APPENDIX **A**

Command Reference

> **Note** The terms "Unidirectional Path Switched Ring" and "UPSR" may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as "Path Protected Mesh Network" and "PPMN," refer generally to Cisco's path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

This appendix provides a command reference for those Cisco IOS commands or those aspects of Cisco IOS commands that are unique to ML-Series cards.

[no] bridge *bridge-group-number* protocol {drpri-rstp | ieee | rstp}

To define the protocol employed by a bridge group, use the **bridge protocol** global configuration command. If no protocol will be employed by the bridge group, this command is not needed. To remove a protocol from the bridge group, use the no form of this command with the appropriate keywords and arguments.

Syntax Description

Parameter	Description
drpri-rstp	The protocol that enables the Dual Resilient Packet Ring Interconnect (DRPRI) feature of the ML-Series cards. **Note** DRPRI is not supported in Release 7.2.
ieee	IEEE 802.1D Spanning Tree Protocol.
rstp	IEEE 802.1W Rapid Spanning Tree Protocol.
bridge-group-number	The identifying number of the bridge group being assigned a protocol.

Defaults   N/A

Command Modes   Global configuration

Usage Guidelines   The Rapid Spanning Tree Protocol (RSTP) or Spanning Tree Protocol (STP) can be implemented.

Examples   The following example assigns the protocol to the bridge group with the bridge group number of 100.

```
Router(config)# bridge 100 protocol rstp
```

Related Commands   bridge-group

clear counters

Use this command to simultaneously clear Ethernet interface performance monitoring (PM) counters in Cisco Transport Controller (CTC), Transaction Language One (TL1), and the Cisco IOS CLI. Using Cisco IOS, you can clear counters on a per-interface basis for any interface, except the 802.13 IEEE RPR interface; in that instance, you can only clear all counters for both spans.

The **clear counters** command can also be executed from CTC by using the Clear button, or from TL1 using a command on the interface. The CTC clearing function allows you to choose between clearing front-end or back-end interfaces. Cisco IOS and TL1 interface clear commands do not have this ability.

Syntax Description   This command has no arguments or keywords.

Defaults   The default is for PM counters not to be cleared.

Command Modes   Privileged exec

Usage Guidelines   This command is applicable to the ML100T-12, ML1000-2, and ML-MR-10 cards on the ONS 15454.

Examples
```
Router#clear counters
Clear "show interface" counters on all interfaces [confirm]
Router#
```

Related Commands   show interface

[no] clock auto

Use the **clock auto** command to determine whether the system clock parameters are configured automatically from the TCC2/TCC2P card. When enabled, both daylight savings time and time zone are automatically configured, and the system clock is periodically synchronized to the TCC2/TCC2P card. Use the no form of the command to disable this feature.

Syntax Description   This command has no arguments or keywords.

Defaults   The default setting is clock auto.

Command Modes   Global configuration

Usage Guidelines   The no form of the command is required before any manual configuration of summertime, timezone, or clock. The no form of the command is required if Network Time Protocol (NTP) is configured in Cisco IOS. The ONS 15454 SONET/SDH is also configured through Cisco Transport Controller (CTC) to use a NTP or Simple Network Time Protocol (SNTP) server to set the date and time of the node.

Examples   ```
Router(config)# no clock auto
```

**Related Commands**    clock timezone

clock set

# interface spr 1

Use this command to create a shared packet ring (SPR) interface on an ML-Series card for a resilient packet ring (RPR) in Cisco proprietary RPR mode. If the interface has already been created, this command enters spr interface configuration mode. The only valid spr interface number is 1.

**Defaults**            N/A

**Command Modes**       Global configuration

**Usage Guidelines**    The command allows the user to create a virtual interface for the Cisco proprietary RPR/SPR. Commands such as **spr wrap** or **spr station-id** can then be applied to the proprietary RPR through SPR configuration command mode.

In this command, interface can be shortened to int.

**Examples**            The following example creates the shared packet ring interface:

```
Router(config)# interface spr 1
```

Related Commands   spr-intf-id

spr station-id

spr wrap

[no] ip radius nas-ip-address {*hostname* | *ip-address*}

The ML-Series card allows the user to configure a separate nas-ip-address for each ML-Series card. This allows the Remote Authentication Dial In User Services (RADIUS) server to distinguish among individual ML-Series card in the same ONS node. If there is only one ML-Series card in the ONS node, this command does not provide any advantage. The public IP address of the ONS node serves as the nas-ip-address in the RADIUS packet sent to the server.

Identifying the specific ML-Series card that sent the request to the server can be useful in debugging from the server. The nas-ip-address is primarily used for validation of the RADIUS authorization and accounting requests.

If this value is not configured, the nas-ip-address is filled in by the normal Cisco IOS mechanism using the value configured by the **ip radius-source** command. If no value is specified, then the best IP address that routes to the server is used. If no address routing to the server is available, the IP address of the server is used.

Syntax Description

Parameter	Description
hostname	The host name of the ML card as defined by "hostname" command.
ip-address	The IP address assigned to one of the ML interfaces, usually a front-end interface such as Fast Ethernet or Gigabit Ethernet.

Defaults   N/A

Command Modes   Global configuration

Usage Guidelines   This command allows the user to specify the IP address or hostname of attribute 4 (nas-ip-address) in the radius packet.

Examples   The following example creates an IP address for attribute 4 of the RADIUS packet:

```
Router# configure terminal
Router(config)# [no] ip radius nas-ip-address 10.92.92.92
```

Related Commands   aaa new-model

aaa authentication login

microcode fail system-reload

In the event of a microcode failure, use this command to configure the ML-Series card to save information to the flash memory and then reboot. The information is saved for use by the Cisco Technical Assistance Center (Cisco TAC). To contact TAC, see the "Obtaining Documentation and Submitting a Service Request" section on page xl.

Defaults   N/A

Command Modes   Global configuration

Usage Guidelines   This command and feature is specific to ML-Series card.

Examples   `router(config)#` **`microcode fail system-reload`**

Related Commands   N/A

[no] pos pdi holdoff *time*

Use this command to specify the time, in milliseconds, to hold off sending the path defect indication (PDI) to the far end when a virtual concatenation (VCAT) member circuit is added to the virtual concatenation group (VCG). Use the no form of the command to use the default value.

Syntax Description	Parameter	Description
	time	Delay time in milliseconds, 100 to 1,000

Defaults   The default value is 100 milliseconds.

Command Modes   Interface configuration mode (packet-over-SONET/SDH [POS] only)

Usage Guidelines   This value is normally configured to match the setting on the peer terminal equipment (PTE). The time granularity for this command is 1 millisecond.

Examples   In this example, interface is shortened to int.

```
Gateway(config)# int pos0
Gateway(config-if)# pos pdi holdoff 500
```

Related Commands   pos trigger defects

[no] pos report *alarm*

Use this command to specify which alarms/signals are logged to the console. This command has no effect on whether alarms are reported to the TCC2/TCC2P and CTC. These conditions are soaked and cleared per Telcordia GR-253. Use the no form of the command to disable reporting of a specific alarm/signal.

Syntax Description

Parameter	Description
alarm	The SONET/SDH alarm that is logged to the console. The alarms are as follows:
	all—All link down alarm failures
	ber_sd_b3—PBIP BER in excess of signal degrade (SD) threshold failure
	ber_sf_b3—PBIP BER in excess of signal fail (SF) threshold failure
	encap—Path signal label encapsulation mismatch failure
	pais—Path alarm indication signal failure
	plop—Path loss of pointer failure
	ppdi—Path payload defect indication failure
	pplm—Payload label mismatch path
	prdi—Path remote defect indication failure
	ptim—Path trace indicator mismatch failure
	puneq—Path label equivalent to zero failure

Defaults   The default is to report all alarms.

Command Modes   Interface configuration mode (POS only)

Usage Guidelines   This value is normally configured to match the setting on the peer PTE.

Examples   In this example, interface is shortened to int.

```
Gateway(config)# int pos0
Gateway(config-if)# pos report all
```

Related Commands   pos trigger defects

[no] pos trigger defects *condition*

Use this command to specify which conditions cause the associated POS link state to change. Use the no form of the command to disable triggering on a specific condition.

Syntax Description	Parameter	Description
	condition	The SONET/SDH condition that causes the link state change. The conditions are as follows:
		all—All link down alarm failures
		ber_sd_b3—PBIP bit error rate (BER) in excess of SD threshold failure
		ber_sf_b3—PBIP BER in excess of SF threshold failure
		encap—Path Signal Label Encapsulation Mismatch failure
		pais—Path Alarm Indication Signal failure
		plop—Path Loss of Pointer failure
		ppdi—Path Payload Defect Indication failure
		pplm—Payload label mismatch path
		prdi—Path Remote Defect Indication failure
		ptim—Path Trace Indicator Mismatch failure
		puneq—Path Label Equivalent to Zero failure

Defaults   The default is to report all conditions. For a list of all conditions, see the list in the Syntax Description.

Command Modes   Interface configuration mode (POS only)

Usage Guidelines   This value is normally configured to match the setting on the peer PTE.

✎
Note   In previous Cisco IOS releases, the **pos trigger delay** command was used to modify the triggering interval. In Release 7.2, this command is not supported.

Examples   In this example, interface is shortened to int.

```
Gateway(config)# int pos0
Gateway(config-if)# pos trigger defects all
```

Related Commands   None

[no] pos scramble-spe

Use this command to enable scrambling.

Syntax Description   This command has no arguments or keywords.

Defaults   The default value depends on the encapsulation.

Encapsulation	Scrambling
LEX	pos scramble-spe
PPP/HDLC	no pos scramble-spe

Command Modes   Interface configuration mode (POS only)

Usage Guidelines   This value is normally configured to match the setting on the peer PTE. This command might change the pos flag c2 configuration.

Examples   In this example, interface is shortened to int.

```
Gateway(config)# int pos0
Gateway(config-if)# pos scramble-spe
```

Related Commands   None

protection group *group_num*

Use this command to create a protection group entity. After you execute this command, the card goes to the config-prot mode. The config-prot mode can be used to configure other parameters for a protection group.

Syntax Description	Parameter	Description
	group_num	Numerical value ranging between 1 and 10.

Defaults   N/A

Command Modes   Protection config

Usage Guidelines   This command is applicable to ML-MR-10 cards.

Examples
```
Router(config)# protection group 1
Router(config-prot)#
```

Related Commands   protection-group

protection peer slot

[no] protection group enable

Use this command to enable or disable a protection group for troubleshooting or maintenance purposes. When a protection group is disabled, the card and port protection (CPP) for the group is not operational. By default, the protection group is enabled if a group is already created and the peer slot number is configured.

Syntax Description   This command has no arguments or keywords.

Defaults   Enabled

Command Modes   Protection config

Usage Guidelines   This command is applicable to ML-MR-10 cards.

Examples
```
Router(config)# protection group 1
Router(config-prot)# protection group enable
Router(config-prot)# no protection group enable
```

Related Commands   protection group

protection-group *group_num*

Use this command to add or delete a Gigabit Ethernet interface, port channel interface, or an IEEE 802.17b-based resilient packet ring (RPR-IEEE) interface from the group. By default, all ports are unprotected.

Parameter	Description
group_num	Numerical value ranging between 1 and 10.

Syntax Description

Defaults N/A

Command Modes Interface config

Usage Guidelines This command is applicable to ML-MR-10 cards.

Examples

```
Router(config-if)#protection-group 1
```

To remove the interfaces from the protection group execute the following command:

```
Router(config-if)# no protection-group
```

Related Commands protection group

protection peer slot *slot_num*

Use this command to specify the slot number of a CPP peer card.

Syntax Description	Parameter	Description
	slot_num	Enter values from 1 to 6 and 12 to 17.
		Values between 7 to 11 are considered invalid because they are assigned to controller, cross-connect, and alarm interface cards.

Defaults   N/A

Command Modes   Protection config

Usage Guidelines   This command is applicable to ML-MR-10 cards.

Examples
```
Router(config)# protection group 1
Router(config-prot)# protection peer slot 12
```
To remove the configuration of a peer slot number, execute the following command:
```
Router(config-prot)# no protection peer slot <slot_num>
```

Related Commands   None

rpr-ieee atd-timer *value*

Use this command to configure the attribute discovery (ATD) timer, which controls the frequency of ATD packet transmissions on the IEEE 802.17b based RPR interface.

Syntax Description	**Parameter**	**Description**
	value	Value expressed in seconds. Range is 1 through 10.

Defaults

Default is 1 second.

Command Modes

IEEE 802.17b based RPR interface configuration

Usage Guidelines

The ATD timer value is very rarely changed. This is usually done only if other equipment uses a different ATD value or has processor limitations and cannot handle frames at one per second.

Examples

In this example, interface is shortened to int.

```
router(config)# int rpr-ieee 0
router(config-if)# rpr-ieee atd-timer 1
```

Related Commands   None

rpr-ieee fairness weight *value*

Use this command to configure the fairness weight of an IEEE 802.17b based RPR station.

Syntax Description	Parameter	Description
	value	Number, expressed as an exponent of two. Range is 0 through 7.

Defaults
The default is 0.

Command Modes
IEEE 802.17b based RPR interface configuration

Usage Guidelines
Weighted fairness is used to allow one card greater access (that is, transmission rate) to the ring than other cards have. This command sets the fairness weight of the particular IEEE 702.17b based RPR interface. By default when a ring is congested, fairness controls ring traffic to allow each station the same amount of added traffic (or transmission rate). A higher fairness weight value on one interface allows the station to add traffic at a higher rate during periods of congestion.

Examples
In this example, interface is shortened to int.

```
router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee fairness weight 3
```

Related Commands
rpr-ieee fairness active weights detect

rpr-ieee fairness mode

[no] rpr-ieee ri foreign

Use this command to control the secondary card laser states and the interface wait to restore (WTR) timer when changing from secondary mode to primary.

Foreign mode indicates that the secondary card's transmit laser(s) are turned off while in standby mode. In turn, the secondary card's partner card does not send traffic through the ring redundant interconnect (RI) interface. The time used to turn the lasers back up causes longer WTR during switchover to primary mode.

If foreign mode is turned off as in the default setting or by using the no form of this command, the secondary card's transmit laser(s) remain turned on while in standby mode, and the RI interface ucode is set to standby. In this case, the secondary card's partner card continues to send traffic through the ring RI interface, and the WTR time during switchover to primary mode is faster.

Syntax Description   This command has no arguments or keywords.

Defaults   The default form is no rpr-ieee ri foreign.

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   This command should be used if the ring is connected to a switch.

The no form of the command reduces a traffic outage if there is a switch from a secondary card to a primary. The secondary card stays in active mode during the WTR interval; the primary card is in active mode with the ucode set to standby during the WTR.

Examples   In this example, interface is shortened to int.

