Chapter 6

Administering the Switch

This chapter describes administrative tasks that are typically performed only after initially configuring the switch or after recovery procedures.

This chapter includes these sections:

- Section 6.1: Managing the Switch Name
- Section 6.2: Managing the System Clock
- Section 6.3: Synchronizing the Time Settings
- Section 6.4: Managing Display Attributes
- Section 6.5: Logging of Event Notifications
- Section 6.6: Event Monitor
- Section 6.7: PTP Monitoring
- Section 6.8: Managing EOS Extensions
- Section 6.9: Switch Administration Commands

6.1 Managing the Switch Name

These sections describe how to configure the switch’s domain and host name.

- Section 6.1.1: Assigning a Name to the Switch describes the assigning of an FQDN to the switch.
- Section 6.1.2: Specifying DNS Addresses describes the adding of name servers to the configuration.

6.1.1 Assigning a Name to the Switch

A fully qualified domain name (FQDN) labels the switch and defines its organization ID in the Domain Name System hierarchy. The switch’s FQDN consists of a host name and domain name.

The host name is uniquely associated with one device within an IP-domain. The default host name is localhost. You can configure the prompt to display the host name, as described in Section 6.4.2: Prompt.

- To assign a host name to the switch, use the hostname command. To return the switch’s host name to the default value of localhost, use the no hostname command.
- To specify the domain location of the switch, use the dns domain command.
Example

- This command assigns the string `main-host` as the switch’s host name.
  
  switch(config)#hostname main-host
  main-host(config)#

- This command configures `aristanetworks.com` as the switch’s domain name.
  
  switch(config)#dns domain aristanetworks.com
  switch(config)#

- This procedure configures `sales1.samplecorp.org` as the switch’s FQDN.
  
  switch(config)#dns domain samplecorp.org
  switch(config)#

- This `running-config` extract contains the switch’s host name and IP-domain name.
  
  switch#show running-config
  
  ! Command: show running-config
  ! device: switch (DCS-7150S-64-CL, EOS-4.13.2F)
  !
  !<-------OUTPUT OMITTED FROM EXAMPLE-------->
  vlan 3-4
  !
  username john secret 5 $1$a7Hjept9$TIKRX6ytkg8o.ENja.na50
  !
  hostname sales1
  ip name-server vrf default 172.17.0.22
  dns domain samplecorp.org
  !
  <-------OUTPUT OMITTED FROM EXAMPLE-------->
  end
  switch#

6.1.2 Specifying DNS Addresses

The Domain Name Server (DNS) maps FQDN labels to IP addresses and provides addresses for network devices. Each network requires at least one server to resolve addresses. The configuration file can list a maximum of three server addresses.

To add name servers to the configuration, use the `ip name-server` command. Each command can add one to three servers. The switch disregards any attempt to add a fourth server to the configuration. All server addresses must be in a single VRF. If servers have been previously configured in a different VRF they must be removed before adding a new server to the configuration.

Example

- This code performs these actions:
  
  - adds three names servers to the configuration in the default VRF
  - attempts to add a fourth server, resulting in an error message
• displays the configuration file.

switch(config)#ip name-server 10.1.1.24 10.1.1.25 172.17.0.22
switch(config)#ip name-server 10.15.3.28
% Maximum number of nameservers reached. '10.15.3.28' not added
switch(config)#show running-config
! device: Switch (EOS-4.11.2-1056939.EOS4112)
! username david secret 5 $1$a7Hjept9$TIKRX6ytkg8o.ENja.na50
! hostname Switch
ip name-server 10.1.1.24
ip name-server 10.1.1.25
ip name-server 172.17.0.22
dns domain aristanetworks.com

<--------OUTPUT OMITTED FROM EXAMPLE-------->

The switch assigns source IP addresses to outgoing DNS requests. To force the switch to use a single, user-defined source interface for all requests, use the ip domain lookup command.

Example

• This command forces the switch to use VLAN 5 as the source interface for DNS requests originating from the default VRF.
  switch(config)#ip domain lookup source-interface Vlan5
  switch(config)#

• This command forces the switch to use VLAN 10 as the source interface for DNS requests originating from VRF “purple.”
  switch(config)#ip domain lookup vrf purple source-interface Vlan10
  switch(config)#
6.2 Managing the System Clock

The switch uses the system clock for displaying the time and time-stamping messages. The system clock is set to Coordinated Universal Time (UTC). The switch calculates local time based on the time zone setting. Time-stamps and time displays are in local time.

6.2.1 Configuring the Time Zone

The time zone setting is used by the switch to convert the system time (UTC) to local time. To specify the time zone, use the `clock timezone` command.

**Examples**

- These commands configure the switch for the United States Central Time Zone.

  ```
  switch(config)#clock timezone US/Central
  switch(config)#show clock
  Mon Jan 14 18:42:49 2013
timezone is US/Central
  ```

- To view the predefined time zone labels, enter `clock timezone` with a question mark.

  ```
  switch(config)#clock timezone ?
  Africa/Abidjan Africa/Accra
  WET WET timezone
  Zulu Zulu timezone
  ```

- This command displays all time zone labels that start with `America`.

  ```
  switch(config)#clock timezone AMERICA?
  America/Adak America/Anchorage
  America/Yellowknife
  ```

6.2.2 Setting the System Clock Manually

The `clock set` command manually configures the system clock time and date, in local time. Any NTP servers properly configured on the switch override time that is manually entered.

**Example**

- This command manually sets the switch time.

  ```
  switch#clock set 08:15:24 14 Jan 2013
  Mon Jan 14 08:15:25 2013
timezone is US/Central
  ```

6.2.3 Displaying the Time

To display the local time and configured time zone, enter the `show clock` command.
Example

- This command displays the switch time.

  switch(config)>show clock
  Mon Jan 14 16:32:46 2013
  timezone is America/Los_Angeles
6.3 Synchronizing the Time Settings

Time settings are synchronized through Network Time Protocol (NTP).

6.3.1 Network Time Protocol (NTP)

Network Time Protocol (NTP) servers synchronize time settings of systems running an NTP client. The switch supports NTP versions 1 through 4. The default is version 4.

After configuring the switch to synchronize with an NTP server, it may take up to ten minutes for the switch to set its clock. The running-config lists NTP servers that the switch is configured to use.

6.3.1.1 Configuring the NTP Server

The ntp server command adds a server to the list or modifies the parameters of a previously listed address. When the system contains multiple NTP servers, the prefer keyword can be used to specify a preferred NTP server, which will be used as the NTP server if not discarded by NTP.

Note that all NTP servers must be in the same VRF, and that they are added in the default VRF if no VRF is specified.

Example

- These commands add three NTP servers, designating the second server as preferred.

  switch(config)# ntp server local-NTP
  switch(config)# ntp server 172.16.0.23 Prefer
  switch(config)# ntp server 172.16.0.25

6.3.1.2 Configuring the NTP Source

The ntp local-interface command configures an interface as the source of NTP packets. That interface’s IP address is then used as the source address for all NTP packets unless a server-specific source is configured using the source option of the ntp server command. For an ntp local-interface command to take effect, the specified interface and the NTP server must both belong to the same VRF.

Example

- This command configures VLAN interface 25 as the source of NTP update packets.

  switch(config)# ntp local-interface vlan 25
  switch(config)#

6.3.1.3 Configuring the Switch as an NTP Server

To configure the switch to accept NTP requests on all interfaces, use the ntp serve all command to enable NTP server mode globally on the switch. To configure an individual interface to accept or deny NTP requests, use the ntp serve command. Interface level settings override the global settings, and changing the settings at either the global or interface level also causes the switch to re-synchronize with its upstream NTP server. NTP server mode is disabled by default.

Example

- This command configures the switch to act as an NTP server, accepting NTP requests.

  switch(config)# ntp serve all
  switch(config)#
6.3.1.4 Configuring NTP Authentication

The switch can be configured to synchronize its clock using NTP packets only from an authenticated source. NTP authentication is disabled by default.

To configure the switch to authenticate NTP packets, create one or more authentication keys using the `ntp authentication-key` command, specify which keys are trusted by using the `ntp trusted-key` command, and use the `ntp authenticate` command to enable NTP authentication. The NTP server must be configured to use the same authentication key and key ID number.

**Example**

- These commands configure the switch to authenticate NTP packets using key 328 with the plaintext password “timeSync.”

```
switch(config)# ntp authentication-key 328 md5 timeSync
switch(config)# ntp trusted key 328
switch(config)# ntp authenticate
```

6.3.1.5 Viewing NTP Settings and Status

To display the status of Network Time Protocol (NTP) on the switch, use the `show ntp status` command. To display the status of connections to NTP servers, use the `show ntp associations` command. Note that for IPv4 addresses, the reference ID is the IPv4 address of the NTP server. For IPv6 addresses, the reference ID is the first four octets of the MD5 hash of the NTP server’s IP address.

**Example**

- This command displays the status of the switch’s NTP connection.

```
switch#show ntp status
unsynchronised
 time server re-starting
 polling server every 64 s
```

- This command displays data about the NTP servers in the configuration.

```
switch#show ntp associations
remote refid st t when poll reach delay offset jitter
moose.aristanet 66.187.233.4 2 u 9 64 377 0.118 9440498 0.017
172.17.2.6 .INIT. 16 u - 1024 0 0.000 0.000 0.000
*LOCAL(0) .LOCL. 10 l 41 64 377 0.000 0.000 0.000
```

6.3.2 Precision Time Protocol (PTP)

The Precision Time Protocol (PTP) enhances the accuracy of real-time clocks in networked devices by providing sub-microsecond clock synchronization. Inbound clock signals are organized into a master-slave hierarchy. PTP identifies the switch port that is connected to the device with the most precise clock. This clock is referred to as the master clock. All the other devices on the network synchronize their clocks with the master and are referred to as slaves.
The master clock sends out a sync message every second. The slave clock sends a delay request message to the master clock noting the time it was sent in order to measure and eliminate packet delays. The master clock then replies with the time stamp the delay message was received. The slave clock then computes the master clock time compensated for delays and finalizes synchronization. Constantly exchanged timing messages ensure continued synchronization.

6.3.2.1 Enable PTP

PTP is disabled globally by default. The following steps are required to enable PTP on an interface:

- Set the PTP Mode
- Enable PTP on an Interface

**Set the PTP Mode**

To allow PTP to be used on switch interfaces, first set the PTP mode using the `ptp mode` command. PTP mode options include:

- **boundary**  The device acts as a boundary clock, and both runs and participates in the best master clock algorithm.
- **disabled**  PTP is disabled, and the device forwards all PTP packets as normal traffic.
- **end-to-end transparent**  The device acts as an end-to-end transparent clock, synchronizing all ports to a connected master clock and updating the time interval field of forwarded PTP packets using switch residence time.
- **peer-to-peer transparent**  The device acts as a peer-to-peer transparent clock, synchronizing all ports to a connected master clock and updating the time interval field of forwarded PTP packets using switch residence time and inbound path delays.
- **generalized Precision Time Protocol (gPTP)**  The device runs generalized Precision Time Protocol (gPTP), participating in the best master clock algorithm but also updating the interval field of forwarded PTP packets using switch residence time and inbound path delays.

To disable PTP globally on the switch, use the `no` or `default` forms of the `ptp mode` command.

**Example**

- This command configures the device as a PTP boundary clock.

```bash
switch(config)# ptp mode boundary
switch(config)#
```

**Enable PTP on an Interface**

To enable PTP on a specific interface on the device, use the `ptp enable` command.

**Example**

- This command enables PTP on Ethernet interface 5.

```bash
switch(config)# interface ethernet 5
switch(config-if-Et5)# ptp enable
```

6.3.2.2 Configuring PTP Global Options

The following PTP global configurations are optional:

- **Configure the PTP Domain**
- **Configure the Offset Hold Time**
- **Set the PTP Priority 1**
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- Set the PTP Priority 2
- Configure the Source IP
- Configure the TTL for the PTP Packets

Configure the PTP Domain
To set the domain number to use for the clock, use the `ptp domain` command.
- The `ptp domain` command configures the domain 1 to use with a clock.
  ```
  switch(config)# ptp domain 1
  switch(config)#
  ```

Configure the Offset Hold Time
To set the PTP offset hold time, use the `ptp hold-tp-time` command.
- The `ptp hold-tp-time` command configures the PTP offset hold time to 600 seconds.
  ```
  switch(config)# ptp hold-tp-time 600
  switch(config)#
  ```

Set the PTP Priority 1
To set the priority 1 value, use the `ptp priority1` command. Lower values take precedence.
- The `ptp priority1` command configures the priority 1 value of 120 to use when advertising the clock.
  ```
  switch(config)# ptp priority1 120
  switch(config)#
  ```

Set the PTP Priority 2
To set the priority 2 value for the clock, use the `ptp priority2` command.
- The `ptp priority2` command configures the priority 2 value of 128.
  ```
  switch(config)# ptp priority2 128
  switch(config)#
  ```

Configure the Source IP
To set the source IP address for all PTP packets, use the `ptp source ip` command.
- The `ptp source ip` command configures the source IP address of 10.0.2.1 for all PTP packets.
  ```
  switch(config)# ptp source ip 10.0.2.1
  switch(config)#
  ```

Configure the TTL for the PTP Packets
To set the time to live (TTL) of the PTP packets, use the `ptp ttl` command. Time to live is the maximum number of hops that a PTP packet may make.
- The `ptp ttl` command configures the time to live (TTL) of 64 hops for PTP packets.
  ```
  switch(config)# ptp ttl 64
  switch(config)#
  ```

6.3.2.3 Configuring PTP Interface Options
The following PTP interface-level configurations are optional:
- Set the PTP Announcement Interval
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- Set the PTP Timeout Interval
- Configure the PTP Delay Mechanism
- Set the Delay Request Interval
- Set the Peer Delay Request Interval
- Set the Peer Link Propagation Threshold
- Set the Interval for Sending Synchronization Messages
- Set the PTP Transport Type

Set the PTP Announcement Interval

To set the interval (in log seconds) between PTP announcement messages on an interface, use the `ptp announce interval` command. This value also affects the time interval.

- This command configures the interval between PTP announcement messages on Ethernet interface 5 to 4 seconds.

```
switch(config)# interface ethernet 5
switch(config-if-Et5)# ptp announce interval 2
switch(config-if-Et5)#
```

Set the PTP Timeout Interval

To set the timeout multiplier for an interface, use the `ptp announce timeout` command. The timeout multiplier is the number of announcement intervals that the interface will wait without receiving a PTP announcement before a timeout occurs; values range from 2 to 255. The default multiplier is 3, which results in a 6-second timeout interval when the announcement interval is set to the default of 2 seconds.

- This command sets timeout multiplier for the interface to 5; since the announcement interval has just been set to 2 (4 seconds), this means the interface will time out if it doesn’t receive a PTP announcement for 20 seconds.

```
switch(config-if-Et5)# ptp announce timeout 5
switch(config-if-Et5)#
```

Configure the PTP Delay Mechanism

To set the delay mechanism used in boundary-mode, use the `ptp delay-mechanism` command.

- This command sets the delay mechanism in boundary clock mode for the interface to peer-to-peer.

```
switch(config-if-Et5)# ptp delay-mechanism p2p
switch(config-if-Et5)#
```

Set the Delay Request Interval

To set the time for the slave devices to send delay request messages, use the `ptp delay-req interval` command.

- This command sets the time the slave devices to send delay request messages to the master state to 3 for the interface.

```
switch(config-if-Et5)# ptp delay-request interval 3
switch(config-if-Et5)#
```

Set the Peer Delay Request Interval

To set the minimum interval between the PTP peer delay-request messages, use the `ptp pdelay-req interval` command.
This command sets the interval between PTP peer delay-request messages on the interface to 3.

```
switch(config-if-Et5)# ptp pdelay-request interval 3
switch(config-if-Et5)#
```

### Set the Peer Link Propagation Threshold

To set the delay threshold for which the peer will be considered unable to run generalized Precision Time Protocol (gPTP), use the `ptp pdelay-neighbor-threshold` command.

This command sets the link propagation delay threshold on the interface to 200000 nanoseconds.

```
switch(config-if-Et5)# ptp pdelay-neighbor-threshold 200000
switch(config-if-Et5)#
```

### Set the Interval for Sending Synchronization Messages

To set the interval (in log seconds) for sending synchronization messages, use the `ptp sync-message interval` command. Value ranges and defaults vary based on the PTP mode of the switch.

This command configures the interval for sending synchronization messages on the interface to 3 (8 seconds).

```
switch(config-if-Et5)# ptp sync-message interval 3
switch(config-if-Et5)#
```

### Set the PTP Transport Type

To set the PTP transport type, use the `ptp transport` command.

