Precision Time Protocol (PTP) Commands

This module describes the commands used to configure the Precision Time Protocol (PTP) in Cisco IOS XR software. PTP is a protocol that provides the ability to distribute time around the network and is based on the IEEE 1588-2008 standard.

For more information about manually setting the router clock, see *Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide*.

For more information about configuring the router to use PTP see the Configuring PTP on *System Management Configuration Guide for Cisco ASR 9000 Series Routers*.

announce

To configure options for configuring PTP profile announcement messages, use the **announce** command in PTP profile configuration or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

announce {**frequency** *frequency* | **interval** *interval* | **timeout** *timeout*}
no announce {**frequency** | **interval** | **timeout**}

Syntax Description

frequency *frequency*	Use to specify multiple announce messages per second (2, 4, 8, 16, 32, 64, or 128). Frequency of 4 means that four messages are sent per second.
interval *interval*	Use to specify one or fewer announce messages per second (every 1, 2,4, 8, or 16 seconds). Interval of 2 means that an announce message is sent every two seconds.
timeout *timeout*	Specifies the number of announce intervals that PTP ports will wait in the Listen state before transitioning to the Master state (2-10).

Command Default

Defaults: interval 2, timeout 3.

Command Modes

PTP profile configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **announce** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the announce message settings for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Task ID

Task ID	Operation
ethernet-services	read, write

The following sets the announcement interval to 8 seconds in the PTP configuration profile.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# announce interval 8
```

clock

To enter Precision Time Protocol (PTP) clock configuration mode and run PTP clock configuration command, use the **clock** command in PTP configuration mode.

clock
no clock

Syntax Description

This command has no keywords or arguments.

Command Default

This command has no default values or behavior.

Command Modes

Global PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

PTP clock configuration commands can also be run from global configuration mode by preceding the command string with the **ptp clock** keywords. From PTP clock configuration mode, the various PTP clock settings can be configured.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to enter PTP clock configuration mode from global configuration mode.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock
RP/0/RSP0/CPU0:router(config-ptp-clock)#
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode

clock operation

To configure the type of PTP clock operation, use the **clock operation** command in PTP interface or profile configuration or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

clock operation {**one-step** | **two-step**}
no clock operation

Syntax Description

one-step	Specifies that the timestamp for the time synchronization message is directly in the synchronization message itself.
two-step	Specifies that the timestamp for the time synchronization message is sent in a message that follows the synchronization message.

Command Default

The default is two-step.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **clock operation** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the clock operation for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets PTP clock operation to two-step.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# clock operation two-step
```

clock-advertisement telecom-profile

To specify that the clock-advertisement behavior (the parameters used in announce messages) will follow the Telecom Profile for frequency (ITU-T G.8265.1), use the **clock-advertisement telecom-profile** command in PTP configuration mode. To remove the setting, use the **no** form of this command.

clock-advertisement telecom-profile
no clock-advertisement

Syntax Description

This command has no keywords or arguments.

Command Default

The default clock advertisement is compliant with the PTP 1588 standard.

Command Modes

PTP configuration

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The clock advertisement mode configuration controls the content of announce packets and the port numbers advertised by the router. Use this command to specify that clock advertisement is compliant with Telecom Profile mode instead of the PTP 1588 standard.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to set the clock advertisement profile.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock-advertisement telecom-profile
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode.

clock-class

To configure the clock class to use when advertising a PTP clock, use the **clock-class** command in PTP clock configuration mode. To remove the setting, use the **no** form of this command.

clock-class *class*
no clock-class

Syntax Description

class	Specifies the clock class to use when advertising this clock. Values can range from 0 to 255.

Command Default

The default is that the clock class is derived from platform properties.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to override the platform value, if needed.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the clock class to 100.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock
RP/0/RSP0/CPU0:router(config-ptp-clock)# clock-class 100
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode.

clock profile

To configure the ITU-T Telecom profile and clock type that can be used in all local PTP sessions, use the **clock profile** command in the PTP configuration mode. To remove the configuration, use the **no** form of this command.

clock profile {**g.8265.1** | **g.8275.1**} {**clock-type T-GM** | **T-BC** | **T-TSC**}
no clock profile {**g.8265.1** | **g.8275.1**} {**clock-type T-GM** | **T-BC** | **T-TSC**}

Syntax Description

clock-type T-GM | **T-BC** | **T-TSC**	Indicates the clock type for G.8275.1 profile. G.8275.1 profile supports three clock types: • T-GM: Telecom Grandmaster • T-BC: Telecom Boundary Clock • T-TSC: Telecom Time Slave Clock

Command Default

The default PTP profile defined in the IEEE-1588 standard is used if this configuration is not used.

Command Modes

PTP configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

The **clock-type** can be configured only when G.8275.1 is selected as the PTP profile.

Note The **clock-selection telecom-profile** and **clock-advertisement telecom-profile** commands are deprecated from Release 6.1.2. They are replaced by the **clock profile** command.

The following example shows configuring G.8265.1 profile:

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock profile g.8265.1
```

Note Configuring the G.8265.1 profile using **clock profile** command is equivalent to using **clock-selection telecom-profile** and **clock-advertisement telecom-profile** commands to configure the G.8265.1 profile in the earlier releases.

The following example shows configuring G.8275.1 profile with T-BC clock type:

```
RP/0/RSP0/CPU0:router(config)# ptp
```

```
RP/0/RSP0/CPU0:router(config-ptp)# clock profile g.8275.1 T-BC
```

clock-selection telecom-profile

To specify that clock-selection behavior (the best-master-clock-algorithm in use) follows the telecom profile for frequency (ITU-T G.8265.1), use the **clock-selection telecom-profile** command in PTP configuration mode. To remove the setting, use the **no** form of this command.

clock-selection telecom-profile
no clock-selection

Syntax Description

This command has no keywords or arguments.

Command Default

By default, the clock selection algorithm is compliant with the PTP 1588 standard.

Command Modes

PTP configuration

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The clock selection mode configuration controls which best master clock algorithm is used. Use this command to specify that the algorithm is compliant with Telecom Profile mode.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to set the clock advertisement profile.