```
router(config)# int rpr-ieee 0
Router(config-if)# no rpr-ieee ri foreign
```

Related Commands   None

rpr-ieee keepalive-timer *interval* [east | west]

Use this command to configure the keepalive timer configuration on a specific IEEE 802.17b based RPR span (east or west).

Syntax Description

Parameter	Description
east	Pertains to configuration for eastbound span traffic.
west	Pertains to configuration for westbound span traffic.
interval	Timer interval expressed in milliseconds. Protection switch keepalive range from 0 to 200 milliseconds.

Defaults   The default is 1 second.

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   If a station does not receive fairness frames from its neighboring stations in the ring, the keepalive timer value determines how much time will elapse before a protection event is triggered. The keepalive timer works in tandem with the SONET holdoff timer. You would lengthen both of these timer intervals to avoid double hits when IEEE 802.17b based RPR is running over a SONET-protected network.

Examples   In this example, interface is shortened to int.

```
router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee keepalive-timer 100 east
```

Related Commands   rpr-ieee protection sonet holdoff-timer

[no] rpr-ieee protection pref jumbo

Use this command to set the IEEE 802.17b based RPR station MTU preference to jumbo Ethernet frames. If all stations on the ring select jumbo preference, the ring MTU is 9,000 bytes; otherwise, it is 1,500 bytes. Use the no form of this command to select normal MTU preference.

Syntax Description   This command has no arguments or keywords.

Defaults   The default is jumbo preference: not set (that is, the ring does not support jumbo frames).

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   Jumbo frame support would be enabled to support frames larger than the standard Ethernet MTU of 1518 bytes across the IEEE 802.17b based RPR ring. In this command, protection can be shortened to prot.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee prot pref jumbo
```

Related Commands   None

[no] rpr-ieee protection request forced-switch {east | west}

Use this command to trigger a forced-switch protection event on the specified IEEE 802.17b-based RPR span. Use the no form of this command to clear the switch.

Syntax Description

Parameter	Description
east	Pertains to configuration for eastbound span traffic.
west	Pertains to configuration for westbound span traffic.

Defaults   N/A

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   If the IEEE 802.17b based RPR forced switch is initiated with this command at the command-line interface (CLI), traffic steers away from this span. To clear the force, use the no form of thecommand.

✎

Note   The command is not cleared if you change the port service state in CTC from OOS,DSBLD (Locked,disabled) to IS/IS,AINS, or OOS,MT (Unlocked,enabled,automaticInService or outofservice Maintenance).

IEEE 802.17b based RPR switching options are similar to the path protection and bidirectional line switched ring (BLSR) protection switching options, but RPR-IEEE switching functions are only available at the CLI and not in CTC.

In this command, protection can be shortened to prot and request can be shortened to req.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee
Router(config-if)# rpr-ieee prot req forced-switch east
```

Related Commands   rpr-ieee protection request manual-switch

[no] rpr-ieee protection request manual-switch {east | west}

Use this command to trigger a manual-switch protection event on the specified IEEE 802.17b based RPR span. Use the no form of this command to deactivate the switch.

Syntax Description

Parameter	Description
east	Pertains to configuration for eastbound span traffic.
west	Pertains to configuration for westbound span traffic.

Defaults   N/A

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   IEEE 802.17b based RPR switching options are similar to the path protection and BLSR protection switching options, but RPR-IEEE switching is only available at the CLI and not in CTC.

In this command, protection can be shortened to prot and request can be shortened to req.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee prot req manual-switch east
```

Related Commands   rpr-ieee protection request forced-switch

rpr-ieee protection sonet holdoff-timer *interval* {east | west}

Use this command to configure the SONET hold-off timer for a protection event on the specified IEEE 802.17b based RPR span. Use the no form of this command to turn off the SONET holdoff timer.

> **Note** This command replaces the **pos vcat defect** {**delayed** | **immediate**} command.

Syntax Description

Parameter	Description
east	Pertains to configuration for eastbound span traffic.
west	Pertains to configuration for westbound span traffic.
interval	Timer interval expressed in milliseconds. Value is a multiple of 10 milliseconds in the range of 0 to 200 milliseconds (for example, interval **2** sets the holdoff timer to 20 milliseconds.

Defaults The default value is 0 milliseconds.

Command Modes IEEE 802.17b based RPR interface configuration

Usage Guidelines This command is used to allow the slower SONET protection mechanisms to take effect ahead of IEEE 802.17b based RPR protection. The SONET holdoff timer works in tandem with the keepalive timer. You could lengthen both of these interval values to avoid double hits when RPR-IEEE is running over a SONET-protected network.

In this command, protection can be shortenened to prot.

Examples In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee prot sonet holdoff-timer 2
```

Related Commands rpr-ieee keepalive-timer

rpr-ieee protection timer fast *rate* {east | west}

Use this command to configure the fast protection timer value for the specified IEEE 802.17b based RPR span.

Syntax Description

Parameter	Description
east	Pertains to configuration for eastbound span traffic.
west	Pertains to configuration for westbound span traffic.
rate	The rate, expressed in milliseconds, at which the fast protection timer sends a protection message. This occurs after a protection event on a particular (east or west) span. Range is 1 to 20 milliseconds.

Defaults   N/A

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   This rate determines how quickly the fast protection timer sends a protection message after a protection event occurs.

In this command, protection can be shortened to prot.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee prot timer fast 5 east
```

Related Commands   rpr-ieee protection timer slow

rpr-ieee protection timer slow *rate* {east | west}

Use this command to configure the slow protection timer value on the specified IEEE 802.17b based RPR span.

Syntax Description

Parameter	Description
east	Pertains to configuration for eastbound span traffic.
west	Pertains to configuration for westbound span traffic.
rate	The rate, expressed in milliseconds, at which the slow protection timer sends a protection message. This occurs after a protection event on a particular (east or west) span. The rate is stated in 100-millisecond increments, with a value of 1 to 10. For example, a rate of **2** would be equivalent to 200 milliseconds.

Defaults   N/A

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   This value determines the sending rate of protection messages between protection events.

In this command, protection can be shortened to prot.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee prot timer slow 2 east
```

Related Commands   rpr-ieee protection timer fast

rpr-ieee protection wtr-timer {interval | never}

Use this command to configure the amount of time that an IEEE 802.17b based RPR span stays in wait-to-restore (WTR) state before normal service is restored on a span. The never argument configures an RPR-IEEE span WTR timer to disallow the WTR function.

Syntax Description

Parameter	Description
interval	The value, expressed in seconds, for the WTR timer to delay in restoring protection to the IEEE 802.17b based RPR span. Range is 0 to 1440 seconds.
never	Never restore protection. Nonrevertive mode.

Defaults

The default value is enabled, and the default interval is 10 seconds.

Command Modes

IEEE 802.17b based RPR interface configuration

Usage Guidelines

This command can be used to moderate an IEEE 802.17 RPR span that repeatedly changes into and out of a protected state. It is provisioned similarly to the WTR timer used in SONET protection schemes. Use the no argument to configure a span not to go through a WTR period before restoring service during a protection event.

In this command, protection can be shortened to prot.b based

Examples

In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee prot wtr-timer 50
```

Related Commands   None

rpr-ieee flag c2 *value*

Use this command to specify the SONET C2 byte path overhead values for both IEEE 802.17b based RPR spans.

Syntax Description	Parameter	Description
	value	The bytes that the path signal uses to flag the IEEE 802.17b based RPR interface for faults. The numeric value range is 0 to 255, and the default is 0 (0x1b) for generic framing procedure (GFP) encapsulation.

Defaults

The default is 0x1B, which indicates GFP encapsulation.

Command Modes

IEEE 802.17b based RPR interface configuration

Usage Guidelines

This value would only be changed if you do not want to specify GFP encapsulation for the span. In practical terms, ths term would almost never be changed.

Examples

In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee flag c2 0
```

Related Commands   None

rpr-ieee pdi holdoff time *interval*

Use this command to configure the interval that occurs before a path defect indication (PDI) is raised on an IEEE 802.17b based RPR span.

Syntax Description	Parameter	Description
	interval	The period, expressed in milliseconds. The range is 100 to 1,000 milliseconds.

Defaults   The default is 100 milliseconds.

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   This command can be used to prevent holdoff timer switching if a PDI is raised on an IEEE 802.17b based RPR span. The PDI is an infrequent occurrence in this kind of span configuration.

Examples   In this example, interface is shortened to int.

```
Router(config)# int prp-ieee 0
Router(config-if)# rpr-ieee pdi holdoff time 100
```

Related Commands   None

[no] rpr-ieee report *alarm*

Use this command to specify which IEEE 802.17b based RPR alarms or signals are logged to the console. Use the no form of the command to disable a particular type of notification.

Syntax Description	**Parameter**	**Description**
	alarm	The SONET/SDH object that is logged to the console. The alarms are as follows:
		all—All link down alarm and signal failures
		encap—Path signal label encapsulation mismatch failure
		pais—Path alarm indication signal failure
		plop—Path loss of pointer failure
		ppdi—Path payload defect indication failure
		pplm—Payload label mismatch path
		prdi—Path remote defect indication failure
		ptim—Path trace indicator mismatch failure
		puneq—Path label equivalent to zero failure
		sd-ber-b3—PBIP BER in excess of SD threshold failure
		sf-ber-b3—PBIP BER in excess of SF threshold failure

Defaults   N/A

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   This command does not determine whether alarms are reported to the TCC2P or whether they are shown in CTC. Conditions that are reported to the CLI console as a result of this command are soaked and cleared per Telcordia GR-253-CORE. Use the no form of the command to disable reporting of a specific alarm/signal.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee report all
```

Related Commands   None

[no] rpr-ieee ri {primary | secondary} peer *peer-MAC-address*

Use this command to set the mode for the IEEE 802.17b based RPR interface and the peer address, or disables the feature. Use the no form to disable the feature.

Syntax Description

Parameter	Description
primary	Single traffic queue mode.
secondary	Dual traffic queue mode.
peer-MAC-address	The MAC of the alternate station. For a primary station, this command enters the MAC address of the secondary station. For a secondary station, this command enters the primary station MAC address.

Command Default   The default is disabled.

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   The peer MAC address is in hexadecimal format. If you change the MAC address, you must repeat this command with the new address.

In this command, interface can be shortened to int. It is not necessary to use the RI term if you are specifically indicating a primary or secondary peer, as in the following example.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee ri mode primary peer 00.24.A4.0E.9A.68
```

Related Commands   rpr-ieee ri {primary | secondary} delay interval

[no] rpr-ieee ri {primary | secondary} delay *interval*

Use this command to change the soak time for a primary card in active mode. Use the no form of this command to set the timer to default.

Syntax Description

Parameter	Description
primary	Single traffic queue mode.
secondary	Dual traffic queue mode.
interval	Interval that the active mode timer waits before switching to the secondary card. Range is 1,000 to 20,000 milliseconds.

Command Default   The default is 3,000 milliseconds.

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   None.

Examples   In this example, interface is shortened to int.

```
router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee ri primary delay 1000
```

Related Commands   rpr-ieee ri mode {primary | secondary}

[no] rpr-ieee shutdown {east | west}

This command is similar to a **rpr-ieee protection request forced-switch {east | west}** command on the span. This command is essentially no different in function; it is an easier way to do the same thing.

Syntax Description

Parameter	Description
east	Specifies a shutdown on the east span of the interface.
west	Specifies a shutdown on the west span of the interface.

Defaults

Default is no shutdown.

Command Modes

IEEE 802.17b based RPR interface configuration

Usage Guidelines

Functionally, there is no difference between this command and the protection request commands.

In this command, shutdown can be shortened to shut.

Note   This command cannot be cleared by transitioning the span state from OOS,DSBLD (Locked,disabled) to IS/IS,AINS/OOS,MT (Unlocked,enabled,automaticInService or Locked,maintenance).

Examples

In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee shut east
```

Related Commands   None

rpr-ieee tx-traffic rate-limit high *rate* [east | west]

Use this command to limit the rate at which Class A1 traffic is transmitted only on a specific (east or west) span.

Syntax Description

Parameter	Description
east	Pertains to configuration for eastbound span traffic.
west	Pertains to configuration for westbound span traffic.
rate	Value, expressed in Mbps, of the maximum rate a station can use to transmit Class A1 traffic onto a particular (east or west) span. (Class A1 traffic is the Class A traffic in excess of A0.) The rate range is 0 to 1161 Mbps.

Defaults   The default is 5 Mbps.

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   Class A1 traffic is used for latency-sensitive traffic, such as voice traffic, that should run at a low rate. This command allows you to control the traffic on a specific span. It applies to only one span. Specifying the span might not be necessary in all cases.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee tx-traffic rate-limit high 10 east
```

Related Commands   rpr-ieee tx-traffic strict

rpr-ieee tx-traffic rate-limit medium [east | west]

rpr-ieee tx-traffic rate-limit low [east | west]

rpr-ieee tx-traffic rate-limit medium *rate* [east | west]

Use this command to limit the rate that Class B-CIR traffic is transmitted on a specific (east or west) span.

Syntax Description

Parameter	Description
east	Pertains to configuration for eastbound span traffic.
west	Pertains to configuration for westbound span traffic.
rate	Value, expressed in Mbps, of the maximum rate a station can use to transmit Class B-CIR traffic onto a particular (east or west) span. The rate range is 0 to 1161 Mbps.

Defaults

The default is 5 Mbps.

Command Modes

IEEE 802.17b based RPR interface configuration

Usage Guidelines

This command is used for adding Class B traffic to a specific span. Traffic added at or below the configured rate (for example, at or below 5 Mbps) is Class B-CIR traffic and is not fairness-eligible. Traffic added above the configured rate (for example, above 5 Mbps) is set as class B-EIR traffic and is fairness-eligible. This command is specific to one span and would only be used if necessary to make this distinction.

Examples

In this example, interface is shortened to int.

```
router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee tx-traffic rate-limit medium 2 east
```

Related Commands

rpr-ieee tx-traffic rate-limit low [rate] {east | west}

rpr-ieee tx-traffic rate-limit high [rate] {east | west}

rpr-ieee tx-traffic rate-limit reserved

rpr-ieee tx-traffic rate-limit reserved *rate* [east | west]

Use this command to limit the transmission rate of Class A0 reserved traffic on a specific (east or west) span.

Syntax Description

Parameter	Description
east	Pertains to configuration for eastbound span traffic.
west	Pertains to configuration for westbound span traffic.
rate	Value, expressed in Mbps, of the total bandwidth a station can use to transmit Class A0 traffic onto a particular (east or west) span. Range is 0 to 1161 Mbps.

Defaults   The default is 0 Mbps.

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   A0 bandwidth is dedicated and cannot be reused for any other traffic, and thus should be assigned cautiously. This command is specific to one span and would only be used if necessary to make a distinction.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee tx-traffic rate-limit reserved 5 east
```

Related Commands   rpr-ieee tx-traffic rate-limit low [rate] {east | west}

rpr-ieee tx-traffic rate-limit medium [rate] {east | west}

rpr-ieee tx-traffic rate-limit high [rate] {east | west}

rpr-ieee tx-traffic rate-limit reserved [rate]

[no] rpr-ieee tx-traffic strict

Use this command to configure either all or none of the traffic added by the node to have the strict order (SO) bit set on or off in the IEEE 802.17b-based RPR header.

Syntax Description   This command has no arguments or keywords.

Defaults   The default is off.

