Commands

Command	Description
flow record	Define data to be included in a flow record by configuring flow record match and collect fields

Command History

Release	Modification
10.14	Command introduced on 8325 Switch series.
10.11	Command introduced on 6400, 6400, 8100, and 8360 Switch series.

Command Information

Platforms	Command context	Authority
8100 8325 8360	`config` `config-flow-exporter`	Administrators or local user group members with execution rights for this command.

show tech ipfix

```
show tech ipfix
```

Description

Shows the IPFIX configuration settings.

If applicable source IP address or source interface is configured for the IPFIX protocol, that configuration is used.

For 6300,6400,8360,8100 Switch Series, If a valid source is configured, the exporter sends flows to an external collector using the effective configured source IP address as the source IP address of the flow packets. In the context of this application, a valid source IP address is any IP address configured in the exporter's VRF namespace.

For 10000 Switch Series, the exported flows show the source IP address of the effective configured source in the default vrf.

For 8325 Switch Series the exported flows to an external collector shows the source IP address of the effective configured source in the default vrf. The exported flows to an internal collector does not utilize any source interface configuration.

Examples

The example shows the IPFIX configuration settings.

```
switch#show tech ipfix
=====================================================
Show Tech executed on Tue Apr 11 02:43:06 2023
=====================================================
=====================================================
[Begin] Feature ipfix
=====================================================
*********************************
Command : show flow exporter
*********************************
-------------------------------------------------------------------------------
Flow exporter 'ipfix'
-------------------------------------------------------------------------------
Status                  : Accepted
Export Protocol         : ipfix
```

```
Destination Type        : Traffic Insight
Destination             : t1
Transport Configuration
Protocol            : udp
Port                : 4739
------------------------------------------------------------------------------
Flow exporter 'V6E1'
------------------------------------------------------------------------------

....

=======================================================
[End] Feature ipfix
=======================================================
```

Command History

Release	Modification
10.14	Command introduced on 8325 and 10000 Switch series.
10.11	Command introduced on 6400, 6400, 8100, and 8360 Switch series.

Command Information

Platforms	Command context	Authority
8100 8325 8360 10000	Manager (#)	Administrators or local user group members with execution rights for this command.

boot set-default

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

Description

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

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

Example

Selecting the primary image as the default boot image:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

boot system

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

Description

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

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

Usage

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

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

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

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

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

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

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

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

Examples

Rebooting the system from the configured default operating system image:

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

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

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

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

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

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

Canceling a system reboot:

```
switch# boot system

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

show boot-history

```
show boot-history [all|{vsf member <1-10>}]
```

Description

Shows boot history information. When no parameters are specified, shows the most recent information about the current boot operation, and the three previous boot operations for the switch. When the **all** parameter is specified, the output of this command shows the boot information for the active management module.

.

To view boot-history on a standby, the command must be sent on the conductor console.

Parameter	Description
`all`	Optional. Shows boot information for the active management module.
`vsf member <1-10>`	Optional. Display boot history for the specified VSF member

Usage

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

The output of this command includes the following information:

Parameter	Description
`Index`	The position of the boot in the history file. Range: 0 to 3.
`Boot ID`	A unique ID for the boot . A system-generated 128-bit string.
`Current Boot, up for <time>`	For the current boot, the **show boot-history** command shows the number of seconds the module has been running on the current software.
`<Timestamp>: boot reason`	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. ■ **Uncontrolled reboot**: The reason for the reboot is not known. ■ **Reboot requested through database**: The reboot occurred because of a request made through the CLI or other API.

Examples

Showing the boot history of the active management module:

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

Index : 2
Boot ID : c34a2c2499004a02bbeeff4992e1fdbd
Current Boot, up for 1 days 13 hrs 13 mins 27 secs

Index : 1
```

```
Boot ID : bfba9bc486304e57904ac717a0ccbdcd
02 Sep 23 02:55:33 : CPU request reset with 0x20201, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:55:33 : Switch boot count is 2

Index : 0
Boot ID : a88a71b7ca9a4574af7e3b811ddfdc7e
02 Sep 23 02:49:26 : Reboot requested by user, Version: FL.10.14.0000-1619-
ga9ec1805bd442~dirty
02 Sep 23 02:50:02 : Switch boot count is 1

Index : 3
Boot ID : f00ba10c8c44457f83fee303d014a89a
25 Aug 23 10:27:42 :  Power on reset with 0x1, Version: FL.10.14.0000-1465-
g9df95249d06b0~dirty
25 Aug 23 10:28:18 :  Switch boot count is 3
25 Aug 23 10:29:02 :  Primary overtemperature fault detected with 0x2 in PSU 1/1
```

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

```
switch#
Management module
==================

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

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

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

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

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

Management module
==================

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

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

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

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

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

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.

Chapter 5
Switch system and hardware commands

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

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

Chapter 6
External storage

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

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

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

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

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

The system supports server connection through data and management ports.

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

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

External storage commands

address

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

Description

Specifies the NAS IP address or hostname.

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

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

Examples

Creating the logfiles storage volume with IP address 10.1.1.1:

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

Deleting an external storage volume named logfiles:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config-external-storage-*<VOLUME-NAME>*	Administrators or local user group members with execution rights for this command.

directory

directory *<DIRECTORY-NAME>*
no directory *<DIRECTORY-NAME>*

Description

Selects an existing directory on the external storage volume.

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

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

Examples

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

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

Clearing the directory /home:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-external-storage-<VOLUME-NAME>`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

disable

```
disable
no disable
```

Description

Disables the external storage volume.

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

Examples

Disabling a volume named logfiles:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-external-storage-<VOLUME-NAME>`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

enable

```
enable
no enable
```

Description

Enables the external storage volume.

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

Examples

Creating and then enabling a volume named logfiles:

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

Disables the external storage volume:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-external-storage-<VOLUME-NAME>`	Operators or Administrators or local user group members with execution rights for this command. Operators can execute this command from the operator context (>) only.

external-storage

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

Description

Creates or updates an external storage volume.

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

Examples

Creating the logfiles storage volume:

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

Deleting the logfiles storage volume:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config	Administrators or local user group members with execution rights for this command.

password (external-storage)

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

Description

Sets the password for network attached storage server login.

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

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

Examples

Creating a volume named logfiles with password Xj#9:

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

Creating a volume named bak1 with a prompted plaintext password:

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

Clearing the password for volume logfiles:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config-external-storage-*<VOLUME-NAME>*	Administrators or local user group members with execution rights for this command.

show external-storage

```
show external-storage [<VOLUME-NAME>]
```

Description

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

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

Examples

```
switch# show external-storage

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

show running-config external-storage

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

Description

Shows the running configuration of the external storage.

Examples

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

Platforms	Command context	Authority
8360 9300 10000		

type

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

Description

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

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

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

Examples

Creating the logfiles volume using NFSV4:

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

Clearing the external storage access type:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-external-storage-<VOLUME-NAME>`	Administrators or local user group members with execution rights for this command.

username

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

Description

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

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

Parameter	Description
<USER-NAME>	Specifies the username.

Examples

Creating a volume named logfiles with the user name nassuser:

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

Clearing the user name nasuser from accessing the logfiles volume:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config-external-storage-*<VOLUME-NAME>*	Administrators or local user group members with execution rights for this command.

vrf

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

Description

Setting a VRF to reach network attached storage.

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

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

Examples

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

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

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config-external-storage-*<VOLUME-NAME>*	Administrators or local user group members with execution rights for this command.

Chapter 7
IP-SLA

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

IP-SLA guidelines

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

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

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

Limitations with VoIP SLAs

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

IP-SLA commands

http

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

Description

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

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

Parameter	Description
	604800.
`version <VERSION-NUMBER>`	Specifies the source interface to use for sending IP-SLA probes.
`http-raw-request <RAW-PAYLOAD>`	HTTP raw request. String.

Examples

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

https

```
https {get | raw} URL [source {<SOURCE-IPV4-ADDR> | <IFNAME>} source-port <PORT-NUM>]
     [proxy proxy-url] [cache disable] [name-server <IPV4-ADDR-DNS-SERVER>]
     [probe-interval <<PROBE-INTERVAL>>] [version <VERSION-NUMBER>] [https-raw-request
<RAW-PAYLOAD>]
no https {get | raw} URL [source {<SOURCE-IPV4-ADDR> | <IFNAME>} source-port <PORT-NUM>]
     [proxy proxy-url] [cache disable] [name-server <IPV4-ADDR-DNS-SERVER>]
     [probe-interval <<PROBE-INTERVAL>>] [version <VERSION-NUMBER>] [https-raw-request
<RAW-PAYLOAD>]
```

Description

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

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

For HTTPS IP-SLA sessions, it is not required to install a certificate on the switch.