```
RP/0/RSP0/CPU0:router(config-ptp)# clock-selection telecom-profile
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode.

cos

To specify the CoS value to use for Precision Time Protocol (PTP) packets sent by the router, use the **cos** command in PTP profile configuration mode or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

cos *number*
no cos

Syntax Description

number	Specifies the CoS value to use (0-7).

Command Default

The default CoS value is 6.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **cos** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the CoS value for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the CoS value to 3 in the PTP configuration profile p1.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# cos 3
```

The following example overrides the CoS value in the profile and sets it to be 2 for the interface:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if) ptp
RP/0/RSP0/CPU0:router(config-if-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-if-ptp)# cos 2
```

delay-request

To configure settings for the PTP delay request message, use the **delay-request** command in PTP profile configuration or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

delay-request {**frequency** *number* | **interval** *number*}
no delay-request

Syntax Description

frequency	Specifies multiple announce messages per second (2, 4, 8, 16, 32, 64, or 128). Frequency of 4 means that four messages are sent per second.
interval	Specifies one or fewer announce messages per second (every 1, 2,4, 8, or 16 seconds). Interval of 2 means that an announce message is sent every two seconds.

Command Default

The default is one second between messages.

Command Modes

PTP configuration mode

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **delay-request** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the delay-request message settings for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the delay request interval in the PTP configuration profile to 8 seconds.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# delay-request interval 8
```

detect-ptsf-unusable

To enable disqualification when appropriate for an FM from selection in the BMCA and declare it as unusable, use the **detect-ptsf-unusable** command in PTP configuration mode.

detect-ptsf-unusable

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

PTP configuration

Command History

Release	Modification
Release 24.2.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
ethernet-services	read, write

The example below demonstrates the example for excluding a Foreign Master (FM) from being considered in the Best Master Clock Algorithm (BMCA) and marking it as inoperable. This action is taken if the secondary clocks generate a signal known as Packet Timing Signal Fail (PTSF)-unusable:

```
Router(config)# ptp
Router(config-ptp)# detect-ptsf-unusable
Router(config-ptp-profile)# commit
```

domain(PTP)

To specify the domain number for the PTP clock, use the **domain** command in PTP clock configuration mode. To remove the setting, use the **no** form of this command.

domain *number*
no domain

Syntax Description

number	Specifies the domain number to use for this clock (0-255).

Command Default

Default is 0.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

PTP uses the specified domain number in all its PTP messages and ignores all PTP messages received from a different domain.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the domain to 200.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock
RP/0/RSP0/CPU0:router(config-ptp-clock)# domain 200
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode.

delay-response

To configure settings for the PTP delay response message, use the **delay-response** command in PTP profile configuration or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

delay-response {**grant-duration** *duration* | **timeout** *value*}
no delay-response {**grant-duration** | **timeout**}

Syntax Description

duration	Specifies the announce grant duration (60-1000 seconds). If port is in slave state, this is the length of grant which is requested. If the port is in master state, this is the maximum grant which will be allowed.
value	Specifies delay response message timeout value (100-10000 milliseconds). If delay-response messages are not received from a master clock for longer than this timeout, the master is no longer qualified for selection. This setting applies only applies if the clock-selection telecom-profile is specified.

Command Default

Default is grant-duration 600, timeout 5000.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **delay-response** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the delay response value for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the PTP delay response timeout to 200 milliseconds in the PTP configuration profile:

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# delay-response timeout 200
```

The following example overrides the delay response timeout value in the profile and sets it to be 150 milliseconds for the interface:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if) ptp
RP/0/RSP0/CPU0:router(config-if-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-if-ptp)# delay-response timeout 150
```

dscp (PTP)

To set the DSCP value for use in Precision Time Protocol (PTP) packets sent by the router, use the **dscp** command in PTP profile configuration or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

dscp *number*
no dscp

Syntax Description

number	Specifies the DSCP value to use (0-63).

Command Default

The default DSCP value is 46.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **dscp** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the DSCP value for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the DSCP value to 20 for PTP operation.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# dscp 20
```

The following example overrides the DSCP value in the profile and sets it to be 42 for the interface:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if) ptp
RP/0/RSP0/CPU0:router(config-if-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-if-ptp)# dscp 42
```

identity

To configure the PTP clock identity, use the **identity** command in PTP clock configuration mode. To remove the setting, use the **no** form of this command.

identity {**eui-64** *number* | **mac-address** *address*}
no identity {**eui-64** *number* | **mac-address** *address*}

Syntax Description

eui-64 *number*	Specifies the full EUI-64 number to determine the clock identity.
mac-address *address*	Specifies the router to determine the clock identity. Use one of the following addressing options to identify the router: • router. Use the router's built-in MAC address as the clock identity • address. Enter a MAC address (H.H.H format).

Command Default

The router for clock identity is derived from the router MAC address.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You can specify a MAC address or a complete EUI-64 value to derive the clock identity. If you do not use this command, the clock identify is derived from the router's MAC address.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the clock identity to MAC address A.B.C.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock
RP/0/RSP0/CPU0:router(config-ptp-clock)# identity mac-address A.B.C
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode.

local-priority

To configure priority for a port in the G.8275.1 profile, use the **local-priority** command in the PTP profile configuration mode or the Interface PTP configuration mode.

local-priority {*priority-value*}

Syntax Description

priority-value	Indicates the priority to be set for a port in the G.8275.1 profile. This priority value is used in the profile's alternate Best Master Clock Algorithm (BMCA). **Note** Lower number indicates higher priority value.

Command Default

The allowed range for the priority values are from 1 to 255. The default priority value is 128.

Command Modes

PTP configuration

Interface PTP configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

The configured local priority value will be ignored if the G.8275.1 BMCA is not in use and a warning message will be displayed in the **show ptp configuration-errors** command.

Note The per-master priority value configured on a master clock overrides the per-port local priority value.

The following example shows configuring priority 1 for a port in the G.8275.1 profile:

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# local-priority 1
```

log best-master-clock changes

To enable logging of changes to the best master clock for Precision Time Protocol (PTP), use the **log best-master-clock changes** command in PTP configuration mode. To remove the setting, use the **no** form of this command.