Command Modes   IEEE 802.17b based RPR interface configuration

Usage Guidelines   By default, the SO bit is turned off. You can turn it on in the IEEE 802.17b based RPR interface with this command if you need to accommodate an application with high sensitivity to out-of-order packets, originating at this node. This command is seldom utilized.

Examples   In this example, interface is shortened to int.

```
Router(config)# int rpr-ieee 0
Router(config-if)# rpr-ieee tx-traffic strict
```

Related Commands   None

[no] rpr-ieee tx-traffic preferred-span {RPR Dest Station mac} {east|west}

Use this command to bypass the shortest-path algorithm for a ringlet selection.

You can specify the preferred span for sending data to a specific RPR destination. The destination is identified by its 48-bit RPR MAC address and the preference is specified as 'east' or 'west,' indicating the respective span.

You can use this command only when the destination is reachable via both the East and West spans (in a closed ring).

Syntax Description

Parameter	Description
RPR Dest Station mac	H.H.H 48-bit MAC-address of RPR destination station.
east/west	The preferred span to reach the RPR station mentioned in RPR desination station MAC.

Defaults

None.

Command Modes

IEEE 802.17b-based RPR interface configuration.

Usage Guidelines

None.

Examples

The following command enables you to use east span to reach the RPR Station, 0019.076c.7e22, when West span is the shortest path:

```
Ml-13-61(config-if)# rpr-ieee tx-traffic preferred-span 0019.076c.7e22 east
```

show controller pos *interface-number* [detail]

Use this command to display the status of the POS controller. Use the detail argument to obtain additional SONET and POS information for the interface.

Syntax Description

Parameter	Description
interface-number	Number of the POS interface (0–1)

Defaults   N/A

Command Modes   Privileged execxecutive

Usage Guidelines   This command can be used to help diagnose and isolate POS or SONET problems.

Examples   The following example is an example of POS continuous concatenation circuit (CCAT) show controller output.

```
Router(config)# show controller pos 0
Router# show controller pos 0
Interface POS0
Hardware is Packet/Ethernet over Sonet
Concatenation: CCAT
Circuit state: IS
PATH
    PAIS      = 0         PLOP      = 0         PRDI    = 0          PTIM = 0
  PPLM     = 0        PUNEQ     = 0        PPDI    = 0         PTIU = 0
  BER_SF_B3 = 0        BER_SD_B3 = 0        BIP(B3) = 20         REI = 2
  NEWPTR    = 0        PSE       = 0        NSE     = 0

Active Alarms : None
Demoted Alarms: None
Active Defects: None
Alarms reportable to CLI: PAIS PLOP PUNEQ PTIM PPLM PRDI PPDI BER_SF_B3 BER_SD_B3
VCAT_OOU_TPT LOM SQM
Link state change defects: PAIS PLOP PUNEQ PTIM PPLM PRDI PPDI BER_SF_B3
Link state change time   : 200 (msec)

DOS FPGA channel number  : 0
Starting STS (0 based)   : 0
VT ID (if any) (0 based) : 255
Circuit size          : VC4
RDI Mode              : 1 bit
C2 (tx / rx)          : 0x01 / 0x01
Framing               : SDH

Path Trace
 Mode            : off
 Transmit String :
 Expected String :
 Received String :
 Buffer          : Stable
```

```
 Remote hostname :
 Remote interface:
 Remote IP addr  :

B3 BER thresholds:
SFBER = 1e-4,   SDBER = 1e-7

5 total input packets,  73842 post-HDLC bytes
0 input short packets,  73842 pre-HDLC bytes
0  input long packets , 0  input runt packets
67  input CRCerror packets , 0  input drop packets
0 input abort packets
0 input packets dropped by ucode

0  total output packets, 0  output pre-HDLC bytes
0 output post-HDLC bytes

Carrier delay is 200 msec
```

The following is an example of POS virtual concatenation (VCAT) show controller output.

```
Router# show controller pos 1
Interface POS1
Hardware is Packet/Ethernet over Sonet
Concatenation: VCAT
VCG State: VCG_NORMAL
LCAS Type:NO LCAS
Defect Processing Mode: IMMEDIATE
PDI Holdoff Time: 100 (msec)
Active Alarms : None
Demoted Alarms: None

***************  Member 1  ***************
ESM State: IS
VCG Member State: VCG_MEMBER_NORMAL
  PAIS     = 0        PLOP      = 0        PRDI     = 0        PTIM = 0
  PPLM     = 0        PUNEQ     = 0        PPDI     = 0        PTIU = 0
  BER_SF_B3 = 0       BER_SD_B3 = 0       BIP(B3) = 16         REI = 17
  NEWPTR   = 0        PSE       = 0        NSE      = 0

Active Alarms : None
Demoted Alarms: None
Active Defects: None
Alarms reportable to CLI: PAIS PLOP PUNEQ PTIM PPLM PRDI PPDI BER_SF_B3 BER_SD_B3
VCAT_OOU_TPT LOM SQM
Link state change defects: PAIS PLOP PUNEQ PTIM PPLM PRDI PPDI BER_SF_B3
Link state change time   : 200 (msec)

DOS FPGA channel number  : 2
Starting STS (0 based)   : 3
VT ID (if any) (0 based) : 255
Circuit size             : VC4
RDI Mode                 : 1 bit
C2 (tx / rx)             : 0x01 / 0x01
Framing                  : SDH

Path Trace
 Mode           : off
 Transmit String :
 Expected String :
 Received String :
 Buffer         : Stable
 Remote hostname :
```

```
 Remote interface:
 Remote IP addr  :

B3 BER thresholds:
SFBER = 1e-4,   SDBER = 1e-7

***************  Member 2  ***************
ESM State: IS
VCG Member State: VCG_MEMBER_NORMAL
  PAIS     = 0        PLOP     = 0        PRDI    = 0        PTIM = 0
  PPLM     = 0        PUNEQ    = 0        PPDI    = 0        PTIU = 0
  BER_SF_B3 = 0       BER_SD_B3 = 0       BIP(B3) = 15       REI = 35
  NEWPTR   = 0        PSE      = 0        NSE     = 0

Active Alarms : None
Demoted Alarms: None
Active Defects: None
Alarms reportable to CLI: PAIS PLOP PUNEQ PTIM PPLM PRDI PPDI BER_SF_B3 BER_SD_B3
VCAT_OOU_TPT LOM SQM
Link state change defects: PAIS PLOP PUNEQ PTIM PPLM PRDI PPDI BER_SF_B3
Link state change time   : 200 (msec)

DOS FPGA channel number  : 3
Starting STS (0 based)   : 24
VT ID (if any) (0 based) : 255
Circuit size          : VC4
RDI Mode              : 1 bit
C2 (tx / rx)          : 0x01 / 0x01
Framing               : SDH

Path Trace
 Mode          : off
 Transmit String :
 Expected String :
 Received String :
 Buffer        : Stable
 Remote hostname :
 Remote interface:
 Remote IP addr  :

B3 BER thresholds:
SFBER = 1e-4,   SDBER = 1e-7

13 total input packets,  5031 post-HDLC bytes
0 input short packets,  5031 pre-HDLC bytes
0 input long packets , 0  input runt packets
0 input CRCerror packets , 0  input drop packets
0 input abort packets
0 input packets dropped by ucode

13  total output packets, 5031  output pre-HDLC bytes
5031 output post-HDLC bytes

Carrier delay is 200 msec
```

Related Commands   show interface pos

clear counters

show controller rpr-ieee *interface-number* [detail]

Use this command to display the status of the IEEE 802.17b based RPR controller. Use the detail argument to obtain additional SONET and RPR-IEEE information for the interface.

Syntax Description

Parameter	Description
interface-number	Number of the IEEE 802.17b based RPR interface (0–1)
detail	Greater detail per interface.

Defaults

N/A

Command Modes

Privileged exec

Usage Guidelines

This command can be used to help diagnose and isolate IEEE 802.17b based RPR or SONET problems.

Examples

```
router# show controller rpr-ieee 0 detail
Interface RPR-IEEE0
Hardware is RPR-IEEE channelized SONET
RPR Interface Defects:
    PROT ACTIVE = 0         MAX STATION = 0        MIS-CONF = 0         PASSTHRU = 1
  EXCEED A0 RESERVED RATE: RINGLET 0 = 0         RINGLET 1 = 0
Active Alarms : None
Demoted Alarms: None
East Span   (Ringlet0 TX  Ringlet1 RX)
Framing Mode: GFP
Concatenation: VCAT
East Span Defects:
    FS      = 0        SF        = 0        SD     = 0        MS   = 0
    WTR     = 0        MATCH     = 0        KEEPALIVE = 0
    LFD     = 0        CSF       = 0        UPI    = 0
Active Alarms : None
Demoted Alarms: None
Alarms reportable to CLI: PAIS PLOP PUNEQ PTIM PPLM ENCAP PRDI PPDI BER_SF_B3 BER_SD_B3
VCAT_OOU_TPT LOM SQM

***************  VCG  ***************
VCG State: VCG_NORMAL
LCAS Type: SW-LCAS
Defect Processing Mode: IMMEDIATE
PDI Holdoff Time: 100 (msec)
Active Alarms : None
Demoted Alarms: None
  DEGRADED  = 1        DOWN      = 1        LOA      = 1

***************  Member 0  ***************
ESM State: IS
VCG Member State: VCG_MEMBER_NORMAL
    PAIS      = 0        PLOP      = 0        PRDI    = 0        PTIM = 0
    PPLM      = 0        PUNEQ     = 1        PPDI    = 0        PTIU = 0
    BER_SF_B3 = 0        BER_SD_B3 = 0        BIP(B3) = 30        REI = 0
```

```
         NEWPTR    = 3          PSE        = 0          NSE     = 0          ENCAP = 0
         OOU-TPT   = 1          LOM        = 1          SQM     = 1          OOG   = 0
Active Alarms : None
Demoted Alarms: None
Active Defects: None
DOS FPGA channel number  : 0
Starting STS (0 based)   : 0
VT ID (if any) (0 based) : 255
Circuit size             : STS1
RDI Mode                 : 1 bit
C2 (tx / rx)             : 0x1B / 0x1B
Framing                  : SONET
Path Trace
 Mode            : off
 Transmit String :
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
Expected String :
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
Received String :
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
 Buffer          : Stable
 Remote hostname :
 Remote interface:
 Remote IP addr  :
B3 BER thresholds:
SFBER:1e-4, SDBER:1e-7, berMap:0x00, SFBER:0, SDBER:0
BER 1e-3:
    BIP Sum:0, setTh:2455, clrTh:1003, BurstMap:0x0003, BurstTh:1188
Counts:0, 0,
    Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-4:
BIP Sum:0, setTh:870, clrTh:201, BurstMap:0x0003, BurstTh:405
    Counts:0, 0,
    Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-5:
    BIP Sum:0, setTh:358, clrTh:81, BurstMap:0x000F, BurstTh:71
    Counts:0, 0, 0, 0,
    Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-6:
    BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x07FF, BurstTh:22
    Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-7:
BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
    Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
    Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-8:
    BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
    Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
    Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-9:
    BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
    Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
    Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-10:
```

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```
     BIP Sum:0, setTh:0, clrTh:0, BurstMap:0x0000, BurstTh:0
Counts:
     Over threshold:TRUE, Bursty:FALSE, Clear higher:FALSE, Set level:TRUE

***************  Member 1  ***************
ESM State: IS
VCG Member State: VCG_MEMBER_NORMAL
     PAIS     = 0          PLOP     = 0          PRDI     = 0          PTIM = 0
     PPLM     = 0          PUNEQ    = 1          PPDI     = 0          PTIU = 0
     BER_SF_B3 = 0         BER_SD_B3 = 0         BIP(B3) = 22           REI = 0
     NEWPTR   = 3          PSE      = 0          NSE      = 0          ENCAP = 0
     OOU-TPT  = 1          LOM      = 1          SQM      = 1          OOG  = 0
Active Alarms : None
Demoted Alarms: None
Active Defects: None
DOS FPGA channel number  : 1
Starting STS (0 based)   : 1
VT ID (if any) (0 based) : 255
Circuit size             : STS1
RDI Mode                 : 1 bit
C2 (tx / rx)             : 0x1B / 0x1B
Framing                  : SONET
Path Trace
 Mode             : off
 Transmit String :
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
 Expected String :
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
 Received String :
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00     ................
 Buffer          : Stable
 Remote hostname :
Remote interface:
 Remote IP addr  :
B3 BER thresholds:
 SFBER:1e-4, SDBER:1e-7, berMap:0x00, SFBER:0, SDBER:0
 BER 1e-3:
     BIP Sum:0, setTh:2455, clrTh:1003, BurstMap:0x0003, BurstTh:1188
     Counts:0, 0,
     Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-4:
     BIP Sum:0, setTh:870, clrTh:201, BurstMap:0x0003, BurstTh:405
     Counts:0, 0,
Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-5:
     BIP Sum:0, setTh:358, clrTh:81, BurstMap:0x000F, BurstTh:71
Counts:0, 0, 0, 0,
     Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
BER 1e-6:
BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x07FF, BurstTh:22
     Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-7:
     BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
     Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
```

```
             Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
      BER 1e-8:
         BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
         Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
         Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
      BER 1e-9:
         BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
         Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
         Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
      BER 1e-10:
         BIP Sum:0, setTh:0, clrTh:0, BurstMap:0x0000, BurstTh:0
         Counts:
         Over threshold:TRUE, Bursty:FALSE, Clear higher:FALSE, Set level:TRUE
   Input CMF Packets 0
   Single bit errors    cHec: 0  tHec: 0  eHec: 0
   Multiple bit errors  cHec: 0  tHec: 0  eHec: 0
   Out of sync counts: 0
   1398002919 input packets dropped by ucode
   West Span    (Ringlet0 RX  Ringlet1 TX)
   Framing Mode: GFP
   Concatenation: VCAT
   West Span Defects:
      FS      = 0         SF       = 0        SD      = 0         MS   = 0
      WTR    = 0          MATCH    = 0        KEEPALIVE = 0
      LFD    = 0          CSF      = 0        UPI     = 0
   Active Alarms : None
   Demoted Alarms: None
   Alarms reportable to CLI: PAIS PLOP PUNEQ PTIM PPLM ENCAP PRDI PPDI BER_SF_B3 BER_SD_B3
   VCAT_OOU_TPT LOM SQM

   ***************   VCG   ***************
   VCG State: VCG_NORMAL
   LCAS Type: SW-LCAS
   Defect Processing Mode: IMMEDIATE
   PDI Holdoff Time: 100 (msec)
   Active Alarms : None
   Demoted Alarms: None
    DEGRADED  = 0        DOWN      = 1        LOA       = 0
   ***************  Member 0  ***************
   ESM State: IS
   VCG Member State: VCG_MEMBER_NORMAL
      PAIS     = 0        PLOP     = 0        PRDI    = 0        PTIM = 0
      PPLM     = 0        PUNEQ    = 1        PPDI    = 0        PTIU = 0
      BER_SF_B3 = 0       BER_SD_B3 = 0       BIP(B3) = 24        REI = 0
      NEWPTR   = 3        PSE      = 0        NSE     = 0        ENCAP = 0
      OOU-TPT  = 1        LOM      = 1        SQM     = 1        OOG  = 0
   Active Alarms : None
   Demoted Alarms: None
   Active Defects: None
   DOS FPGA channel number  : 2
   Starting STS (0 based)   : 24
   VT ID (if any) (0 based) : 255
   Circuit size        : STS1
   RDI Mode            : 1 bit
   C2 (tx / rx)        : 0x1B / 0x1B
   Framing             : SONET
   Path Trace
    Mode            : off
    Transmit String :
     00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00      ................
     00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00      ................
     00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00      ................
     00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00      ................
    Expected String :
```