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

Examples

```
switch(config-ipsla-1)# https get https://device.arubanetworks.com/root/home.html
switch(config-ipsla-1)# https get https://2.2.2.2 source 1/1/1
switch(config-ipsla-1)# https get https://device.arubanetworks.com  source 2.2.2.1
switch(config-ipsla-1)# https get https://device.arubanetworks.com/root/home.html
source-interface 1/1/1
switch(config-ipsla-1)# https get https://device.arubanetworks.com  name-server
10.10.10.2
switch(config-ipsla-1)# https raw https://device.arubanetworks.com/root/home.html
raw-request "GET /en/US/hmpgs/index.html"
switch(config-ipsla-1)# no https get https://2.2.2.2 source 1/1/1
switch(config-ipsla-1)# no https raw
https://device.arubanetworks.com/root/home.html raw-request "GET
/en/US/hmpgs/index.html"
```

Command History

Release	Modification
10.12.1000	Command introduced.

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

icmp-echo

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

Description

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

Parameter	Description
`{<DEST-IPV4-ADDR> | <HOSTNAME>}`	Selects the destination IPv4 address for the IP-SLA or the hostname of the destination.
`[source {<SOURCE-IPV4-ADDR> | <IFNAME>}]`	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.
`name-server <IPV4-ADDR-DNS-SERVER>`	Specifies the DNS server for destination hostname resolution.
`payload-size <PAYLOAD-SIZE>`	Specifies the payload size of an SLA probe. Range: 0 to 1440.
`tos <TYPE-OF-SERVICE>`	Specifies the type of serve to be used in the probe packets. Range: 0 to 255.
`probe-interval <PROBE-INTERVAL>`	Specifies the probe interval in seconds. Range: 5 to 604800.

Examples

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

ip-sla

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

Description

Creates an IP Service Level Agreement (SLA) profile and switches to the **config-ip-sla** context.

The **no** form of this command deletes an IP-SLA profile. By default, all profile use the default VRF (default).

Parameter	Description
<IP-SLA-NAME>	Specifies an IP-SLA profile name. Length: 1 to 64 characters.

Examples

Creating an IP-SLA:

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

Deleting an IP-SLA:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config`	Administrators or local user group members with execution rights for this command.

ip-sla responder

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

Description

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

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

Parameter	Description
<SLA-NAME>	Specifies the SLA name. Length: 1 to 64 characters.
udp-echo	Enables responder for udp-echo probes.
tcp-connect	Selects TCP connect as the IP-SLA test mechanism.
vrf *<VRF-NAME>*	Specifies the name of the VRF to use.
udp-jitter-voip	Selects VOIP jitter as the IP-SLA test mechanism.
<PORT-NUM>	Specifies the port number to listen for IP-SLA probes. Range: 1 to 65535.
[source {*<SOURCE-IPV4-ADDR>* | *<IFNAME>*}]	Selects the source IPv4 address for SLA probes or the source interface to use for sending IP-SLA probes.

Examples

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360	config	Administrators or local user group members with execution rights for this command.

Platforms	Command context	Authority
9300 10000		

show ip-sla responder

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

Description

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

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

Examples

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

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

switch(config)# show ip-sla responder 1

  SLA Name            : 1 (non-persistent)
  SLA Type            : udp-echo
  VRF Name            : default
  Responder Port      : 10
  Responder IP        :
  Responder Interface :
  Responder Status    : Running
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config`	Administrators or local user group members with execution rights for this command.

show ip-sla responder results

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

Description

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

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

Examples

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config	Administrators or local user group members with execution rights for this command.

show ip-sla

```
show ip-sla {<SLA-NAME> [results] | all}
```

Description

Shows the given IP-SLA source configuration and status.

Parameter	Description
<SLA-NAME>	Specifies the SLA name.
`results`	Shows the statistics calculated for an SLA type.
`all`	Shows all ip-sla source configurations and status.

Examples

```
switch# show ip-sla xyz results

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

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

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

    Minimum RTT(ms)                    : 12
    Maximum RTT(ms)                    : 12
    Average RTT(ms)                    : 12
    DNS RTT(ms)                        : 0
    TCP RTT(ms)                        : 12

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


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

```
       Source Port                     : 5555
       Status                          : running

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

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

       Minimum RTT(ms)                 : 1
       Maximum RTT(ms)                 : 1
       Average RTT(ms)                 : 1
       DNS RTT(ms)                     : 0

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

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

    Voice Scores:
       MOS  Score                      : 4.38   ICPIF                  : 0


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


switch(config)# show ip-sla https-sla
    SLA Name                : https-sla
    Status                  : running
    SLA Type                : https
    VRF                     : default
    Source Port             : 1027
```

```
    Source IP               : 1.1.1.1
    Source Interface        :
    Domain Name Server      :
    Probe Interval(seconds) : 60
    HTTPS Request Type      : raw
    HTTPS URL               : https://1.1.1.2
    Cache                   : Enabled
    HTTPS Proxy URL         :
    HTTP Version Number     :

switch(config)# show ip-sla all

IP-SLA session status
IP-SLA Name                          : 707 (non-persistent)
IP-SLA Type                          : https
Destination Host Name/IP Address     : NA
Destination Port                     : NA
Source IP Address/IFName             :
Source Port                          :
Status                               : running



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



IP-SLA Latest Probe Results
Last Probe Time                      : 2023 Jun 05 13:10:19
Packets Sent                         : 1
Packets Received                     : 1
Packet Loss in Test                  : 0.0000%



Minimum RTT(ms)                      : 20
Maximum RTT(ms)                      : 20
Average RTT(ms)                      : 20
DNS RTT(ms)                          : 0
TCP RTT(ms)                          : 12
TLS RTT(ms)                          : 8

switch(config)# show ip-sla http-sla
    IP-SLA Name             : http-sla
    Status                  : running
    IP-SLA Type             : http
    VRF                     : ipslasrc
    Source IP               : 2.2.2.2
    Source Interface        :
    Domain Name Server      : 10.10.10.2
    Probe Interval(seconds) : 90
    HTTP Request Type       : get
    HTTP/HTTPS URL          : abcd.com/ws/home
    Cache                   : Enabled
    HTTP Proxy URL          :
```

```
    HTTP Version Number     : 1.1
    ```

IP-SLA status description
    ```
    | Status                   | Description                                          |
    |--------------------------|------------------------------------------------------|
    | running                  | SLA is fully operational                             |
    | Bind Error               | Another service is using the same source port  |
    | Interface Down           | Interface status is not up
    | Dns Resolution Error     | Failed to resolve destination hostname         |
    | No Route                 | No available route to the responder            |
    | Internal Error           | Unexpected error prevents SLA session          |
    | Disabled                 | SLA is disabled                                |
    |Configuration Incomplete | Configuration is not complete to enable the SLA|
    ```
IP SLA session cumulative counters description
    ```
    | Status                           | Description
                              |
    |----------------------------------|-----------------------------------------
------------------------------|
    |Probes Timed-out                  | Total numbers of probes failed to receive
response.                       |
    |Bind Error                        | Total numbers of probes transmission failed
as source port not available.|
    |Destination Address Unreachable | Total numbers of probes transmission failed
due to route unavailable.    |
    |DNS Resolution Failures           | Total numbers of probes failed due to DNS
resolution failure.             |
    |Reception Error                   | Total numbers of probes failed due to
internal error in reception.       |
    |Transmission Error                | Total numbers of probes failed due to
internal errr in transmission.     |
```

Command History

Release	Modification
10.12.1000	Updated to display **https** as an IP-SLA type.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

start-test

`start-test`

Description

Starts the IP-SLA probes.

Examples

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config-ip-sla-*<IP-SLA-NAME>*	Administrators or local user group members with execution rights for this command.

stop-test

stop-test

Description

Stops the IP-SLA probes.

Examples

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360	config-ip-sla-*<IP-SLA-NAME>*	Administrators or local user group members with execution rights for this command.

Platforms	Command context	Authority
9300 10000		

tcp-connect

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

Description

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

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

Examples

```
switch(config-ipsla-1)# tcp-connect 2.2.2.2 8080
switch(config-ipsla-1)# tcp-connect 2.2.2.2 8080 source 2.2.2.1 source-port 6000
switch(config-ipsla-1)# tcp-connect 2.2.2.2 8080 source 1/1/1 source-port 6000
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080 source
2.2.2.1 source-port 6000
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080 source
1/1/1 source-port 6000
switch(config-ipsla-1)# tcp-connect https://device.arubanetworks.com 8080 name-
server 10.10.10.2
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config-ip-sla-*<IP-SLA-NAME>*	Administrators or local user group members with execution rights for this command.

udp-echo

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

Description

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

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

Examples

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config-ip-sla-*<IP-SLA-NAME>*	Administrators or local user group members with execution rights for this command.

udp-jitter-voip

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

Description

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

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

Parameter	Description
`tos <TYPE-OF-SERVICE>`	Specifies the type of service. Range: 0 to 255.
`probe-interval <PROBE-INTERVAL>`	Specifies the probe interval in seconds. Range: 120 to 604800.