log best-master-clock changes
no log best-master-clock changes

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
logging	read, write

The following example sets up PTP to log the best master clock changes.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# log best-master-clock changes
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode.

master (PTP)

To add a master to the list of acceptable Precision Time Protocol (PTP) masters for an interface or profile, use the **master** command in PTP profile configuration or Interface PTP configuration mode. To remove the setting, use the **no** form of this command.

master {**ipv4** *address* | **ipv6** *address*} [**clock-class** *class* | **delay-symmetry** *number* | **multicast** | **non-negotiated** | **priority** *number*]
no master {**ipv4** *address* | **ipv6** *address*} [**clock-class** *class* | **delay-symmetry** *number* | **multicast** | **non-negotiated** | **priority** *number*]

Syntax Description

ipv4 *address*	Specifies the IPv4 address of a master.
ipv6 *address*	Specifies the IPv6 address of a master.
clock-class *class*	Overrides the clock class received in announce messages from this master.
delay-symmetry *number*	Specifies the expected asymmetry.
multicast	Indicates that the master sends multicast message.
non-negotiated	Specifies non-negotiated unicast message.
priority *number*	Indicates the priority for selecting between multiple masters (lower numbers are high priority).
clock-class *class*	Overrides the clock class received in announce messages from this master.

Command Default

This command has no default values or behavior.

Command Modes

PTP profile configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.
Release 6.2x	This command was modified. Support was extended to IPv6 addresses.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The address type used to configure the master must match the PTP transport type configured on the interface. If multiple masters are configured, the router attempts to communicate with all configured masters and selects between the available ones based on priority.

Note IPv4 multicast for PTP is not supported on Cisco ASR 9000 Routers.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example assigns two masters to the profile and gives higher priority to the master with IPv4 address 10.10.4.5.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# master ipv4 10.10.4.5 priority 1
RP/0/RSP0/CPU0:router(config-ptp-profile)# master ipv4 10.10.4.7 priority 2
```

min-clock-class

To configure minimum clock class accepted from a PTP master, use the **min-clock-class** command in the PTP configuration mode. To remove the configuration, use the **no** form of this command.

min-clock-class *class*
no min-clock-class *class*

Syntax Description

class	Indicates the minimum clock class accepted. The range is between 0 and 255.

Command Default

The default clock class can be obtained from the platform properties.

Command Modes

PTP configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

The clocks with clock-class number higher than the minimum clock class number will not be considered for a parent clock selection. This command is used to override the platform value (if needed).

Note clock-class values are not numerically ordered (lower value of clock-class has higher importance).

The following example configures the minimum clock class to 7:

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# min-clock-class 7
```

multicast

To allow PTP multicast messages to be sent, use the **multicast** command in PTP profile configuration mode or Interface PTP configuration mode. To remove the setting, use the **no** form of this command.

multicast
no multicast

This command has no keywords or arguments.

Command Default

By default, multicast messaging is disabled for PTP.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When multicast is configured, announce and sync messages are sent as multicast messages, but delay-response messages are sent as unicast messages.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example enables PTP multicast messages in the configuration profile:

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# multicast
```

The following example overrides the multicast setting in the profile and removes it for the interface:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if) ptp
RP/0/RSP0/CPU0:router(config-if-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-if-ptp)# no multicast
```

phase-difference-threshold-breach

To enable a bistate alarm which is triggered when the phase difference value for any qualified foreign master exceeds the configured value, use the **phase-difference-threshold-breach** command in PTP configuration mode.

phase-difference-threshold-breach *threshold-value*

Syntax Description

threshold-value	Specifies the threshold value for triggering PTP phase alarms. The range is from 0 to 4294967295 nanoseconds.

Command Default

No default behavior or values

Command Modes

PTP configuration

Command History

Release	Modification
Release 24.2.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to configure threshold for triggering phase difference alarms:

```
Router(config)# ptp
Router(config-ptp)# phase-difference-threshold-breach 300
Router(config-ptp-profile)# commit
```

priority1

To specify the priority 1 number to use when advertising a PTP clock, use the **priority1** command in PTP clock configuration mode. To remove the setting, use the **no** form of this command.

priority1 *number*
no priority1

Syntax Description

number	Specifies the priority 1 number to use for this clock (0-255).

Command Default

Default is 128.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the priority 1 number to 50

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock
RP/0/RSP0/CPU0:router(config-ptp-clock)# priority1 50
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode.
priority2, on page 27	Specifies the priority 2 number to use when advertising a PTP clock.

priority2

To specify the priority 2 number to use when advertising a PTP clock, use the **priority2** command in PTP clock configuration mode. To remove the setting, use the **no** form of this command.

priority2 *number*
no priority2

Syntax Description

number	Specifies the priority 2 number to use for this clock (0-255).

Command Default

Default is 128.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the priority 2 number to 50

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock
RP/0/RSP0/CPU0:router(config-ptp-clock)# priority2 50
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode
priority1, on page 26	Specifies the priority 1 number to use when advertising a PTP clock.

profile (interface)

To assign a Precision Time Protocol (PTP) configuration profile to an interface, use the **profile** command in interface PTP configuration mode. To remove the configuration profile from the interface, use the **no** form of this command.

profile *profile-name*
no profile *profile-name*

Syntax Description

profile-name	Name of profile to associate with the Interface.

Command Default

No configuration profile is associated with the interface.