```
         00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
         00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
         00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
         00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
        Received String :
         00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
         00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
         00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
         00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
        Buffer          : Stable
        Remote hostname :
        Remote interface:
        Remote IP addr  :
       B3 BER thresholds:
        SFBER:1e-4, SDBER:1e-7, berMap:0x00, SFBER:0, SDBER:0
        BER 1e-3:
           BIP Sum:0, setTh:2455, clrTh:1003, BurstMap:0x0003, BurstTh:1188
           Counts:0, 0,
           Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
        BER 1e-4:
           BIP Sum:0, setTh:870, clrTh:201, BurstMap:0x0003, BurstTh:405
           Counts:0, 0,
           Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
        BER 1e-5:
           BIP Sum:0, setTh:358, clrTh:81, BurstMap:0x000F, BurstTh:71
           Counts:0, 0, 0, 0,
           Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
        BER 1e-6:
           BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x07FF, BurstTh:22
           Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
           Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
        BER 1e-7:
           BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
           Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
           Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
        BER 1e-8:
           BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
           Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
           Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
        BER 1e-9:
           BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
           Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
           Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
       BER 1e-10:
           BIP Sum:0, setTh:0, clrTh:0, BurstMap:0x0000, BurstTh:0
           Counts:
           Over threshold:TRUE, Bursty:FALSE, Clear higher:FALSE, Set level:TRUE

       ***************  Member 1  ***************
       ESM State: IS
       VCG Member State: VCG_MEMBER_NORMAL
           PAIS      = 0         PLOP      = 0         PRDI     = 0         PTIM = 0
           PPLM      = 0         PUNEQ     = 1         PPDI     = 0         PTIU = 0
           BER_SF_B3 = 0         BER_SD_B3 = 0         BIP(B3)  = 24         REI = 0
           NEWPTR    = 3         PSE       = 0         NSE      = 0         ENCAP = 0
           OOU-TPT   = 1         LOM       = 1         SQM      = 1         OOG  = 0
       Active Alarms : None
       Demoted Alarms: None
       Active Defects: None
       DOS FPGA channel number  : 3
       Starting STS (0 based)   : 25
       VT ID (if any) (0 based) : 255
       Circuit size         : STS1
       RDI Mode             : 1 bit
```

```
C2 (tx / rx)            : 0x1B / 0x1B
Framing                 : SONET
Path Trace
 Mode            : off
Transmit String :
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
 Expected String :
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
 Received String :
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00    ................
 Buffer          : Stable
 Remote hostname :
 Remote interface:
 Remote IP addr  :
B3 BER thresholds:
 SFBER:1e-4, SDBER:1e-7, berMap:0x00, SFBER:0, SDBER:0
 BER 1e-3:
     BIP Sum:0, setTh:2455, clrTh:1003, BurstMap:0x0003, BurstTh:1188
     Counts:0, 0,
     Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-4:
     BIP Sum:0, setTh:870, clrTh:201, BurstMap:0x0003, BurstTh:405
     Counts:0, 0,
     Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-5:
     BIP Sum:0, setTh:358, clrTh:81, BurstMap:0x000F, BurstTh:71
     Counts:0, 0, 0, 0,
     Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-6:
     BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x07FF, BurstTh:22
     Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
     Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
BER 1e-7:
     BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
     Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
     Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-8:
     BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
     Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
     Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-9:
     BIP Sum:0, setTh:399, clrTh:89, BurstMap:0x03FF, BurstTh:25
     Counts:0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
     Over threshold:FALSE, Bursty:TRUE, Clear higher:TRUE, Set level:FALSE
 BER 1e-10:
     BIP Sum:0, setTh:0, clrTh:0, BurstMap:0x0000, BurstTh:0
     Counts:
     Over threshold:TRUE, Bursty:FALSE, Clear higher:FALSE, Set level:TRUE
Input CMF Packets 0
Single bit errors    cHec: 0  tHec: 0  eHec: 0
Multiple bit errors  cHec: 2  tHec: 0  eHec: 0
Out of sync counts: 22
88086836 input packets dropped by ucode
```

Related Commands   show interface rpr-ieee

show interface pos *interface-number*

Use this command to display the status of the POS.

Syntax Description	Parameter	Description
	interface-number	Number of the POS interface (0–1)

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command can be used to help diagnose and isolate POS or SONET/SDH problems.

In this command, interface can be shortened to int.

Examples

```
Gateway# show interface pos 0
POS0 is up, line protocol is up
  Hardware is Packet/Ethernet over Sonet
  Description: foo bar
  MTU 4470 bytes, BW 155520 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, crc 32, loopback not set
  Keepalive set (10 sec)
  Scramble enabled
  Last input 00:00:09, output never, output hang never
  Last clearing of "show interface" counters 05:17:30
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec

     2215 total input packets,  223743 post-HDLC bytes
     0 input short packets,  223951 pre-HDLC bytes
     0  input long packets , 0  input runt packets
     0  input CRCerror packets , 0  input drop packets
     0 input abort packets
     0 input packets dropped by ucode

     0 packets input, 0 bytes
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
             0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort

     2216  total output packets, 223807  output pre-HDLC bytes
     224003 output post-HDLC bytes

     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 applique, 8 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
```

Related Commands   show controller pos

clear counters

show interface rpr-ieee *interface-number*

Use this command to display the status of chosen IEEE 802.17b based RPR interface.

Syntax Description

P a rameter	Description
interface-number	Number of the IEEE 802.17b based RPR interface (0–1)

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command can be used to help diagnose and isolate IEEE 802.17b based RPR interface or SONET/SDH problems.

In this command, interface can be shortened to int.

The rpr-ieee tx-traffic rate-limit high command shows the Class A1 rate range as 0 to 1161 Mbps

Note   If the Class A1transmit rate is set to 5 Mbps , this command does not provide full interface information as it does for other typical values (3, 4, 6, 8, and 10 Mbps).

Examples

```
router# show interface rpr-ieee 0

RPR-IEEE0 is up, line protocol is up
  Hardware is RPR-IEEE Channelized SONET, address is 0005.9a3c.59c0 (bia 0005.9a3c.59c0)
  MTU 1500 bytes, BW 96768 Kbit, DLY 100 usec,
     reliability 255/255, txload 128/255, rxload 128/255
 Encapsulation: RPR-IEEE,
  West Span: loopback not set
  East Span: loopback not set
     MAC passthrough not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  West Span:5 minutes output rate 96361986 bits/sec, 76243 packets/sec
          5 minutes input rate 89824634 bits/sec, 71241 packets/sec
East Span: 5 minutes output rate 71872254 bits/sec, 56867 packets/sec
          5 minutes input rate 95391157 bits/sec, 75475 packets/sec
    3402516571 packets input, 4038397818 bytes
    Received 0 broadcasts (0 IP multicast)
    0 runts, 0 giants, 0 throttles
    3 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog, 0 multicast
    0 input packets with dribble condition detected
    1355393210 packets output, 4104587724 bytes, 0 underruns
    0 output errors, 0 collisions, 1 interface resets
```

```
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier
0 output buffer failures, 0 output buffers swapped out
```

Related Commands   show int pos

show int spr

show ons alarm

Use this command to display all the active alarms on the ML-Series card running the Cisco IOS CLI session.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command can be used to help diagnose and isolate card problems.

Examples

```
router# show ons alarm
Equipment Alarms
Active: CONTBUS-IO-A CTNEQPT-PBWORK

Port Alarms
  POS0  Active: None
  POS1  Active: None
  FastEthernet0  Active: None
  FastEthernet1  Active: None
  FastEthernet2  Active: None
  FastEthernet3  Active: None
  FastEthernet4  Active: None
  FastEthernet5  Active: None
  FastEthernet6  Active: None
  FastEthernet7  Active: None
  FastEthernet8  Active: None
  FastEthernet9  Active: None
  FastEthernet10  Active: None
  FastEthernet11  Active: None

POS0

Active Alarms : None
Demoted Alarms: None

POS1 VCG State: VCG_NORMAL
VCAT Group
Active Alarms : None
Demoted Alarms: None

Member 0
Active Alarms : None
Demoted Alarms: None

Member 1
Active Alarms : None
Demoted Alarms: None
```

Related Commands   show controller pos

show ons alarm defect

show ons alarm failure

show ons alarm defect eqpt

Use this command to display the equipment-layer defects.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command displays the set of active defects for the equipment layer and the possible set of defects that can be set.

Examples
```
router# show ons alarm defect eqpt
Equipment Defects
Active: CONTBUS-IO-B
Reportable to TCC/CLI: CONTBUS-IO-A CONTBUS-IO-B CTNEQPT-PBWORK CTNEQPT-PBPROT EQPT
RUNCFG-SAVENEED ERROR-CONFIG
```

Related Commands   show ons alarm failure

show ons alarm defect port

Use this command to display the port-layer defects.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command displays the set of active defects for the link layer and the possible set of defects that can be set. Note that the TPTFAIL defect can only occur on the POS ports and the CARLOSS defect can only occur on the Ethernet ports.

Examples
```
router# show ons alarm defect port
Port Defects
  POS0
  Active: TPTFAIL
  Reportable to TCC: CARLOSS TPTFAIL
  POS1
  Active: TPTFAIL
  Reportable to TCC: CARLOSS TPTFAIL
  GigabitEthernet0
  Active: None
  Reportable to TCC: CARLOSS TPTFAIL
  GigabitEthernet1
  Active: None
  Reportable to TCC: CARLOSS TPTFAIL
```

Related Commands   show interface

show ons alarm failure

show ons alarm defect pos *interface-number*

Use this command to display the link-layer defects.

Syntax Description

Parameter	Description
interface-number	Number of the interface (0–1)

Defaults

N/A

Command Modes

Privileged exec

Usage Guidelines

This command displays the set of active defects for the POS layer and the possible set of defects that can be set.

Examples

```
router# show ons alarm defect pos 0
POS0
Active Defects: None
Alarms reportable to TCC/CLI: PAIS PRDI PLOP PUNEQ PPLM PTIM PPDI BER_SF_B3 BER_SD_B3
```

Related Commands

show controller pos

show ons alarm failure

show ons alarm defect rpr [interface-number]

Use this command to display the interface defects on the layer.

Syntax Description

Parameter	Description
interface-number	Number of the interface (0–1)

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command displays the set of active defects for the IEEE 802.17b based RPR and the possible set of defects that can be set.

Examples
```
router# show ons alarm defect rpr

RPR-IEEE0
Active: None
Reportable to SC: RPR-PASSTHRU RPR-PROT_ACTIVE RPR-MAX_STATION RPR-MIS_CONF
RPR-RINGLET0_A0_EXCEED_BANDWIDTH RPR-RINGLET1_A0_EXCEED_BANDWIDTH RPR-RI_PEER_MISSING
RPR-RI_FAULT
```

Related Commands   show ons alarm

show ons alarm failure eqpt

Use this command to display the equipment-layer failures.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command displays the active failures for the equipment layer. If an EQPT alarm is present, the board fail defect that was the source of the alarm is displayed.

Examples

```
router# show ons alarm failure eqpt
Equipment
Active Alarms: None
```

Related Commands   show ons alarm defect

show ons alarm failure port

Use this command to display the port-layer failures.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command displays the set of active failures for the link layer.

Examples
```
router# show ons alarm failure port
Port Alarms
  POS0  Active: TPTFAIL
  POS1  Active: TPTFAIL
  GigabitEthernet0  Active: None
  GigabitEthernet1  Active: None
```

Related Commands   show interface

show ons alarm defect

show ons alarm failure pos [*interface-number*]

Use this command to display the link-layer failures.

Syntax Description

Parameter	Description
interface-number	Number of the interface (0–1)

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines This command displays the set of active failures for a specific interface at the POS layer. The display also specifies if an alarm has been demoted, as defined in Telcordia GR-253.

Examples
```
router# show ons alarm failure pos 0
POS0
Active Alarms : None
Demoted Alarms: None
```

Related Commands show controller pos

show ons alarm defect

show ons alarm failure rpr *interface-number*

Use this command to display failures on a specific IEEE 802.17b based RPR interface.

Syntax Description

Parameter	Description
interface-number	Number of the interface (0–1)

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command displays the set of active failures for a specific IEEE 802.17b based RPR interface. The display also specifies if an alarm has been demoted, as defined in Telcordia GR-253-CORE.

Examples
```
router# show ons alarm failure rpr

RPR-IEEE0
Active: None
```

Related Commands   show ons alarm

show ethernet service instance platform

Use this command to display ethernet flow point (EFP) information such as the EFP status and RPR destination of the card.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged EXEC

Usage Guidelines   This command is applicable to ML-MR-10 cards.

Examples
```
Router# show ethernet service instance platform
NOTE: EFP status UP/DOWN is determined based on both ingress and egress interface states
and RPR destination resolving status. EFP status FLAPPING means more than one RPR station
is advertising this specific P2P service and need to check the network level config.
(*) RPR-destination field is valid only for EFPs configured on RPR interfaces
EFP-ID     Intf   EFP-Status RPR-Destination
1          Gi0    DOWN       Not applicable
1          Gi8    DOWN       Not applicable
30         Gi8    DOWN       Not applicable
30         RP0    DOWN       aabb.bbbb.cccc (static)
```

Related Commands   None

show ons qos output interface *interface-number*

Use this command to display the hardware queue association of various traffic classes. This command also displays the operating mode of the associated queue. If "service-policy" is not installed on the interface, all the traffic goes through the default queues.

Syntax Description

Parameter	Description
interface-number	The interface numbers can be assigned as follows: • Gigabit Ethernet: Gn (where *n* = 0-9) • RPR-IEEE: rpr0 • port-channel: portn (where *n* = 1-10)

Defaults   N/A

Command Modes   Privileged EXEC

Usage Guidelines This command is applicable to ML-MR-10 cards on ONS 15454.

Examples   Example of a Gigabit Ethernet interface is as follows:

```
router# show ons qos output interface G0

Class Name     QoS-Group     Mode          HW Queue No.
ou1            0             WRR           0
ou3            2             WRR           1
class-defaul
t              3             WRR           3
```

Example of a port-channel interface is as follows:

```
router# show ons qos output interface port5

Class Name     QoS-Group     Mode          HW Queue No.
ou1            0             WRR           0
ou3            2             WRR           1
ou2            1             WRR           2
class-defaul
t              3             WRR           3
```

Example of an RPR interface is as follows:

```
router# show ons qos output interface rpr0

Class Name     QoS-Group     Mode          HW Queue No.
ou1            0             WRR           C0
ou3            2             WRR           C2
ou2            1             WRR           C1
class-defaul
t              3             WRR           C3
```

Related Commands   show ons queue counters drop interface

show ons queue counters drop interface *interface-number*

This command is used to display drops in queues associated with the interface.

Syntax Description

Parameter	Description
interface-number	The interface numbers can be assigned as follows: • Gigabit Ethernet: Gn (where *n* = 0-9) • RPR-IEEE: rpr0 • port-channel: portn (where *n* = 1-10)

Defaults   N/A

Command Modes   Privileged EXEC

Usage Guidelines This command is applicable to ML-MR-10 cards.

Examples   Example of Gigabit Ethernet interface is as follows:

```
router# show ons queue counters drop interface G9

Q#    GREEN_PKTS_DROP     GREEN_BYTES_DROP
0     0                   0
1     0                   0
2     0                   0
3     584402              44420312


Q#    YELLOW_PKTS_DROP    YELLOW_BYTES_DROP
0      0                  0
1     0                   0
2     0                   0
3     0                   0


Q#    RED_PKTS_DROP       RED_BYTES_DROP
0     0                   0
1     0                   0
2     0                   0
3     122203981           12220398100
```

Example of an RPR interface is as follows:

```
Router# show ons queue counter drop interface RPR-IEEE 0

RPR-IEEE0

Queues 0-7 are for rpr east span, Queues 8-15 are for rpr west span

HW QUEUE NUMBER   GREEN PKTS DROPS   GREEN BYTES DROPS
0 (PTQ)           0                  0
1(STQ)            0                  0
2 (Class-A)       0                  0
3 (Class-B)       0                  0
4 (Class-C0)      0                  0
5 (Class-C1)      0                  0
6 (Class-C2)      0                  0
7 (Class-C3)      0                  0
8 (PTQ)           0                  0
9 (STQ)           0                  0
10 (Class-A)      0                  0
11 (Class-B)      0                  0
12 (Class-C0)     0                  0
13 (Class-C1)     0                  0
14 (Class-C2)     0                  0
15 (Class-C3)     0                  0


HW QUEUE NUMBER   YELLOW PKTS DROPS   YELLOW BYTES DROPS
0 (PTQ)           0                   0
1(STQ)            0                   0
2 (Class-A)       0                   0
3 (Class-B)       0                   0
4 (Class-C0)      0                   0
5 (Class-C1)      0                   0
6 (Class-C2)      0                   0
7 (Class-C3)      0                   0
8 (PTQ)           0                   0
9 (STQ)           0                   0
10 (Class-A)      0                   0
11 (Class-B)      0                   0
12 (Class-C0)     0                   0
13 (Class-C1)     0                   0
14 (Class-C2)     0                   0
15 (Class-C3)     0                   0


HW QUEUE NUMBER   RED PKTS DROPS   RED BYTES DROPS
0 (PTQ)           0                0
1(STQ)            0                0
2 (Class-A)       0                0
3 (Class-B)       0                0
4 (Class-C0)      0                0
```

```
HW QUEUE NUMBER   RED PKTS DROPS      RED BYTES DROPS

5 (Class-C1)      0                   0

6 (Class-C2)      0                   0

7 (Class-C3)      0                   0

8 (PTQ)           0                   0

9 (STQ)           0                   0

10 (Class-A)      0                   0

11 (Class-B)      0                   0

12 (Class-C0)     0                   0

13 (Class-C1)     0                   0

14 (Class-C2)     0                   0

15 (Class-C3)     0                   0
```

Related Commands   show ons queue counters per_q_cntr int

show ons queue counters per_q_cntr int *interface-number*

Use this command to display per queue packet counters, byte counts, and queue buildup for the specified interface.

Syntax Description	Parameter	Description
	interface-number	The interface numbers can be assigned as follows:
		• Gigabit Ethernet: Gn (where n = 0-9)
		• RPR-IEEE: rpr0
		• port-channel: portn (where n = 1-10)

Defaults   N/A

Command Modes   Privileged EXEC

Usage Guidelines   This command is applicable to ML-MR-10 cards.

Examples   Example for a Gigabit Ethernet interface is as follows:

```
router# show ons queue counters per_q_cntr int GigabitEthernet9

Q#    PACKETS TRANSMITTED    BYTES TRANSMITTED    QUEUE BUILDUP/SEC
0     27                     9126                 0
1     0                      0                    0
2     0                      0                    0
3     61156102               4654988836           110
```

Note   Queue Buildup is accumulated for five minutes.

Example for an RPR interface is as follows:

```
router# show ons queue counters per_q_cntr interface RPR-IEEE 0

RPR-IEEE0

Queues 0-7 are for rpr east span, Queues 8-15 are for rpr west span
HW QUEUE NUMBER    PACKETS TRANSMITTED    BYTES TRANSMITTED    QUEUE BUILDUP/SEC
0 (PTQ)            0                      0                    0
1 (STQ)            0                      0                    0
2 (Class-A)        0                      0                    0
3 (Class-B)        0                      0                    0
4 (Class-C0)       0                      0                    0
5 (Class-C1)       0                      0                    0
```

HW QUEUE NUMBER	PACKETS TRANSMITTED	BYTES TRANSMITTED	QUEUE BUILDUP/SEC
6 (Class-C2)	0	0	0
7 (Class-C3)	0	0	0
8 (PTQ)	0	0	0
9 (STQ)	0	0	0
10 (Class-A)	0	0	0
11 (Class-B)	0	0	0
12 (Class-C0)	0	0	0
13 (Class-C1)	0	0	0
14 (Class-C2)	0	0	0
15 (Class-C3)	0	0	0

Note Queue buildup is accumulated for five minutes.

Related Commands show ons queue counters drop interface

show policy-map interface *interface-number*

Use this command to display Quality of Service (QOS) statistics.

Syntax Description

Parameter	Description
interface-number	The interface numbers can be assigned as follows: • GigabitEthernet—0-9 • RPR-IEEE—0 • port-channel—1-10

Defaults   N/A

Command Modes   Privileged EXEC

Usage Guidelines   This command is applicable to ML-MR-10 cards.

✎

Note   When this command is executed, the class maps that are configured under a policy-map applied to an interface are displayed. This command also displays the number of packets dropped from an output queue, determines if the QOS policy is active on the interface, and determines if the traffic meets the requirements to become a member of the class.

Examples   Example of output service policy:

```
Router# show policy-map interface gigabitEthernet 9

  Service-policy output: out

    Class-map: qos1 (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: qos-group 1
      Weighted Fair Queueing
       Bandwidth 30 (%) Max Threshold 5314 (packets)
       (depth/total drops/bytes drops) 0/0/0

    Class-map: qos0 (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: qos-group 0
      Weighted Fair Queueing
       Strict Priority Max Threshold 5314 (packets)
       (depth/total drops/bytes drops) 0/0/0

    Class-map: class-default (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
```

```
      Match: any
      Weighted Fair Queueing
       Bandwidth 20 (%) Max Threshold 5314 (packets)
       (depth/total drops/bytes drops) 0/0/0
```

Example of input service policy:

```
Router# show policy-map interface gigabitEthernet 8

  Service-policy input: in

    Class-map: cos1 (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: cos  1
      police:
        5000000 bps, 125000 limit, 20000000 bps, 500000 extended limit
        conformed 0 packets, 0 bytes; actions:
         transmit
        exceeded 0 packets, 0 bytes; actions:
         set-cos-transmit 4
        violated 0 packets, 0 bytes; actions:
         drop

    Class-map: cos2 (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: cos  2

    Class-map: cos3 (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: cos  3

    Class-map: class-default (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
```

Related Commands   None

show protection interface *interface-name*

Use this command to display the protection configuration and the status of an interface.

Syntax Description

Parameter	Description
interface_name	Name of the Gigabit Ethernet, portchannel, or RPR interface.

Command Modes   Privileged EXEC

Usage Guidelines   This command is applicable to ML-MR-10 cards.

Examples
```
Router# show protection interface GigabitEthernet 0
Interface GigabitEthernet0:
===========================
Group         : 1
Port State    : Active
Port FSM State : Active (Port is Active)
Link not forced down, Link status: UP
```

Related Commands   None

show protection <detail | group> *group_num*

Use this command to display the configuration and status of a protection group. The "detail" option displays all the protection groups and the "group" option displays the protection group you specified.

Syntax Description

Parameter	Description
detail	Displays all protection groups." and "group" should be set in italics and have the description.
group	Displays the specified protection group (1 to 10).
group_num	Numerical value ranging between 1-10.

Command Modes   Privileged EXEC

Usage Guidelines   This command is applicable to ML-MR-10 cards.

Examples
```
Router# show protection group 1
Protection Group: 1
====================
Peer Slot Number   : 12
Group State        : Active
Group FSM State    : Active (Group is Active)
Peer               : Present
RPR0 interface     : UP

Interface          State
---------          -------
GigabitEthernet0    Active
Router#
```

Related Commands   None

show rpr-ieee counters

Use this command to display the various packet/byte counters for each span of the IEEE 802.17b based RPR interface. For definitions of ML-Series card statistics, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 SONET and DWDM Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Syntax Description This command has no arguments or keywords.

Defaults Defaults can vary by each counter.

Command Modes Privileged exec

Usage Guidelines This command is primarily a troubleshooting tool. The same counter data is also available through Simple Network Management Protocol (SNMP) data, the Transaction Language 1 (TL1) interface, and CTC.

Examples
```
router# show rpr-ieee counters
Data Traffic Counters for Interface RPR-IEEE0
WEST Span:
Transit                         Packets         Bytes
Total Low Priority              1162649477      183697386417
Total Med EIR Priority          8936750         1412005236
Total Med CIR+EIR Priority      48436675        7653001286
Total High Priority             17567660        2775677008
Total Multicast                 66039554        10435555023
Total Unicast                   1162614609      183690629992

Host Receive                    Packets         Bytes
Unicast Low Priority            16147390254     2550939336924
Unicast Med EIR Priority        0               0
Unicast Med CIR Priority        0               0
Unicast High Priority           0               0
Multicast Low Priority          1389170314      219486727447
Multicast Med EIR Priority      0               0
Multicast Med CIR Priority      0               0
Multicast High Priority         0               0
Broadcast                       0               N/A

Total Receive                   Packets         Bytes
Unicast Low Priority            17319366142     2736075078618
Unicast Med EIR Priority        0               0
Unicast Med CIR Priority        0               0
Unicast High Priority           0               0
Multicast Low Priority          1389170314      219488627991
Multicast Med EIR Priority      0               0
Multicast Med CIR Priority      0               0
Multicast High Priority         0               0

Host Transmit                   Packets         Bytes
```

```
Unicast Low Priority             18701060600    2954767575274
Unicast Med EIR Priority         0              0
Unicast Med CIR Priority         0              0
Unicast High Priority            0              0
Multicast Low Priority           233345         38183383
Multicast Med EIR Priority       456173838      72075466404
Multicast Med CIR Priority       48446005       7654468790
Multicast High Priority          192647108      30438243064
Broadcast                        0              N/A

Total Transmit                   Packets        Bytes
Unicast Low Priority             19863597488    3138448403894
Unicast Med EIR Priority         0              0
Unicast Med CIR Priority         0              0
Unicast High Priority            0              0
Multicast Low Priority           268795         45108717
Multicast Med EIR Priority       495672023      78316179634
Multicast Med CIR Priority       57382139       9066377962
Multicast High Priority          210212898      33213637884

Traffic Rate (5 Minutes)         packets/sec    bits/sec
Transit Low Priority             0              0
Transit Med EIR Priority         0              0
Transit Med CIR+EIR Priority     0              0
Transit High Priority            0              0
Transit Multicast                0              0
Transit Unicast                  0              0
Host Receive                     71269          90075869
Total Receive                    71269          90076596
Host Transmit                    76333          96478080
Total Transmit                   76332          96478112

Control Frames:                  Received       Transmitted
Control                          26155194       8462107
OAM Echo                         0              0
OAM Flush                        0              0
OAM Org                          0              0
OAM SAS Notify                   0              0
Topology ATD                     1946003        392352
Topology Checksum                4034923        4034891
Topology Protection              20174268       4034864
LRTT                             0              0
FDD                              0              0

Received Errors:
0 input errors, 0 CRC, 0 ignored,
0 framer runts, 0 framer giants, 0 framer aborts,
0 mac runts, 0 mac giants, 0 mac ttl strips,
0 non_we drop, 0 ltb_strict drop, 0 htb_strict drop
0 scff errors, 0 bad addr frames, 0 self sourced frames

EAST Span:
Transit                          Packets        Bytes
Total Low Priority               2561406909     404771885533
Total Med EIR Priority           19279          3064252
Total Med CIR+EIR Priority       35591          5614688
Total High Priority              32164          5113038
Total Multicast                  1389153110     219542479597
Total Unicast                    1172313263     185238866568

Host Receive                     Packets        Bytes
Unicast Low Priority             6599528894     1042960369924
Unicast Med EIR Priority         11972905593    1891155540262
Unicast Med CIR Priority         1826846617     288560828526
```

```
Unicast High Priority               3693986118    583445203252
Multicast Low Priority              42456         9288351
Multicast Med EIR Priority          39498185      6240713230
Multicast Med CIR Priority          8936134       1411909172
Multicast High Priority             17565790      2775394820
Broadcast                           0             N/A

Total Receive                       Packets       Bytes
Unicast Low Priority                7761607024    1226426632416
Unicast Med EIR Priority            11972905600   1891010247740
Unicast Med CIR Priority            1826846617    288584487022
Unicast High Priority               3693986118    583547505106
Multicast Low Priority              42456         9288351
Multicast Med EIR Priority          39498185      6235011598
Multicast Med CIR Priority          8936134       1411909172
Multicast High Priority             17565790      2775394820

Host Transmit                       Packets       Bytes
nicast Low Priority                 6356990298    1004807678284
Unicast Med EIR Priority            7701766350    1216879083616
Unicast Med CIR Priority            1830175717    289167763286
Unicast High Priority               3695903572    583952764376
Multicast Low Priority              233345        38183383
Multicast Med EIR Priority          407714881     64418951198
Multicast Med CIR Priority          96890130      15308640540
Multicast High Priority             192646933     30438215414
Broadcast                           0             N/A

Total Transmit                      Packets       Bytes
Unicast Low Priority                7529228323    1190034710362
Unicast Med EIR Priority            7701766354    1216879084248
Unicast Med CIR Priority            1830175717    289167763286
Unicast High Priority               3695903572    583952764376
Multicast Low Priority              1389383752    219580264474
Multicast Med EIR Priority          407714881     64418951198
Multicast Med CIR Priority          96890130      15308640540
Multicast High Priority             192646933     30438215414

Traffic Rate (5 Minutes)            packets/sec    bits/sec
Transit Low Priority                6062          7654634
Transit Med EIR Priority            0             0
Transit Med CIR+EIR Priority        0             0
Transit High Priority               0             0
Transit Multicast                   6062          7654634
Transit Unicast                     0             0
Host Receive                        75568         95494249
Total Receive                       75568         95512522
Host Transmit                       56933         71958410
Total Transmit                      62992         79613030