This command configures the PTP transport type for the interface to IPv4.

```
switch(config-if-Et5)# ptp transport ipv4
switch(config-if-Et5)#
```

### Viewing PTP Settings and Status

The following commands display the status of the switch PTP server connections:

- Show General PTP Information
- Show PTP Local Clock and Offset
- Show PTP Masters Information
- Show PTP Clock Properties
- Show PTP Information for all Interfaces
- Show PTP Interface Counters
- Show PTP Foreign Master
- Show PTP Source IP

### Show General PTP Information

To display general Precision Time Protocol (PTP) information, use the `show ptp` command.
The `show ptp` command displays PTP summary and port status information.

```
switch#show ptp
PTP Mode: qptp - Generalized PTP Clock
Clock Identity: 2001:0DB8:73:ff:ff:26:fd:90
Grandmaster Clock Identity: 2001:0DB8:96:ff:fe:6c:ed:02
Number of slave ports: 1
Number of master ports: 6
Slave port: Ethernet33
Mean Path Delay (nanoseconds): 718
Steps Removed: 1
Neighbor Rate Ratio: 1.00000007883
Rate Ratio: 1.00000007883
```

```
Interface State    AS      Time Since Last    Neighbor    Mean Path   Residence
Capable Changed            Rate Ratio  Delay (ns)  Time (ms)  
--------- -------- ------- ------------------ ----------- ----------- ---------
Et1       Disabled No      Never              1.0         0           0
Et2       Disabled No      Never              1.0         0           0
Et3       Disabled No      Never              1.0         0           0
Et4       Disabled No      Never              1.0         0           0
Et5       Disabled No      Never              1.0         0           0
Et6       Disabled No      Never              1.0         0           0
Et7       Master   Yes     0:21:08            1.00000009  420         0
```

Show PTP Local Clock and Offset

The `show ptp local-clock` command displays the local PTP clock and offset.

```
switch#show ptp local-clock
PTP Mode: Boundary Clock
Clock Identity: 0x00:1c:73:ff:ff:1e:83:24
Clock Domain: 1
Number of PTP ports: 24
Priority1: 128
Priority2: 128
Clock Quality:
Class: 248
Accuracy: 0x30
OffsetScaledLogVariance: 0xffff
Offset From Master: 0
Mean Path Delay: 0
Steps Removed: 0
```

Switch#
Show PTP Masters Information

The `show ptp masters` command displays the PTP clock’s master and grandmaster identity and configuration.

```
switch# show ptp masters
Parent Clock:
Parent Clock Identity: 0x00:1c:73:ff:ff:00:72:40
Parent Port Number: 0
Parent IP Address: N/A
Observed Parent Offset (log variance): N/A
Observed Parent Clock Phase Change Rate: N/A

Grandmaster Clock:
Grandmaster Clock Identity: 0x00:1c:73:ff:ff:00:72:40
Grandmaster Clock Quality:
   Class: 248
   Accuracy: 0x30
   OffsetScaledLogVariance: 0xffff
   Priority1: 128
   Priority2: 128
```

Show PTP Clock Properties

The `show local-clock time-properties` command displays PTP clock properties.

```
switch# show local-clock time-properties
Current UTC offset valid: False
Current UTC offset: 0
Leap 59: False
Leap 61: False
Time Traceable: False
Frequency Traceable: False
PTP Timescale: False
Time Source: 0x0
```

switch#
Show PTP Information for all Interfaces

The `show ptp interface` command displays PTP information for specified interfaces.

```
switch# show ptp interface
Interface Ethernet1
PTP: Disabled
Port state: Disabled
Sync interval: 1.0 seconds
Announce interval: 2.0 seconds
Announce interval timeout multiplier: 3
Delay mechanism: end to end
Delay request message interval: 32.0 seconds
Transport mode: ipv4

Interface Ethernet5
PTP: Disabled
Port state: Disabled
Sync interval: 8.0 seconds
Announce interval: 2.0 seconds
Announce interval timeout multiplier: 5
Delay mechanism: peer to peer
Peer delay request message interval: 8.0 seconds
Peer Mean Path Delay: 0
Transport mode: ipv4
```

Show PTP Interface Counters

The `show ptp interface counters` command displays PTP interface counters for specified interfaces.

```
switch# show ptp interface ethernet 5 counters
Interface Ethernet5
Announce messages sent: 0
Announce messages received: 0
Sync messages sent: 0
Sync messages received: 0
Follow up messages sent: 0
Follow up messages received: 0
Delay request messages sent: 0
Delay request messages received: 0
Delay response messages sent: 0
Delay response messages received: 0
Peer delay request messages sent: 0
Peer delay request messages received: 0
Peer delay response messages sent: 0
Peer delay response messages received: 0
Peer delay response follow up messages sent: 0
Peer delay response follow up messages received: 0
```

Show PTP Foreign Master

The `show ptp foreign-master-record` command displays information about foreign masters (PTP sources not designated as the switch’s master from which the switch has received sync packets).

```
switch# show ptp foreign-master-record
No Foreign Master Records
```

<<------OUTPUT OMITTED FROM EXAMPLE--------->
Show PTP Source IP

The `show ptp source ip` command displays PTP IP source information.

```plaintext
switch#show ptp source ip
PTP source IP: 10.0.2.1
switch#
```
6.4 Managing Display Attributes

Display commands control the content of the banner and the command line prompt.

6.4.1 Banners

The switch can display two banners:

- **Login banner**: The login banner precedes the login prompt. One common use for a login banner is to warn against unauthorized network access attempts.

- **motd banner**: The message of the day (motd) banner is displayed after a user logs into the switch.

This output displays both banners in bold:

```
This is a login banner
switch login: john
Password:
Last login: Mon Jan 14 09:24:36 2013 from adobe-wrks.aristanetworks.com
This is an motd banner
switch>
```

These commands create the login and motd banner shown earlier in this section.

```
switch(config)#banner login
Enter TEXT message. Type 'EOF' on its own line to end.
This is a login banner
EOF

switch(config)#banner motd
Enter TEXT message. Type 'EOF' on its own line to end.
This is an motd banner
EOF
```

To create a banner:

**Step 1** Enter global configuration mode.

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

**Step 2** Enter banner edit mode by typing the desired command:

- To create a login banner, type `banner login`.
- To create a motd banner, type `banner motd`.

The switch responds with instructions on entering the banner text.

```
switch(config)#banner login
Enter TEXT message. Type 'EOF' on its own line to end.
```

**Step 3** Enter the banner text.

```
This is the first line of banner text.
This is the second line of banner text.
```

**Step 4** Press Enter to place the cursor on a blank line after completing the banner text.

**Step 5** Exit banner edit mode by typing EOF.

```
EOF
switch(config)#
```
6.4.2 Prompt

The prompt provides an entry point for EOS commands. The `prompt` command configures the contents of the prompt. The `no prompt` command returns the prompt to the default of `%H%P`.

Characters allowed in the prompt include A-Z, a-z, 0-9, and these punctuation marks:

`! @ # $ % ^ & * ()-+=fg[ ]:<>,.?/˜n`

The prompt supports these control sequences:
- `%s` – space character
- `%t` – tab character
- `%%` – percent character
- `%H` – host name
- `%D` – time and date
- `%D{f_char}` – time and date, format specified by the BSD `strftime` function.
- `%h` – host name up to the first '.'
- `%P` – extended command mode
- `%p` – command mode
- `%r` – redundancy status on modular systems (has no effect on a fixed system)
- `%R` – extended redundancy status on modular systems – includes status and slot number (has no effect on a fixed system)

Example

- This command creates a prompt that displays `system 1` and the command mode.
  ```
  host-name.dut103(config)#prompt system%s1%P
  system 1(config) #
  ```
- This command creates a prompt that displays the command mode.
  ```
  host-name.dut103(config)#prompt %p
  (config) #
  ```
- These equivalent commands create the default prompt.
  ```
  % prompt %H%P
  host-name.dut103(config) #
  ```

  ```
  % no prompt
  host-name.dut103(config) #
  ```
6.5 Logging of Event Notifications

Arista switches log event notifications using the Syslog protocol. By default, event notifications are logged internally to /var/log/messages, but they can also be displayed on the console or logged to an external server. Severity levels and log message destinations can be configured via the CLI, and individual processes and protocols can also be configured to adjust or limit the messages that they log. Details of the current logging configuration may be viewed using the `show logging` command.

For a full list of Syslog messages, visit the Arista website.

6.5.1 Managing TCAM Capacity Warnings

Strata chipsets (Helix, Trident, Trident2, and Tomahawk) provide event logging for the hardware capacity of TCAM tables on a per-slice basis, triggering a capacity warning by default whenever any slice exceeds 90% capacity. As a result, default TCAM logging can generate high levels of syslog messages on Strata platforms. If this presents a problem, the `hardware capacity alert table` command can be used to adjust the capacity levels at which warnings occur to above the 90% default; this adjustment can be made per TCAM resource and per slice. The command can also be used to disable TCAM hardware capacity messages of level “Warning” and below entirely for a given slice by setting the threshold to 0 or using the `no` version of the command.

To determine the chipset of your device, enter `show platform ?` in the CLI.

Examples

- This command reduces hardware capacity Syslog warnings by increasing the capacity threshold to 99% for EFP table monitoring in slice 2.
  
  `switch(config)#hardware capacity alert table EFP feature Slice-2 threshold 99`

- This command reduces messages by disabling hardware capacity Syslog warnings entirely for the IFP table in slice 5.
  
  `switch(config)#hardware capacity alert table IFP feature Slice-5 threshold 0`

- This command reduces messages by disabling hardware capacity Syslog warnings entirely for the VFP table in all slices.
  
  `switch(config)#no hardware capacity alert table VFP`

Note

Hardware capacity messages are user-configurable only at or below the “Warning” level. The TCAM management software always sends “Error” messages to Syslog and to affected features when all TCAM resources are depleted.
6.6 Event Monitor

The event monitor writes system event records to local files for access by SQLite database commands.

Note

Beginning with release EOS-4.20.5F, event-monitor is not enabled by default. Use the config# event-monitor command to explicitly enable event-monitor.

6.6.1 Description

The event monitor receives notifications for important events or changes to the enabled event monitor tables. These changes are logged to a fixed-size circular buffer. The size of this buffer is configurable, but it does not grow dynamically. Buffer contents can be stored to permanent files to increase the event monitor effective capacity. The permanent file size and the number of permanent files is configurable. The buffer is stored at a fixed location on the switch.

Specific event monitor queries are available through CLI commands. For queries not available through specific commands, manual queries are supported through other CLI commands. When the user issues a query command, the relevant events from the circular buffer and permanent files are written to and accessed from a temporary SQLite database file. The database keeps a separate table for each logging type (such as mac, arp, route, and others). When the monitor receives notification of a new event, the database file is deleted, then recreated.

6.6.2 Configuring the Event Monitor

Enabling the Event Monitor

The event-monitor command enables the event monitor and specifies the types of events that are logged. The event monitor is an event logging service that records system events to a local database. The event monitor records these events:

- all changes to all events.
- arp changes to the ARP table (IPv4 address to MAC address mappings).
- Neighbor changes to the neighbor table (IPv6 address to MAC address mappings)
- backup backed up log files.
- buffer changes to the local buffer settings.
- IGMP snooping changes to the IGMP snooping table.
- lacp changes to the LACP table events.
- mac changes to the MAC address table (MAC address to port mappings).
- mroute changes to the IP multicast routing table.
- neighbor changes to the neighbor routing table.
- route changes to the IPv4 routing table.
- route6 changes to the IPv6 routing table.
- stpunstable events that cause STP instability.

Beginning with release EOS-4.20.5F, event-monitor is not enabled by default. Use the event-monitor command to explicitly enable event-monitor. The no event-monitor all command disables the event monitor. The no event-monitor command, followed by a log type parameter, disables event recording for the specified type.
Example
- This command disables the event monitor for all types of events.
  
  ```
  switch(config)#no event-monitor all
  ```
- This command enables the event monitor for routing table changes.
  
  ```
  switch(config)#event-monitor route
  ```

The `event-monitor clear` command removes the contents of the event monitor buffer. If event monitor backup is enabled, this command removes the contents from all event monitor backup files.

Example
- This command clears the contents of the event monitor buffer.
  
  ```
  switch#event-monitor clear
  ```

Configuring the Buffer

The `event-monitor buffer max-size` command specifies the size of the event monitor buffer. The event monitor buffer is a fixed-size circular data structure that receives event records from the event monitor. When event monitor backup is enabled, the buffer is copied to a backup file before each rollover. Buffer size ranges from 6 Kb to 50 Kb. The default size is 32 Kb.

Example
- This command configures a buffer size of 48 Kb.
  
  ```
  switch(config)#event-monitor buffer max-size 48
  ```

Configuring Permanent Files

The `event-monitor backup path` command enables storage of the event monitor buffer to permanent switch files and specifies the path/name of these files. The command references file location either from the flash drive root directory where the CLI operates (`/mnt/flash`) or from the switch root directory (`/`).

The event monitor buffer is circular – after the buffer is filled, new data replaces older data at the beginning of the buffer. The buffer is copied into a new backup file after each buffer writing cycle before the switch starts re-writing the buffer.

Example
- These commands configure the switch to store the event monitor buffer in sw-event.log, then display the new file in the flash directory.
  
  ```
  switch(config)#event-monitor backup path eventmon_backup_dir/event.log
  ```
  
  ```
  bash-4.3# ls /mnt/flash/eventmon_backup_dir/
  ```
  
  ```
  arpevent.log.1 lacpevent.log.1 neighborevent.log.1 routeevent.log.1 igmpsnopingevent.log.1 macevent.log.1 route6event.log.1 stpunstablevent.log.1
  ```

The `event-monitor backup max-size` command specifies the quantity of event monitor backup files the switch maintains. The switch appends a extension number to the file name when it creates a new file. After every 500 events, the switch deletes the oldest backup file if the file limit is exceeded.
Example

- These commands configure the switch to back up the event buffer to a series of files named `sw-event.log`. The switch can store a maximum of four files.

```
switch(config)#event-monitor backup path sw-event.log
switch(config)#event-monitor backup max-size 4
switch(config)#
```
The first five files that the switch creates to store event monitor buffer contents are:

sw-event.log.0
sw-event.log.1
sw-event.log.2
sw-event.log.3
sw-event.log.4

The switch deletes **sw-event.log.0** the first time it verifies the number of existing backup files after the creation of **sw-event.log.4**.

### 6.6.3 Querying the Event Monitor

These CLI commands perform SQL-style queries on the event monitor database:

- The **show event-monitor arp** command displays ARP table events.
- The **show event-monitor mac** command displays MAC address table events.
- The **show event-monitor route** command displays routing table events.

#### Example

- This command displays all events triggered by MAC address table events.

  ```
  switch#show event-monitor mac
  % Writing 0 Arp, 0 Route, 1 Mac events to the database
  2012-01-19 13:57:55|1|0808.0808.0808|Ethernet1|configuredStaticMac|added|0
  ```

  For other database queries, the **show event-monitor sqlite** command performs an SQL-style query on the database, using the statement specified in the command.

#### Example

- This command displays all entries from the route table.

  ```
  switch#show event-monitor sqlite select * from route;
  2019-09-30 14:01:21.659428|16.16.16.255/32|default|receiveBcast|0|0|updated|20
  2019-09-30 14:01:21.659464|192.168.201.12/30|default|connected|1|0|updated|21
  2019-09-30 14:01:21.659497|192.168.1.255/32|default|receiveBcast|0|0|updated|22
  2019-09-30 14:01:21.659503|192.168.201.8/32|default|receiveBcast|0|0|updated|23
  2019-09-30 14:01:21.659512|16.16.16.0/32|default|receiveBcast|0|0|updated|24
  2019-09-30 14:01:21.659517|192.168.201.12/32|default|receiveBcast|0|0|updated|25
  2019-09-30 14:01:21.659524|192.168.201.15/32|default|receiveBcast|0|0|updated|26
  2019-09-30 14:01:21.659541|192.168.201.8/30|default|connected|1|0|updated|27
  2019-09-30 14:01:21.659564|16.16.16.0/24|default|connected|1|0|updated|28
  2019-09-30 14:01:21.659578|192.168.201.9/32|default|receive|0|0|updated|29
  ```

### 6.6.4 Accessing Event Monitor Database Records

The **event-monitor interact** command replaces the CLI prompt with an SQLite prompt. The event monitor buffer and all backup logs are synchronized into a single SQLite file and loaded for access from the prompt.

- To access help from the SQLite prompt, enter `.help`
- To exit SQLite and return to the CLI prompt, enter `.quit` or `.exit`
The `event-monitor sync` command combines the event monitor buffer and all backup logs and synchronizes them into a single SQLite file. The data can be accessed through SQLite or by using the `show event-monitor` commands described above.

**Examples**

- This command replaces the EOS CLI prompt with an SQLite prompt.
  
  ```
  switch# event-monitor interact
  sqlite>
  ```

- This command exits SQLite and returns to the EOS CLI prompt.
  
  ```
  sqlite> .quit
  switch#
  ```

- This command synchronizes the buffer and backup logs into a single SQLite file.
  
  ```
  switch(config)# event-monitor sync
  switch(config)#
  ```
6.7 PTP Monitoring

The Precision Time Protocol (PTP) is a protocol used to synchronize clocks throughout a computer network. PTP achieves clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems. PTP allows users to view most recent history of offset from master, mean path delay and skew values through CLI command and optionally generate syslogs. To generate syslogs, users must configure threshold values for each metric, and whenever the switch sees an unusual data, it generates a syslog.

By default recording and displaying recent history is enabled. To view available data use show tech-support command. But by default syslog is disabled, and user must configure in order to generate syslog.

6.7.1 Configuring PTP Monitoring

The following PTP configurations are supported on all PTP supported device.

- Use **ptp monitor** command to enable or disable PTP monitoring on the device. The PTP monitor is enabled by default. The **no** form of the command disables the PTP monitoring and clears all the recorded data.

  ```
  Switch(config)#[no] ptp monitor
  ```

- Use **ptp monitor threshold offset-from-master** command to configure the value of the offset from master threshold in nanoseconds. Syslog is generated if the most recently calculated offset from master is not in the range (-<threshold>, <threshold>). Max offset threshold is one second. The **no** form of the command clears all the offset value set for master threshold.

  ```
  Switch(config)#[no] ptp monitor threshold offset-from-master <threshold>
  ```

- Use **ptp monitor threshold mean-path-delay** command to configure the value of the mean path delay threshold in nanoseconds. Syslog is generated if the value of the most recently calculated mean path delay is greater than or equal to this threshold. Max threshold is one second. The **no** form of the command clears all the threshold value set.

  ```
  Switch(config)#[no] ptp monitor threshold mean-path-delay <threshold>
  ```

- Use **ptp monitor threshold skew** command to configure the value of the skew threshold percentage. Syslog is generated if the value of the most recently calculated skew is not in the range \((1/(1+<threshold>)), 1*(1+<threshold>)\). Skew threshold value is a double precision (16 digit) real number ranging from 0 to 10 (100%). The **no** form of the command clears all the skew value set.

  ```
  Switch(config)#[no] ptp monitor threshold skew <threshold>
  ```

---

**Note**

Mean path delay is always non-negative.
6.7.2 Displaying PTP Monitoring Information

Use **show ptp monitor** command to display the list of up to 100 recorded entries of offset from master, mean path delay and skew values, along with current PTP mode, whether or not the feature is enabled, number of entries displayed and the configured thresholds for each metric. Entries are sorted by the system time at when the value has been calculated, starting from the most recent data at the top.