Command Modes

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A PTP profile is a configuration template that can be applied to multiple interfaces. Define the profile using the **profile** command in PTP configuration mode.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to assign a configuration profile to a specific interface.

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if)# ptp
RP/0/RSP0/CPU0:router(config-if-ptp)# profile tp128
```

Related Commands

Command	Description
profile (PTP), on page 29	Enters Precision Time Protocol (PTP) profile configuration mode.

profile (PTP)

To enter Precision Time Protocol (PTP) profile configuration mode and run PTP profile configuration commands, use the **profile** command in PTP configuration mode or interface PTP configuration mode.

profile *name*

Syntax Description

name	Enters PTP profile configuration mode for the specified profile name.

Command Default

No default behavior or values

Command Modes

PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A Precision Time Protocol (PTP) profile is a configuration template that can be applied to multiple interfaces. From PTP profile configuration mode, the following PTP profile configuration commands are available:

```
RP/0/RSP0/CPU0:router(config-ptp-profile)# ?

  announce        Announce message options
  clear           Clear the uncommitted configuration
  clock           PTP clock-operation to use
  commit          Commit the configuration changes to running
  cos             Specify the CoS-bits value to use
  delay-request   Configure the sending of delay-request messages
  delay-response  Delay-Response message options
  describe        Describe a command without taking real actions
  do              Run an exec command
  dscp            Specify the DSCP value to use
  exit            Exit from this submode
  master          Add a master to listen to on interfaces using this profile
  multicast       Allow multicast messages to be sent
  no              Negate a command or set its defaults
  port            PTP port options
  pwd             Commands used to reach current submode
  root            Exit to the global configuration mode
  show            Show contents of configuration
  source          PTP source address options
  sync            Configure how often Sync messages are sent
  sync            Sync message options
  transport       PTP transport type to use on this interface
  unicast-grant   Unicast grant options
```

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to configure the profile tp128:

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile tp128
RP/0/RSP0/CPU0:router(config-ptp-profile)#
```

Related Commands

Command	Description
profile (interface), on page 28	Assigns a PTP configuration profile to an interface.

port state

To configure the state for a PTP port, use the **port state** command in the PTP profile configuration mode or the Interface PTP configuration mode. To remove the setting, use the **no** form of this command.

port state {**slave-only**}
no port state

Syntax Description

slave-only	Configures the port state to be a slave.

Command Default

Dynamic port state changes are based on the peers with which the port communicates.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example configures the PTP port state to be slave-only:

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp)# port state slave-only
```

ptp

To enter Precision Time Protocol (PTP) configuration mode and run PTP configuration commands, use the **ptp** command. Using the command from global configuration mode enters PTP configuration mode. Using the command from interface configuration mode enters interface PTP configuration mode. To remove PTP settings, use the **no** form of this command.

ptp
no ptp

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

Global configuration

Interface configuration

Command History

Release	Modification
Release 4.3.1	Support was added for this command in Bundle Ethernet interface configuration mode.
Release 4.3.1	Support was added for this command in Bundle Ethernet interface configuration mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

PTP configuration commands can also be run from global configuration mode by preceding the command string with the **ptp** keyword. From PTP configuration mode, the following PTP configuration commands are available:

```
RP/0/RSP0/CPU0:router(config-ptp)# ?
  clear                Clear the uncommitted configuration
  clock                PTP Clock Configuration
  clock-advertisement  Clock advertisement configuration
  clock-selection      Clock selection configuration
  commit               Commit the configuration changes to running
  describe             Describe a command without taking real actions
  do                   Run an exec command
  exit                 Exit from this submode
  log                  Precision Time Protocol logging configuration
  no                   Negate a command or set its defaults
  profile              PTP Profile Configuration
  pwd                  Commands used to reach current submode
  root                 Exit to the global configuration mode
  show                 Show contents of configuration
  time-of-day          Precision Time Protocol time-of-day configuration
```

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to enter PTP configuration mode from global configuration mode.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)#
```

The following example shows how to enter interface PTP configuration mode.

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if)# ptp
RP/0/RSP0/CPU0:router(config-if-ptp)#
```

Related Commands

Command	Description
profile (PTP), on page 29	Enters PTP profile configuration mode.

show ptp advertised-clock

To display properties of the clock that the system advertises over Precision Time Protocol (PTP), use the **show ptp advertised-clock** command in EXEC mode.

show ptp advertised-clock

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
ethernet-services	read

Example

The following shows information about the PTP advertised clock. The output displays the clock identity and the clock properties.

```
RP/0/RSP0/CPU0:router# show ptp advertised-clock

Fri Jan  9 04:54:33.345 PST
Clock ID: Local Clock (2651fffec41c26)
Clock properties:
  Priority1: 128, Priority2: 128, Class: 6, Accuracy: 0xfe
  Offset scaled log variance: 0xffff
  Domain: 0, Time Source: GPS, Timescale: PTP
  Frequency-traceable, Time-traceable
  Current UTC offset: 34 seconds
```

show ptp foreign-masters

To display the Precision Time Protocol (PTP) foreign master clocks that are available to the router, use the **show ptp foreign-masters** command in EXEC mode.

show ptp foreign-masters breif [interface *name* **location** *node* **] [best]**

Syntax Description

brief	Lists all foreign-masters known on the router, ordered by the interface on which they were discovered. If this option is omitted, the output also includes detailed clock properties, unicast messages that are granted from the master, length of time the master has been qualified, and information about the clock peer.
name	Displays foreign masters that were discovered the specified interface. For more information, use the question mark (?) online help function
node	Displays foreign masters that were discovered the specified node
best	Displays the state of the best foreign master found in the network

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 24.2.1	The command output was modified to include phase difference values and servo status.
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays the state of foreign masters for the PTP processes. It is only relevant when running as a boundary clock; in grandmaster mode, no relevant output gets displayed.

The **show ptp foreign-masters** command with the **best** keyword collects grandmaster information from all RPs and filters out all but the grandmaster on the active timing card. If the active timing card does not support running as slave, no foreign masters are displayed and instead, it is indicated that slaving is not supported (refer examples section).

Task ID

Task ID	Operation
ethernet-services	read

Example

The following shows output with the brief option.