Examples

```
switch(config-ipsla-1)# udp-jitter-voip  2.2.2.2 8080 advantage-factor 10 codec-
type g711a
    switch(config-ipsla-1)# udp-jitter-voip  2.2.2.2 8080 advantage-factor 10
codec-type g711a source 2.2.2.1
    switch(config-ipsla-1)# udp-jitter-voip  https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a
    switch(config-ipsla-1)# udp-jitter-voip  2.2.2.2 8080 advantage-factor 10
codec-type g711a source 1/1/1
    switch(config-ipsla-1)# udp-jitter-voip  https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a source 2.2.2.1
    switch(config-ipsla-1)# udp-jitter-voip  https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a source 1/1/1
    switch(config-ipsla-1)# udp-jitter-voip  https://device.arubanetworks.com 8080
advantage-factor 10 codec-type g711a name-server 10.10.10.2 probe-interval 120
source 10.1.1.1 source-port 8888 tos 10
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-ip-sla-<IP-SLA-NAME>`	Administrators or local user group members with execution rights for this command.

vrf

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

Description

Configures the VRF on which the SLA will send or receive packets. By default, the default VRF is used.

The **no** form of the command removes VRF from SLA.

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

Examples

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config-ip-sla-*<IP-SLA-NAME>*	Administrators or local user group members with execution rights for this command.

show interface

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

Description

Shows active configurations and operational status information for interfaces.

Parameter	Description
<IFNAME>	Specifies a interface name.
<IFRANGE>	Specifies the port identifier range.
brief	Shows brief info in tabular format.
physical	Shows the physical connection info in tabular format.
extended	Shows additional statistics, including the **tx filtered** and **rx filtered** counters. ■ Rx filter packets are protocol packets received when the protocol is disabled on the switch and there is only one port in the VLAN. Protocols include OSPF, PIM, RIP, LACP, and LLDP.

Parameter	Description
	▪ An example of a Tx filtered packet would be a multicast packet being filtered from going out of the ingress port.
`human-readable`	Shows statistics rounded to the nearest power of 1000, for example, 1K, 345M, 2G. This is available only in the CLI interface output.
`non-zero`	Shows only non zero statistics.
`LAG`	Shows LAG interface information.
`monitor`	Continuously monitor interface statistics.
`LOOPBACK`	Shows loopback interface information.
`TUNNEL`	Shows tunnel interface information.
`VLAN`	Shows VLAN interface information.
`<LAG-ID>`	Specifies the LAG number. Range: 1-256
`<LOOPBACK-ID>`	Specifies the LOOPBACK number. Range: 0-255
`<TUNNEL-ID>`	Specifies the tunnel ID. Range: 1-255
`<VLAN-ID>`	Specifies the VLAN ID. Range: 1-4094
`VXLAN`	Shows the VXLAN interface information.
`<VXLAN-ID>`	Specifies the VXLAN interface identifier. Default: 1

Examples

Showing interface information when it is configured as a route-only port (the **persona** item is only available on the Aruba 10000 Switch Series):

```
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
 Persona: access
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
```

Showing information when the interface is currently linked at a downshifted speed:

```
switch(config-if)# show interface 1/1/1
Interface 1/1/1 is up
...
Auto-negotiation is on with downshift active
```

Showing information when the interface is shut down during a VSX split (the **persona** item is only available on the Aruba 10000 Switch Series):

```
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:
 Persona: access
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
```

Showing the monitor information:

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

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

```
Help for Interface Monitor
h  Toggle human-readable mode
c  Clear interface statistics
```

```
Does not apply to rates
Arrows, PgUp, PgDn, Home, End
Navigate interface statistics
Delay: 2
help: ?, quit: q
```

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

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

```
switch(config-if)# show interface 1/1/1 human-readable
Interface 1/1/1 is up
Rate                              RX                   TX        Total (RX+TX)
---------------- -------------------- -------------------- --------------------
Bits / sec                        3M                   3M                   6M
Pkts / sec                       316                  316                  633
Unicast                          319                  319                  638
Multicast                          0                    0                    0
Broadcast                          0                    0                    0
Utilization %                    < 1                  < 1                  < 1
Statistic                         RX                   TX                Total
---------------- -------------------- -------------------- --------------------
Packets                         577K                 577K                   1M
Unicast                         577K                 577K                   1M
Multicast                          0                   51                   51
Broadcast                          0                   15                   15
Bytes                           744M                 745M                   1G
Jumbos                             0                    0                    0
Dropped                            0                    0                    0
Filtered                           0                    0                    0
Pause Frames                       0                    0                    0
Errors                             0                    0                    0
CRC/FCS                            0                  n/a                    0
Collision                        n/a                    0                    0
Runts                              0                  n/a                    0
Giants                             0                  n/a                    0
```

Showing information about extended counters:

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

```
switch(config-if)# show interface 1/1/17 extended
------------------------------------------------------------------
Interface 1/1/17
------------------------------------------------------------------
Statistics                                      Value
------------------------------------------------------------------
Dot1d Tp Port In Frames                         547
Dot1d Tp Port Out Frames                        608
Dot3 In Pause Frames                            0
Dot3 Out Pause Frames                           0
```

```
Ethernet Stats Broadcast Packets               19
Ethernet Stats Bytes                           40162
Ethernet Stats Packets                         342
...
----------------------------------------------------------------------
Error-Statistics                               Value
----------------------------------------------------------------------
Dot1d Base Port MTU Exceeded Discards          0
Dot3 Control In Unknown Opcodes                0
Dot3 Stats Alignment Errors                    0
Dot3 Stats FCS Errors                          0
Dot3 Stats Frame Too Longs                     0
Dot3 Stats Internal Mac Transmit Errors        0
Ethernet RX Oversize Packets                   0
...
```

Showing interface link-status:

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


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

Showing interface loopback 1 link-status:

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

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

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

Showing interface link-status:

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

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

Command History

Release	Modification
10.11	Added `monitor` parameter.
10.10	Added `human-readable` parameter.
10.09	Added persona information for the 10000 Switch Series.
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 statistics

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

Description

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

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

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

Examples

Showing statistics of all interfaces:

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

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

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

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

```
show interface statistics human-readable
-------------------------------------------------------------------------------------------------------------------------------
Interface            RX Bytes   RX Pkts  RX Drops  TX Bytes   TX Pkts  TX Drops  RX Bcast  RX Mcast  TX Bcast  TX Mcast  RX Pause  TX Pause
-------------------------------------------------------------------------------------------------------------------------------
1/1/1                    744M      577K         0      745M      578K         0         0         0        73       287         0         0
1/1/2                    474M      367K         0      475M      369K         0         0         0        73       288         0         0
1/1/3                       0         0         0         0         0         0         0         0         0         0         0         0
```

Showing statistics of a single interfaces:

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

Showing statistics of all members of a LAG interface:

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

Showing error statistics of all interfaces:

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

Showing monitor statistics:

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

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

                                                    help: ?, quit: q
```

```
Help for Interface Monitor

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

c    Clear interface statistics
       Does not apply to rates

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

Delay:2
                                                                    help: ?, qui
```

Showing monitor error statistics in human-readable format:

```
show interface 1/1/1-1/1/3,1/1/30-1/1/32 error-statistics monitor human-readable
-------------------------------------------------------------------------------------------------
Interface                RX Errors    TX Errors    RX Giants     RX Runts      CRC/FCS  Collisions
-------------------------------------------------------------------------------------------------
1/1/1                            0            0            0            0            0           0
1/1/2                            0            0            0            0            0           0
1/1/3                            0            0            0            0            0           0
1/1/30                           0            0            0            0            0           0
1/1/31                           0            0            0            0            0           0
1/1/32                           0            0            0            0            0           0


Human-readable                                                                 help: ?, quit: q
```

```
Help for Interface Monitor

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

c    Clear interface statistics
        Does not apply to rates

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

Delay:2
                                                                          help: ?, quit: q
```

Command History

Release	Modification
10.11	Added `moitor` parameter.
10.10	Added `human-readable` parameter.
10.07 or earlier	--

Command Information

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

Chapter 8
Mirroring

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

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

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

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

Mirroring statistics and sFlow

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

Mirroring and sFlow configuration on the same port is supported.