Control Frames:                     Received      Transmitted
Control                             26155236      8462109
OAM Echo                            0             0
OAM Flush                           0             0
OAM Org                             0             0
OAM SAS Notify                      0             0
Topology ATD                        1946019       392355
Topology Checksum                   4034954       4034891
Topology Protection                 20174268      4034864
LRTT                                0             0
FDD                                 0             0

Received Errors:
3 input errors, 0 CRC, 0 ignored,
```

```
0 framer runts, 0 framer giants, 0 framer aborts,
0 mac runts, 0 mac giants, 3 mac ttl strips,
0 non_we drop, 0 ltb_strict drop, 0 htb_strict drop 0 scff errors, 0 bad addr frames, 0
self sourced frames
```

Related Commands   show int rpr-ieee interface-number

show rpr-ieee failure rpr-ieee *interface-number*

Use this command to display all inputs used to determine the failure state of each span on the IEEE 802.17b-based RPR interface.

Syntax Description

Parameter	Description
interface-number	IEEE 802.17b based RPR interface number. No space is included between rpr-iee and the interface number (for example, rpr-ieee0).

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command is primarily used for troubleshooting. Some of its information overlaps that obtained with **show rpr-ieee topology** and **show rpr-ieee protection** commands.

Examples
```
router# show rpr-ieee failure rpr-ieee0
 Self Detected Failures Information for Interface RPR-IEEE0
Span WEST:
Reported  Debounced  Current   Stable     Debounce
                state      state      state     for(sec)  delay(sec)
HW missing      IDLE       IDLE       IDLE      403628    0
Layer 1         IDLE       IDLE       IDLE      403628    0
MAC Keepalive   IDLE       IDLE       IDLE      403628    0
Link quality    IDLE       IDLE       IDLE      403628    0
Mate interface  IDLE       IDLE       IDLE      403628    0
Span mismatch   IDLE       IDLE       IDLE      403628    0
Result Self Detect = IDLE
Span EAST:
                Reported   Debounced  Current   Stable    Debounce
                state      state      state     for(sec)  delay(sec)
HW missing      IDLE       IDLE       IDLE      403628    0
Layer 1         IDLE       IDLE       IDLE      403628    0
MAC Keepalive   IDLE       IDLE       IDLE      403628    0
Link quality    IDLE       IDLE       IDLE      403628    0
Mate interface  IDLE       IDLE       IDLE      403628    0
Span mismatch   IDLE       IDLE       IDLE      403628    0
Result Self Detect = IDLE
```

Related Commands   show int rpr-ieee

show rpr-ieee fairness detail

Use this command to display the state information of the fairness state machine for each span of the IEEE 802.17b based RPR interface.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   This command can be used for troubleshooting traffic issues related to fairness weighting or bandwidth usage. It provides deep detail for the fairness state of all IEEE 802.17b based RPR traffic on the interface.

Examples
```
router# show rpr-ieee fairness detail
IEEE 802.17 Fairness on RPR-IEEE0:
   Bandwidth: 96768 kilobits per second
   Station using aggressive rate adjustment.
Westbound Tx (Ringlet 1)
   Weighted Fairness:
     Local Weight: 0  (1)
   Single-Choke Fairness Status:
     Local Congestion:
        Congested? No
          Head? No
        Local Fair Rate:
           Approximate Bandwidth: 64892 Kbps
           25957 normalized bytes per aging interval
51914 bytes per ageCoef aging interval
        Downstream Congestion:
         Congested? No
            Tail? No
          Received Source Address: 0000.0000.0000
Received Fair Rate:
           Approximate Bandwidth: FULL RATE
65535 normalized bytes per aging interval

Reserved Rate:

     0 Kbps
     0 bytes per aging interval
   Unreserved Rate:
     96768 Kbps
     4838 bytes per aging interval
Allowed Rate:
     Approximate Bandwidth: 96000 Kbps
     4800 bytes per aging interval
   Allowed Rate Congested:
     Approximate Bandwidth: 96000 Kbps
     4800 bytes per aging interval
```

```
            TTL to Congestion: 255
            Total Hops Tx: 4
        Advertised Fair Rate:
            Approximate Bandwidth: FULL RATE
65535 normalized bytes per aging interval
            8191 bytes per aging interval
Eastbound Tx (Ringlet 0)
    Weighted Fairness:
        Local Weight: 0  (1)
    Single-Choke Fairness Status:
        Local Congestion:
            Congested? No
                Head? No
            Local Fair Rate:
                Approximate Bandwidth: 0 Kbps
                0 normalized bytes per aging interval
                0 bytes per ageCoef aging interval
        Downstream Congestion:
            Congested? No
                Tail? No
            Received Source Address: 0000.0000.0000
            Received Fair Rate:
                Approximate Bandwidth: FULL RATE
                65535 normalized bytes per aging interval

        Reserved Rate:
0 Kbps
            0 bytes per aging interval
        Unreserved Rate:
            96768 Kbps
            4838 bytes per aging interval
        Allowed Rate:
            Approximate Bandwidth: 96000 Kbps
            4800 bytes per aging interval
        Allowed Rate Congested:
            Approximate Bandwidth: 96000 Kbps
            4800 bytes per aging interval
            TTL to Congestion: 255
            Total Hops Tx: 4
        Advertised Fair Rate:
            Approximate Bandwidth: FULL RATE
            65535 normalized bytes per aging interval
            8191 bytes per aging interval
```

Related Commands   show rpr-ieee fairness history

show rpr-ieee fairness history

Use this command to retrievs performance monitoring information about local and downstream IEEE 802.17b based RPR congestion history over a period of up to 24 hours.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   Use this command to determine whether the local IEEE 802.17b based RPR station has been congested within the past 24 hr and, if so, what the time frame and degree of congestion is. Fairness history aids in managing traffic by allowing you to monitor or diagnose the ring.

Examples
```
router# show rpr-ieee fairness history
IEEE 802.17 Fairness History on RPR-IEEE0 for last 24 hours:
 Congestion information gathered every 900 second(s)
Westbound Tx (Ringlet 1)
 Local Congestion:
No.  Time:      Aging Intervals        Seconds       Percent
                Congested / Total    Congested / Total  Congested
Instantaneous: 0 / 30               0 (ms) / 12 (ms)    0%
   65  08:01:45: 0 / 2250000        0 / 900             0%
   64  07:46:45:0 / 2250000         0 / 900             0%
   63  07:31:45:0 / 2250000         0 / 900             0%
   62  07:16:45:0 / 2250000         0 / 900             0%
   61  07:01:45:0 / 2250000         0 / 900             0%
   60  06:46:45:0 / 2250000         0 / 900             0%
   59  06:31:45:0 / 2250010         0 / 900             0%
   58  06:16:45:0 / 2250000         0 / 900             0%
   57  06:01:45:0 / 2250000         0 / 900             0%
   56  05:46:45:0 / 2250020         0 / 900             0%
   55  05:31:45:0 / 2250000         0 / 900             0%
   54  05:16:45:0 / 2250000         0 / 900             0%
   53  05:01:45:0 / 2250000         0 / 900             0%
   52  04:46:45:0 / 2250000         0 / 900             0%
   51  04:31:45:0 / 2250000         0 / 900             0%
   50  04:16:45:0 / 2250000         0 / 900             0%
   49  04:01:45:0 / 2250000         0 / 900             0%
   48  03:46:45:0 / 2250000         0 / 900             0%
   47  03:31:45: 0 / 2250000        0 / 900             0%
   46  03:16:45:0 / 2250000         0 / 900             0%
   45  03:01:45:0 / 2250000         0 / 900             0%
   44  02:46:45:0 / 2250000         0 / 900             0%
   43  02:31:45: 0 / 2250000        0 / 900             0%
   42  02:16:45:0 / 2250010         0 / 900             0%
   41  02:01:45:0 / 2250000         0 / 900             0%
   40  01:46:45:0 / 2250000         0 / 900             0%
   39  01:31:45: 0 / 2250000        0 / 900             0%
   38  01:16:45:0 / 2250000         0 / 900             0%
```

```
37  01:01:45:0 / 2250000           0 / 900          0%
36  00:46:45:0 / 2250000           0 / 900          0%
35  00:31:45:0 / 2250000           0 / 900          0%
34  00:16:45:0 / 2250000           0 / 900          0%
33  00:01:45:0 / 2250000           0 / 900          0%
32  23:46:45:0 / 2250030           0 / 900          0%
31  23:31:45:0 / 2250000           0 / 900          0%
30  23:16:45:0 / 2250000           0 / 900          0%
29  23:01:45:0 / 2250090           0 / 900          0%
28  22:46:45:0 / 2250000           0 / 900          0%
27  22:31:45:0 / 2250000           0 / 900          0%
26  22:16:45:0 / 2250000           0 / 900          0%
25  22:01:45:0 / 2250000           0 / 900          0%
24  21:46:45:0 / 2250000           0 / 900          0%
23  21:31:45:0 / 2250000           0 / 900          0%
22  21:16:45:0 / 2250050           0 / 900          0%
21  21:01:45:0 / 2250000           0 / 900          0%
20  20:46:45:0 / 2250000           0 / 900          0%
19  20:31:45:0 / 2250000           0 / 900          0%
18  20:16:45:0 / 2250060           0 / 900          0%
17  20:01:45:0 / 2250000           0 / 900          0%
16  19:46:45:0 / 2250000           0 / 900          0%
15  19:31:45:0 / 2250000           0 / 900          0%
14  19:16:45:0 / 2250000           0 / 900          0%
13  19:01:45:0 / 2250000           0 / 900          0%
12  18:46:45:0 / 2250090           0 / 900          0%
11  18:31:45:0 / 2250000           0 / 900          0%
10  18:16:45:0 / 2250000           0 / 900          0%
9   18:01:45: 0 / 2250000          0 / 900          0%
8   17:46:45: 0 / 2250000          0 / 900          0%
7   17:31:45: 0 / 2250000          0 / 900          0%
6   17:16:45: 0 / 2250000          0 / 900          0%
5   17:01:45: 0 / 2250000          0 / 900          0%
4   16:46:45: 0 / 2250000          0 / 900          0%
3   16:31:45: 0 / 2250000          0 / 900          0%
2   16:16:45: 0 / 2250000          0 / 900          0%
1   16:01:45; 0 / 2250000          0 / 900          0%
96  15:46:45:0 / 2250000           0 / 900          0%
95  15:31:45:0 / 2250000           0 / 900          0%
94  15:16:45:0 / 2250000           0 / 900          0%
93  15:01:45:0 / 2250000           0 / 900          0%
92  14:46:45:0 / 2250000           0 / 900          0%
91  14:31:45:0 / 2250000           0 / 900          0%
90  14:16:45:0 / 2250000           0 / 900          0%
89  14:01:45:0 / 2250000           0 / 900          0%
88  13:46:45:0 / 2250000           0 / 900          0%
87  13:31:45:0 / 2250000           0 / 900          0%
86  13:16:45:0 / 2250000           0 / 900          0%
85  13:01:45:0 / 2250000           0 / 900          0%
84  12:46:45:0 / 2250000           0 / 900          0%
83  12:31:45:0 / 2250100           0 / 900          0%
82  12:16:45:0 / 2250000           0 / 900          0%
81  12:01:45:0 / 2250000           0 / 900          0%
80  11:46:45:0 / 2250030           0 / 900          0%
79  11:31:45:0 / 2250000           0 / 900          0%
78  11:16:45:0 / 2250010           0 / 900          0%
77  11:01:45:0 / 2250000           0 / 900          0%
76  10:46:45:0 / 2250000           0 / 900          0%
75  10:31:45:0 / 2250000           0 / 900          0%
74  10:16:45:0 / 2250000           0 / 900          0%
73  10:01:45:0 / 2250000           0 / 900          0%
72  09:46:45:0 / 2250070           0 / 900          0%
71  09:31:45:0 / 2250000           0 / 900          0%
70  09:16:45:0 / 2250000           0 / 900          0%
```

```
 69  09:01:45:0 / 2250000          0 / 900          0%
 68  08:46:45:0 / 2250000          0 / 900          0%
 67  08:31:45:0 / 2250000          0 / 900          0%
Downstream Congestion:
No.  Time    : Aging Intervals     Seconds          Percent
               Congested / Total   Congested / Total Congested
Instantaneous :      0 / 30        0 (ms) / 12 (ms)  0%
 65  08:01:45 :      0 / 2250000          0 / 900    0%
 64  07:46:45 :      0 / 2250000          0 / 900    0%
 63  07:31:45 :      0 / 2250000          0 / 900    0%
 62  07:16:45 :      0 / 2250000          0 / 900    0
 61  07:01:45 :      0 / 2250000          0 / 900    0%
 60  06:46:45 :      0 / 2250000          0 / 900    0%
 59  06:31:45 :      0 / 2250010          0 / 900    0%
 58  06:16:45 :      0 / 2250000          0 / 900    0%
 57  06:01:45 :      0 / 2250000          0 / 900    0%
 56  05:46:45 :      0 / 2250020          0 / 900    0%
 55  05:31:45 :      0 / 2250000          0 / 900    0%
 54  05:16:45 :      0 / 2250000          0 / 900    0%
 53  05:01:45 :      0 / 2250000          0 / 900    0%
 52  04:46:45 :      0 / 2250000          0 / 900    0%
 51  04:31:45 :      0 / 2250000          0 / 900    0%
 50  04:16:45 :      0 / 2250000          0 / 900    0%
 49  04:01:45 :      0 / 2250000          0 / 900    0%
 48  03:46:45 :      0 / 2250000          0 / 900    0%
 47  03:31:45 :      0 / 2250000          0 / 900    0%
 46  03:16:45 :      0 / 2250000          0 / 900    0%
 45  03:01:45 :      0 / 2250000          0 / 900    0%
 44  02:46:45 :      0 / 2250000          0 / 900    0%
 43  02:31:45 :      0 / 2250000          0 / 900    0%
 42  02:16:45 :      0 / 2250010          0 / 900    0%
 41  02:01:45 :      0 / 2250000          0 / 900    0%
 40  01:46:45 :      0 / 2250000          0 / 900    0%
 39  01:31:45 :      0 / 2250000          0 / 900    0%
 38  01:16:45 :      0 / 2250000          0 / 900    0%
 37  01:01:45 :      0 / 2250000          0 / 900    0%
 36  00:46:45 :      0 / 2250000          0 / 900    0%
 35  00:31:45 :      0 / 2250000          0 / 900    0%
 34  00:16:45 :      0 / 2250000          0 / 900    0%
 33  00:01:45 :      0 / 2250000          0 / 900    0%
 32  23:46:45 :      0 / 2250030          0 / 900    0%
 31  23:31:45 :      0 / 2250000          0 / 900    0%
 30  23:16:45 :      0 / 2250000          0 / 900    0%
 29  23:01:45 :      0 / 2250090          0 / 900    0%
 28  22:46:45 :      0 / 2250000          0 / 900    0%
 27  22:31:45 :      0 / 2250000          0 / 900    0%
 26  22:16:45 :      0 / 2250000          0 / 900    0%
 25  22:01:45 :      0 / 2250000          0 / 900    0%
 24  21:46:45 :      0 / 2250000          0 / 900    0%
 23  21:31:45 :      0 / 2250000          0 / 900    0%
 22  21:16:45 :      0 / 2250050          0 / 900    0%
 21  21:01:45 :      0 / 2250000          0 / 900    0%
 20  20:46:45 :      0 / 2250000          0 / 900    0%
 19  20:31:45 :      0 / 2250000          0 / 900    0%
 18  20:16:45 :      0 / 2250060          0 / 900    0%
 17  20:01:45 :      0 / 2250000          0 / 900    0%
 16  19:46:45 :      0 / 2250000          0 / 900    0%
 15  19:31:45 :      0 / 2250000          0 / 900    0%
 14  19:16:45 :      0 / 2250000          0 / 900    0%
 13  19:01:45 :      0 / 2250000          0 / 900    0%
 12  18:46:45 :      0 / 2250090          0 / 900    0%
 11  18:31:45 :      0 / 2250000          0 / 900    0%
 10  18:16:45 :      0 / 2250000          0 / 900    0%
  9  18:01:45 :      0 / 2250000          0 / 900    0%
```