```
RP/0/RSP0/CPU0:router# show ptp foreign-masters brief

M=Multicast,Q=Qualified,GM=Grandmaster

Interface         Transport Address                   Priority1 State
Gi0/2/0/0         IPv4      192.168.172.122           13        M,Q
                  IPv4      192.168.172.123           17        M
Gi0/2/0/1         IPv6      fe80::2b0:4aff:fe6b:f4fc  1         Q,GM
                  IPv6      fe80::2b0:4aff:fe6b:1234  18        Q
Gi0/3/0/0         Ethernet  00b0.4a6b.f4fc
```

The example indicates if the foreign-master is multicast and the clock that is being used as the grandmaster.

The following example shows output for the location 0/2/CPU0, including the brief option.

```
RP/0/RSP0/CPU0:router# show ptp foreign-masters brief location 0/2/CPU0

M=Multicast,Q=Qualified,GM=Grandmaster

Interface         Transport Address                   Priority1 State
Gi0/2/0/0         IPv4      192.168.172.122           13        M,Q
                  IPv4      192.168.172.123           17        M
Gi0/2/0/1         IPv6      fe80::2b0:4aff:fe6b:f4fc  1         Q,GM
                  IPv6      fe80::2b0:4aff:fe6b:1234  18        Q
```

The following example shows output for the interface GigabitEthernet0/2/0/0, without the brief option.

```
RP/0/RSP0/CPU0:router# show ptp foreign-masters brief interface GigabitEthernet0/2/0/0

Interface GigabitEthernet0/2/0/3 (PTP port number 27):

    IPv4, Address 172.108.11.25
       Configured priority: None
       Announce granted:   every 2 seconds,   600 seconds
       Sync granted:       16 per-second,     400 seconds
       Delay-Resp granted: 16 per-second,     600 seconds
       Qualified for 6 days, 2 hours, 11 minutes
       Clock ID: ACDE48FFFE234567
       Clock properties:
          Priority1: 1, Priority2: 83, Class: 6, Accuracy: 0x2B
          Offset scaled log variance: 0x27FF, Steps-removed: 5
          Domain: 0, Time Source: GPS, Timescale: PTP
          Frequency-traceable, Time-traceable
          Current UTC offset: 25 seconds
       Parent properties:
          Clock-ID: BADE48FFFE234367
          Port number: 3, Steps Removed: 2

    IPv4, Address 172.108.11.23, Multicast
       Configured priority: 27
       Announce granted: every 2 seconds,   600 seconds
       Qualified for 5 days, 4 hours, 27 minutes
       Clock ID: ACDE48FFFE234567
       Clock properties:
```

```
        Priority1: 7, Priority2: 83, Class: 6, Accuracy: 0x2B
        Offset scaled log variance: 0x27FF, Steps-removed: 5
        Domain: 0, Time Source: GPS, Timescale: PTP
        Frequency-traceable, Time-traceable
        Current UTC offset: 25 seconds
     Parent properties:
        Clock-ID: BADE48FFFE234367
        Port number: 5, Steps Removed: 1

  IPv4, Address 172.108.11.18, Multicast
     Configured priority: 11
     Not qualified
```

The following example shows state information for the best foreign master in the network.

```
RP/0/RSP0/CPU0:router# show ptp foreign-masters best

  Used to set system frequency and time
  IPv4, Address 1.2.3.4
  Received on interface GigabitEthernet0/2/0/3 (port number 0x1007)
  Clock ID: ACDE48FFFE234567
  Best foreign-master for 5 days, 4 hours, 27 minutes
  Advertised for 5 days, 4 hours, 20 minutes
  Clock properties:
     Priority1: 7, Priority2: 83, Class: 6, Accuracy: 0x2B
     Offset scaled log variance: 0x27FF, Steps-removed: 5
     Domain: 0, Time Source: GPS, Timescale: PTP
     Frequency-traceable, Time-traceable
     Current UTC offset: 25 seconds
  Parent properties:
     Clock-ID: BADE48FFFE234367
     Port number: 0x0005
```

This example indicates the display when slaving is not supported on the active timing card.

```
RP/0/RSP0/CPU0:router # show ptp foreign-masters best
PTP slaving is not supported on the RSP.
```

This example indicates the phase-difference and servo status as PTSF-unuable.

```
Router#show-ptp-foreign-masters
Ethernet, Address 0102.0304.050a, Multicast
    Configured priority: 40
    Configured clock class: None
    Configured delay asymmetry: 3 microseconds
    Announce granted:   4 per-second,      600 seconds
    Sync granted:       4 per-second,      600 seconds
    Delay-resp granted: 4 per-second,      600 seconds
    Not qualified (PTSF lossSync)
    Clock ID: abcdef1
    Phase difference: -5000ns
    Servo status: PTSF-unusable
    Received clock properties:
      Domain: 0, Priority1: 1, Priority2: 100, Class: 52
      Accuracy: 0x00, Offset scaled log variance: 0x0000
      Steps-removed: 2, Time source: GPS, Timescale: PTP
      Time-traceable
      Current UTC offset: 0 seconds
```

```
Parent properties:
  Clock ID: 0
  Port number: 0
```

show ptp interfaces

To display a summary of the Precision Time Protocol (PTP) port state for the specified interface, use the **show ptp interfaces** command in EXEC mode.

show ptp interfaces [**brief**] {*interface* | **all**}
show ptp interfaces summary location *node*

Syntax Description

interface	Specifies the interface. For more information, use the question mark (?) online help function.
all	Displays information for all interfaces.
brief	Displays a one-line summary of the functional state of the interface (or all interfaces).
location *node*	Displays information for the specified node

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
ethernet-services	read

Example

The following shows the output for GigabitEthernet0/2/0/3 interface in master state.