**Example**

```
Switch# show ptp monitor
PTP Mode: Boundary Clock
Ptp monitoring: enabled
Number of entries: 5
Offset from master threshold: 1500
Mean path delay threshold: not configured
Skew threshold: 0.5

<table>
<thead>
<tr>
<th>Interface</th>
<th>Time</th>
<th>Offset from Master (ns)</th>
<th>Mean Path Delay (ns)</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Et8</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>71</td>
<td>5849</td>
<td>1.003159918</td>
</tr>
<tr>
<td>Et1</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>113</td>
<td>3672</td>
<td>1.004990621</td>
</tr>
<tr>
<td>Et2</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>706</td>
<td>7799</td>
<td>1.002744199</td>
</tr>
<tr>
<td>Et1</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>803</td>
<td>5861</td>
<td>1.003432049</td>
</tr>
<tr>
<td>Et1</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>610</td>
<td>3415</td>
<td>0.998974658</td>
</tr>
</tbody>
</table>
```
Managing EOS Extensions

6.8 Managing EOS Extensions

The most simple and efficient way to make the most of the extensibility on which EOS is built is through the use of extensions. An extension is a pre-packaged optional feature or a set of scripts in an RPM Package Manager (RPM) or Software image extension (SWIX) format. A variety of extensions are available from the EOS Central page at http://eos.arista.com.

These sections describe basic EOS extension tasks:

- Section 6.8.1: Installing EOS Extensions
- Section 6.8.2: Installing EOS Extensions on a Dual-Supervisor Switch
- Section 6.8.3: Verifying EOS Extensions Installation
- Section 6.8.4: Uninstalling an EOS Extension

6.8.1 Installing EOS Extensions

Complete the following steps to install an EOS extension.

**Step 1** Download the desired extension and copy it onto the device’s flash storage.

```bash
switch#dir
Directory of flash:
-rwx 479183792 Jun 23 09:46 EOS-4.13.3F.swi
-rwx 21280296 Feb 6 16:48 arista-splunk-extension.swix
-rwx 27 Jun 23 10:08 boot-config
drxw 4096 Sep 26 2012 schedule
-rwx 1481 Jun 27 05:54 startup-config
```

**Step 2** Copy the file from the flash storage to the extensions partition.

```bash
switch#copy flash:arista-splunk-extension.swix extension:
Copy completed successfully.
```

**Step 3** Install the EOS extension.

```bash
switch#extension arista-splunk-extension.swix
If this extension modifies the behavior of the CLI, any running CLI sessions will need to be reset in order for the CLI modifications to take effect.
```

**Step 4** If extension persistence across reboots is required, the extension should also be copied into the boot-extensions partition.

```bash
switch#copy installed-extensions boot-extensions
```

**Step 5** Run the extension. As the CloudVision extension adds additional CLI commands to EOS, the CLI session must be restarted so that the additional commands are available. To achieve this, close the SSH or the telnet session and open a new session.

6.8.2 Installing EOS Extensions on a Dual-Supervisor Switch

Complete the following steps to install an EOS extension on a dual-supervisor switch.

**Step 1** Copy the extension from the primary supervisor to the standby supervisor’s flash directory.

```bash
switch(sl)#copy flash:<filename>.swix supervisor-peer://mnt/flash/
```
Step 2  Establish a session to the standby supervisor from the primary.

switch(s1)#session peer-supervisor
Warning: Permanently added '127.1.0.2':3601 (RSA) to the list of known hosts.
Last login: Mon Aug 27 17:32:00 2018 from supervisor1

WARNING - you are currently logged in to the standby supervisor.
Not all cli commands are available or supported. Any configuration
done from this cli will not be reflected in the active supervisor's
running config and will be lost when the active supervisor writes
its startup config.
switch(s2)#

Step 3  Repeat the steps listed in the Installing EOS Extensions to install the EOS extension.

Step 4  Repeat the steps listed in the Verifying EOS Extensions Installation to verify the extension installation.

Step 5  Exit standby supervisor.

switch(s2)#exit
Connection to 127.1.0.1 closed.
switch(s1)#

6.8.3  Verifying EOS Extensions Installation

Complete the steps to verify that the EOS extensions are installed correctly.

Step 1  Run the show extensions command to verify that the EOS extensions are available and installed correctly.

switch#show extensions
Name                                  Version/Release                      Status Extension
-----------------------------------------------------------------------------------------
EosSdk-1.2.1-fl.boca-1943435.i686.rpm 1.2.1/1943435.flbocaesossd A, NI     1
arista-splunk-extension.swix          0.95/1498976.2013tdsplun A, I      2
fping-2.4b2-10.fc12.1686.rpm          2.4b2/10.fc12 A, I                  1
gnuplot.swix                         1.10.0/1.fc14 A, I                  16
splunkforwarder-5.0.9-213964.i386.rpm 5.0.9/213964 A, NI                 1

A: available | NA: not available | I: installed | NI: not installed | F: forced

Step 2  Run the show boot-extensions command to verify that the EOS extensions are enabled for boot persistence.

switch#show boot-extensions
arista-splunk-extension.swix
fping-2.4b2-10.fc12.1686.rpm
gnuplot.swix
6.8.4 Uninstalling an EOS Extension

Complete the following steps to uninstall an EOS extension.

**Step 1** Uninstall the existing EOS extension using the `no extension` command.

```bash
switch#no extension fping-2.4b2-10.fc12.i686.rpm
switch#show extensions
```

<table>
<thead>
<tr>
<th>Name</th>
<th>Version/Release</th>
<th>Status</th>
<th>extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>EosSdk-1.2.1-fl.boca-1943435.i686.rpm</td>
<td>1.2.1/1943435.flbocaeossd</td>
<td>A, NI 1</td>
<td></td>
</tr>
<tr>
<td>arista-splunk-extension.swix</td>
<td>0.95/1498976.2013ltdsplun</td>
<td>A, I 2</td>
<td></td>
</tr>
<tr>
<td>fping-2.4b2-10.fc12.i686.rpm</td>
<td>2.4b2/10.fc12</td>
<td>A, NI 1</td>
<td></td>
</tr>
<tr>
<td>gnuplot.swix</td>
<td>1.10.0/1.fc14</td>
<td>A, I 16</td>
<td></td>
</tr>
<tr>
<td>splunkforwarder-5.0.9-213964.i386.rpm</td>
<td>5.0.9/213964</td>
<td>A, NI 1</td>
<td></td>
</tr>
</tbody>
</table>

A: available | NA: not available | I: installed | NI: not installed | F: forced

**Step 2** Remove the extension from the boot-extension using the `copy installed-extensions boot-extensions` command.

```bash
switch#copy installed-extensions boot-extensions
```

**Note** If your system is a Dual-Supervisor Switch, connect to the secondary supervisor using the `session peer-supervisor` command, repeat steps 1 and 2, and finally exit from the secondary supervisor.
6.9 Switch Administration Commands

Switch Name Configuration Commands
- `dns domain`
- `hostname`
- `ip domain-list`
- `ip domain lookup`
- `ip host`
- `ip name-server`
- `ipv6 host`
- `show hostname`
- `show hosts`
- `show ip domain-name`
- `show ip name-server`

Banner Configuration Commands
- `banner login`
- `banner motd`
- `show banner`

Prompt Configuration Command
- `prompt`

Event Manager Commands
- `event-monitor`
- `event-monitor backup max-size`
- `event-monitor backup path`
- `event-monitor buffer max-size`
- `event-monitor clear`
- `event-monitor interact`
- `event-monitor sync`
- `no event-monitor`
- `show event-monitor arp`
- `show event-monitor igmpsnooping`
- `show event-monitor mac`
- `show event-monitor mroute`
- `show event-monitor neighbor`
- `show event-monitor route6`
- `show event-monitor route`
- `show event-monitor sqlite`
- `show event-monitor stpunstable`

Email Configuration Command
- `email`

System Clock Commands
- `clock set`
- `clock timezone`
- `show clock`

NTP Configuration Commands
- `ntp authenticate`
Switch Administration Commands

- ntp authentication-key
- ntp local-interface
- ntp serve
- ntp serve all
- ntp server
- ntp trusted-key
- show ntp associations
- show ntp status

**PTP Configuration Commands**
- clear ptp interface counters
- ptp announce interval
- ptp announce timeout
- ptp delay-mechanism
- ptp delay-req interval
- ptp domain
- ptp enable
- ptp forward-v1
- ptp hold-ptp-time
- ptp mode
- ptp pdelay-neighbor-threshold
- ptp pdelay-req interval
- ptp priority1
- ptp priority2
- ptp role
- ptp source ip
- ptp sync-message interval
- ptp sync timeout
- ptp transport
- ptp ttl
- show local-clock time-properties
- show ptp
- show ptp foreign-master-record
- show ptp interface
- show ptp interface counters
- show ptp local-clock
- show ptp masters
- show ptp source ip

**PTP Monitor Commands**
- ptp monitor
- ptp monitor threshold mean-path-delay
- ptp monitor threshold offset-from-master
- ptp monitor threshold skew
- show ptp monitor

**Syslog Configuration Commands**
- logging format sequence-numbers
- logging repeat-messages
banner login

The *banner login* command configures a message that the switch displays before login and password prompts. The login banner is available on console, telnet, and ssh connections.

The *no banner login* and *default banner login* commands delete the login banner.

**Command Mode**

- Global Configuration

**Command Syntax**

```
banner login
no banner login
default banner login
```

**Parameters**

- **`banner_text`** To configure the banner, enter a message when prompted. The message may span multiple lines. Banner text supports the following keywords:
  - **$(hostname)** displays the switch’s host name.
  - **EOF** To end the banner editing session, type EOF on its own line and press enter.

**Examples**

- These commands create a two-line login banner.
  ```
  switch(config)#banner login
  Enter TEXT message. Type 'EOF' on its own line to end.
  This is a login banner for $(hostname).
  Enter your login name at the prompt.
  EOF
  switch(config)#
  ```
  This output displays the login banner.
  ```
  This is a login banner for switch.
  Enter your login name at the prompt.
  switch login: john
  Password:
  Last login: Mon Jan 14 09:05:23 2013 from adobe-wrks.aristanetworks.com
  switch>
  ```
**banner motd**

The `banner motd` command configures a “message of the day” (motd) that the switch displays after a user logs in. The motd banner is available on console, telnet, and ssh connections.

The `no banner motd` and `default banner motd` commands delete the motd banner.

**Command Mode**

Global Configuration

**Command Syntax**

```
   banner motd
   no banner motd
   default banner motd
```

**Parameters**

- `banner_text` To configure the banner, enter a message when prompted. The message may span multiple lines. Banner text supports this keyword:
  - `$(hostname)` displays the switch’s host name.
- `EOF` To end the banner editing session, type EOF on its own line and press enter.

**Examples**

- These commands create an motd banner.

  ```
  switch(config)#banner motd
  Enter TEXT message. Type 'EOF' on its own line to end.
  This is an motd banner for $(hostname)
  EOF
  switch(config)#
  ```

  This output displays the motd banner.

  ```
  switch login: john
  Password:
  Last login: Mon Jan 14 09:17:09 2013 from adobe-wrks.aristanetworks.com
  This is an motd banner for Switch
  switch>
  ```
clear ptp interface counters

The `clear ptp interface counters` command resets the Precision Time Protocol (PTP) packet counters.

**Command Mode**
Privileged EXEC

**Command Syntax**
```
clear ptp interface [INTERFACE_NAME] counters
```

**Parameters**
- `INTERFACE_NAME` Interface type and numbers. Options include:
  - `<no parameter>` Display information for all interfaces.
  - `ethernet e_range` Ethernet interface range specified by `e_range`.
  - `loopback l_range` Loopback interface specified by `l_range`.
  - `management m_range` Management interface range specified by `m_range`.
  - `port-channel p_range` Port-Channel Interface range specified by `p_range`.
  - `vlan v_range` VLAN interface range specified by `v_range`.
  - `vxlan vx_range` VXLAN interface range specified by `vx_range`.

Valid parameter formats include number, number range, or comma-delimited list of numbers and ranges.

**Example**
- This command clears all PTP counters.
```
switch# clear ptp counters
switch#
```
clock set

The clock set command sets the system clock time and date. If the switch is configured with an NTP server, NTP time synchronizations override manually entered time settings.

Time entered by this command is local, as configured by the clock timezone command.

**Command Mode**

Privileged EXEC

**Command Syntax**

```
clock set hh:mm:ss date
```

**Parameters**

- **hh:mm:ss** is the current time (24-hour notation).
- **date** is the current date. Date formats include:
  - *mm/dd/yy* example: 05/15/2012
  - *Month day year* example: May 15 2012
  - *day month year* example: 15 May 2012

**Example**

- This command manually sets the switch time.

```
switch# clock set 08:15:24 14 Jan 2013
Mon Jan 14 08:15:25 2013
timezone is US/Central
```
**clock timezone**

The *clock timezone* command specifies the UTC offset that converts system time to local time. The switch uses local time for time displays and to time-stamp system logs and messages.

The no *clock timezone* and default *clock timezone* commands delete the *timezone* statement from *running-config*, setting local time to UTC.

**Command Mode**

Global Configuration

**Command Syntax**

```
clock timezone zone_name
no clock timezone
default clock timezone
```

**Parameters**

- `zone_name`  the time zone. Settings include a list of predefined time zone labels.

**Examples**

- This command configures the switch for the United States Central Time Zone.
  ```
  switch(config)#clock timezone US/Central
  switch(config)#show clock
  Fri Jan 11 18:42:49 2013
  timezone is US/Central
  switch(config)#
  ```

- To view the predefined time zone labels, enter *clock timezone* with a question mark.
  ```
  switch(config)#clock timezone ?
  Africa/Abidjan       Africa/Accra
  Africa/Addis_Ababa   Africa/Algiers
  Africa/Asmara        Africa/Asmera
  Africa/Bamako        Africa/Bangui
  W-SU                 W-SU timezone
  WET                  WET timezone
  Zulu                 Zulu timezone
  ```

- This command displays all time zone labels that start with *America*.
  ```
  switch(config)#clock timezone AMERICA?
  America/Adak         America/Anchorage
  America/Anguilla     America/Antigua
  America/Araguaina    America/Argentina/Buenos_Aires
  America/Virgin       America/Whitehorse
  America/Winnipeg     America/Yakutat
  America/Yellowknife
  ```

``` switch(config)#clock timezone AMERICA
```
dns domain

The **dns domain** command configures the switch’s domain name. The switch uses this name to complete unqualified host names.

The **no dns domain** and **default dns domain** commands delete the domain name by removing the **dns domain** command from **running-config**.

**Command Mode**

Global Configuration

**Command Syntax**

```bash
dns domain string
no dns domain
default dns domain
```

**Parameters**

- **string**  domain name (text string)

**Example**

- This command configures **aristanetworks.com** as the switch’s domain name.

  ```bash
  switch(config)#dns domain aristanetworks.com
  switch(config)#
  ```
email

The `email` command places the switch in email client configuration mode. If you configure a `from-user` and an outgoing SMTP server on the switch, you can then use an email address as an output modifier to a `show` command and receive the output as email.

**Command Mode**
Global Configuration

**Command Syntax**

```
email
```

**Example**
- This command places the switch in email client configuration mode.
  
  ```
  switch(config)#email
  switch(config)#
  ```
no event-monitor

The `no event-monitor` and `default event-monitor` commands remove the specified `event-monitor` configuration statements from `running-config`, returning the switch to the specified default state.

- `no event-monitor <with no parameters>` restores all default setting states:
  - event monitor is enabled.
  - buffer backup is disabled.
- `no event-monitor backup` disables the backup.

To disable the event monitor, enter the `no event-monitor all` command (event-monitor).

Command Mode
Global Configuration

Command Syntax

```
no event-monitor [PARAMETER]
default event-monitor [PARAMETER]
```

Parameters

- `PARAMETER` the event monitor property that is returned to the default state.
  - `<no parameter>` all event monitor properties.
  - `backup` event monitor buffer backup is disabled.

Example

- This command removes all event monitor configuration statements from `running-config`.

```
switch(config)#no event-monitor
switch(config)#
```
event-monitor

The `event-monitor` command enables the event monitor and specifies the types of events that are logged. The event monitor is an event logging service that records system events to a local database. The database maintains a separate table for each event type.

Beginning with release EOS-4.20.5F, `event-monitor` is not enabled by default. Use the `event-monitor` command to explicitly enable event-monitor.

- The `no event-monitor all` command disables the event monitor.
- The `no event-monitor` command, followed by a log type parameter, disables event recording for the specified type.
- The `event-monitor` and `default event-monitor` commands enable the specified event logging type by removing the corresponding `no event-monitor` command from `running-config`.

The `no event-monitor` and `default event-monitor` commands, without a `LOG_TYPE` parameter, restore the default event monitor settings by deleting all event monitor related commands from `running-config`.

Command Mode
Global Configuration

Command Syntax

```
  event-monitor LOG_TYPE
  no event-monitor LOG_TYPE
  default event-monitor LOG_TYPE
```

Parameters

- `LOG_TYPE` specifies the event logging type. Options include:
  - `all` all event logging types.
  - `arp` changes to ARP table.
  - `backup` backed up log files.
  - `buffer` changes to the local buffer settings.
  - `igmp-snooping` changes to IGMP snooping table.
  - `lacp` changes to the LACP table events.
  - `mac` changes to MAC address table.
  - `mroute` changes to multicast routing table.
  - `neighbor` changes to the neighbor routing table.
  - `route` changes to IP routing table.
  - `route6` changes to IP route6 table.
  - `stp-unstable` events that cause STP instability.