Limitations

The following limitations apply when configuring multiple mirroring sessions on a switch:

- CPU generated packets egressing on a routed L3 interface will not be mirrored to the destination port.
- Untagged egress packets that get mirrored will have the native VLAN tag in the mirrored packet. These extra bytes can cause traffic loss at the mirror destination when running line rate traffic.
- True egress mirroring is not supported on 832x platforms. Egress mirroring takes place at the ingress. The packets that may get dropped at the egress might also have been mirrored at ingress. Traffic will be mirrored even before the policy actions are processed at the egress.
- Packets mirrored to CPU from a Layer-3 Route Only Port (ROP) will have a VLAN tag with the VLAN ID set to the internal VLAN ID assigned to that port.
- 832x platforms have 4 mirror ASIC resources that can be used among the different mirror sessions. Each direction in a mirror session will consume 1 mirror ASIC resource. Hence, a user can have up to 4 unidirectional mirror sessions or 2 bi-directional mirror sessions active at any given time. If there are no mirror ASIC resources available when attempting to enable a mirror session, the 'Operation Status' field of `show mirror` command for session ID will have the status set to 'platform_session_limit_reached.'

- The mirror destination port among the active mirror sessions must be unique i.e. if an interface is configured as a source or destination in an active mirror session, the same port cannot be used as a destination in another active mirror session.
- The interface/LAG used to transmit ERSPAN packets cannot be a source in *any* mirror session.
- The interface/LAG used to transmit ERSPAN packets must be unique per ERSPAN mirror session. If a change in the L3 topology causes multiple ERSPAN mirror sessions to use the same egress interface/LAG to transmit the ERSPAN packets, then only one session will work. The other session(s) will go into an error state.

Mirroring commands

clear mirror

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

Description

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

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

Examples

Clearing mirror statistics for all configured mirror sessions:

```
switch# clear mirror all
```

Clearing mirror statistics for mirror session 1:

```
switch# clear mirror 1
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

clear mirror endpoint

Applies only to the Aruba 8100 and 8360 Switch Series.

```
clear mirror endpoint [<NAME>]
```

Description

Clears mirror endpoint statistics for all configured mirror endpoints. The optional parameter can be added to clear a specific mirror endpoint.

Parameter	Description
<NAME>	Specifies name of the mirror endpoint instance to be cleared.

Examples

Clearing statistics for all configured mirror endpoints:

```
switch# clear mirror endpoint
```

Clearing mirror statistics for mirror endpoint test:

```
switch# clear mirror endpoint test
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8360	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

comment

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

Description

Specifies a comment for the mirroring session.

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

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

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

Usage

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

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

Examples

Adding a comment to a mirror session:

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

Removing the comment from mirror session 3:

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

Adding a comment to a mirror endpoint:

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

Replacing the existing comment for mirror endpoint:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

copy tcpdump-pcap

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

Description

Saves packet capture files to external storage.

Parameter	Description
<FILE-NAME>	Specifies the packet capture file to save.
<REMOTE-URL>	Specifies the external storage to which the packet capture file will be saved.

Usage

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

Examples

Saving my_capture_file.pcap to sftp://root@10.0.0.2/file.pcap:

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

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	Manager (#)	Administrators or local user group members with execution rights for this command.

copy tshark-pcap

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

Description

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

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

Parameter	Description
`vrf <VRF-NAME>`	Specifies the name of a VRF. Default: default.

Example

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

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	Manager (#)	Administrators or local user group members with execution rights for this command.

destination cpu

```
destination cpu
no destination cpu
```

Description

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

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

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

Examples

Configuring a mirror session with CPU as the destination.

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

Removing the destination entirely.

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	config-mirror-*<SESSION-ID>*	Administrators or local user group members with execution rights for this command.

destination interface

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

Description

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

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

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

Usage

Supported mirror destinations: Layer 2 or Layer 3 Ethernet ports, LAGs, or CPU as a Mirror Destination. A port that is already a member of a LAG is not a valid mirror destination.

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

Examples

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

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

Replacing the existing destination with different interface:

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

Removing a destination:

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

Switch	Destination interface limit per mirror session (4 possible sessions)
8320	1
8325	1
8360	64
9300	1
10000	1

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

destination tunnel

```
destination tunnel <TUNNEL-IPV4> source <SOURCE-IPv4-ADDR>
   dscp <DSCP-VALUE> vrf <VRF-NAME>
no destination tunnel
```

Description

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

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

ERSPAN is not supported leaving the switch by the OOB port. If VRF management is configured for an ERSPAN session, the session will be in "mirror_err_tunnel_oob_port_not_supported" operation status.

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

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

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

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

Examples

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

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

Replacing the existing tunnel destination:

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

Replacing the existing destination with a different DSCP value:

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

Removing the destination:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-mirror-<SESSION-ID>`	Administrators or local user group members with execution rights for this command.

diagnostic

```
diagnostic

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

Description

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

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

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

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

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

Example

Performing diagnostic:

```
switch# diagnostic

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

diag utilities tcpdump

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

Description

Captures traffic received or transmitted over a network.

Parameter	Description
`command <TEXT>`	Captures packets based on a specified tcpdump command string.
`delete file <FILE-NAME>`	Deletes specified tcpdump list files.
`list-files`	Lists all the tcpdump capture files saved on the device.
`vrf <VRF-NAME>`	Captures packets on the specified VRF. If no VRF is named, the default is used.
`count <COUNT-NUM>`	Runs the tcpdump command until the specified number of packets are captured. Range: 1-2147483647.
`proto <PROTO-NUM>`	Captures packets of a particular type based on IP protocol number. Range: 0-255.
`host-ip <IP-ADDR>`	Captures packets matching with the source or destination IP address.
`source-ip <IP-ADDR>`	Captures packets from the specified IP address.
`destination-ip <IP-ADDR>`	Captures packets sent to the specified IP address.
`host-port <PORT>`	Captures packets matching with the source or destination port.
`source-port <PORT>`	Captures packets from the specified IP port.
`destination-port <PORT>`	Captures packets sent to the specified IP port.
`verbosity <LEVEL>`	Captures packets of the specified verbosity. Range: level1-level4. If no verbosity is specified, the default is level1.
`print <DATA>`	Captures the data of each packet. The maximum is 262144 bytes
`ethernet-type <ETH-NUM>`	Captures packets based on the particular ethernet type. Range: 0-65535.

Usage

- When using the **command** option, the only traffic captured will be packets that have been mirrored to the CPU.

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

Examples

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

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

Listing saved capture files:

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

Reading my_capture_file.pcap:

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

Removing my_capture_file.pcap:

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

Command History

Release	Modification
10.08	Command introduced

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	Manager (#)	Administrators or local user group members with execution rights for this command.

disable

`disable`

Description

Disables the mirroring session specified by the current command context.

Usage

By default, mirroring sessions are disabled.

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

Example

Disabling a mirroring session:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

enable

```
enable
```

Description

Enables the mirroring session for the current command context.

Usage

By default, mirroring sessions are disabled.

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

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

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

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

Example

Configuring and enabling a mirroring session:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

mirror session

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

Description

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

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

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

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

Examples

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

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

mirror endpoint

```
mirror endpoint <NAME>
no mirror endpoint <NAME>
```

Description

Creates the specified mirror endpoint or enters its context if it already exists. The specifics of a mirror endpoint are created or altered while in the mirror endpoint context and the mirror endpoint is enabled or disabled from this context. It may be possible to support different encapsulations by different ASICs. For example, UDP for PVOS compatibility. Termination of GRE encapsulation is also supported.