```
RP/0/RSP0/CPU0:router# show ptp interfaces GigabitEthernet0/2/0/3

      GigabitEthernet0/2/0/3 is in MASTER state
       PTP port number: 1
       IPv4 transport: IPv4 address 1.2.3.4
       Linestate: Up

       Mechanism: Two-step delay-request-response
          Sync rate: every 2 seconds
          Announce rate: every 8 seconds, timeout 5
          Delay-Req rate: every 4 seconds
       CoS: 6, DSCP: 46
       Platform capabilities:
          Supported:     One-step, Ethernet
```

```
      Not-Supported: IPv6, Multicast, Slave
      Max-Sync-rate: 4 per second
   Master state only
   23 Unicast peers
```

Example

The following shows that the GigabitEthernet0/1/0/3 interface is in the un-calibrated state.

```
RP/0/RSP0/CPU0:router# show ptp interfaces GigabitEthernet0/1/0/3

  GigabitEthernet0/1/0/3 is in UNCALIBRATED state
    PTP port number: 4
    IPv4 transport: IPv4 address 5.4.3.2
    Linestate: Up
    Mechanism: Two-step delay-request-response, Slave-only
       Sync rate: 2 per second
       Announce rate: 2 per second, timeout 4
       Delay-Req interval: 4 per second
    CoS: 5, DSCP: 23
    Platform capabilities:
       Supported:     One-step, Ethernet, Multicast, Slave
       Not-Supported: IPv6
       Max-Sync-rate: 2 per second
    Master table:
    (K = Known, Q = Qualified, GM = Grandmaster)
       IPv4 address 5.4.3.3: priority 5, multicast, K,Q,GM
       IPv4 address 5.4.3.4: priority not set
       MAC-address 12ab.7431.327c: priority 3, K
    Slave state only
```

Example

The following shows output with the **brief** keyword specified.

```
RP/0/RSP0/CPU0:router# show ptp interfaces brief

 Intf              Port         Port                 Line
 Name              Number       State        Transport  State     Mechanism
 ------------------------------------------------------------------------------
 Gi0/2/0/0         1            MASTER       IPv4       Up        2-step DRRM
 Gi0/2/0/1         5            PASSIVE      Ethernet   Up        1-step DRRM
 Gi0/2/0/2         23           MASTER       Ethernet   Up        2-step DRRM
 Gi0/2/0/0         6            INIT         IPv4       Down      2-step DRRM
```

Example

The following shows summary output for the location 0/2/cpu0.

```
RP/0/RSP0/CPU0:router# show ptp interfaces summary location 0/2/cpu0

  ====================================
  Interface port states
  ====================================
   INIT                  11
```

```
LISTENING              27
PASSIVE                12
PRE-MASTER              2
MASTER                 50
UNCALIBRATED            0
SLAVE                   1
FAULTY                  0
----------------------------
Total                 103
```

show ptp local-clock

To display properties of the local Precision Time Protocol (PTP) clock, use the **show ptp local-clock** command in EXEC mode.

show ptp local-clock

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
ethernet-services	read

Example

The following shows information about the local PTP clock.

```
RP/0/RSP0/CPU0:router# show ptp local-clock

     Sat Jul 28 14:15:54.357 UTC
     Clock ID: 2651fffec4496e
     Clock properties:
       Priority1: 128, Priority2: 128, Class: 248, Accuracy: 0xfe
       Offset scaled log variance: 0xffff
       Domain: 0, Time Source: Internal, Timescale: ARB
       No frequency or time traceability
       Current UTC offset: 34 seconds
```

show ptp packet-counters

To display counters for packets received and send by Precision Time Protocol (PTP), use the **show ptp packet-counters** command in EXEC mode.

show ptp packet-counters location *node*
show ptp packet-counters *interface* **detail**
show ptp packet-counters *interface* **master** {**ipv4** *ipv4-address* | **ethernet** *ethernet-address*}

Syntax Description

location *node*	Displays information for the specified node
interface	Specifies the interface.
detail	Displays detailed information.
master	Displays information regarding the PTP master.
ipv4-address	Specifies an IPv4 address.
ethernet-address	Specifies an Ethernet address.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
ethernet-services	read

Example

The following displays the packet counters for the GigabitEthernet0/2/0/1 interface.

```
RP/0/RSP0/CPU0:router# show ptp packet-counters GigabitEthernet0/2/0/1

        Packets                      Sent        Received         Dropped
        ------------------------------------------------------------------
        Announce                        3              83              11
        Sync                            0              32               5
        Follow-Up                       0              31               0
        Delay-Req                      22               0               0
        Delay-Resp                      0              21               7
```

```
    Pdelay-Req                    0              7              0
    Pdelay-Resp                   0              0              0
    Pdelay-Resp-Follow-Up         0              0              0
    Signaling                     2              1              0
    Management                    0              0              0
    Other                         0              3             12
                              -----          -----          -----
    TOTAL                        27            178             35
```

Example

The following displays the packet counters with additional details for the GigabitEthernet0/2/0/1 interface.