Related Commands
- `no event-monitor`

Examples

- This command disables the event monitor for all types of events.

```
switch(config)# no event-monitor all
switch(config)#
```
• This command enables the event monitor for routing table changes.
  
  switch(config)#event-monitor route
  switch(config)#
event-monitor backup max-size

The event-monitor backup max-size command specifies the quantity of event monitor backup files the switch maintains. Values range from 1 to 200 files with a default of ten files.

The event-monitor backup path command specifies the path/name of these files. The switch appends an extension to the file name that tracks the creation order of backup files. When the quantity of files exceeds the configured limit, the switch deletes the oldest file.

The no event-monitor backup max-size and default event-monitor backup max-size command restores the default maximum number of backup files the switch can store to ten by removing the corresponding event-monitor backup max-size command from running-config.

Command Mode
Global Configuration

Command Syntax

```
event-monitor backup max-size file_quantity
no event-monitor backup max-size
default event-monitor backup max-size
```

Parameters

- **file_quantity** maximum number of backup files. Value ranges from 1 to 200. Default is 10.

Examples

- These commands configure the switch to back up the event buffer to a series of files named sw-event.log. The switch can store a maximum of four files.

  ```
  switch(config)#event-monitor backup path sw-event.log
  switch(config)#event-monitor backup max-size 4
  switch(config)#
  ```

  The first five files that the switch creates to store event monitor buffer contents are:

  - `sw-event.log.0`
  - `sw-event.log.1`
  - `sw-event.log.2`
  - `sw-event.log.3`
  - `sw-event.log.4`

  The switch deletes `sw-event.log.0` the first time it verifies the number of existing backup files after the creation of `sw-event.log.4`. 
event-monitor backup path

The **event-monitor backup path** command enables the storage of the event monitor buffer to switch files and specifies the path/name of these files. The command references the file location either from the flash drive root directory (/mnt/flash) where the CLI operates or from the switch root directory (/).

The event monitor buffer is circular – after the buffer is filled, new data is written to the beginning of the buffer, replacing old data. At the conclusion of each buffer writing cycle, it is copied into a new backup file before the switch starts re-writing the buffer. The switch appends a extension number to the file name when it creates a new file. After every 500 events, the switch deletes the oldest backup file if the file limit specified by the **event-monitor backup max-size** command is exceeded.

**running-config** can contain a maximum of one **event-monitor backup path** statement. Subsequent **event-monitor backup path** commands replace the existing statement in **running-config**, changing the name of the file where event monitor backup files are stored.

The **no event-monitor backup path** and **default event-monitor backup path** commands disable the storage of the event monitor buffer to switch files by deleting the **event-monitor backup path** command from **running-config**.

**Command Mode**

Global Configuration

**Command Syntax**

```
event-monitor backup path URL_FILE
no event-monitor backup path
default event-monitor backup path
```

**Parameters**

- **URL_FILE**  
  path and file name of the backup file

  - **path_string**  
    specified path is appended to /mnt/flash/

  - **file: path_string**  
    specified path is appended to /

  - **flash: path_string**  
    specified path is appended to /mnt/flash/

**Examples**

- These commands configure the switch to store the event monitor buffer in sw-event.log, then display the new file in the flash directory.

  ```
  switch(config)#event-monitor backup path eventmon_backup_dir/event.log
  switch(config)#
  bash-4.3# ls /mnt/flash/eventmon_backup_dir/
  arpevent.log.1 lacpevent.log.1 neighborevent.log.1 routeevent.log.1 igmpssnoopingevent.log.1 macevent.log.1 route6event.log.1 stpunstableevent.log.1
  ```
event-monitor buffer max-size

The `event-monitor buffer max-size` command specifies the size of the event monitor buffer. The event monitor buffer is a fixed-size circular data structure that receives event records from the event monitor. When event monitor backup is enabled (`event-monitor backup path`), the buffer is copied to a backup file before each rollover.

Buffer size ranges from 6 Kb to 50 Kb. The default size is 32 Kb.

The `no event-monitor buffer max-size` and `default event-monitor buffer max-size` commands restore the default buffer size of 32 Kb by removing the `event-monitor buffer max-size` command from `running-config`.

Command Mode

Global Configuration

Command Syntax

```
event-monitor buffer max-size buffer_size
no event-monitor buffer max-size
default event-monitor buffer max-size
```

Parameters

- `buffer_size` buffer capacity (Kb). Values range from 6 to 50. Default value is 32.

Example

- This command configures a buffer size of 48 Kb.

```
switch(config)#event-monitor buffer max-size 48
switch(config)#
```
event-monitor clear

The `event-monitor clear` command removes the contents of the event monitor buffer. If event monitor backup is enabled, this command removes the contents from all event monitor backup files.

**Command Mode**

Privileged EXEC

**Command Syntax**

`event-monitor clear`

**Example**

- This command clears the contents of the event monitor buffer.

```
switch#event-monitor clear
switch#
```
event-monitor interact

The `event-monitor interact` command replaces the CLI prompt with an SQLite prompt. The event monitor buffer and all backup logs are synchronized into a single SQLite file and loaded for access from the prompt.

- To access help from the SQLite prompt, enter `.help`
- To exit SQLite and return to the CLI prompt, enter `.quit` or `.exit`

**Command Mode**
Privileged EXEC

**Command Syntax**

```
event-monitor interact
```

**Examples**

- This command replaces the EOS CLI prompt with an SQLite prompt.

  ```
  switch# event-monitor interact
  sqlite>
  ```

- This command exits SQLite and returns to the EOS CLI prompt.

  ```
  sqlite> .quit
  switch#
  ```
event-monitor sync

The `event-monitor buffer sync` command combines the event monitor buffer and all backup logs and synchronizes them into a single SQLite file, which is stored at `/var/log/eventMon.db`

**Command Mode**
Privileged EXEC

**Command Syntax**
```
event-monitor sync
```

**Example**
- This command synchronizes the buffer and backup logs into a single SQLite file.

```
switch(config)#event-monitor sync
switch(config)#
```
hostname

The `hostname` command assigns a text string as the switch’s host name. The default host name is `localhost`.

The prompt displays the host name when appropriately configured through the `prompt` command. The `no hostname` and `default hostname` commands return the switch’s host name to the default value of `localhost`.

**Command Mode**

Global Configuration

**Command Syntax**

- `hostname string`
- `no hostname`
- `default hostname`

**Parameters**

- `string`  host name assigned to the switch.

**Example**

- This command assigns the string `main-host` as the switch’s host name.

```
switch(config)#hostname main-host
main-host(config)#
```

The prompt was previously configured to display the host name.
ip domain-list

The `ip domain-list` command specifies a domain name to add to the IP domain list.

The `no ip domain-list` and `default ip domain-list` commands return the IP domain list to its default state, in which the switch selects source IP addresses for each DNS request from the specified VRF.

Command Mode

Global Configuration

Command Syntax

- `ip domain-list [IP_DOMAIN_NAME]`
- `no ip domain-list [IP_DOMAIN_NAME]`
- `default ip domain-list [IP_DOMAIN_NAME]`

Parameters

- **IP_DOMAIN_NAME** specifies the IP domain name.

Examples

- This command specifies foo.com as the IP domain name to add to the IP domain list.
  ```
  switch(config)# ip domain-list foo.com
  switch(config)#
  ```

- This command removes foo.com and returns the IP domain list to its default state.
  ```
  switch(config)# no ip domain-list foo.com
  switch(config)#
  ```
ip domain lookup

The **ip domain lookup** command specifies the source interface for all DNS requests sent from the specified VRF.

The **no ip domain lookup** and **default ip domain lookup** commands return the switch to its default state, in which the switch selects source IP addresses for each DNS request from the specified VRF.

**Command Mode**
Global Configuration

**Command Syntax**
```
ip domain lookup [VRF_INSTANCE] source-interface INTF_NAME
no ip domain lookup [VRF_INSTANCE] source-interface
default ip domain lookup [VRF_INSTANCE] source-interface
```

**Parameters**
- **VRF_INSTANCE** specifies the VRF instance being modified.
- <no parameter> changes are made to the default VRF.
- **vrf vrf_name** changes are made to the specified VRF.
- **INTF_NAME** name of source interface to be used for DNS requests. Options include:
  - **ethernet e_num** Ethernet interface specified by *e_num*.
  - **loopback l_num** Loopback interface specified by *l_num*.
  - **management m_num** Management interface specified by *m_num*.
  - **port-channel p_num** Port-channel interface specified by *p_num*.
  - **vlan v_num** VLAN interface specified by *v_num*.

**Examples**
- This command specifies VLAN 5 as the source interface for DNS requests originating from the default VRF.
  ```
  switch(config)#ip domain lookup source-interface Vlan5
  switch(config)#
  ```
- This command specifies VLAN 10 as the source interface for DNS requests originating from VRF "purple."
  ```
  switch(config)#ip domain lookup vrf purple source-interface Vlan10
  switch(config)#
  ```
**ip host**

The **ip host** command associates a hostname to an IPv4 address. This command supports local hostname resolution based on local hostname-IP address maps. Multiple hostnames can be mapped to an IP address. IPv4 and IPv6 addresses can be mapped to the same hostname (to map an IPv6 address to a hostname, use the **ipv6 host** command). The **show hosts** command displays the local hostname-IP address mappings.

The **no ip host** and **default ip host** commands removes hostname-IP address maps by deleting the corresponding **ip host** command from **running-config**, as specified by command parameters:

- no parameters: command removes all hostname-IP address maps.
- **hostname** parameter: command removes all IP address maps for the specified hostname.
- **hostname** and **IP address** parameters: command removes specified hostname-IP address maps.

**Command Mode**
- Global Configuration

**Command Syntax**

```
ip host  hostname  hostadd_1  [hostadd_2]  ...  [hostadd_X]
no ip host [hostname]  [hostadd_1]  [hostadd_2]  [hostadd_X]
default ip host [hostname]  [hostadd_1]  [hostadd_2]  [hostadd_X]
```

**Parameters**

- **hostname**   hostname (text).
- **hostadd_N**  IPv4 address associated with hostname (dotted decimal notation).

**Related Commands**

- **ipv6 host**
- **show hosts**

**Examples**

- This command associates the hostname **test_lab** with the IP addresses **10.24.18.5** and **10.24.16.3**.
  
  ```
  switch(config)#ip host test_lab 10.24.18.5 10.24.16.3
  ```

- This command removes all IP address maps for the hostname **production_lab**.
  
  ```
  switch(config)#no ip host production_lab
  ```
**ip name-server**

The `ip name-server` command adds name server addresses to `running_config`. The switch uses name servers for name and address resolution. The switch can be configured with up to three name servers. Although a command can specify multiple name server addresses, `running_config` stores each address in a separate statement. Name server addresses can be IPv4 and IPv6; each command can specify both address types.

Attempts to add a fourth server generate an error message. All name server addresses must be configured in the same VRF. When name servers were previously configured in a VRF, they must all be removed before adding new name server entries.

The `no ip name-server` and `default ip name-server` commands remove specified name servers from `running_config`. Commands that do not list an address remove all name servers.

**Command Mode**

Global Configuration

**Command Syntax**

```
ip name-server [VRF_INSTANCE] SERVER_1 [SERVER_2] [SERVER_3]
no ip name-server [VRF_INSTANCE] [SERVER_1] [SERVER_2] [SERVER_3]
default ip name-server [VRF_INSTANCE] [SERVER_1] [SERVER_2] [SERVER_3]
```

**Parameters**

- **VRF_INSTANCE** specifies the VRF instance containing the addresses.
  - `<no parameter>` default VRF.
  - `vrf vrf_name` a user-defined VRF.
- **SERVER_X** IP address of the name server (dotted decimal notation). Options include:
  - `ipv4_addr` (A.B.C.D)
  - `ipv6_addr` (A:B:C:D:E:F:G:H)
  A command can contain both (IPv4 and IPv6) address types.

**Guidelines**

All configured name server addresses must come from the same VRF. To use a user defined VRF for connection to a name server, first remove any name servers configured in the default VRF.

**Examples**

- This command adds two name servers to the configuration.
  
  ```
  switch(config)#ip name-server 172.0.14.21 3:4F21:1902::
  switch(config)#
  ```

- This command attempts to add a name server when the configuration already lists three servers.
  
  ```
  switch(config)#ip name-server 172.1.10.22
  % Maximum number of nameservers reached. '172.1.10.22' not added
  switch(config)#
  ```
ipv6 host

The ipv6 host command associates a hostname to an IPv6 address. This command supports local hostname resolution based on local hostname-IP address maps. Multiple hostnames can be mapped to an IPv6 address. IPv4 and IPv6 addresses can be mapped to the same hostname (to map IPv4 addresses to a hostname, use the ip host command). The show hosts command displays the local hostname-IP address mappings.

The no ipv6 host and default ipv6 host commands remove hostname-IP address maps by deleting the corresponding ipv6 host command from running-config, as specified by command parameters:

- no parameters: command removes all hostname-IPv6 address maps.
- hostname parameter: command removes all IPv6 address maps for the specified hostname.
- hostname and IP address parameters: command removes specified hostname-IP address maps.

Command Mode
Global Configuration

Command Syntax
ipv6 host hostname hostadd_1 [hostadd_2] ... [hostadd_X]
no ipv6 host [hostname] [hostadd_1] [hostadd_2] [hostadd_X]
default ipv6 host [hostname] [hostadd_1] [hostadd_2] [hostadd_X]

Parameters
- hostname hostname (text).
- hostadd_N IPv6 addresses associated with hostname (dotted decimal notation).

Related Commands
- ip host
- show hosts

Example
- This command associates the hostname support_lab with the IPv6 address 2001:0DB8:73:ff:ff:26:fd:90.
  switch(config)#ipv6 host support_lab 2001:0DB8:73:ff:ff:26:fd:90
  switch(config)
logging format sequence-numbers

The logging format sequence-numbers command causes the sequence numbers of syslog messages to be visible when the messages are displayed.

The no logging format sequence-numbers and default logging format sequence-numbers commands remove the logging format sequence-numbers command from running-config.

Command Mode

Global Configuration

Command Syntax

logging format sequence-numbers
no logging format sequence-numbers
default logging format sequence-numbers

Examples

- This command enables sequence numbering that can be seen when syslog messages are displayed.
  
  switch(config)#logging format sequence-numbers
  switch(config)#

- To display the sequence numbers, issue the show logging command.
  
  switch#show logging
  Syslog logging: enabled
  Buffer logging: level debugging
  Console logging: level informational
  Synchronous logging: disabled
  Trap logging: level informational
  Sequence numbers: enabled
  Syslog facility: local4
  Hostname format: Hostname only
  Repeat logging interval: disabled

  Log Buffer:

  Nov 12 14:03:34 switch1 SuperServer: 1: %SYS-7-CLI_SCHEDULER_LOG_STORED: Logfile for scheduled CLI execution job 'tech-support' is stored in flash:/schedule/tech-support/tech-support_2012-11-12.1402.log.gz
  Nov 12 14:06:52 switch1 Cli: 2: %SYS-5-CONFIG_I: Configured from console by admin on con0 (0.0.0.0)
  Nov 12 14:07:26 switch1 Cli: 3: %SYS-5-CONFIG_E: Enter configuration mode from console by admin on con0 (0.0.0.0)
  Nov 12 14:14:29 switch1 Cli: 4: %SYS-5-CONFIG_I: Configured from console by admin on con0 (0.0.0.0)
  Nov 12 14:15:55 switch1 Cli: 5: %SYS-5-CONFIG_E: Enter configuration mode from console by admin on con0 (0.0.0.0)
  Nov 12 14:33:05 switch1 Cli: 6: %SYS-5-CONFIG_I: Configured from console by admin on con0 (0.0.0.0)
  Nov 12 14:45:13 switch1 Cli: 7: %SYS-5-CONFIG_E: Enter configuration mode from console by admin on con0 (0.0.0.0)
  switch#
logging repeat-messages

The **logging repeat-messages** command configures repetition of syslog messages instead of summarizing the count of repeats.

The **no logging repeat-messages** and **default logging repeat-messages** commands disable the functionality to repeat logging messages in *running-config*.

**Command Mode**
Global Configuration

**Command Syntax**

- `logging repeat-messages`
- `no logging repeat-messages`
- `default logging repeat-messages`

**Examples**
- This command repeats syslog messages instead of summarizing the count of repeats.

  ```
  switch(config)#logging repeat-messages
  switch(config)#
  ```

- This command displays the status of logging repeat messages command.

  ```
  switch(config)#show logging
  Syslog logging: enabled
  Buffer logging: level debugging
  Console logging: level debugging
  Monitor logging: level debugging
  Synchronous logging: disabled
  Trap logging: level informational
  Sequence numbers: disabled
  Syslog facility: local4
  Hostname format: Hostname only
  Repeat logging interval: disabled
  Repeat messages: enabled
  
  Facility              Severity     Effective Severity
  -------------------- -------------- ---------------
  aaa                   debugging    debugging
  accounting           debugging    debugging
  
  switch(config)#
  ```
**ntp authenticate**

The `ntp authenticate` command enables the authentication of incoming NTP packets. When authentication is enabled, NTP packets will be used to synchronize time on the switch only if they include a trusted authentication key. Authentication keys are created on the switch using the `ntp authentication-key` command, and the `ntp trusted-key` command is used to specify which keys are trusted. NTP authentication is disabled by default.

The `no ntp authenticate` and `default ntp authenticate` commands disable NTP authentication on the switch by removing the corresponding `ntp authenticate` command from `running-config`.