The **no** form of this command removes an existing mirror endpoint. An enabled mirror endpoint is automatically disabled first before removal.

Parameter	Description
<NAME>	Specifies mirror endpoint name.

Examples

Creating a mirror endpoint named test :

```
switch(config)# mirror endpoint test
```

Deleting mirror endpoint named test:

```
switch(config)# no mirror endpoint test
```

Configuring a mirror endpoint named test :

```
6100(config)# mirror endpoint test
6100(config-mirror-endpoint-test)#
6100(config-mirror-endpoint-test)# destination
  interface  Specify interfaces to send traffic
6100(config-mirror-endpoint-test)# destination interface
  IFNAMELIST  An interface, a range or a comma seperated list of interfaces
6100(config-mirror-endpoint-test)# destination interface 1/1/3
  <cr>
6100(config-mirror-endpoint-test)# destination interface 1/1/3
6100(config-mirror-endpoint-test)#
6100(config-mirror-endpoint-test)# source 1.1.1.1 destination 1.1.1.2 id 1 vrf
default
6100(config-mirror-endpoint-test)#
```

Only physical ports can be configured as interface for mirror-endpoint destination. LAG port is not supported as interface for mirror-endpoint destination.

The maximum allowed number of destination interfaces for both mirror-session and mirror-endpoint is 1.

Command History

Release	Modification
10.13.1000	Added support for 4100i, 6000, and 6100 switches.
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8360	config	Administrators or local user group members with execution rights for this command.

show mirror

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

Description

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

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

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

`enable`
The mirroring session is enabled.
`disable`
The mirroring session has been configured but not yet enabled, or has been disabled.

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

`dest_doesnt_exist`
The configured destination interface is not found in the system. The mirroring session cannot be enabled.
`destination_shutdown`
The mirroring session is enabled, but the destination interface is shut down. No traffic can be monitored.
`disabled`
The mirroring session is disabled and is not in an error condition.
`enabled`
The mirroring session is enabled.
`external/driver_error`
An internal ASIC hardware error occurred.
`hit_active_sessions_capacity`
The mirroring session could not be enabled because the maximum number of supported mirroring sessions are already enabled.
`internal_error`
An invalid parameter was passed to the ASIC software layer.
`no_dest_configured`
The mirroring session does not have a destination interface configured.
`no_name_configured`
A software error occurred. The mirroring session does not have a session ID in its configuration.
`null_mirror`
A software error occurred. The session object reference is invalid.
`out_of_memory`
The system is out of memory, reboot recommended.
`tunnel_route_resolution_not_populated`
If the destination tunnel IP address is not reachable.
`unknown_error`
An unexpected error occurred.

Examples

Showing summary information about all configured mirroring sessions:

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

Showing detailed information about a single mirroring session:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

show mirror endpoint

`show mirror endpoint [<NAME>]`

Description

Shows a list of all configured mirror endpoints, their Admin Status and their Operation Status.

The optional parameter will display the details of the specified mirror endpoint if it exists.

Parameter	Description
<NAME>	Specifies name of the mirror endpoint instance to be displayed.

Examples

Showing a summary of all configured mirror endpoints on the switch:

```
switch# show mirror endpoint
Name    Admin Status   Operation Status
-----  -------------- ------------------------------------------------------
test    enable         enabled
monitor disable        disabled
```

Showing the details of enabled mirror endpoint test:

```
switch# show mirror endpoint test
Mirror Endpoint: audit
Admin Status: enable
```

```
Operation Status: enabled
Comment: Mirror Endpoint Audit
Type: gre
Tunnel: source 1.1.1.1 destination 1.1.1.2 id 1 vrf default
Interface: 1/1/3
Output Packets: 123456789
Output Bytes: 0
```

"Output Packets" in "show mirror endpoint [name]" is only supported for statistics.
"Output Bytes" in "show mirror endpoint [name]" is not supported due to ASIC limitation.

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8360	Operator (>) or Manager (#)	Administrators or local user group members with execution rights for this command.

shutdown

Applies only to the Aruba 8100 and 8360 Switch Series.

```
shutdown
no shutdown
```

Description

Enables mirror endpoint from its default disabled state. To verify the mirror endpoint was successfully activated, run the **show mirror endpoint NAME** command and verify that the **Admin Status** and **Operational Status** has changed from disabled to enabled. If the status value remains disabled, consult the system logs to determine the reason for activation failure. To disable the mirror endpoint, first disable the remote mirror session on the switch that's originating the data. Next, use the `shutdown` command to disable the mirror endpoint.

Examples

Enabling a mirror endpoint:

```
switch(config)# mirror endpoint test
```

```
switch(config-mirror-endpoint-test)# no shutdown
```

Disabling a mirror endpoint:

```
switch(config)# mirror endpoint test
switch(config-mirror-endpoint-test)# shutdown
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8360	config	Administrators or local user group members with execution rights for this command.

source

Applies only to the Aruba 8100 and 8360 Switch Series.

```
source <SOURCE-IP> destination <DESTINATION-IP> id <1-4294967295> [vrf <VRF_NAME>] [type
{gre}]
no source
```

Description

Configures tunnel parameters of the mirror endpoint. Configuring a tunnel parameter to a mirror endpoint will replace the existing configuration. By default the VRF is **default**, users can also explicitly provide a custom VRF. The default tunnel type is considered to be GRE and users also have the option to explicitly give type as GRE.

The **no** form removes the tunnel parameters of the mirror endpoint.

Parameter	Description
<SOURCE-IP>	Specifies L3 encapsulated IPv4 source in the form A.B.C.D.
<DESTINATION-IP>	Specifies L3 encapsulated IPv4 destination in the form A.B.C.D.
id	Specifies tunnel identifier from the encapsulated packet.
<VRF_NAME>	Specifies the name of VRF for which the tunnel belongs to.

Examples

Configuring a tunnel parameter to a mirror endpoint:

```
switch(config-mirror-endpoint-test)# source 1.1.1.1 destination 7.7.7.7 id 1 vrf
default type gre
```

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8360	`config`	Administrators or local user group members with execution rights for this command.

source interface

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

Description

Configures the specified interface (either an Ethernet port or a LAG) as a source of traffic to be mirrored.

The **no** form of this command ceases mirroring traffic from the specified source interface and removes the source interface from the mirroring session configuration.

Parameter	Description
<PORT-NUM>	Specifies a physical port on the switch. Use the format **member/slot/port** (for example, **1/3/1**).
<LAG-NAME>	Specifies the identifier for the LAG (link aggregation group).
<DIRECTION>	Selects the direction of traffic to be mirrored from this source interface. There is no default for this parameter. Valid values are the following:
`both`	Mirror both transmitted and received packets.
`rx`	Mirror only received packets.
`tx`	Mirror only transmitted packets.

Usage

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

Switch	Source interface limit per mirror session (4 possible sessions)
8320	128
8325	128
8360	64
9300	128
10000	72

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

You can configure the same source interface in multiple mirroring sessions, if required.

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

Examples

Configuring a mirrored traffic source interface:

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

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

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

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

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

Removing the first source interface:

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

Configuring a source interface to mirror received packets only:

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

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

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

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

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

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

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

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

source vlan

Applies only to the Aruba 8100 and 8360 Switch Series.

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

Description

Mirroring with VLAN as a source is supported in the following traffic directions:

- **both** - traffic received and transmitted
- **rx** - only received traffic
- **tx** - only transmitted traffic

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

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

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

- Reenter the **source vlan <VLAN-NUM> <direction>** command with the new preferred direction.
- Use the **no source vlan <VLAN-NUM> <direction>** form of the command with a direction (**rx** or **tx**) to selectively remove the specified direction.

Specifying the last remaining direction for that VLAN will remove the VLAN from the configuration entirely.

Mirroring allows configuration of VLAN as a source. When VLAN source is configured in the **rx** direction, all packets are mirrored as they are received in the switch. When VLAN source is configured in **tx** direction, all packets are mirrored as they are transmitted out of the switch.

For packets bridged through the switch:

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

For routed packets:

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

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

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

The **no** form command will cease mirroring traffic from the specified source VLAN and remove the source from the mirror configuration.

Parameter	Description
`VLAN-NUM`	Selects the VLAN number.
`direction`	Specifies the direction of mirroring. **tx** (transmit), **rx** (receive), or **both**.

Examples

Creating a mirror session and adding a VLAN as a source of traffic in both directions on that port:

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

Creating a mirror session and adding two VLANs as sources of traffic:

directions:

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

Configuring the source in session 2 to receive by specifying the source interface configuration:

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

Removing the first source interface in session 2 entirely, and removing the transmit direction from the other so that mirroring only occurs in the receive direction:

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

Command History

Release	Modification
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8360	config	Administrators or local user group members with execution rights for this command.

Chapter 9
Monitoring a device using SNMP

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

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

Ports default to an unsplit state. When a port is 'split', the split interfaces become active and can be configured independently. For example, when a 40G QSFP+ port is split four ways, each split interface behaves like a separate 10G SFP+ port. The split interfaces have the same name as the base port with an added suffix to represent their lane of the breakout cable or optical channel on SR4 optics. Splitting an interface removes most of the port's configuration settings and makes it inactive. The port will no longer appear in many show interface commands and most configuration commands are not allowed; the split interface name must be used.

The same thing happens in reverse when an interface is unsplit. However, note that the 'split' and 'no split' commands are always performed in the unsplit port's context.

Limitations with breakout cable support

- The JL720A Aruba 8360-48XT4C models (ordered SKU #s JL706A/JL707A) do not support split ports.

Breakout cable support commands

split