```
RP/0/RSP0/CPU0:router# show ptp packet-counters GigabitEthernet0/2/0/1 details

 Packets                      Sent        Received         Dropped
    ------------------------------------------------------------------
    Announce                     3              83             11
    Sync                         0              32              5
    Follow-Up                    0              31              0
    Delay-Req                   22               0              0
    Delay-Resp                   0              21              7
    Pdelay-Req                   0               7              0
    Pdelay-Resp                  0               0              0
    Pdelay-Resp-Follow-Up        0               0              0
    Signaling                    2               1              0
    Management                   0               0              0
    Other                        0               3             12
                           -----          -----          -----
    TOTAL                       27             178             35

Master IPv4 5.4.3.4:
    Packets                    Sent        Received         Dropped
    ------------------------------------------------------------------
    Announce                     1              40              1
    Sync                         0              23              4
    Follow-Up                    0              14              0
    Delay-Req                   12               0              0
    Delay-Resp                   0              10              7
    Pdelay-Req                   0               7              0
    Pdelay-Resp                  0               0              0
    Pdelay-Resp-Follow-Up        0               0              0
    Signaling                    2               1              0
    Management                   0               0              0
    Other                        0               3             12
                           -----          -----          -----
   TOTAL                        15              98             24

Master Ethernet 12ab.7431.327c:
    Packets                    Sent        Received         Dropped
    ------------------------------------------------------------------
    Announce                     2              43             10
    Sync                         0               9              1
    Follow-Up                    0              17              0
    Delay-Req                   10               0              0
    Delay-Resp                   0              11              0
    Pdelay-Req                   0               0              0
    Pdelay-Resp                  0               0              0
    Pdelay-Resp-Follow-Up        0               0              0
    Signaling                    0               0              0
```

```
  Management                    0              0              0
  Other                         0              0              0
                              -----          -----          -----
  TOTAL                        12             80             11
```

Example

The following displays the packet counters for the master with IPv4 address 5.4.3.4 for the GigabitEthernet0/2/0/1 interface.

```
RP/0/RSP0/CPU0:router# show ptp packet-counters GigabitEthernet0/2/0/1 master ipv4 5.4.3.4

    Master IPv4 5.4.3.4:
      Packets                    Sent        Received         Dropped
      ------------------------------------------------------------------
      Announce                      1              40              1
      Sync                          0              23              4
      Follow-Up                     0              14              0
      Delay-Req                    12               0              0
      Delay-Resp                    0              10              7
      Pdelay-Req                    0               7              0
      Pdelay-Resp                   0               0              0
      Pdelay-Resp-Follow-Up         0               0              0
      Signaling                     2               1              0
      Management                    0               0              0
      Other                         0               3             12
                                  -----          -----          -----
      TOTAL                        15              98             24
```

Example

The following displays the packet counters for the location 0/2/cpu0 for the GigabitEthernet0/2/0/1 interface.

```
RP/0/RSP0/CPU0:router# show ptp packet-counters location 0/2/cpu0

    Packets                    Sent        Received         Dropped
      ------------------------------------------------------------------
      Announce                  1735             101              52
      Sync                      3753              32               5
      Follow-Up                 3751              32               7
      Delay-Req                    0            4073             108
      Delay-Resp                4073               0               0
      Pdelay-Req                   0               7               0
      Pdelay-Resp                  0               0               0
      Pdelay-Resp-Follow-Up        0               0               0
      Signaling                   73              18               0
      Management                   0               0               0
      Other                        0               3             218
                                -----          -----          -----
      TOTAL                     13385            4266             390

      Drop Reason                                    Drop Count
      ------------------------------------------------------------
      Not ready for packets                                 289
      Wrong domain number                                    71
      Packet too short                                        1
      Local packet received, same port number                 7
```

```
    Local packet received, higher port number            11
    Local packet received, lower port number             11
    No timestamp received with packet                     0
    Zero timestamp received with packet                   0
                                                        -----
TOTAL
```

show ptp unicast-peers

To display information on the peers to which Precision Time Protocol (PTP) is sending unicast messages, use the **show ptp unicast-peers** command in EXEC mode.

show ptp unicast-peers *interface*

Syntax Description

interface	Displays information for the specified interface.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
ethernet-services	read

The following example shows PTP unicast peer information for the GigabitEthernet0/2/0/1 interface.

```
RP/0/RSP0/CPU0:router# show ptp unicast-peers GigabitEthernet0/2/0/1

Interface GigabitEthernet0/2/0/1:
    IPv4-address 1.2.3.4
      Announce granted:   every 2 seconds,  600 seconds
      Sync granted:       16 per second,    600 seconds
      Delay-Resp granted: 16 per second,    600 seconds
    IPv4-address 1.2.3.5
      Announce granted:   every 1 second,   400 seconds
    IPv4-address 1.2.3.6
      Delay-Resp granted: 16 per second,    600 seconds
```

The following example shows PTP unicast peer information for all interfaces.

```
RP/0/RSP0/CPU0:router# show ptp unicast-peers

Interface GigabitEthernet0/2/0/1:
    IPv4-address 1.2.3.4
      Announce granted:   every 2 seconds,  600 seconds
      Sync granted:       16 per second,    600 seconds
      Delay-Resp granted: 16 per second,    600 seconds
    IPv4-address 1.2.3.5
```

```
      Announce granted:   every 1 second,   400 seconds
    IPv4-address 1.2.3.6
      Delay-Resp granted: 16 per second,    600 seconds

Interface GigabitEthernet0/3/0/2:
    Mac-address 00b0.4a6b.f4fc
      Announce granted:   every 2 seconds,  600 seconds
      Sync granted:       16 per second,    600 seconds
      Delay-Resp granted: 16 per second,    600 seconds
    Mac-address 00b0.4a6b.f4fd
      Announce granted:   every 1 second,   400 seconds

Interface GigabitEthernet0/3/0/3:
    No known peers
```

source ipv4 address

To specify the source IPv4 address to use when sending IPv4 packets, use the **source ipv4 address** command in PTP profile configuration or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

source ipv4 address *address*
no source ipv4 address

Syntax Description

address	Specifies an IPv4 address.

Command Default

This command has no default values or behavior.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **source ipv4 address** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the source IPv4 address for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example specifies the source IPv4 address 10.10.10.4 for PTP packets.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# source ipv4 address 10.10.10.4
```