**Command Mode**

Global Configuration

**Command Syntax**

```
ntp authenticate
no ntp authenticate
default ntp authenticate
```

**Examples**

- This command enables NTP authentication on the switch.
  ```
  switch(config)# ntp authenticate
  switch(config)#
  ```

- This command disables NTP authentication on the switch.
  ```
  switch(config)# no ntp authenticate
  switch(config)#
  ```
**ntp authentication-key**

The `ntp authentication-key` command creates an authentication key for use in authenticating incoming NTP packets. For the key to be used in authentication:

- It must be configured as a trusted key using the `ntp trusted-key` command.
- NTP authentication must be enabled on the switch using the `ntp authenticate` command.
- The same key must be configured on the NTP server.

The `no ntp authentication-key` and `default ntp authentication-key` commands remove the specified authentication key by removing the corresponding `ntp authentication-key` command from `running-config`.

**Command Mode**

Global Configuration

**Command Syntax**

```
ntp authentication-key key_id ENCRYPT_TYPE password_text
no ntp authentication-key key_id
default ntp authentication-key key_id
```

**Parameters**

- `key_id` key ID number. Value ranges from 1 to 65534.
- `ENCRYPT_TYPE` encryption method. Values include:
  - `md5` `key_text` is MD5 encrypted.
  - `sha1` `key_text` is SHA-1 encrypted.
- `password_text` the authentication-key password.

**Example**

- This command creates an NTP authentication key with ID 234 and password “timeSync” using MD5 encryption.

  ```
  switch(config)#ntp authentication-key 234 md5 timeSync
  
  Running-config stores the password as plain text.
  ```

- This command removes NTP authentication key 234.

  ```
  switch(config)#no ntp authentication-key 234
  ```
ntp local-interface

The **ntp local-interface** command configures an interface as the source of NTP updates. That interface’s IP address is then used as the source address for all NTP packets sent to all destinations unless a server-specific source interface has been specified using the *source* option of the *ntp server* command.

The **no ntp local-interface** and **default ntp local-interface** commands remove the *ntp local-interface* command from *running-config*.

**Command Mode**
- Global Configuration

**Command Syntax**
```
ntp local-interface [VRF_INSTANCE] INT_PORT
no ntp local-interface
default ntp local-interface
```

**Parameters**
- **VRF_INSTANCE** the VRF instance to be used for connection to the specified server.
  - <no parameter> connects using the default VRF.
  - *vrf* vrf_name connects using the specified user-defined VRF.
- **INT_PORT** the interface port that specifies the NTP local interface. Settings include:
  - *ethernet* e_range Ethernet interface list.
  - *loopback* l_range loopback interface list.
  - *management* m_range management interface list.
  - *port-channel* c_range port channel interface list.
  - *vlan* v_range VLAN interface list.

**Examples**
- This command configures VLAN interface 25 as the source of NTP update packets.
  ```
  switch(config)#ntp local-interface vlan 25  
  switch(config)#
  ```
- This command removes the *ntp local-interface* command from the configuration.
  ```
  switch(config)#no ntp local-interface  
  switch(config)#
  ```
ntp serve

The **ntp serve** command configures the command mode interface to accept incoming NTP requests regardless of the global setting.

The **no ntp serve** command configures the command mode interface to refuse incoming NTP requests regardless of the global setting. The **default ntp serve** command configures the command mode interface to follow the global setting.

Using this command also causes the switch to re-synchronize with its upstream NTP server.

**Command Modes**
- Interface-Ethernet Configuration
- Interface-Loopback Configuration
- Interface-Management Configuration
- Interface-Port-channel Configuration
- Interface-VLAN Configuration
- Interface-VXLAN Configuration

**Command Syntax**
- `ntp serve`
- `no ntp serve`
- `default ntp serve`

**Example**

- These commands configure Ethernet interface 5 to accept incoming NTP requests regardless of global settings.
  ```
  switch(config)#interface ethernet 5
  switch(config-if-Et5)#ntp serve
  switch(config-if-Et5)#
  ```

- These commands configure Ethernet interface 5 to deny incoming NTP requests regardless of global settings.
  ```
  switch(config)#interface ethernet 5
  switch(config-if-Et5)#no ntp serve
  switch(config-if-Et5)#
  ```

- These commands configure Ethernet interface 5 to use global settings in responding to incoming NTP requests.
  ```
  switch(config)#interface ethernet 5
  switch(config-if-Et5)#default ntp serve
  switch(config-if-Et5)#
  ```
**ntp serve all**

The **ntp serve all** command configures the switch to act as an NTP server by accepting incoming NTP requests.

Using this command also causes the switch to re-synchronize with its upstream NTP server.

Individual interfaces can be configured separately to accept or deny NTP requests by using the **ntp serve** command, and these settings override the global setting.

**Command Mode**

Global Configuration

**Command Syntax**

```
ntp serve all
no ntp serve all
default ntp serve all
```

**Example**

- This command configures the switch to accept incoming NTP requests.
  
  ```
  switch(config)#ntp serve all
  switch(config)#
  ```

- This command configures the switch to deny incoming NTP requests.
  
  ```
  switch(config)#no ntp serve all
  switch(config)#
  ```
**ntp server**

The `ntp server` command adds a Network Time Protocol (NTP) server to `running-config`. If the command specifies a server that already exists in `running-config`, it will modify the server settings. The switch synchronizes the system clock with an NTP server when `running-config` contains at least one valid NTP server.

The switch supports NTP versions 1 through 4. The default is version 4.

The `prefer` option specifies a preferred NTP server, which will be used as the NTP server if not discarded by NTP.

The `no ntp server` and `default ntp server` commands remove the specified NTP server from `running-config`. To remove an NTP server configured in a user-defined VRF, include the VRF name in the `no ntp server` command.

**Command Mode**

Global Configuration

**Command Syntax**

```
ntp server [VRF_INSTANCE] SERVER_NAME
[PREFERENCE] [NTP_VERSION] [IP_SOURCE] [burst] [iburst] [AUTH_KEY] [MAX_POLL_INT]
[MIN_POLL_INT]
no ntp [server [VRF_INSTANCE] SERVER_NAME]
default ntp [server [VRF_INSTANCE] SERVER_NAME]
```

All parameters except `VRF_INSTANCE` and `SERVER_NAME` can be placed in any order.

**Parameters**

- **VRF_INSTANCE** the VRF instance to be used for connection to the specified server.
  - <no parameter> connects using the default VRF.
  - `vrf vrf_name` connects using the specified user-defined VRF.
- **SERVER_NAME** NTP server location. Options include:
  - `IP address` in dotted decimal notation
  - an FQDN host name
- **PREFERENCE** indicates priority of this server when the switch selects a synchronizing server.
  - <no parameter> server has no special priority.
  - `prefer` server has priority when the switch selects a synchronizing server.
- **NTP_VERSION** specifies the NTP version. Settings include:
  - <no parameter> sets NTP version to 4 (default).
  - `version number`, where `number` ranges from 1 to 4.
- **IP_SOURCE** specifies the source interface for NTP updates for the specified NTP server. This option overrides global settings created by the `ntp local-interface` command. Options include:
  - <no parameter> sets the source interface to the global default.
  - `source ethernet e_num` Ethernet interface specified by `e_num`.
  - `source loopback l_num` loopback interface specified by `l_num`.
  - `source management m_num` management interface specified by `m_num`.
  - `source port-channel p_num` port-channel interface specified by `p_num`.
  - `source vlan v_num` VLAN interface specified by `v_num`. 
- **burst** indicates that when the NTP server is reached, the switch sends packets to the server in bursts of eight instead of the usual one. Recommended only for local servers. Off by default.
- **iburst** indicates that the switch sends packets to the server in bursts of eight instead of the usual one until the server is reached. Recommended for general use to speed synchronization. Off by default.
- **AUTH_KEY** the authentication key to use in authenticating NTP packets from the server.
  - <no parameter> no authentication key is specified.
  - **key <1 to 65534>** switch will use the specified key to authenticate NTP packets from the server.
- **MAX_POLL_INT** specifies the maximum polling interval for the server (as the base-2 logarithm of the interval in seconds). Settings include:
  - <no parameter> sets the maximum polling interval to 10 (1,024 seconds, the default).
  - **maxpoll number**, where **number** is the base-2 logarithm of the interval in seconds. Values range from 3 (8 seconds) to 17 (131,072 seconds, approximately 36 hours).
- **MIN_POLL_INT** specifies the minimum polling interval for the server (as the base-2 logarithm of the interval in seconds). Settings include:
  - <no parameter> sets the minimum polling interval to 6 (64 seconds, the default).
  - **minpoll number** where **number** is the base-2 logarithm of the interval in seconds. Values range from 3 (8 seconds) to 17 (131,072 seconds, approximately 36 hours).

**Guidelines**

To configure multiple parameters for a single server, include them all in a single **ntp server** command. Using the command again for the same server overwrites parameters previously configured in **running-config**.

All NTP servers must use the same VRF. If no VRF is specified, the server is configured in the default VRF. To use a user-defined VRF for connection to an NTP server, first use the **no ntp server** command to remove any NTP servers configured in the default VRF.

When specifying a source interface, choose an interface in the same VRF as the server. If the source interface is not in the same VRF, the source data will be included in **running-config** but will not be added to NTP packets.

An NTP server may be configured using an invalid or inactive VRF, but the status of the NTP server will remain inactive until the VRF is active.

**Examples**

- This command configures the switch to update its time with the NTP server at address 172.16.0.23 and designates it as a preferred NTP server.

  ```
  switch(config)# ntp server 172.16.0.23 prefer
  ```

- This command configures the switch to update its time through an NTP server named **local-nettime**.

  ```
  switch(config)# ntp server local-nettime
  ```

- This command configures the switch to update its time through a version 3 NTP server.

  ```
  switch(config)# ntp server 171.18.1.22 version 3
  ```
• These commands reconfigure the switch to access the above NTP servers through VRF “magenta.”

switch(config)#no ntp server 172.16.0.23
switch(config)#no ntp server local-nettime
switch(config)#no ntp server 171.18.1.22
switch(config)#ntp server vrf magenta 172.16.0.23 prefer
switch(config)#ntp server vrf magenta local-nettime
switch(config)#ntp server vrf magenta 171.18.1.22 version 3
switch(config)#
**ntp trusted-key**

The `ntp trusted-key` command specifies which authentication keys will be trusted for authentication of NTP packets. A packet with a trusted key will be used to update the local time if authenticated.

The `no ntp trusted-key` and `default ntp trusted-key` commands remove the specified authentication keys from the trusted key list by removing the corresponding `ntp trusted-key` command from `running-config`.

**Command Mode**
Global Configuration

**Command Syntax**

```
ntp trusted-key key_list
no ntp trusted-key
default ntp trusted-key
```

**Parameters**

- `key_list` specified one or more keys. Formats include a number (1 to 65534), number range, or comma-delimited list of numbers and ranges.

**Examples**

- This command configures the switch to trust authentication keys 234 and 237 for authentication of NTP packets.

  ```
  switch(config)#ntp trusted-key 234,237
  switch(config)#
  ```
prompt

The prompt command specifies the contents of the CLI prompt. Characters allowed in the prompt include A-Z, a-z, 0-9, and these punctuation marks:

`! @ # $ % ^ & * ( ) - = + f g [ ] ; : <> , . ? / ~`

The prompt supports these control sequences:

- `%s` – space character
- `%t` – tab character
- `%c` – percent character
- `%D` – time and date
- `%D{f_char}` – time and date, format specified by the BSD `strftime (f_char)` time conversion function.
- `%H` – host name
- `%h` – host name up to the first ‘.’
- `%P` – extended command mode
- `%p` – command mode
- `%r` – redundancy status on modular systems
- `%R` – extended redundancy status on modular systems – includes status and slot number

Table 6-1 displays Command Mode and Extended Command Mode prompts for various modes.

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The no prompt and default prompt commands return the prompt to the default of `%H%R%P`.

Command Mode

Global Configuration

Command Syntax

```
  prompt p_string
  no prompt
  default prompt
```

1. When logged into a fixed system or a supervisor on a modular system, this option has no effect.
2. When logged into a fixed system, this option has no effect.
Parameters

- $p\_string$ prompt text (character string). Elements include letters, numbers, and control sequences.

Examples

- This command creates a prompt that displays system 1 and the command mode.
  
  ```
  host-name.dut103(config)#prompt system%s1%P
  system 1(config) #
  ```

- This command creates a prompt that displays the command mode.
  
  ```
  host-name.dut103(config)#prompt %p
  (config)#
  ```

- These equivalent commands create the default prompt.
  
  ```
  % prompt %H%P
  host-name.dut103(config)#
  ```

  ```
  % no prompt
  host-name.dut103(config)#
  ```
ptp announce interval

The ptp announce interval command configures the interval (in log seconds) between PTP announcement messages on the configuration mode interface. The no ptp announce interval command resets the announce interval to its default of 1 (2 seconds).

Command Mode
- Interface-Ethernet Configuration
- Interface-Port Channel Configuration

Command Syntax
- `ptp announce interval log_interval`
- `no ptp announce interval`
- `default ptp announce interval`

Parameters
- `log_interval` The number of log seconds between PTP announcement messages (base 2 log (seconds)). Value ranges from -3 (1/8 second) to 4 (16 seconds); default value is 1 (2 seconds).

Examples
- These commands set the interval between PTP announcements on Ethernet interface 5 to 4 seconds.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp announce interval 2
  switch(config-if-Et5)#
  ```
- These commands reset the PTP announcement interval on Ethernet interface 5 to the default value of 1 (2 seconds).
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# no ptp announce interval
  switch(config-if-Et5)#
  ```
**ptp announce timeout**

The `ptp announce timeout` sets the timeout multiplier for the configuration-mode interface. The timeout multiplier is the number of announcement intervals that the interface will wait without receiving a PTP announcement before a timeout occurs; the range is from 2 to 255. The default multiplier is 3, which results in a 6-second timeout interval when the announcement interval is set to the default of 2 seconds. To configure the announcement interval, use the `ptp announce interval` command.

**Command Mode**

- Interface-Ethernet Configuration
- Interface-Port Channel Configuration

**Command Syntax**

```
ptp announce timeout multiplier
no ptp announce timeout
default ptp announce timeout
```

**Parameters**

- `multiplier` Number of announcement intervals after which the interface will time out if it does not receive a PTP announcement. The range is from 2 to 255; default value is 3.

**Examples**

- This command sets the timeout multiplier for Ethernet interface 5 to 5. This means that the interface will time out if it doesn't receive a PTP announcement within five announcement intervals.

  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp announce timeout 5
  switch(config-if-Et5)#
  ```

- These commands reset the PTP timeout interval on interface Ethernet 5 to the default value of 3.

  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# no ptp announce timeout
  switch(config-if-Et5)#
  ```
ptp delay-mechanism

The `ptp delay-mechanism` command configures the delay mechanism in boundary clock mode. The `no ptp delay-mechanism` command disables the feature.

**Command Mode**

- Interface-Ethernet Configuration
- Interface-Port Channel Configuration

**Command Syntax**

```
ptp delay-mechanism mech_type
no ptp delay-mechanism
default ptp delay-mechanism
```

**Parameters**

- `mech_type`   The delay mechanism. Options include:
  - `e2e`   end-to-end delay mechanism
  - `p2p`   peer-to-peer mechanism

**Examples**

- This command sets the delay mechanism to peer-to-peer in the boundary clock mode.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp delay-mechanism p2p
  ```

- This command sets the delay mechanism to end-to-end in the boundary clock mode.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp delay-mechanism e2e
  ```

- This command removes the delay mechanism configuration from Ethernet 5.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# no ptp delay-mechanism e2e
  ```
ptp delay-req interval

The `ptp delay-req interval` command specifies the time in log seconds recommended to the slave devices to send delay request messages. You must enable PTP on the switch first and configure the source IP address for PTP communication. The `no ptp delay-req interval` command resets the interval to its default of 5 (32 seconds).

**Command Mode**

- Interface-Ethernet Configuration
- Interface-Port Channel Configuration

**Command Syntax**

```plaintext
ptp delay-req interval log_interval
no ptp delay-req interval
default ptp delay-req interval
```

**Parameters**

- `log_interval` The range is -1 to 8 log seconds (base 2 log (seconds)). The default is 5 (32 seconds).

**Examples**

- These commands set the minimum interval allowed between PTP delay request messages on Ethernet interface 5 to 3 (8 seconds).
  ```plaintext
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp delay-request interval 3
  switch(config-if-Et5)#
  ```

- These commands reset the minimum interval allowed between PTP delay-request messages to the default of 5 (32 seconds).
  ```plaintext
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# no ptp delay-request interval
  switch(config-if-Et5)#
  ```
**ptp domain**

The *ptp domain* command sets the domain number to use for the clock. The *no ptp domain* command disables the feature.

**Command Mode**
- Global Configuration

**Command Syntax**
- `ptp domain domain_number`
- `no ptp domain`
- `default ptp domain`

**Parameters**
- `domain_number` Value ranges from 0 to 255.

**Examples**
- This command shows how to configure domain 1 for use with a clock.
  ```
  switch(config)# ptp domain 1
  switch(config)#
  ```
- This command removes the configured domain 1 for use with a clock.
  ```
  switch(config)# no ptp domain 1
  switch(config)#
  ```
**ptp enable**

The `ptp enable` command enables PTP on the interface. The `no ptp enable` command disables PTP on the interface.

**Command Mode**
- Interface-Ethernet Configuration
- Interface-Port Channel Configuration

**Command Syntax**

- `ptp enable`
- `no ptp enable`
- `default ptp enable`

**Examples**

- This command enables PTP on Ethernet interface 5.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp enable
  ```