```
split [<COUNT>][<SPEED>][confirm]
no split [confirm]
```

Description

Splits a port into multiple interfaces. Only ports capable of supporting breakout cables or SR4/eSR4/eDR4 optics can be split.

Parameter	Description
<COUNT>	Specifies the number of child interfaces to activate upon splitting the port. Default: 4.
<SPEED>	Specifies the speed for the child interfaces.
`confirm`	Specifies the confirmation of port splitting.

Usage

- Some switch interfaces support different split counts depending on the installed transceiver. For these interfaces, the number of child interfaces to activate can be specified. If omitted, the default is 4. For transceivers capable of supporting multiple split modes, the closest mode with enough lanes is used.

- Some transceivers also support multiple split modes with different speeds. For example, 2x200G or 2x100G. When a speed is not specified, the highest available speed for the split count is used. To select a different split mode with a lower speed, the desired speed must be specified.

When the current transceiver does not support the configured split speed, the interface will remain down with an `Invalid speed` error.

Ports that are not splittable in the currently applied interface profile can be configured as split, but remain in a **down** state until a compatible profile is selected and the switch rebooted to apply it.

The splittable ports for all models are shown in the table below:

Model	Description	Port info
8320 Series		
■ JL479A ■ JL579A ■ JL581A	8320 48 10/6 40 X472 5 2 Bundle 8320 32 40G X472 5 2 Bundle 8320 48 T/6 40 X472 5 2 Bundle	49-54 (40G) 5-28 (40G - center 24 ports) 49-54 (40G)
8325 Series		
■ JL635A	8325-48Y8C 48p 25G 8p 100G switch 8325-48Y8C FB 6 F 2 PS Bundle	49-56 (40G or 100G)
■ JL624A ■ JL625A ■ JL626A ■ JL627A ■ JL636A	8325-48Y8C BF 6 F 2 PS Bundle JL626A 8325-32C FB 6 F 2 PS Bundle 8325-32C BF 6 F 2 PS Bundle 8325-32C 32p 100G switch	49-56 (40G or 100G) 49-56 (40G or 100G) 1-32 (40G or 100G) 1-32 (40G or 100G) 1-32 (40G or 100G)
8360 32Y4C models		
JL717A (base system) ■ JL700A Port-to-Power model ■ JL701A Power-to-Port model	8360-32Y4C switch 8360-32Y4C switch	33-36 (40G or 100G) 33-36 (40G or 100G)
8360 16Y2C models		
JL718A (base system) ■ JL702A Port-to-Power model ■ JL703A Power-to-Port model	8360-16Y2C switch 8360-16Y2C switch	17-18 (40G or 100G) 17-18 (40G or 100G)
8360 48XT4C models		
JL720A (base system) ■ JL706A Port-to-Power model ■ JL707A Power-to-Port model	8360-48XT4C switch Aruba 8360-48XT4C switch	NO SUPPORT for Split ports
8360-12C models		
JL721A (base system) ■ JL708A Port-to-Power model ■ JL709A Power-to-Port model	8360-12C switch 8360-12C switch	1-12 (40G or 100G) 1-12 (40G or 100G)
8360 24XF2C models		
JL722A (base system)	8360-24XF2C switch	25-26 (40G or 100G)

Model	Description	Port info
▪ JL710A Port-to-Power model ▪ JL711A Power-to-Port model	8360-24XF2C switch	25-26 (40G or 100G)
9300 Switch Series ▪ R8Z96A	9300-32D 32p 100/200/400G QSFP-DD p 10G SFP+ Switch	All ports are splittable. QSFP28 ports are capable of operating as: ▪ 100G ports ▪ 40G ports ▪ Split into 4 individual 25G or 10G ports
▪ S0F95A ▪ S0F96A	HPE Aruba Networking 9300S 32P QSFP28 100G 8p QSFP-DD 400G TAA Switch HPE Aruba Networking 9300S 32P QSFP28 100G 8p QSFP-DD 400G Switch	Some ports are splittable depending on the interface profile use. See the Installation and Getting Started Guide for more information.
10000 Switch Series ▪ R8P13A	10000-48Y6C FB6F2PS Bundle	Ports 49-54 are splittable. QSFP28 ports are capable of operating as: ▪ 100G ports ▪ 40G ports ▪ Split into 4 individual 25G or 10G ports
▪ R8P14A	10000-48Y6C BF6F2PS Bundle	Ports 49-54 are splittable. QSFP28 ports are capable of operating as: ▪ 100G ports ▪ 40G ports ▪ Split into 4 individual 25G or 10G ports

Examples

Before splitting an interface (example on a 8325 Series Switch):

```
switch(config)# show interface 1/1/56 brief
--------------------------------------------------------------------------------
Port    Native  Mode   Type      Enabled Status Reason                Speed Desc
        VLAN
--------------------------------------------------------------------------------
1/1/56  --      routed QSFP+DA1  no      down   Administratively down --    --
```

After splitting:

```
switch(config)# interface 1/1/56
switch(config-if)# split
This command will disable the specified port, clear its configuration,
```

```
and split it into multiple interfaces.

Continue (y/n)? y

8325(config-if)# show interface 1/1/56,1/1/56:1-1/1/56:4 brief
--------------------------------------------------------------------------------
Port      Native Mode   Type       Enabled Status  Reason           Speed   Desc
          VLAN                                                     (Mb/s)
--------------------------------------------------------------------------------
1/1/56    --     routed QSFP+DA1   no      down    Interface split  --      --
1/1/56:1  --     routed QSFP+DA1   yes     up                       10000   --
1/1/56:2  --     routed QSFP+DA1   yes     up                       10000   --
1/1/56:3  --     routed QSFP+DA1   yes     up                       10000   --
1/1/56:4  --     routed QSFP+DA1   yes     up                       10000   --
```

Unsplitting a port on a switch that does not require a reboot:

```
switch(config)# interface 1/1/1
switch(config-if)# no split
This command will disable the split interfaces for this port and clear
their configuration.

Continue (y/n)? y
```

Splitting an interface two ways on a 9300 Series Switch using the default for speed, taking the port capability (400G), and assuming 200G:

```
switch(config)# interface 1/1/1
switch(config-if)# split 2
This command will disable the specified port, clear its configuration,
and split it into multiple interfaces.

Continue (y/n)? y

switch(config-if)# show interface brief
--------------------------------------------------------------------------------
Port     Native  Mode   Type       Enabled Status  Reason    Speed   Description
         VLAN                                               (Mb/s)
--------------------------------------------------------------------------------
1/1/1:1   --     routed 400G-SR8    yes     up              200000
1/1/1:2   --     routed 400G-SR8    yes     up              200000
```

Changing the interface to 2x100G mode:

```
switch(config)# interface 1/1/1
switch(config-if)# split 2 100g
This command will clear the configuration for all split interfaces of
this port.