The following example overrides the source IPv4 address in the profile and sets it to be 10.10.10.6 for the interface:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if) ptp
RP/0/RSP0/CPU0:router(config-if-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-if-ptp)# source ipv4 address 10.10.10.6
```

sync

To configure settings for PTP sync messages, use the **sync** command in PTP profile configuration or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

sync {**frequency** *frequency* | **interval** *interval* }
no sync {**frequency** | **interval**}

Syntax Description

frequency *frequency*	Use to specify multiple sync messages per second (2, 4, 8, 16, 32, 64, or 128). Frequency of 4 means that four messages are sent per second.
interval*interval*	Use to specify one or fewer sync messages per second (every 1, 2,4, 8, or 16 seconds). Interval of 2 means that a sync message is sent every two seconds.

Command Default

Defaults: interval 1,timeout 5000.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **sync** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the sync value for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the PTP sync timeout to 2000 milliseconds.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# sync frequency 2000
```

The following example overrides the sync frequency value in the profile and sets it to be 1500 milliseconds for the interface:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if) ptp
RP/0/RSP0/CPU0:router(config-if-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-if-ptp)# sync frequency 1500
```

timescale

To set the time scale to use when advertising time for Precision Time Protocol (PTP), use the **timescale** command in PTP clock configuration mode. To remove the setting, use the **no** form of this command.

timescale {**ARB** | **PTP**}
no timescale

Syntax Description

ARB	Specifies ARB (arbitrary) time.
PTP	Specifies PTP time.

Command Default

The default value is derived from platform properties.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to override the platform value, if needed.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the time scale to ARB.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock
RP/0/RSP0/CPU0:router(config-ptp-clock)# timescale ARB
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode.

time-of-day

To set the priority used by Precision Time Protocol (PTP) when selecting between PTP and other sources for time-of-day on the router (for example GPS), use the **time-of-day** command in PTP configuration mode. To remove the setting, use the **no** form of this command.

time-of-day priority *number*
no time-of-day priority

Syntax Description

priority	*number*	Specifies the time of day priority to rank a foreign PTP grand master against other time sources, such as GPS (1-255).

Command Default

The default is priority 100.

Command Modes

PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the time of day priority to 200.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# time-of-day priority 200
```

time-source

To set the time source advertised in announcement messages by the local clock for Precision Time Protocol (PTP), use the **clock time-source** command in PTP clock configuration mode. To remove the setting, use the **no** form of this command.

time-source *source*
no time-source

Syntax Description

source	Specifies the type of time source: GPS, NTP, PTP, atomic-clock, hand-set, internal oscillator, other, or terrestrial radio.

Command Default

The default is the value specified by the platform.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to override the platform value, if needed, using any of the time-source values specified in the IEEE 1588-2008 standard.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the time source to PTP.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# clock
RP/0/RSP0/CPU0:router(config-ptp-clock)# time-source ptp
```

Related Commands

Command	Description
ptp, on page 32	Enters PTP configuration mode.

transport

To specify the PTP transport type, use the **transport** command in PTP profile configuration or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

transport {**ethernet** | **ipv4**}
no transport

Syntax Description

ethernet	Specifies that Ethernet is used as the transport type on the interface.
ipv4	Specifies IPv4 is used as the transport type on the interface

Command Default

This command has no default values or behavior.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **transport** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the 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.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example sets the transport type to be Ethernet.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# transport ethernet
```

The following example overrides the transport type in the profile and sets it to be ipv4 for the interface:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if) ptp
RP/0/RSP0/CPU0:router(config-if-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-if-ptp)# transport ipv4
```

uncalibrated-clock-class

To configure the clock class that is advertised when PTP is in ACQUIRING state and interface connected to the Best Master is in Uncalibrated state, use the **uncalibrated-clock-class** command in the PTP configuration mode. To remove the configuration, use the **no** form of this command.

uncalibrated-clock-class *class*
no uncalibrated-clock-class *class*

Syntax Description

class	Indicates the clock class to be advertised when PTP is in ACQUIRING state. The range is between 0 and 255.

Command Default

The default clock class can be obtained from the platform properties.

Command Modes

PTP configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

This command is used to override the platform value (if needed).

The following example configures the clock class to 255:

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# uncalibrated-clock-class 255
```

Related Commands

clock-class	Configures the clock class that can be used to advertise a PTP clock.

unicast-grant invalid-request

To specify whether unicast grant requests with unacceptable parameters are denied or granted with reduced parameters, use the **unicast-grant invalid-request** command in PTP profile configuration or interface PTP configuration mode. To remove the setting, use the **no** form of this command.

unicast-grant invalid-request {**deny** | **reduce**}
no unicast-grant invalid-request

Syntax Description

deny	Indicates that unicast grant requests with unacceptable parameters are denied. For example, assume that a request for a grant is received with a packet interval of 1 per second and duration of 600 seconds, and that the maximum packet interval is 2 per second and duration is 500 seconds. If **deny** is configured, the grant will be denied.
reduce	Indicates that unicast grant requests with unacceptable parameters are granted with reduced parameters. For example, assume that a request for a grant is received with a packet interval of 1 per second and duration of 600 seconds, and that the maximum packet interval is 2 per second and duration is 500 seconds. If **reduce** is configured, a grant with packet interval of 2-per-second and duration of 500 seconds will be granted.

Command Default

The default is **reduce**.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **unicast-grant invalid-request** command can be used configure the global PTP configuration profile which can then be associated with many interfaces. Similarly it can be used in interface PTP configuration mode to set the unicast-grant invalid-request value for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example determines that unicast grant requests with unacceptable parameters are granted with reduced parameters.

```
RP/0/RSP0/CPU0:router(config)# ptp
RP/0/RSP0/CPU0:router(config-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-ptp-profile)# unicast-grant invalid-request reduce
```

The following example overrides the unicast grant value in the profile and sets it to be deny for the interface:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/0/0/10
RP/0/RSP0/CPU0:router(config-if) ptp
RP/0/RSP0/CPU0:router(config-if-ptp)# profile p1
RP/0/RSP0/CPU0:router(config-if-ptp)# unicast-grant invalid-request deny
```