```
 8  17:46:45 :        0 / 2250000           0 / 900        0%
 7  17:31:45 :        0 / 2250000           0 / 900        0%
 6  17:16:45 :        0 / 2250000           0 / 900        0%
 5  17:01:45 :        0 / 2250000           0 / 900        0%
 4  16:46:45 :        0 / 2250000           0 / 900        0%
 3  16:31:45 :        0 / 2250000           0 / 900        0%
 2  16:16:45 :        0 / 2250000           0 / 900        0%
 1  16:01:45 :        0 / 2250000           0 / 900        0%
96  15:46:45 :        0 / 2250000           0 / 900        0%
95  15:31:45 :        0 / 2250000           0 / 900        0%
94  15:16:45 :        0 / 2250000           0 / 900        0%
93  15:01:45 :        0 / 2250000           0 / 900        0%
92  14:46:45 :        0 / 2250000           0 / 900        0%
91  14:31:45 :        0 / 2250000           0 / 900        0%
90  14:16:45 :        0 / 2250000           0 / 900        0%
89  14:01:45 :        0 / 2250000           0 / 900        0%
88  13:46:45 :        0 / 2250000           0 / 900        0%
87  13:31:45 :        0 / 2250000           0 / 900        0%
86  13:16:45 :        0 / 2250000           0 / 900        0%
85  13:01:45 :        0 / 2250000           0 / 900        0%
84  12:46:45 :        0 / 2250000           0 / 900        0%
83  12:31:45 :        0 / 2250100           0 / 900        0%
82  12:16:45 :        0 / 2250000           0 / 900        0%
81  12:01:45 :        0 / 2250000           0 / 900        0%
80  11:46:45 :        0 / 2250030           0 / 900        0%
79  11:31:45 :        0 / 2250000           0 / 900        0%
78  11:16:45 :        0 / 2250010           0 / 900        0%
77  11:01:45 :        0 / 2250000           0 / 900        0%
76  10:46:45 :        0 / 2250000           0 / 900        0%
75  10:31:45 :        0 / 2250000           0 / 900        0%
74  10:16:45 :        0 / 2250000           0 / 900        0%
73  10:01:45 :        0 / 2250000           0 / 900        0%
72  09:46:45 :        0 / 2250070           0 / 900        0%
71  09:31:45 :        0 / 2250000           0 / 900        0%
70  09:16:45 :        0 / 2250000           0 / 900        0%
69  09:01:45 :        0 / 2250000           0 / 900        0%
68  08:46:45 :        0 / 2250000           0 / 900        0%
67  08:31:45 :        0 / 2250000           0 / 900        0%
Eastbound Tx (Ringlet 0)
 Local Congestion:
 No.   Time      : Aging Intervals     Seconds            Percent
                   Congested / Total   Congested / Total  Congested
 Instantaneous:        0 / 30          0 (ms) / 12 (ms)     0%
   65  08:01:45 :        0 / 2250000        0 / 900          0%
   64  07:46:45 :        0 / 2250000        0 / 900          0%
   63  07:31:45 :        0 / 2250000        0 / 900          0%
   62  07:16:45 :        0 / 2250000        0 / 900          0%
   61  07:01:45 :        0 / 2250000        0 / 900          0%
   60  06:46:45 :        0 / 2250000        0 / 900          0%
   59  06:31:45 :        0 / 2250010        0 / 900          0%
   58  06:16:45 :        0 / 2250000        0 / 900          0%
   57  06:01:45 :        0 / 2250000        0 / 900          0%
   56  05:46:45 :        0 / 2250020        0 / 900          0%
   55  05:31:45 :        0 / 2250000        0 / 900          0%
   54  05:16:45 :        0 / 2250000        0 / 900          0%
   53  05:01:45 :        0 / 2250000        0 / 900          0%
   52  04:46:45 :        0 / 2250000        0 / 900          0%
   51  04:31:45 :        0 / 2250000        0 / 900          0%
   50  04:16:45 :        0 / 2250000        0 / 900          0%
   49  04:01:45 :        0 / 2250000        0 / 900          0%
   48  03:46:45 :        0 / 2250000        0 / 900          0%
   47  03:31:45 :        0 / 2250000        0 / 900          0%
   46  03:16:45 :        0 / 2250000        0 / 900          0%
   45  03:01:45 :        0 / 2250000        0 / 900          0%
```

```
44  02:46:45 :     0 / 2250000    0 / 900           0%
43  02:31:45 :     0 / 2250000    0 / 900           0%
42  02:16:45 :     0 / 2250010    0 / 900           0%
41  02:01:45 :     0 / 2250000    0 / 900           0%
40  01:46:45 :     0 / 2250000    0 / 900           0%
39  01:31:45 :     0 / 2250000    0 / 900           0%
38  01:16:45 :     0 / 2250000    0 / 900           0%
37  01:01:45 :     0 / 2250000    0 / 900           0%
36  00:46:45 :     0 / 2250000    0 / 900           0%
35  00:31:45 :     0 / 2250000    0 / 900           0%
34  00:16:45 :     0 / 2250000    0 / 900           0%
33  00:01:45 :     0 / 2250000    0 / 900           0%
32  23:46:45 :     0 / 2250030    0 / 900           0%
31  23:31:45 :     0 / 2250000    0 / 900           0%
30  23:16:45 :     0 / 2250000    0 / 900           0%
29  23:01:45 :     0 / 2250090    0 / 900           0%
28  22:46:45 :     0 / 2250000    0 / 900           0%
27  22:31:45 :     0 / 2250000    0 / 900           0%
26  22:16:45 :     0 / 2250000    0 / 900           0%
25  22:01:45 :     0 / 2250000    0 / 900           0%
24  21:46:45 :     0 / 2250000    0 / 900           0%
23  21:31:45 :     0 / 2250000    0 / 900           0%
22  21:16:45 :     0 / 2250050    0 / 900           0%
21  21:01:45 :     0 / 2250000    0 / 900           0%
20  20:46:45 :     0 / 2250000    0 / 900           0%
19  20:31:45 :     0 / 2250000    0 / 900           0%
18  20:16:45 :     0 / 2250060    0 / 900           0%
17  20:01:45 :     0 / 2250000    0 / 900           0%
16  19:46:45 :     0 / 2250000    0 / 900           0%
15  19:31:45 :     0 / 2250000    0 / 900           0%
14  19:16:45 :     0 / 2250000    0 / 900           0%
13  19:01:45 :     0 / 2250000    0 / 900           0%
12  18:46:45 :     0 / 2250090    0 / 900           0%
11  18:31:45 :     0 / 2250000    0 / 900           0%
10  18:16:45 :     0 / 2250000    0 / 900           0%
9  18:01:45 :      0 / 2250000    0 / 900           0%
8  17:46:45 :      0 / 2250000    0 / 900           0%
7  17:31:45 :      0 / 2250000    0 / 900           0%
6  17:16:45 :      0 / 2250000    0 / 900           0%
5  17:01:45 :      0 / 2250000    0 / 900           0%
4  16:46:45 :      0 / 2250000    0 / 900           0%
3  16:31:45 :      0 / 2250000    0 / 900           0%
2  16:16:45 :      0 / 2250000    0 / 900           0%
1  16:01:45 :      0 / 2250000    0 / 900           0%
96  15:46:45 :     0 / 2250000    0 / 900           0%
95  15:31:45 :     0 / 2250000    0 / 900           0%
94  15:16:45 :     0 / 2250000    0 / 900           0%
93  15:01:45 :     0 / 2250000    0 / 900           0%
92  14:46:45 :     0 / 2250000    0 / 900           0%
91  14:31:45 :     0 / 2250000    0 / 900           0%
90  14:16:45 :     0 / 2250000    0 / 900           0%
89  14:01:45 :     0 / 2250000    0 / 900           0%
88  13:46:45 :     0 / 2250000    0 / 900           0%
87  13:31:45 :     0 / 2250000    0 / 900           0%
86  13:16:45 :     0 / 2250000    0 / 900           0%
85  13:01:45 :     0 / 2250000    0 / 900           0%
84  12:46:45 :     0 / 2250000    0 / 900           0%
83  12:31:45 :     0 / 2250100    0 / 900           0%
82  12:16:45 :     0 / 2250000    0 / 900           0%
81  12:01:45 :     0 / 2250000    0 / 900           0%
80  11:46:45 :     0 / 2250030    0 / 900           0%
79  11:31:45 :     0 / 2250000    0 / 900           0%
78  11:16:45 :     0 / 2250010    0 / 900           0%
77  11:01:45 :     0 / 2250000    0 / 900           0%
```

```
76  10:46:45 :      0 / 2250000     0 / 900          0%
75  10:31:45 :      0 / 2250000     0 / 900          0%
74  10:16:45 :      0 / 2250000     0 / 900          0%
73  10:01:45 :      0 / 2250000     0 / 900          0%
72  09:46:45 :      0 / 2250070     0 / 900          0%
71  09:31:45 :      0 / 2250000     0 / 900          0%
70  09:16:45 :      0 / 2250000     0 / 900          0%
69  09:01:45 :      0 / 2250000     0 / 900          0%
68  08:46:45 :      0 / 2250000     0 / 900          0%
67  08:31:45 :      0 / 2250000     0 / 900          0%

Downstream Congestion:
No.  Time    : Aging Intervals   Seconds            Percent
               Congested / Total  Congested / Total  Congested
Instantaneous :     0 / 30          0 (ms) / 12 (ms)  0%
65  08:01:45 :      0 / 2250000           0 / 900     0%
64  07:46:45 :      0 / 2250000           0 / 900     0%
63  07:31:45 :      0 / 2250000           0 / 900     0%
62  07:16:45 :      0 / 2250000           0 / 900     0%
61  07:01:45 :      0 / 2250000           0 / 900     0%
60  06:46:45 :      0 / 2250000           0 / 900     0%
59  06:31:45 :      0 / 2250010           0 / 900     0%
58  06:16:45 :      0 / 2250000           0 / 900     0%
57  06:01:45 :      0 / 2250000           0 / 900     0%
56  05:46:45 :      0 / 2250020           0 / 900     0%
55  05:31:45 :      0 / 2250000           0 / 900     0%
54  05:16:45 :      0 / 2250000           0 / 900     0%
53  05:01:45 :      0 / 2250000           0 / 900     0%
52  04:46:45 :      0 / 2250000           0 / 900     0%
51  04:31:45 :      0 / 2250000           0 / 900     0%
50  04:16:45 :      0 / 2250000           0 / 900     0%
49  04:01:45 :      0 / 2250000           0 / 900     0%
48  03:46:45 :      0 / 2250000           0 / 900     0%
47  03:31:45 :      0 / 2250000           0 / 900     0%
46  03:16:45 :      0 / 2250000           0 / 900     0%
45  03:01:45 :      0 / 2250000           0 / 900     0%
44  02:46:45 :      0 / 2250000           0 / 900     0%
43  02:31:45 :      0 / 2250000           0 / 900     0%
42  02:16:45 :      0 / 2250010           0 / 900     0%
41  02:01:45 :      0 / 2250000           0 / 900     0%
40  01:46:45 :      0 / 2250000           0 / 900     0%
39  01:31:45 :      0 / 2250000           0 / 900     0%
38  01:16:45 :      0 / 2250000           0 / 900     0%
37  01:01:45 :      0 / 2250000           0 / 900     0%
36  00:46:45 :      0 / 2250000           0 / 900     0%
35  00:31:45 :      0 / 2250000           0 / 900     0%
34  00:16:45 :      0 / 2250000           0 / 900     0%
33  00:01:45 :      0 / 2250000           0 / 900     0%
32  23:46:45 :      0 / 2250030           0 / 900     0%
31  23:31:45 :      0 / 2250000           0 / 900     0%
30  23:16:45 :      0 / 2250000           0 / 900     0%
29  23:01:45 :      0 / 2250090           0 / 900     0%
28  22:46:45 :      0 / 2250000           0 / 900     0%
27  22:31:45 :      0 / 2250000           0 / 900     0%
26  22:16:45 :      0 / 2250000           0 / 900     0%
25  22:01:45 :      0 / 2250000           0 / 900     0%
24  21:46:45 :      0 / 2250000           0 / 900     0%
23  21:31:45 :      0 / 2250000           0 / 900     0%
22  21:16:45 :      0 / 2250050           0 / 900     0%
21  21:01:45 :      0 / 2250000           0 / 900     0%
20  20:46:45 :      0 / 2250000           0 / 900     0%
19  20:31:45 :      0 / 2250000           0 / 900     0%
18  20:16:45 :      0 / 2250060           0 / 900     0%
17  20:01:45 :      0 / 2250000           0 / 900     0%
```