Continue (y/n)? y

switch(config-if)# show interface brief
--------------------------------------------------------------------------------
Port     Native  Mode   Type       Enabled Status  Reason    Speed   Description
         VLAN                                               (Mb/s)
--------------------------------------------------------------------------------
1/1/1:1   --     routed 400G-SR8    yes     up              100000
```

```
1/1/1:2   --     routed 400G-SR8    yes     up              100000
```

Command History

Release	Modification
10.10.1000	Added parameters: ***<COUNT>*** , **<SPEED>**
10.07 or earlier	--

Command Information

Platforms	Command context	Authority
8100 8320 8325 8360 9300 10000	`config-if`	Administrators or local user group members with execution rights for this command.

Chapter 11
Aruba AirWave

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

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

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

SNMP support and AirWave

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

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

SNMP on the switch

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

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

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

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

```
snmp-server vrf mgmt
!
...
```

Supported features with AirWave and the AOS-CX switch

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

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

Configuring the AOS-CX switch to be monitored by AirWave

Prerequisites

Aruba AirWave is active on the network.

Procedure

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

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

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

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

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

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

switch(config)# snmpv3 context Admin
```

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

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

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

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

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

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

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

AirWave commands

logging

```
logging {<IPV4-ADDR> | <IPV6-ADDR> | <FQDN | HOSTNAME>} [ {udp [<PORT-NUM>] }|{tcp
[<PORT-NUM>} | {tls [<PORT-NUM> [auth-mode {certificate|subject-name}] [legacy-tls-
renegotiation]}] [severity <LEVEL>] [vrf <VRF-NAME>] [include-auditable-events]
[filter <FILTER-NAME>] [ rate-limit-burst <BURST> [rate-limit-interval <INTERVAL>] ]

no logging {<IPV4-ADDR> | <IPV6-ADDR> | <HOSTNAME>
```

Description

Enables syslog forwarding to a remote syslog server.

The `no` form of this command disables syslog forwarding to a remote syslog server.

Parameter	Description
{*<IPV4-ADDR>* | *<IPV6-ADDR>* | *<HOSTNAME>*}	Selects the IPv4 address, IPv6 address, or host name of the remote syslog server. Required.
[udp [*<PORT-NUM>*] | tcp [*<PORT-NUM>*]]	Specifies the UDP port or TCP port of the remote syslog server to receive the forwarded syslog messages.
udp [*<PORT-NUM>*]	Range: 1 to 65535. Default: 514
tcp [*<PORT-NUM>*]	Range: 1 to 65535. Default: 1470
tls [*<PORT-NUM>*]	Range: 1 to 65535. Default: 6514
include-auditable-events	Specifies that auditable messages are also logged to the remote syslog server.
severity *<LEVEL>*	Specifies the severity of the syslog messages: ■ alert: Forwards syslog messages with the severity of alert (6) and emergency (7). ■ crit: Forwards syslog messages with the severity of critical (5) and above. ■ debug: Forwards syslog messages with the severity of debug (0) and above. ■ emerg: Forwards syslog messages with the severity of emergency (7) only. ■ err: Forwards syslog messages with the severity of err (4) and above ■ info: Forwards syslog messages with the severity of info (1) and above. Default. ■ notice: Forwards syslog messages with the severity of notice (2) and above. ■ warning: Forwards syslog messages with the severity of warning (3) and above.
auth-mode	Specifies the TLS authentication mode used to validate the certificate. ■ certificate: Validates the peer using trust anchor certificate based authentication. Default. ■ subject-name: Validates the peer using trust anchor certificates as well as subject-name based authentication.
legacy-tls-renegotiation	Enables the TLS connection with a remote syslog server supporting legacy renegotiation.
vrf *<VRF-NAME>*	Specifies the VRF used to connect to the syslog server. Optional. Default: default

Examples

Enabling the syslog forwarding to remote syslog server 10.0.10.2:

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

Enabling the syslog forwarding of messages with a severity of `err (4)` and above to TCP port 4242 on remote syslog server 10.0.10.9 with VRF `lab_vrf`:

```
switch(config)# logging 10.0.10.9 tcp 4242 severity err vrf lab_vrf
```

Disabling syslog forwarding to a remote syslog server:

```
switch(config)# no logging
```

Enabling syslog forwarding over TLS to a remote syslog server using subject-name authentication mode:

```
switch(config)# logging example.com tls auth-mode subject name
```

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.

snmp-server community

```
snmp-server community <STRING>
no snmp-server community <STRING>
```

Description

Adds an SNMPv1/SNMPv2c community string. A community string is a password that controls read access to the SNMP agent. A network management program must supply this name when attempting to get SNMP information from the switch. A maximum of 10 community strings are supported. Once you create your own community string, the default community string (`public`) is deleted.

The `no` form of this command removes the specified SNMPv1/SNMPv2c community string. When no community string exists, a default community string with the value `public` is automatically defined.

Parameter	Description
<STRING>	Specifies the SNMPv1/SNMPv2c community string. Range: 1 to 32 printable ASCII characters, excluding space and question mark.

Examples

Setting the SNMPv1/SNMPv2c community string to **private**:

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

Removing SNMPv1/SNMPv2c community string **private**:

```
switch(config)# no snmp-server community private
```

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.

snmp-server host

```
snmp-server host <IPv4-ADDR> trap version <VERSION> [community <STRING>]
[port <UDP-PORT>] [vrf <VRF-NAME>]
no snmp-server host <IPv4-ADDR> trap version <VERSION> [community <STRING>]
[port <UDP-PORT>] [vrf <VRF-NAME>]
snmp-server host <IPv4-ADDR> inform version v2c [community <STRING>]
[port <UDP-PORT>] [vrf <VRF-NAME>]
no snmp-server host <IPv4-ADDR> inform version v2c [community <STRING>]
[port <UDP-PORT>] [vrf <VRF-NAME>]
snmp-server host <IPv4-ADDR> [trap version v3 | inform version v3] user <NAME>
[port <UDP-PORT>] [vrf <VRF-NAME>]
no snmp-server host <IPv4-ADDR> [trap version v3 | inform version v3] user <NAME>
[port <UDP-PORT>] [vrf <VRF-NAME>]
```

Description

Configures a trap/informs receiver to which the SNMP agent can send SNMP v1/v2c/v3 traps or v2c informs. A maximum of 30 SNMP traps/informs receivers can be configured.

The `no` form of this command removes the specified trap/inform receiver.

Configuring `snmpv3 informs` is not supported.

Parameter	Description
<IPv4-ADDR>	Specifies the IP address of a trap receiver 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`.
`trap version` *<VERSION>*	Specifies the trap notification type for SNMPv1 or v2c. Available options are: `v1` or `v2c`.
`inform version v2c`	Specifies the inform notification type for SNMPv2c.
`trap version v3`	Specifies the trap notification type for SNMPv3.

Parameter	Description
`user <NAME>`	Specifies the SNMPv3 user name to be used in the SNMP trap notifications.
`community <STRING>`	Specifies the name of the community string to use when sending trap notifications. Range: 1 - 32 printable ASCII characters, excluding space and question mark. Default: `public`.
<UDP-PORT>	Specifies the UDP port on which notifications are sent. Range: 1 - 65535. Default: 162.
`vrf <VRF-NAME>`	Specifies the name of the VRF on which to send the notifications.

Examples

```
switch(config)# snmp-server host 10.10.10.10 trap version v1
switch(config)# no snmp-server host 10.10.10.10 trap version v1
switch(config)# snmp-server host 10.10.10.10 trap version v2c community public
switch(config)# no snmp-server host 10.10.10.10 trap version v2c community public
switch(config)# snmp-server host 10.10.10.10 trap version v2c community public
port 5000
switch(config)# no snmp-server host 10.10.10.10 trap version v2c community public
port 5000
switch(config)# snmp-server host 10.10.10.10 trap version v2c community public
port 5000 vrf default
switch(config)# no snmp-server host 10.10.10.10 trap version v2c community public
port 5000 vrf default
switch(config)# snmp-server host 10.10.10.10 inform version v2c community public
switch(config)# no snmp-server host 10.10.10.10 inform version v2c community
public
switch(config)# snmp-server host 10.10.10.10 inform version v2c community public
port 5000
switch(config)# no snmp-server host 10.10.10.10 inform version v2c community
public port 5000
switch(config)# snmp-server host 10.10.10.10 inform version v2c community public
port 5000 vrf default
switch(config)# no snmp-server host 10.10.10.10 inform version v2c community
public port 5000 vrf default

switch(config)# snmp-server host 10.10.10.10 trap version v3 user Admin
switch(config)# no snmp-server host 10.10.10.10 trap version v3 user Admin
switch(config)# snmp-server host 10.10.10.10 trap version v3 user Admin port 2000
switch(config)# no snmp-server host 10.10.10.10 trap version v3 user Admin port
2000
```

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.

snmp-server vrf

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

Description

Configures the VRF on which the SNMP agent listens for incoming requests. By default, the SNMP agent does not listen on any VRF.