- This command disables PTP on Ethernet interface 5.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# no ptp enable
  ```
ptp forward-v1

The `ptp forward-v1` command configures the switch to forward Precision Time Protocol version packets as regular multicast traffic. By default, PTP v1 packets are trapped by the CPU, logged and discarded.

The `no ptp forward-v1` and `default ptp forward-v1` commands restore the default forwarding behavior by removing the corresponding `ptp forward-v1` command from `running-config`.

**Command Mode**

Global Configuration

**Command Syntax**

```
ptp forward-v1
no ptp forward-v1
default ptp forward-v1
```

**Examples**

- This command configures the switch to forward PTP v1 packets as regular multicast traffic.
  ```
  switch(config)#ptp forward-v1
  switch(config)#
  ```

- This command configures the switch to log and discard PTP v1 packets.
  ```
  switch(config)#no ptp forward-v1
  switch(config)#
  ```
**ptp hold-ptp-time**

The *ptp hold-ptp-time* command configures the PTP offset hold time in seconds. The *no ptp hold-ptp-time* command disables the feature.

**Command Mode**

Global Configuration

**Command Syntax**

```
ptp hold-ptp-time offset
no ptp hold-ptp-time
default ptp hold-ptp-time
```

**Parameters**

- *offset*  Value ranges from 0 to 86400.

**Examples**

- This command shows how to configure the PTP offset hold time.
  
  ```
  switch(config)# ptp hold-ptp-time 600
  switch(config)#
  ```

- This command removes the configured PTP offset hold time.
  
  ```
  switch(config)# no ptp hold-ptp-time
  switch(config)#
  ```
**ptp mode**

The `ptp mode` command configures the Precision Time Protocol (PTP) packet forwarding mode for the switch. By default, PTP is disabled globally; the mode must be changed to use PTP on switch interfaces.

The `no ptp mode` and `default ptp mode` commands return the forwarding mode to `disabled` by removing the `ptp mode` command from `running-config`.

**Command Mode**

Global Configuration

**Command Syntax**

```
  ptp mode mode_name
  no ptp mode
  default ptp mode
```

**Parameters**

- `mode_name` Default mode is `disabled`. Options include:
  - `boundary` The device acts as a boundary clock, and both runs and participates in the best master clock algorithm.
  - `disabled` The default mode. PTP is disabled, and the device forwards all PTP packets as normal traffic.
  - `e2etransparent` The device acts as an end-to-end transparent clock, synchronizing all ports to a connected master clock and updating the time interval field of forwarded PTP packets using switch residence time.
  - `p2ptransparent` The device acts as a peer-to-peer transparent clock, synchronizing all ports to a connected master clock and updating the time interval field of forwarded PTP packets using switch residence time and inbound path delays.
  - `gptp` The device runs generalized Precision Time Protocol (gPTP), participating in the best master clock algorithm but also updating the interval field of forwarded PTP packets using switch residence time and inbound path delays.

**Examples**

- This command configures the switch to act as a PTP boundary clock.

  ```
  switch(config)# ptp mode boundary
  switch(config)#
  ```

- This command restores PTP to disabled mode.

  ```
  switch(config)# no ptp mode
  switch(config)#
  ```
ptp pdelay-neighbor-threshold

The `ptp pdelay-neighbor-threshold` command configures the propagation delay threshold above which the switch will consider the neighbor connected to this port to be incapable of participating in generalized Precision Time Protocol (gPTP).

The `no ptp pdelay-neighbor-threshold` and `default ptp pdelay-neighbor-threshold` commands restore the threshold to 100000 nanoseconds by removing the corresponding `ptp pdelay-neighbor-threshold` command from `running-config`.

**Command Mode**
- Interface-Ethernet Configuration
- Interface-Port Channel Configuration

**Command Syntax**
```
ptp pdelay-neighbor-threshold link_prop
no ptp pdelay-neighbor-threshold
default ptp pdelay-neighbor-threshold
```

**Parameters**
- `link_prop` Threshold in nanoseconds. Value ranges from 0 to 10000000000 (ten billion). Default is 100000.

**Examples**
- These commands set the link propagation delay threshold on Ethernet interface 5 to 200000 nanoseconds.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp pdelay-neighbor-threshold 200000
  switch(config-if-Et5)#
  ```
- These commands restore the link propagation delay threshold on Ethernet interface 5 to its default value of 100000 nanoseconds.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# no ptp pdelay-neighbor-threshold
  switch(config-if-Et5)#
  ```
ptp pdelay-req interval

The `ptp pdelay-req interval` command configures the interval between Precision Time Protocol peer delay-request messages. The `no ptp pdelay-req interval` command removes the configuration.

**Command Mode**
- Interface-Ethernet Configuration
- Interface-Port Channel Configuration

**Command Syntax**
```
ptp pdelay-req interval log_interval
no ptp pdelay-req interval
default ptp pdelay-req interval
```

**Parameters**
- `log_interval` The log interval in seconds (base 2 log (seconds)). Value ranges from 0 to 5.

**Examples**
- This command shows how to configure the interval allowed between PTP peer delay request messages on interface Ethernet 5.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp pdelay-request interval 3
  switch(config-if-Et5)#
  ```
- This command removes the configure the interval allowed between PTP peer delay request messages on interface Ethernet 5.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# no ptp pdelay-request interval
  switch(config-if-Et5)#
  ```
ptp priority1

The `ptp priority1` command configures the priority 1 value for advertising the switch’s PTP clock. Priority 1 is the most significant of the six factors used by devices in the selection of a master clock. Lower values indicate higher priority.

The `no ptp priority1` and `default ptp priority1` commands restore the priority 1 default setting of 128.

**Command Mode**

Global Configuration

**Command Syntax**

```
ptp priority1 priority_rate
no ptp priority1
default ptp priority1
```

**Parameters**

- `priority_rate` Value ranges from 0 to 255. Default is 128.

**Examples**

- This command sets the priority 1 level for the switch’s PTP clock to 120.
  
  ```
  switch(config)# ptp priority1 120
  switch(config)#
  ```

- This command restores the default priority 1 level of 128.
  
  ```
  switch(config)# no ptp priority1
  switch(config)#
  ```
**ptp priority2**

The `ptp priority2` command sets the priority 2 value for the clock. The range is from 0 to 255. Priority 2 is the fifth most significant of the six factors used by devices in the selection of a master clock. Lower values indicate higher priority.

The `no ptp priority2` and `default ptp priority2` commands restore the priority 2 default setting of 128.

**Command Mode**

Global Configuration

**Command Syntax**

```
  ptp priority2  priority_rate
  no ptp priority2
  default ptp priority2
```

**Parameters**

- `priority_rate` Specifies the priority 2 level for the PTP clock. Value ranges from 0 to 255; default value is 128.

**Examples**

- This command sets the priority 2 level for the switch’s PTP clock to 120.
  ```
  switch(config)# ptp priority2 120
  switch(config)#
  ```

- This command restores the default priority 2 level of 128.
  ```
  switch(config)# no ptp priority2
  switch(config)#
  ```
**ptp role**

The `ptp role` command configures a port to operate either in the master mode or the dynamic mode when it is executed in the interface configuration mode.

The `no ptp role` command removes the master or dynamic mode if it was previously configured on an interface.

**Command Mode**

Interface-Ethernet Configuration

**Command Syntax**

```
ptp role [dynamic | master]
no ptp role
default ptp role
```

**Related Commands**

- `ptp enable`
- `ptp enable`
- `show ptp interface`

**Parameters**

- `dynamic` the dynamic mode.
- `master` the master clock mode that has the most precise time.

**Examples**

- This command configures a port to operate in the master mode for Ethernet interface 1.

  ```
  switch(config)#interface ethernet 1
  switch(config-if-Et1)#ptp role master
  ```

- This command configures a port to operate in the dynamic mode for Ethernet interface 1.

  ```
  switch(config)#interface ethernet 1
  switch(config-if-Et1)#ptp role dynamic
  ```
**ptp source ip**

The `ptp source ip` command configures the source IP address for all PTP packets. The IP address can be in IPv4 format. The `no ptp source ip` command removes this configuration.

**Command Mode**
- Global Configuration

**Command Syntax**

```
ptp source ip ipv4_addr
no ptp source ip
default ptp source ip
```

**Parameters**
- `ipv4_addr` IPv4 address

**Examples**
- This command configures the source IP address **10.0.2.1** for all PTP packets.
  
```bash
switch(config)# ptp source ip 10.0.2.1
switch(config)#
```
- This command removes the source IP address **10.0.2.1** for all PTP packets.
  
```bash
switch(config)# no ptp source ip
switch(config)#
```
**ptp sync-message interval**

The `ptp sync-message interval` command configures the time for sending synchronization messages by specifying its $\log_2$ value. Default values and ranges depend on the PTP mode, which is set using the `ptp mode` command.

The `no ptp sync-message interval` and `default ptp sync-message interval` commands restore the sync interval to its default (1 second in `boundary` mode, 1/8 second in `gptp` mode) by removing the corresponding `ptp sync-message interval` command from `running-config`.

**Command Mode**

- Interface-Ethernet Configuration
- Interface-Port Channel Configuration

**Command Syntax**

```
ptp sync-message interval log_interval
no ptp sync-message interval
default ptp sync-message interval
```

**Parameters**

- `log_interval` The interval between PTP synchronization messages sent from the master to the slave (base 2 log(seconds)). Values vary according to PTP mode: in `boundary` mode, the range is from -7 (1/128 second) to 3 (8 seconds) and the default value is 0 (1 second). In `gptp` mode, the range is from -3 (1/8 second) to 17 (131072 seconds, approximately 36 hours) with a default of -3.

**Examples**

- These commands set the interval for PTP synchronization messages on Ethernet interface 5 to 3 (8 seconds).
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp sync-message interval 3
  switch(config-if-Et5)#
  ```

- In `boundary` mode, these commands restore the interval for PTP synchronization messages on Ethernet interface 5 to its default of 0 (1 second).
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# no ptp sync-message interval
  switch(config-if-Et5)#
  ```
**ptp sync timeout**

A PTP synchronization timeout occurs if a sync message is not received for a specified period of time, calculated as a multiple of the PTP sync-message interval. The **ptp sync timeout** command configures the sync timeout multiplier. The range is 2 to 255, with a default of 20 (20 times the sync interval). To configure the sync interval, use the **ptp sync-message interval** command.

The **no ptp sync timeout** and **default ptp sync timeout** commands restore the PTP sync timeout multiplier to its default value of 20.

**Command Mode**

Interface-Ethernet Configuration

**Command Syntax**

```plaintext
ptp sync timeout interval_multiplier
no ptp sync timeout
default ptp sync timeout
```

**Parameters**

- **interval_multiplier**  The number of sync intervals that must pass without the configuration mode interface receiving a PTP sync message before a timeout occurs. Value ranges from 2 to 255. Default value is 20.

**Examples**

- These commands configure the sync timeout on Ethernet interface 5 to ten times the configured sync interval.

```
switch(config)# interface ethernet 5
switch(config-if-Et5)# ptp sync timeout 10
switch(config-if-Et5)#
```
**ptp transport**

The **ptp transport** command configures the PTP transport type for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface. The **no ptp transport** command removes the setting from the running configuration.

**Command Mode**

- Interface-Ethernet Configuration
- Interface-Port Channel Configuration

**Command Syntax**

```
ptp transport TRANSPORT_TYPE
no ptp transport
default ptp transport
```

**Parameters**

- **TRANSPORT_TYPE**    The transport mode in boundary clock mode. Options include:
  - `ipv4`    The IPv4 address used as the transport type on the interface.
  - `layer2`  The Layer 2 protocol used as the transport type on the interface.

**Examples**

- This command overrides the transport type in the profile and sets it to be IPv4 for the interface.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# ptp transport ipv4
  switch(config-if-Et5)#
  ```

- This command removes the interval for PTP synchronization messages on interface Ethernet 5.
  ```
  switch(config)# interface ethernet 5
  switch(config-if-Et5)# no ptp transport
  switch(config-if-Et5)#
  ```
ptp ttl

The **ptp ttl** command configures the Time To Live (TTL) value of the PTP packets. The **no ptp ttl** resets the TTL value to the default value of 1 hop by removing the **ptp ttl** command from the running configuration.

**Command Mode**

Global Configuration

**Command Syntax**

```
ptp ttl  hop_count
no ptp ttl
default ptp ttl
```

**Parameters**

- **hop_count**: The TTL value measured in hops. Value ranges from 1 to 255, default is 1.

**Example**

- This command sets the time to live of the PTP packets to 60 hops.
  
  ```
  switch(config)# ptp ttl 60
  switch(config)#
  ```

- This command resets the time to live of the PTP packets to the default value of 1 hop.
  
  ```
  switch(config)# no ptp ttl
  switch(config)#
  ```
show banner

The show banner command displays the specified banner.

Command Mode
Privileged EXEC

Command Syntax
    show banner BANNER_TYPE

Parameters
• BANNER_TYPE banner that the command displays. Options include
  • login command displays login banner.
  • motd command displays message of the day banner.

Example
• These commands configure and display the message of the day banner.

  switch(config)#banner motd
  Enter TEXT message. Type 'EOF' on its own line to end.
  This is an motd banner for $(hostname)
  EOF
  switch(config)#show banner motd
  This is an motd banner for $(hostname)

  switch(config)#
**show clock**

The `show clock` command displays the current system clock time and configured time zone. The switch uses the system clock for system log messages and debugging traces.

**Command Mode**

EXEC

**Command Syntax**

`show clock`

**Example**

- This command displays the current system clock time and configured time zone.

```
switch>show clock
Wed Nov 2 10:29:32 2011
timezone is America/Los_Angeles
switch>
```
show event-monitor arp

The `show event-monitor arp` command performs an SQL-style query on the event monitor database and displays ARP table events as specified by command parameters. The event monitor buffer and all backup logs are synchronized into a single SQLite file.

**Command Mode**
Privileged EXEC

**Command Syntax**
```
show event-monitor arp [GROUP] [MESSAGES] [INTERFACE] [IP] [MAC] [TIME] [VRF]
```
Optional parameters can be placed in any order.

**Parameters**
- **GROUP** used with aggregate functions to group results. Analogous to SQL `group by` command.
  - `GROUP <no parameter>` results are not grouped.
  - `GROUP <parameter>` results are grouped by interface.
  - `GROUP <parameter>` results are grouped by IP address.
  - `GROUP <parameter>` results are grouped by MAC address.
  - `GROUP <parameter>` results are grouped by VRF.
- **MESSAGES** number of messages returned from query. Analogous to SQL `limit` command.
  - `MESSAGES <no parameter>` result-set size is not limited.
  - `MESSAGES <value>` number of results that are displayed. Values range from 1 to 15,000.
- **INTERFACE** restricts result-set to events that include specified interface (SQL Like command).
  - `INTERFACE <no parameter>` result-set not restricted by interface.
  - `INTERFACE <parameter>` Ethernet interface list.
  - `INTERFACE <parameter>` loopback interface list.
  - `INTERFACE <parameter>` management interface list.
  - `INTERFACE <parameter>` port channel interface list.
  - `INTERFACE <parameter>` tunnel interface list.
  - `INTERFACE <parameter>` VXLAN interface list.
  - `INTERFACE <parameter>` port channel interface list.
- **IP** restricts result-set to events that include specified IP address (SQL Like command).
  - `IP <no parameter>` result-set not restricted to specific IP addresses.
  - `IP <parameter>` IP address, as represented by regular expression.
- **MAC** restricts result-set to events that include specified MAC address (SQL Like command).
  - `MAC <no parameter>` result-set not restricted to specific MAC addresses.
  - `MAC <parameter>` MAC address, as represented by regular expression.
- **TIME** restricts result-set to events generated during specified period.
  - `TIME <no parameter>` result-set not restricted by time of event.
  - `TIME <parameter>` includes events generated during last minute.
  - `TIME <parameter>` includes events generated during last day.
  - `TIME <parameter>` includes events generated during last hour.
  - `TIME <parameter>` includes events generated during last week.
Switch Administration Commands

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- **VRF** restricts result-set to events that include a specific VRF.
- `<no parameter>` result-set not restricted by time of event.
- **match-vrf vrf_name** the VRF name.

**Example**

This command displays ARP table events listed in the event monitor database.

```
switch# show event-monitor arp
2012-11-06 12:36:10|10.33.6.159|Vlan1417|0000.00dc.cc0d|0|added|2186271
2012-11-06 12:38:20|10.33.7.150|Vlan1417|0000.00f7.e25f|0|added|2186292
2012-11-06 12:38:34|10.33.6.62|Vlan1417|0000:00:01:c2:ac|0|added|2186295
2012-11-06 12:39:13|10.33.7.162|Vlan1417|00:00:00:45:c2:79|0|added|2186299
2012-11-06 12:39:50|10.33.12.54|Vlan1417|||removed|2186303
2012-11-06 12:39:51|10.33.6.218|Vlan1417|00:00:00:e9:36:46|0|added|2186305
2012-11-06 12:40:00|10.33.6.140|Vlan1417|00:00:00:4a:36:c3|0|added|2186308
2012-11-06 12:40:02|10.33.6.239|Vlan1417|00:00:00:5b:a7:21|0|added|2186312
2012-11-06 12:41:16|10.33.7.11|Vlan1417|00:00:00:3f:94:59|0|added|2186320
2012-11-06 12:41:50|10.33.7.60|Vlan1417|00:00:00:1f:3c:8e|0|added|2186346
2012-11-06 12:43:34|10.33.7.81|Vlan1417|00:00:00:e3:0d:9c|0|added|2186762
2012-11-06 12:43:42|10.33.6.214|Vlan1417|00:00:00:7b:09:7d|0|added|2186765
2012-11-06 12:43:59|10.33.7.149|Vlan1417|00:00:00:8d:a6:d8|0|added|2186768
switch#
```
show event-monitor igmpsnooping

The show event-monitor igmpsnooping command performs an SQL-style query on the event-monitor database, using the statement specified in the command.

Command Mode
Privileged EXEC

Command Syntax
`show event-monitor igmpsnooping [GROUP] [MESSAGES] [MAC] [INTERFACE] [VLAN] [TIME]`

Optional parameters can be placed in any order.

Parameters
- **GROUP** used with aggregate functions to group results. Analogous to SQL `group by` command.
  - `<no parameter>` results are not grouped.
  - `group-by interface` results are grouped by interface.
  - `group-by mac` results are grouped by MAC address.
  - `group-by vlan` results are grouped by VLAN.
- **MESSAGES** number of messages returned from query. Analogous to SQL `limit` command.
  - `<no parameter>` result-set size is not limited.
  - `limit msg_quantity` number of results that are displayed. Values range from 1 to 15,000.
- **MAC** restricts result-set to events that include specified MAC address (SQL Like command).
  - `<no parameter>` result-set not restricted to specific MAC addresses.
  - `match-mac mac_address_rex` MAC address, as represented by regular expression.
- **INTERFACE** restricts result-set to events that include specified interface (SQL Like command).
  - `<no parameter>` result-set not restricted by interface.
  - `match-interface ethernet e_range` Ethernet interface list.
  - `match-interface loopback l_range` loopback interface list.
  - `match-interface management m_range` management interface list.
  - `match-interface port-channel c_range` port channel interface list.
  - `match-interface vlan v_range` VLAN interface list.
  - `match-interface tunnel t_range` tunnel interface list.
  - `match-interface vxlan vx_range` VXLAN interface list.
- **TIME** restricts result-set to events with specified period.
  - `<no parameter>` result-set not restricted by time of event.
  - `match-time last-minute` includes events generated during last minute.
  - `match-time last-day` includes events generated during last day.
  - `match-time last-hour` includes events generated during last hour.
  - `match-time last-week` includes events generated during last week.
- **VLAN** restricts result-set to events that include a specific VLAN (SQL Like command).
  - `<no parameter>` result-set not restricted by time of event.
  - `match-vlan vlan` VLAN interface number.
Examples

switch#show event-monitor igmpsnoping
switch#
show event-monitor mac

The `show event-monitor mac` command performs an SQL-style query on the event monitor database and displays MAC address table events as specified by command parameters. The event monitor buffer and all backup logs are synchronized into a single SQLite file.

**Command Mode**
Privileged EXEC

**Command Syntax**
```
show event-monitor mac [GROUP] [MESSAGES] [INTERFACE] [MAC] [TIME]
```
Optional parameters can be placed in any order.

**Parameters**
- **GROUP** used with aggregate functions to group results. Analogous to SQL `group by` command.
  - `<no parameter>` results are not grouped.
  - `group-by interface` results are grouped by interface.
  - `group-by mac` results are grouped by MAC address.
- **MESSAGES** number of messages returned from query. Analogous to SQL `limit` command.
  - `<no parameter>` result-set size is not limited.
  - `limit msg_quantity` number of results that are displayed. Values range from 1 to 15,000.
- **INTERFACE** restricts result-set to events that include specified interface (SQL Like command).
  - `<no parameter>` result-set not restricted by interface.
  - `match-interface ethernet e_range` Ethernet interface list.
  - `match-interface loopback l_range` loopback interface list.
  - `match-interface management m_range` management interface list.
  - `match-interface port-channel c_range` port channel interface list.
  - `match-interface vlan v_range` VLAN interface list.
  - `match-interface tunnel t_range` tunnel interface list.
  - `match-interface vxlan vx_range` VXLAN interface list.
- **MAC** restricts result-set to events that include specified MAC address (SQL Like command).
  - `<no parameter>` result-set not restricted to specific MAC addresses.
  - `match-mac mac_address_rex` MAC address, as represented by regular expression.
- **TIME** restricts result-set to events with specified period.
  - `<no parameter>` result-set not restricted by time of event.
  - `match-time last-minute` includes events generated during last minute.
  - `match-time last-day` includes events generated during last day.
  - `match-time last-hour` includes events generated during last hour.
  - `match-time last-week` includes events generated during last week.

**Examples**
- This command displays all events triggered by MAC address table events.

```
switch#show event-monitor mac
% Writing 0 Arp, 0 Route, 1 Mac events to the database
2012-01-19 13:57:55|1|0808.0808.0808|Ethernet1|configuredStaticMac|added|0
```
This command displays events triggered by MAC address table changes.

```
switch#show event-monitor mac match-mac 08:08:08:%
2012-01-19 13:57:55|1|0808.0808.0808|Ethernet1|configuredStaticMac|added|0
```
show event-monitor mrout

The `show event-monitor mrout` command performs an SQL-style query on the event-monitor database, using the statement specified in the command.

**Command Mode**
Privileged EXEC

**Command Syntax**
```
show event-monitor mrout [GROUP] [MESSAGES] [IP] [INTERFACE] [SRC_IP] [TIME]
```
Optional parameters can be placed in any order.

**Parameters**
- **GROUP** used with aggregate functions to group results. Analogous to SQL `group by` command.
  - <no parameter> results are not grouped.
  - `group-by interface` results are grouped by interface.
  - `group-by ip6` results are grouped by IPv6 address.
  - `group-by mac` results are grouped by MAC address.
  - `group-by vrf` results are grouped by VRF.
- **MESSAGES** number of messages returned from query. Analogous to SQL `limit` command.
  - <no parameter> result-set size is not limited.
  - `limit msg_quantity` number of results that are displayed. Values range from 1 to 15,000.
- **IP** restricts result-set to events that include specified IP address (SQL Like command).
  - <no parameter> result-set not restricted to specific IP addresses.
  - `match-ipv6 ip_address_rex` IP address, as represented by regular expression.
- **INTERFACE** restricts result-set to events that include specified interface (SQL Like command).
  - <no parameter> result-set not restricted by interface.
  - `match-interface ethernet e_range` Ethernet interface list.
  - `match-interface loopback l_range` loopback interface list.
  - `match-interface management m_range` management interface list.
  - `match-interface port-channel c_range` port channel interface list.
  - `match-interface vlan v_range` VLAN interface list.
  - `match-interface tunnel t_range` tunnel interface list.
  - `match-interface vxlan vx_range` VXLAN interface list.
- **SRC_IP** restricts result-set to events that include specified Source IP address (SQL Like command).
  - <no parameter> result-set not restricted to specific IP addresses.
  - `match-ip ip_address_rex` IP address, as represented by regular expression.
- **TIME** restricts result-set to events with specified period.
  - <no parameter> result-set not restricted by time of event.
  - `match-time last-minute` includes events generated during last minute.
  - `match-time last-day` includes events generated during last day.
  - `match-time last-hour` includes events generated during last hour.
  - `match-time last-week` includes events generated during last week.
Examples

- This command displays neighbor table events listed in the event monitor database.

```bash
switch#show event-monitor mroute
2011-07-28 12:33:28|default|16.17.18.19/32|225.0.0.1/32|Vlan2|iif|join|31
2011-07-28 12:33:28|default|16.17.18.19/32|225.0.0.1/32|Vlan3|oif|join|32
2011-07-28 12:33:28|default|16.17.18.19/32|225.0.0.1/32|Vlan4|oif|join|33
2011-07-28 12:33:28|default|10.11.12.13/32|225.0.0.2/32|||added|34
2011-07-28 12:33:28|default|10.11.12.13/32|225.0.0.2/32|Vlan3|iif|join|35
2011-07-28 12:33:28|default|10.11.12.13/32|225.0.0.2/32|Vlan2|oif|join|36
2011-07-28 12:33:28|default|16.17.18.19/32|225.0.0.1/32|Vlan4||leave|37
2011-07-28 12:33:28|default|16.17.18.19/32|225.0.0.1/32|||deleted|38
2011-07-28 12:33:28|default|10.11.12.13/32|225.0.0.2/32|||deleted|39
```
show event-monitor neighbor

The `show event-monitor neighbor` command performs an SQL-style query on the event monitor database and displays neighbor table events as specified by command parameters. The event monitor buffer and all backup logs are synchronized into a single SQLite file.

**Command Mode**
Privileged EXEC

**Command Syntax**
```
show event-monitor neighbor [GROUP] [MESSAGES] [INTERFACE] [IP6] [MAC] [TIME] [VRF]
```

Optional parameters can be placed in any order.

**Parameters**
- `GROUP` used with aggregate functions to group results. Analogous to SQL `group by` command.
  - `<no parameter>` results are not grouped.
  - `group-by interface` results are grouped by interface.
  - `group-by ip6` results are grouped by IPv6 address.
  - `group-by mac` results are grouped by MAC address.
  - `group-by vrf` results are grouped by VRF.
- `MESSAGES` number of messages returned from query. Analogous to SQL `limit` command.
  - `<no parameter>` result-set size is not limited.
  - `limit msg_quantity` number of results that are displayed. Values range from 1 to 15,000.
- `INTERFACE` restricts result-set to events that include specified interface (SQL Like command).
  - `<no parameter>` result-set not restricted by interface.
  - `match-interface ethernet e_range` Ethernet interface list.
  - `match-interface loopback l_range` loopback interface list.
  - `match-interface management m_range` management interface list.
  - `match-interface port-channel c_range` port channel interface list.
  - `match-interface vlan v_range` VLAN interface list.
  - `match-interface tunnel t_range` tunnel interface list.
  - `match-interface vxlan vx_range` VXLAN interface list.
- `IP6` restricts result-set to events that include specified IP address (SQL Like command).
  - `<no parameter>` result-set not restricted to specific IP addresses.
  - `match-ipv6 ip6_address_rex` IPv6 address, as represented by regular expression.
- `MAC` restricts result-set to events that include specified MAC address (SQL Like command).
  - `<no parameter>` result-set not restricted to specific MAC addresses.
  - `match-mac mac_address_rex` MAC address, as represented by regular expression.
- `TIME` restricts result-set to events with specified period.
  - `<no parameter>` result-set not restricted by time of event.
  - `match-time last-minute` includes events generated during last minute.
  - `match-time last-day` includes events generated during last day.
  - `match-time last-hour` includes events generated during last hour.
- **match-time last-week** includes events generated during last week.

- **VRF** restricts result-set to events that include a specific VRF (SQL Like command).

- **<no parameter>** result-set not restricted by time of event.

- **match-vrf vrf_name** VRF name, as represented by a regular expression.

### Examples
- This command displays neighbor table events listed in the event monitor database.

  ```bash
  switch# show event-monitor neighbor
  2019-09-30 14:37:32.894147|def0::1|Vlan1|default|0005.0005.0005|1|added|1
  2019-09-30 14:37:32.894395|def0::2|Vlan1|default|0005.0005.0005|1|added|2
  2019-09-30 14:37:32.894607|def0::3|Vlan1|default|0005.0005.0005|1|added|3
  2019-09-30 14:37:32.894815|def0::4|Vlan1|default|0005.0005.0005|1|added|4
  2019-09-30 14:37:32.895071|def0::5|Vlan1|default|0005.0005.0005|1|added|5
  2019-09-30 14:37:32.895303|def0::6|Vlan1|default|0005.0005.0005|1|added|6
  2019-09-30 14:37:32.895527|def0::7|Vlan1|default|0005.0005.0005|1|added|7
  2019-09-30 14:37:32.895732|def0::8|Vlan1|default|0005.0005.0005|1|added|8
  2019-09-30 14:37:32.895968|def0::9|Vlan1|default|0005.0005.0005|1|added|9
  2019-09-30 14:37:32.896194|def0::a|Vlan1|default|0005.0005.0005|1|added|10
  ```
show event-monitor route6

The `show event-monitor route6` command performs an SQL-style query on the event monitor database and displays routing6 table events as specified by command parameters. The event monitor buffer and all backup logs are synchronized into a single SQLite file.

**Command Mode**

Privileged EXEC

**Command Syntax**

```
show event-monitor route6 [GROUP] [MESSAGES] [IP6] [TIME]
```

Optional parameters can be placed in any order.

**Parameters**

- `GROUP` used with aggregate functions to group results. Analogous to SQL `group by` command.
  - `<no parameter>` results are not grouped.
  - `group-by interface` results are grouped by interface.
  - `group-by ip6` results are grouped by IPv6 address.
  - `group-by mac` results are grouped by MAC address.
  - `group-by vrf` results are grouped by VRF.
- `MESSAGES` number of messages returned from query. Analogous to SQL `limit` command.
  - `<no parameter>` result-set size is not limited.
  - `limit msg_quantity` number of results that are displayed. Values range from 1 to 15,000.
- `IP6` restricts result-set to events that include specified IP address (SQL Like command).
  - `<no parameter>` result-set not restricted to specific IP addresses.
  - `match-ipv6 ip6_address_rex` IPv6 address, as represented by regular expression.
- `TIME` restricts result-set to events with specified period.
  - `<no parameter>` result-set not restricted by time of event.
  - `match-time last-minute` includes events generated during last minute.
  - `match-time last-day` includes events generated during last day.
  - `match-time last-hour` includes events generated during last hour.
  - `match-time last-week` includes events generated during last week.

**Examples**

- This command displays neighbor table events listed in the event monitor database.

```
switch#show event-monitor route6
2019-09-30 14:59:30.660447|def1::1:0/128|default|receive|0|1|updated|41
2019-09-30 14:59:30.660720|def1::2:0/128|default|attached|0|1|updated|42
2019-09-30 14:59:30.660983|def1::3:0/128|default|staticConfig|0|1|updated|43
2019-09-30 14:59:30.661226|def1::4:0/128|default|kernel|0|1|updated|44
2019-09-30 14:59:30.661469|def1::5:0/128|default|rip|0|1|updated|45
2019-09-30 14:59:30.661706|def1::6:0/128|default|connected|0|1|updated|46
2019-09-30 14:59:30.661968|def1::7:0/128|default|redirect|0|1|updated|47
2019-09-30 14:59:30.662207|def1::8:0/128|default|bgpAggregate|0|1|updated|48
2019-09-30 14:59:30.662451|def1::9:0/128|default|ospfAggregate|0|1|updated|49
2019-09-30 14:59:30.662694|def1::a:0/128|default|ospf|0|1|updated|50
2019-09-30 14:59:30.662935|def1::b:0/128|default|bgp|0|1|updated|51
2019-09-30 14:59:30.663174|def1::c:0/128|default|unknown|0|1|updated|52
switch#
```
show event-monitor route

The `show event-monitor route` command performs an SQL-style query on the event monitor database and displays routing table events as specified by command parameters. The event monitor buffer and all backup logs are synchronized into a single SQLite file.

**Command Mode**
Privileged EXEC

**Command Syntax**
```
show event-monitor route [GROUP] [MESSAGES] [IP] [TIME]
```
Optional parameters can be placed in any order.

**Parameters**
- **GROUP** used with aggregate functions to group results. Analogous to SQL `group by` command.
  - <no parameter> results are not grouped.
  - `group-by ip` results are grouped by IPv4 address.
- **MESSAGES** number of messages returned from query. Analogous to SQL `limit` command.
  - <no parameter> result-set size is not limited.
  - `limit msg_quantity` number of results that are displayed. Values range from 1 to 15,000.
- **IP** restricts result-set to events that include specified IP address (SQL Like command).
  - <no parameter> result-set not restricted to specific IP addresses.
  - `match-ip ip_address_rex` IP address, as represented by regular expression.
- **TIME** restricts result-set to events with specified period.
  - <no parameter> result-set not restricted by time of event.
  - `match-time last-minute` includes events generated during last minute.
  - `match-time last-day` includes events generated during last day.
  - `match-time last-hour` includes events generated during last hour.
  - `match-time last-week` includes events generated during last week.

**Example**
- This command displays 10 routing table events listed in the event monitor database.
  
  ```
  switch#show event-monitor route limit 10
  2019-09-30 14:01:21.659428|16.16.16.255/32|default|receiveBcast|0|0|updated|20
  2019-09-30 14:01:21.659464|192.168.201.12/30|default|connected|1|0|updated|21
  2019-09-30 14:01:21.659497|192.168.1.255/32|default|receiveBcast|0|0|updated|22
  2019-09-30 14:01:21.659503|192.168.201.8/32|default|receiveBcast|0|0|updated|23
  2019-09-30 14:01:21.659512|16.16.16.0/32|default|receiveBcast|0|0|updated|24
  2019-09-30 14:01:21.659517|192.168.201.12/32|default|receiveBcast|0|0|updated|25
  2019-09-30 14:01:21.659524|192.168.201.15/32|default|receiveBcast|0|0|updated|26
  2019-09-30 14:01:21.659541|192.168.201.8/30|default|connected|1|0|updated|27
  2019-09-30 14:01:21.659564|16.16.16.0/24|default|connected|1|0|updated|28
  2019-09-30 14:01:21.659578|192.168.201.9/32|default|receive|0|0|updated|29
  switch#
  ```
show event-monitor sqlite

The **show event-monitor sqlite** command performs an SQL-style query on the event monitor database, using the statement specified in the command.

**Command Mode**
Privileged EXEC

**Command Syntax**
```
show event-monitor sqlite statement
```

**Parameters**
- **statement** SQLite statement.

**Example**
- This command displays all entries from the route table.
  switch# show event-monitor sqlite select * from route;
  2019-09-30 14:01:21.659428|16.16.16.255/32|default|receiveBcast|0|0|updated|20
  2019-09-30 14:01:21.659464|192.168.201.12/30|default|connected|1|0|updated|21
  2019-09-30 14:01:21.659497|192.168.1.255/32|default|receiveBcast|0|0|updated|22
  2019-09-30 14:01:21.659503|192.168.201.8/32|default|receiveBcast|0|0|updated|23
  2019-09-30 14:01:21.659512|16.16.16.0/32|default|receiveBcast|0|0|updated|24
  2019-09-30 14:01:21.659517|192.168.201.12/32|default|receiveBcast|0|0|updated|25
  2019-09-30 14:01:21.659524|192.168.201.15/32|default|receiveBcast|0|0|updated|26
  2019-09-30 14:01:21.659541|192.168.201.8/30|default|connected|1|0|updated|27
  2019-09-30 14:01:21.659564|16.16.16.0/24|default|connected|1|0|updated|28
  2019-09-30 14:01:21.659578|192.168.201.9/32|default|receive|0|0|updated|29
switch#
show event-monitor stpunstable

The `show event-monitor stpunstable` command performs an SQL-style query on the event-monitor database, using the statement specified in the command.