The `no` form of this command stops the SNMP agent from listening for incoming requests on the specified VRF.

Parameter	Description
<VRF-NAME>	Specifies the VRF on which the SNMP agent listens for incoming requests. The SNMP agent can listen on either the `mgmt` or `default` VRF. If configured for both, the SNMP agent listens on `default`, which has a higher priority.

Example

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

```
switch(config)# no snmp-server vrf default
```

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.

snmpv3 context

```
snmpv3 context <NAME> vrf <VRF-NAME> [community <STRING>]
no snmpv3 context <NAME> [vrf <VRF-NAME>]
```

Description

Creates an SNMPv3 context on the specified VRF.

The `no` form of this command removes the specified SNMP context.

Parameter	Description
<NAME>	Specifies the name of the context. Range: 1 to 32 printable ASCII

Parameter	Description
	characters, excluding space and question mark (?).
`vrf <VRF-NAME>`	Specifies the VRF associated with the context. Default: default.
`community <STRING>`	Specifies the SNMP community string associated with the context. Range: 1 to 32 printable ASCII characters, excluding space and question mark. Default: public.

Examples

Creating an SNMPv3 context named **newContext**:

```
switch(config)# snmpv3 context newContext
```

Creating an SNMPv3 context named **newContext** on VRF **myVrf** and with community string **private**.

```
switch(config)# snmpv3 context newContext vrf myVrf community private
```

Removing the SNMPv3 context named **newContext** on VRF **myVrf**:

```
switch(config)# no snmpv3 context newContext vrf myVrf
```

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.

snmpv3 user

```
snmpv3 user <NAME> [auth <AUTH-PROTOCOL> auth-pass {plaintext | ciphertext}
<AUTH-PWORD> [priv <PRIV-PROTOCOL> priv-pass {plaintext | ciphertext} <PRIV-PWORD>] ]
no snmpv3 user <NAME> [auth <AUTH-PROTOCOL> auth-pass
<AUTH-PWORD> [priv <PRIV-PROTOCOL> priv-pass <PRIV-PWORD>] ]
```

Description

Creates an SNMPv3 user and adds it to an SNMPv3 context.

The `no` form of this command removes the specified SNMPv3 user.

Parameter	Description
<NAME>	Specifies the SNMPv3 username. Range 1 - 32 printable ASCII characters, excluding space and question mark.
`auth` *<AUTH-PROTOCOL>*	Specifies the authentication protocol used to validate user logins. Available options are: `md5` or `sha`.
`auth-pass {plaintext | ciphertext}` *<AUTH-PWORD>*	Specifies the SNMPv3 user password. Range for `plaintext` is 8 - 32 printable ASCII characters, excluding space and question mark. Range for `ciphertext` is 1 - 120 printable ASCII characters. This option is only used when copying user configuration settings between switches. It enables you to duplicate a user's configuration on another switch without having to know their password.
`priv` *<PRIV-PROTOCOL>*	Specifies the SNMPv3 security protocol (encryption method). Available options are: `aes` or `des`.
`priv-pass {plaintext | ciphertext}` *<PRIV-PWORD>*	Specifies the SNMPv3 user privacy passphrase. Range for `plaintext` is 8 - 32 printable ASCII characters, excluding space and question mark. Range for `ciphertext` is 1 - 120 printable ASCII characters. This option is only used when copying user configuration settings between switches. It enables you to duplicate a user's configuration on another switch without having to know their password.

Examples

Defining an SNMPv3 user named **Admin** using **sha** authentication with the plaintext password **mypassword** and using **des** security with the plaintext password **myprivpass**:

```
switch(config)# snmpv3 user Admin auth sha auth-pass plaintext mypassword priv des
priv-pass plaintext myprivpass
```

Removing an SNMPv3 user named `Admin`:

```
switch(config)# no snmpv3 user Admin
```

Defining an SNMPv3 user named **Admin** using **sha** authentication with the plaintext password **mypassword** and using **des** security with the plaintext password **myprivpass**:

```
switch(config)# snmpv3 user Admin auth sha auth-pass plaintext mypassword priv des
priv-pass plaintext myprivpass
```

Copying an SNMP user from switch 1 to switch 2.

On switch 1, configure a user called **Admin**, then issue the `show running-config` command to display switch configuration settings. The snmpv3 user command uses the `ciphertext` option to protect the users's passwords.

```
switch1(config)# snmpv3 user Admin auth sha auth-pass plaintext mypassword
priv des priv-pass plaintext myprivpass
switch1(config)# exit
switch1# show running-config
Current configuration:
!
!Version AOS-CX TL.10.00.0003-8017-gdeb0606~dirty
!
!
!
snmpv3 user Admin auth sha auth-pass ciphertext
AQBapZHf2d20GYr/xcGUzYzm0zjNf/4VKHtSqbNImqtfYbJYCgAAALkGFJVcSp3nZ3o=
priv des priv-pass ciphertext
AQBapb0H2poBQKXPoVsC9L9qzZyfJQnzR7hmTr7LGsOsI7K3CgAAAKP98Rq2jfTrFwQ=
ssh server vrf mgmt
!
!
!
!
interface mgmt
    no shutdown
    ip dhcp
vlan 1
```

On switch 2, execute the snmpv3 user command that was displayed by `show running-config` on switch 1. This creates the user on switch 2 with the same configuration settings.

```
switch1(config)# snmpv3 user Admin auth sha auth-pass
ciphertextAQBapZHf2d20GYr/xcGUzYzm0zjNf/4VKHtSqbNImqtfYbJYCgAAALkGFJVcSp3nZ3o=priv
des priv-pass ciphertext
AQBapb0H2poBQKXPoVsC9L9qzZyfJQnzR7hmTr7LGsOsI7K3CgAAAKP98Rq2jfTrFwQ=
```

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.

Chapter 12

Support and Other Resources

Accessing HPE Aruba Networking Support

HPE Aruba Networking Support Services	https://www.arubanetworks.com/support-services/
AOS-CX Switch Software Documentation Portal	https://www.arubanetworks.com/techdocs/AOS-CX/help_portal/Content/home.htm
HPE Aruba Networking Support Portal	https://networkingsupport.hpe.com/home
North America telephone	1-800-943-4526 (US & Canada Toll-Free Number) +1-408-754-1200 (Primary - Toll Number) +1-650-385-6582 (Backup - Toll Number - Use only when all other numbers are not working)
International telephone	https://www.arubanetworks.com/support-services/contact-support/

Be sure to collect the following information before contacting Support:

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

Other useful sites

Other websites that can be used to find information:

HPE Aruba Networking Developer Hub	https://developer.arubanetworks.com/hpe-aruba-networking-aoscx/docs/about
Airheads social forums and Knowledge Base	https://community.arubanetworks.com/
HPE Aruba Networking Hardware	https://www.arubanetworks.com/techdocs/hardware/DocumentationPortal/Content/home.htm

Documentation and Translations Portal	
HPE Aruba Networking software	https://networkingsupport.hpe.com/downloads
Software licensing and Feature Packs	https://lms.arubanetworks.com/
End-of-Life information	https://www.arubanetworks.com/support-services/end-of-life/

Accessing Updates

You can access updates from the HPE Aruba Networking Support Portal at https://networkingsupport.hpe.com.

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

To subscribe to eNewsletters and alerts:

https://networkingsupport.hpe./notifications/subscriptions (requires an active HPE Aruba Networking Support Portal account to manage subscriptions). Security notices are viewable without an HPE Aruba Networking Support Portal account.

Warranty Information

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

Regulatory Information

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

Additional regulatory information

HPE Aruba Networking is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements, environmental data (company programs, product recycling, energy efficiency), and safety information and compliance data, (RoHS and WEEE). For more information, see https://www.arubanetworks.com/company/about-us/environmental-citizenship/.

Documentation Feedback

HPE Aruba Networking is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback-switching@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help

content, include the product name, product version, help edition, and publication date located on the legal notices page.