**Command Mode**
Privileged EXEC

**Command Syntax**

```
show event-monitor stpunstable [MESSAGES] [TIME]
```

Optional parameters can be placed in any order.

**Parameters**

- **MESSAGES** number of messages returned from query. Analogous to SQL `limit` command.
  - <no parameter> result-set size is not limited.
  - `limit msg_quantity` number of results that are displayed. Values range from 1 to 15,000.
- **TIME** restricts result-set to events with specified period.
  - <no parameter> result-set not restricted by time of event.
  - `match-time last-minute` includes events generated during last minute.
  - `match-time last-day` includes events generated during last day.
  - `match-time last-hour` includes events generated during last hour.
  - `match-time last-week` includes events generated during last week.

**Example**

```
switch#show event-monitor stpunstable limit 5
2019-02-07 07:22:10.286164|Cist|Ethernet5|forward-delay-while|1
2019-02-07 07:22:10.286651|Cist|Ethernet6|forward-delay-while|2
2019-02-07 07:22:10.286844|Cist|Ethernet8|forward-delay-while|3
2019-02-07 07:22:10.287030|Cist|Ethernet14|forward-delay-while|4
2019-02-07 07:22:10.287215|Cist|Ethernet21|forward-delay-while|5
switch#
```
show hostname

The `show hostname` command displays the hostname and the fully qualified domain name (FQDN) of the switch.

**Command Mode**

EXEC

**Command Syntax**

`show hostname`

**Example**

- This command displays the hostname and FQDN of the switch.

```
switch>show hostname
Hostname: switch_1
FQDN:     switch_1.aristanetworks.com

switch>
```
show hosts

The **show hosts** command displays the default domain name, name lookup service style, a list of name server hosts, and the static hostname-IP address maps.

**Command Mode**

EXEC

**Command Syntax**

```
show hosts
```

**Example**

- This command displays the switch’s IP domain name:

  switch> **show hosts**

  Default domain is: aristanetworks.com
  Name/address lookup uses domain service
  Name servers are: 172.22.22.40, 172.22.22.10

  Static Mappings:

<table>
<thead>
<tr>
<th>Hostname</th>
<th>IP</th>
<th>Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST_LAB</td>
<td>IPV4</td>
<td>10.24.18.6</td>
</tr>
<tr>
<td>PRODUCTION_LAB</td>
<td>IPV4</td>
<td>10.24.18.7</td>
</tr>
<tr>
<td>SUPPORT_LAB</td>
<td>IPV6</td>
<td>2001:0DB8:73:ff:ff:26:fd:90</td>
</tr>
</tbody>
</table>

  switch>
show ip domain-name

The show ip domain-name command displays the switch’s IP domain name that is configured with the ip domain name command.

Command Mode

EXEC

Command Syntax

show ip domain-name

Example

• This command displays the switch’s IP domain name:

  switch>show ip domain-name
  aristanetworks.com
  switch>
**show ip name-server**

The `ip name-server` command displays the ip addresses of name-servers in *running-config*. The name servers are configured by the `ip name-server` command.

**Command Mode**

EXEC

**Command Syntax**

```
show ip name-server
```

**Example**

- This command displays the IP address of name servers that the switch is configured to access.

  ```
  switch>show ip name-server
  172.22.22.10
  172.22.22.40
  switch>
  ```
show local-clock time-properties

The `show local-clock time-properties` command displays the Precision Time Protocol (PTP) clock properties.

Command Mode
- Privileged EXEC

Command Syntax
- `show local-clock time-properties`

Examples
- This command shows the PTP clock properties.
  
  switch# show local-clock time-properties
  Current UTC offset valid: False
  Current UTC offset: 0
  Leap 59: False
  Leap 61: False
  Time Traceable: False
  Frequency Traceable: False
  PTP Timescale: False
  Time Source: 0x0
  switch#
**show ntp associations**

The `show ntp associations` command displays the status of connections to NTP servers.

**Command Mode**
EXEC

**Command Syntax**
```
show ntp associations
```

**Display Values**
- **st (stratum):** number of steps between the switch and the reference clock.
- **t (transmission type):** u – unicast; b – broadcast; l – local.
- **when:** interval since reception of last packet (seconds unless unit is provided).
- **poll:** interval between NTP poll packets. Maximum (1024) reached as server and client syncs.
- **reach:** octal number that displays status of last eight NTP messages (377 - all messages received).
- **delay:** round trip delay of packets to selected reference clock.
- **offset:** difference between local clock and reference clock.
- **jitter:** maximum error of local clock relative to reference clock.

**Example**
- This command displays the status of the switch’s NTP associations.

```
     switch>show ntp associations
       remote       refid     st  t  when poll reach   delay   offset   jitter
       jitter
     ================================
   =======
     172.1.1.1   .INIT.     16  u   -1024  0     0.000    0.000  0.000  0.000
     0.000
     moose.aristanet 192.187.233.4   2 u     9   64 377    0.118  9440498
     0.017
     172.17.2.6   .INIT.     16  u   -1024  0     0.000    0.000  0.000  0.000
     *LOCAL(0)   .LOCL.     10  l    41  64 377    0.000    0.000    0.000
```
show ntp status

The `show ntp status` command displays the status of NTP on the switch. If the switch clock is not synchronized to an NTP server, the status reads “unsynchronised” and shows the server polling interval. If the clock is synchronized to an NTP server, the status shows the reference ID and stratum of the server, the precision of the synchronization, and the polling interval.

**Important!** As specified in RFC5905, for servers with IPv4 addresses the reference ID is the four-octet IPv4 address, but for servers with IPv6 addresses the reference ID is the first four octets of the MD5 hash of the IPv6 address.

**Command Mode**
EXEC

**Command Syntax**

```
show ntp status
```

**Example**

- This command displays the switch’s NTP status.

```
switch>show ntp status
synchronised to NTP server (172.16.1.50) at stratum 4
time correct to within 77 ms
polling server every 1024 s
switch>
```
show ptp

The `show ptp` command displays summary Precision Time Protocol (PTP) information and PTP status of switch ports.

**Command Mode**

EXEC

**Command Syntax**

`show ptp`

**Example**

- This command displays summary PTP information.

```bash
switch# show ptp
PTP Mode: gptp - Generalized PTP Clock
Clock Identity: 2001:0DB8:73:ff:ff:26:fd:90
Grandmaster Clock Identity: 2001:0DB8:96:ff:fe:6c:ed:02
Number of slave ports: 1
Number of master ports: 6
Slave port: Ethernet33
Mean Path Delay (nanoseconds): 718
Steps Removed: 1
Neighbor Rate Ratio: 1.0000007883
Rate Ratio: 1.0000007883
```

<table>
<thead>
<tr>
<th>Interface</th>
<th>Capable</th>
<th>Changed</th>
<th>AS</th>
<th>Time Since Last</th>
<th>Neighbor Rate Ratio</th>
<th>Mean Path Delay (ns)</th>
<th>Residence Time (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Et1</td>
<td>Disabled</td>
<td>No</td>
<td>Never</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Et2</td>
<td>Disabled</td>
<td>No</td>
<td>Never</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Et3</td>
<td>Disabled</td>
<td>No</td>
<td>Never</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Et4</td>
<td>Disabled</td>
<td>No</td>
<td>Never</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Et5</td>
<td>Disabled</td>
<td>No</td>
<td>Never</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Et6</td>
<td>Disabled</td>
<td>No</td>
<td>Never</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Et7</td>
<td>Master</td>
<td>Yes</td>
<td>0:21:08</td>
<td>1.00000009</td>
<td>420</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<--------OUTPUT OMITTED FROM EXAMPLE--------->
**show ptp foreign-master-record**

The `show ptp foreign-master-record` command displays information about foreign masters (PTP sources not designated as the switch's master from which the switch has received sync packets).

**Command Mode**

EXEC

**Command Syntax**

`show ptp foreign-master-record`

**Examples**

- This command displays information about PTP foreign masters.

  ```
  switch# show ptp foreign-master-record
  No Foreign Master Records
  switch#
  ```
show ptp interface

The **show ptp interface** command displays PTP information for all the interfaces on the device.

**Command Mode**
EXEC

**Command Syntax**
```
show ptp [INTERFACE_NAME] [STATUS_FILTER]
```

**Parameters**
- **INTERFACE_NAME** Interface type and numbers. Options include:
  - <no parameter> Display information for all interfaces.
  - ethernet `e_range` Ethernet interface range specified by `e_range`.
  - loopback `l_range` Loopback interface specified by `l_range`.
  - management `m_range` Management interface range specified by `m_range`.
  - port-channel `p_range` Port-Channel Interface range specified by `p_range`.
  - vlan `v_range` VLAN interface range specified by `v_range`.

Valid range formats include number, number range, or comma-delimited list of numbers and ranges.

- **STATUS_FILTER** Filters interfaces by their configuration status. Options include:
  - <no parameter> all interfaces.
  - enabled PTP configured interfaces.

**Examples**
This command displays PTP information for all the interfaces on the device.
```
switch# show ptp interface
Interface Ethernet1
PTP: Disabled
Port state: Disabled
Sync interval: 1.0 seconds
Announce interval: 2.0 seconds
Announce interval timeout multiplier: 3
Delay mechanism: end to end
Delay request message interval: 32.0 seconds
Transport mode: ipv4
<-------OUTPUT OMITTED FROM EXAMPLE-------->
Interface Ethernet5
PTP: Disabled
Port state: Disabled
Sync interval: 8.0 seconds
Announce interval: 2.0 seconds
Announce interval timeout multiplier: 5
Delay mechanism: peer to peer
Peer delay request message interval: 8.0 seconds
Peer Mean Path Delay: 0
Transport mode: ipv4
<-------OUTPUT OMITTED FROM EXAMPLE-------->
switch#
```
show ptp interface counters

The `show ptp interface counters` command displays PTP interface counters for all interfaces.

**Command Mode**
EXEC

**Command Syntax**
```
show ptp [INTERFACE_NAME] counters
```

**Parameters**
- `INTERFACE_NAME`  Interface type and numbers. Options include:
  - `<no parameter>`  Display information for all interfaces.
  - `ethernet e_range`  Ethernet interface range specified by `e_range`.
  - `loopback l_range`  Loopback interface specified by `l_range`.
  - `management m_range`  Management interface range specified by `m_range`.
  - `port-channel p_range`  Port-Channel Interface range specified by `p_range`.
  - `vlan v_range`  VLAN interface range specified by `v_range`.
  - `vxlan vx_range`  VXLAN interface range specified by `vx_range`.

Valid range formats include number, number range, or comma-delimited list of numbers and ranges.

**Examples**
- This command displays the PTP interface counters.
  ```
  switch# show ptp interface ethernet 5 counters
  Interface Ethernet5
  Announce messages sent: 0
  Announce messages received: 0
  Sync messages sent: 0
  Sync messages received: 0
  Follow up messages sent: 0
  Follow up messages received: 0
  Delay request messages sent: 0
  Delay request messages received: 0
  Delay response messages sent: 0
  Delay response messages received: 0
  Peer delay request messages sent: 0
  Peer delay request messages received: 0
  Peer delay response messages sent: 0
  Peer delay response messages received: 0
  Peer delay response follow up messages sent: 0
  Peer delay response follow up messages received: 0
  switch#
  ```
show ptp local-clock

The **show ptp local-clock** command displays the Precision Time Protocol (PTP) clock information.

**Command Mode**
EXEC

**Command Syntax**
```
show ptp local-clock
```

**Example**
- This command shows how to display the PTP local clock and offset.
```
switch#show ptp local-clock
PTP Mode: Boundary Clock
Clock Identity: 0x00:1c:73:ff:ff:1e:83:24
Clock Domain: 1
Number of PTP ports: 24
Priority1: 128
Priority2: 128
Clock Quality:
  Class: 248
  Accuracy: 0x30
  OffsetScaledLogVariance: 0xffffffff
Offset From Master: 0
Mean Path Delay: 0
Steps Removed: 0
```

switch#
show ptp masters

The **show ptp masters** command displays information about the switch's PTP master and grand master clocks.

**Command Mode**
- Privileged EXEC

**Command Syntax**

```
show ptp masters
```

**Examples**

- This command displays information about the switch's PTP master and grand master clocks.

```
switch# show ptp masters
Parent Clock:
Parent Clock Identity: 0x00:1c:73:ff:ff:00:72:40
Parent Port Number: 0
Parent IP Address: N/A
Observed Parent Offset (log variance): N/A
Observed Parent Clock Phase Change Rate: N/A

Grandmaster Clock:
Grandmaster Clock Identity: 0x00:1c:73:ff:ff:00:72:40
Grandmaster Clock Quality:
  Class: 248
  Accuracy: 0x30
  OffsetScaledLogVariance: 0xffff
  Priority1: 128
  Priority2: 128

switch#
```
**show ptp source ip**

The **show ptp source ip** command displays the PTP source IP for the device.

**Command Mode**
Privileged EXEC

**Command Syntax**

```
show ptp source ip
```

**Examples**
- This command shows the PTP source IP to be 10.0.2.1.
  
  ```
  switch#show ptp source ip
  PTP source IP: 10.0.2.1
  switch#
  ```
ptp monitor

The `ptp monitor` command to enable or disable PTP monitoring on the device. The PTP monitor is enabled by default.

The `no ptp monitor` command disables the PTP monitoring and clears all the recorded data from `running-config`.

**Command Mode**
- Global Configuration

**Command Syntax**
- `ptp monitor`
- `no ptp monitor`

**Example**
- In this example the `ptp monitor` command enables the PTP monitoring on the switch. The `no` form of the command disables the PTP monitoring and clears all the recorded data.

```bash
Switch(config)# ptp monitor
```
**ptp monitor threshold offset-from-master**

The `ptp monitor threshold offset-from-master` command configures the value of the offset from master threshold in nanoseconds. Max offset threshold is one second.

The `no ptp monitor threshold offset-from-master` command clears all the offset value set for master threshold from running-config.

**Command Mode**
- Global Configuration

**Command Syntax**

```
ptp monitor threshold offset-from-master <threshold>
no ptp monitor threshold offset-from-master <threshold>
```

**Parameter**
- `threshold` Offset threshold value in nanoseconds. The value ranges from 0 to 000000000 nanoseconds, +/- offset from 0 (nanosecond).

**Example**
- In this example the ptp monitor threshold offset value of 1 nanosecond is set on the switch.

```
Switch(config)# ptp monitor threshold offset-from-master 1
```
**ptp monitor threshold mean-path-delay**

The `ptp monitor threshold mean-path-delay` command configure the value of the mean path delay threshold in nanoseconds.

The `no ptp monitor threshold mean-path-delay` command clears all the mean path delay threshold value from `running-config`.

**Command Mode**

Global Configuration

**Command Syntax**

```
ptp monitor threshold mean-path-delay <threshold>
no ptp monitor threshold mean-path-delay <threshold>
```

**Parameter**

- `threshold` mean-path-delay threshold value ranges from 0 to 1000000000 nanoseconds. Offset from 0 nanosecond.

**Example**

- In this example the `ptp monitor mean-path-delay` threshold value of 1 nanosecond is set on the switch.

  ```
  Switch(config)# ptp monitor threshold mean-path-delay 1
  ```
ptp monitor threshold skew

The **ptp monitor threshold skew** command configures the value of the skew threshold percentage. Skew threshold value is a double precision (16 digit) real number.

The **no ptp monitor threshold skew** command clears all the skew threshold value from **running-config**.

**Command Mode**
- Global Configuration

**Command Syntax**

```
ptp monitor threshold skew <threshold>
no ptp monitor threshold skew <threshold>
```

**Parameters**
- **threshold**  skew threshold value in nanoseconds. Value ranges from 0 to 10, percentage offset from 1.0 (1 = 100%)

**Example**
- In this example the ptp monitor skew threshold value of 1 nanosecond is set on the switch.

  ```
  Switch(config)# ptp monitor threshold skew 1
  ```
show ptp monitor

The **show ptp monitor** command displays the list of up to 100 recorded entries of offset from master, mean path delay and skew values, along with current PTP mode, whether or not the feature is enabled, number of entries displayed and the configured thresholds for each metric. Entries are sorted by the system time at which the value has been calculated, starting from the most recent data at the top.

**Command Mode**

EXEC

**Command Syntax**

`show ptp monitor`

**Example**

- In this example the **show ptp monitor** command displays the information recorded by ptp monitor.

```
Switch# show ptp monitor
PTP Mode: Boundary Clock
Ptp monitoring: enabled
Number of entries: 5
Offset from master threshold: 1500
Mean path delay threshold: not configured
Skew threshold: 0.5

<table>
<thead>
<tr>
<th>Interface</th>
<th>Time</th>
<th>Offset from Master (ns)</th>
<th>Mean Path Delay (ns)</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Et8</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>71</td>
<td>5849</td>
<td>1.003159918</td>
</tr>
<tr>
<td>Et1</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>113</td>
<td>3672</td>
<td>1.004990621</td>
</tr>
<tr>
<td>Et2</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>706</td>
<td>7799</td>
<td>1.002744199</td>
</tr>
<tr>
<td>Et1</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>803</td>
<td>5861</td>
<td>1.003432049</td>
</tr>
<tr>
<td>Et1</td>
<td>21:23:12.901 UTC Feb 22 2018</td>
<td>610</td>
<td>3415</td>
<td>0.998974658</td>
</tr>
</tbody>
</table>
```