```
16  19:46:45 :       0 / 2250000       0 / 900      0%
15  19:31:45 :       0 / 2250000       0 / 900      0%
14  19:16:45 :       0 / 2250000       0 / 900      0%
13  19:01:45 :       0 / 2250000       0 / 900      0%
12  18:46:45 :       0 / 2250090       0 / 900      0%
11  18:31:45 :       0 / 2250000       0 / 900      0%
10  18:16:45 :       0 / 2250000       0 / 900      0%
 9  18:01:45 :       0 / 2250000       0 / 900      0%
 8  17:46:45 :       0 / 2250000       0 / 900      0%
 7  17:31:45 :       0 / 2250000       0 / 900      0%
 6  17:16:45 :       0 / 2250000       0 / 900      0%
 5  17:01:45 :       0 / 2250000       0 / 900      0%
 4  16:46:45 :       0 / 2250000       0 / 900      0%
 3  16:31:45 :       0 / 2250000       0 / 900      0%
 2  16:16:45 :       0 / 2250000       0 / 900      0%
 1  16:01:45 :       0 / 2250000       0 / 900      0%
96  15:46:45 :       0 / 2250000       0 / 900      0%
95  15:31:45 :       0 / 2250000       0 / 900      0%
94  15:16:45 :       0 / 2250000       0 / 900      0%
93  15:01:45 :       0 / 2250000       0 / 900      0%
92  14:46:45 :       0 / 2250000       0 / 900      0%
91  14:31:45 :       0 / 2250000       0 / 900      0%
90  14:16:45 :       0 / 2250000       0 / 900      0%
89  14:01:45 :       0 / 2250000       0 / 900      0%
88  13:46:45 :       0 / 2250000       0 / 900      0%
87  13:31:45 :       0 / 2250000       0 / 900      0%
86  13:16:45 :       0 / 2250000       0 / 900      0%
85  13:01:45 :       0 / 2250000       0 / 900      0%
84  12:46:45 :       0 / 2250000       0 / 900      0%
83  12:31:45 :       0 / 2250100       0 / 900      0%
82  12:16:45 :       0 / 2250000       0 / 900      0%
81  12:01:45 :       0 / 2250000       0 / 900      0%
80  11:46:45 :       0 / 2250030       0 / 900      0%
79  11:31:45 :       0 / 2250000       0 / 900      0%
78  11:16:45 :       0 / 2250010       0 / 900      0%
77  11:01:45 :       0 / 2250000       0 / 900      0%
76  10:46:45 :       0 / 2250000       0 / 900      0%
75  10:31:45 :       0 / 2250000       0 / 900      0%
74  10:16:45 :       0 / 2250000       0 / 900      0%
73  10:01:45 :       0 / 2250000       0 / 900      0%
72  09:46:45 :       0 / 2250070       0 / 900      0%
71  09:31:45 :       0 / 2250000       0 / 900      0%
70  09:16:45 :       0 / 2250000       0 / 900      0%
69  09:01:45 :       0 / 2250000       0 / 900      0%
68  08:46:45 :       0 / 2250000       0 / 900      0%
67  08:31:45 :       0 / 2250000       0 / 900      0%
```

Related Commands   show rpr-ieee fairness

show rpr-ieee protection

Use this command to display the protection state of the local station, along with brief overview of the station's neighbors, timer configuration, and self-detected failures that might contribute to the current state.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   Use this command to show the current protection status on the ring.

In this command, protection can be shortened to prot.

Examples
```
router# show rpr-ieee protection

 Protection Information for Interface RPR-IEEE0
 MAC Addresses
   West Span (Ringlet 0 RX) neighbor 000b.fcff.9d34
   East Span (Ringlet 1 RX) neighbor 0013.1991.1fc0
   Station MAC address 0005.9a3c.59c0
 TP frame sending timers:
fast timer: 10 msec
    slow timer: 1x100 msec (100 msec)
Protection holdoff timers:
    L1 Holdoff                        Keepalive Detection
    West Span  0x10 msec (  0 msec)    West Span   5 msec
    East Span  0x10 msec (  0 msec)    East Span   5 msec
 Configured protection mode: STEERING
 Protection Status
   Ring is IDLE
   Protection WTR period is 10 sec. (timer is inactive)
    Self Detected Requests             Remote Requests
    West Span IDLE                     West Span IDLE
    East Span IDLE                     East Span IDLE
    Distant Requests
    East Span IDLE                     West Span IDLE
   West Span Failures: none
   East Span Failures: none
```

Related Commands   None

show rpr-ieee rate detail

Use this command to display the configured rate limits for each service class of traffic.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   Use this command to show the configured rates for Class A1, B-EIR, B-CIR, and reserved traffic.

Examples
```
router# show rpr-ieee rate detail
 Rate Limit Information for Interface RPR-IEEE0
 West Span:
   Reserved Bandwidth (Class A0): 0 Mbps
   Rate Limiter High (Class A1): 20 Mbps
   Rate Limiter Medium (Class B-CIR): 10 Mbps
   Rate Limiter Low (Class B-EIR, C): full
 East Span:
   Reserved Bandwidth (Class A0): 0 Mbps
   Rate Limiter High (Class A1): 20 Mbps
   Rate Limiter Medium (Class B-CIR): 10 Mbps
   Rate Limiter Low (Class B-EIR, C): full
 Service Type: Relaxed
Idle Shaper is Enabled
   Transmit at 500 packets per million when PTQ vacancy above 18432 bytes
   Transmit at 250 packets per million when PTQ vacancy below 18432 bytes
```

Related Commands   None

show rpr-ieee topology detail

Use this command to display topology information gathered by the station from the protection and ATD messages received on either span of an IEEE 802.17b based RPR ring.

Syntax Description   This command has no arguments or keywords.

Defaults   N/A

Command Modes   Privileged exec

Usage Guidelines   Use this command to obtain an extremely detailed status of the ring, including details about each station's configuration.

Examples
```
router# show rpr-ieee topology detail
802.17 Topology Display
  RX ringlet0->West spanRX ringlet1->East span
Number of nodes on
    ringlet0: 5ringlet1: 5
=======================================================================
Local Station Topology Info
=======================================================================
Topology entry:
  Station MAC address: 0005.9a3c.59c0
   West Span (Outer ringlet RX) neighbor 000b.fcff.9d34
   East Span (Inner ringlet RX) neighbor 0013.1991.1fc0
  Ring Topology: CLOSED (STABLE)
  Containment Active: NO
  A0 class reserved rate:
    ringlet0: 0 (mbps)ringlet1: 0 (mbps)
  Ringlet reserved rate:
    ringlet0: 0 (mbps)ringlet1: 0 (mbps)
  Ringlet unreserved rate:
    ringlet0: 96 (mbps)ringlet1: 96 (mbps)
  Ringlet effective unreserved rate:
    ringlet0: 95.9 (mbps)ringlet1: 95.9 (mbps)
  Advertised Protection requests:
    ringlet0: IDLEringlet1: IDLE
  Active Edges:
    ringlet0: NO ringlet1: NO
  Configured protection mode: STEERING
  Jumbo preference: NOT SET (ring doesn't support JUMBOS)
  Is revertive: YES
  Measured LRTT: 0
  Sequence Number: 3
ATD INFO:
  ATD timer: 1 sec
  Station Name: ML100T-481
  A0 reserved Bandwidth:
    ringlet0: 0 mbpsringlet1: 0 mbps
  SAS enabled: YES
```

```
    Weight:
        ringlet0: 1ringlet1: 1
    Secondary Mac Addresses:
          MAC 1: 0000.0000.0000 (UNUSED)
          MAC 2: 0000.0000.0000 (UNUSED)


=========================================================================
Topology Map for Outer ringlet
=========================================================================


=========================================================================
Topology entry at Index 1 on ringlet 0:
  Station MAC address: 000b.fcff.9d34
  Valid on ringlet0: YES
  Entry reachable: YES
  Advertised Protection requests:
      ringlet0: IDLEringlet1: IDLE
  Active Edges:
      ringlet0: NO ringlet1: NO
  Preferred protection mode: STEERING
  Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
  Measured LRTT: 0
  Sequence Number: 3
ATD INFO:
  Station Name: ML100X-491
  A0 reserved Bandwidth:
      ringlet0: 0 mbpsringlet1: 0 mbps
  SAS enabled: YES
  Weight:
      ringlet0: 1ringlet1: 1
  Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
        MAC 2: 0000.0000.0000 (UNUSED)
=========================================================================

Topology entry at Index 2 on ringlet 0:
  Station MAC address: 0011.2130.b568
  Valid on ringlet0: YES
  Entry reachable: YES
  Advertised Protection requests:
      ringlet0: IDLEringlet1: IDLE
  Active Edges:
      ringlet0: NO ringlet1: NO
  Preferred protection mode: STEERING
  Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
  Measured LRTT: 0
  Sequence Number: 3
ATD INFO:
  Station Name: ML1000-491
  A0 reserved Bandwidth:
      ringlet0: 0 mbpsringlet1: 0 mbps
  SAS enabled: YES
  Weight:
      ringlet0: 1ringlet1: 1
  Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
        MAC 2: 0000.0000.0000 (UNUSED)
=========================================================================

Topology entry at Index 3 on ringlet 0:
  Station MAC address: 0005.9a39.7630
  Valid on ringlet0: YES
  Entry reachable: YES
  Advertised Protection requests:
```

```
        ringlet0: IDLEringlet1: IDLE
    Active Edges:
        ringlet0: NO ringlet1: NO
    Preferred protection mode: STEERING
    Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
    Measured LRTT: 0
    Sequence Number: 3
ATD INFO:
    Station Name: ML1000-492
    A0 reserved Bandwidth:
        ringlet0: 0 mbpsringlet1: 0 mbps
    SAS enabled: YES
    Weight:
        ringlet0: 1ringlet1: 1
    Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
        MAC 2: 0000.0000.0000 (UNUSED)
=======================================================================

Topology entry at Index 4 on ringlet 0:
    Station MAC address: 0013.1991.1fc0
    Valid on ringlet0: YES
    Entry reachable: YES
    Advertised Protection requests:
        ringlet0: IDLEringlet1: IDLE
    Active Edges:
        ringlet0: NO ringlet1: NO
    Preferred protection mode: STEERING
    Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
    Measured LRTT: 0
    Sequence Number: 3
ATD INFO:
    Station Name: ML100T-482
    A0 reserved Bandwidth:
        ringlet0: 0 mbpsringlet1: 0 mbps
    SAS enabled: YES
    Weight:
        ringlet0: 1ringlet1: 1
    Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
        MAC 2: 0000.0000.0000 (UNUSED)
=======================================================================

Topology entry at Index 5 on ringlet 0:
    Station MAC address: 0005.9a3c.59c0
      Valid on ringlet0: YES
    Entry reachable: YES
    Advertised Protection requests:
        ringlet0: IDLEringlet1: IDLE
    Active Edges:
        ringlet0: NO ringlet1: NO
    Preferred protection mode: STEERING
    Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
    Measured LRTT: 0
    Sequence Number: 3
ATD INFO:
    Station Name: ML100T-481
    A0 reserved Bandwidth:
        ringlet0: 0 mbpsringlet1: 0 mbps
    SAS enabled: YES
    Weight:
        ringlet0: 1ringlet1: 1
    Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
```

```
                MAC 2: 0000.0000.0000 (UNUSED)
==========================================================================
Topology Map for Inner ringlet
==========================================================================


==========================================================================
Topology entry at Index 1 on ringlet 1:
  Station MAC address: 0013.1991.1fc0
  Valid on ringlet1: YES
  Entry reachable: YES
  Advertised Protection requests:
      ringlet0: IDLEringlet1: IDLE
  Active Edges:
      ringlet0: NO ringlet1: NO
  Preferred protection mode: STEERING
  Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
  Measured LRTT: 0
  Sequence Number: 3
ATD INFO:
  Station Name: ML100T-482
  A0 reserved Bandwidth:
      ringlet0: 0 mbpsringlet1: 0 mbps
  SAS enabled: YES
  Weight:
      ringlet0: 1ringlet1: 1
  Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
        MAC 2: 0000.0000.0000 (UNUSED)
==========================================================================

Topology entry at Index 2 on ringlet 1:
  Station MAC address: 0005.9a39.7630
  Valid on ringlet1: YES
  Entry reachable: YES
  Advertised Protection requests:
      ringlet0: IDLEringlet1: IDLE
  Active Edges:
      ringlet0: NO ringlet1: NO
  Preferred protection mode: STEERING
  Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
  Measured LRTT: 0
  Sequence Number: 3
ATD INFO:
  Station Name: ML1000-492
  A0 reserved Bandwidth:
      ringlet0: 0 mbpsringlet1: 0 mbps
  SAS enabled: YES
  Weight:
      ringlet0: 1ringlet1: 1
  Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
        MAC 2: 0000.0000.0000 (UNUSED)
==========================================================================

Topology entry at Index 3 on ringlet 1:
  Station MAC address: 0011.2130.b568
  Valid on ringlet1: YES
  Entry reachable: YES
  Advertised Protection requests:
      ringlet0: IDLEringlet1: IDLE
  Active Edges:
      ringlet0: NO ringlet1: NO
  Preferred protection mode: STEERING
  Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
```

```
    Measured LRTT: 0
    Sequence Number: 3
ATD INFO:
  Station Name: ML1000-491
  A0 reserved Bandwidth:
      ringlet0: 0 mbpsringlet1: 0 mbps
  SAS enabled: YES
  Weight:
      ringlet0: 1ringlet1: 1
  Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
        MAC 2: 0000.0000.0000 (UNUSED)
========================================================================
Topology entry at Index 4 on ringlet 1:
  Station MAC address: 000b.fcff.9d34
  Valid on ringlet1: YES
  Entry reachable: YES
  Advertised Protection requests:
      ringlet0: IDLEringlet1: IDLE
  Active Edges:
      ringlet0: NO ringlet1: NO
  Preferred protection mode: STEERING
  Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
  Measured LRTT: 0
  Sequence Number: 3
ATD INFO:
  Station Name: ML100X-491
  A0 reserved Bandwidth:
      ringlet0: 0 mbpsringlet1: 0 mbps
  SAS enabled: YES
  Weight:
      ringlet0: 1ringlet1: 1
  Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
        MAC 2: 0000.0000.0000 (UNUSED)
========================================================================

Topology entry at Index 5 on ringlet 1:
  Station MAC address: 0005.9a3c.59c0
  Valid on ringlet1: YES
  Entry reachable: YES
  Advertised Protection requests:
      ringlet0: IDLEringlet1: IDLE
  Active Edges:
      ringlet0: NO ringlet1: NO
  Preferred protection mode: STEERING
  Jumbo preference: NOT SET (ring doesn't supports JUMBOS)
  Measured LRTT: 0
  Sequence Number: 3
ATD INFO:
  Station Name: ML100T-481
  A0 reserved Bandwidth:
      ringlet0: 0 mbpsringlet1: 0 mbps
  SAS enabled: YES
  Weight:
      ringlet0: 1ringlet1: 1
  Secondary Mac Addresses:
        MAC 1: 0000.0000.0000 (UNUSED)
        MAC 2: 0000.0000.0000 (UNUSED)
```

Related Commands   None

[no] shutdown

Use this command to place a POS or IEEE 802.17b based RPR interface in pass-through mode. This command has no arguments or keywords. Use the no form of this command to reverse the shutdown.

Defaults   The default is not shut down.

Command Modes   POS or IEEE 802.17b based RPR interface configuration

Usage Guidelines   For GFP and high-level data link control (HDLC) modes, the POS shutdown causes a path alarm indication signal (AIS-P) to be sent to the peer. In RPR-IEEE mode, AIS-P is not inserted toward the peer.

In this command, shutdown can be shortened to shut.

Examples   In this example, interface is shortened to int.

```
Router(config)# int pos 0
Router(config-if)# shut
```

Related Commands   None

spr-intf-id *shared-packet-ring-number*

Use this command to assign the POS interface to the SPR interface.

Syntax Description

Parameter	Description
shared-packet-ring-number	The only valid shared-packet-ring-number (SPR number) is 1.

Defaults   N/A

Command Modes   POS interface configuration

Usage Guidelines
- The SPR number must be 1, which is the same SPR number assigned to the SPR interface.
- The members of the SPR interface must be POS interfaces.
- An SPR interface is configured similarly to a EtherChannel (port-channel) interface. Instead of using the **channel-group** command to define the members, you use the **spr-intf-ID** command. Like port-channel, you then configure the SPR interfaces instead of the POS interface.

✎
Note   A similar command, the **spr drpri-id [0 | 1]** command, is not supported in R7.2.

Examples   In this example, interface is shortened to int. An ML-Series card POS interface is being assigned to an SPR interface with a shared-packet-ring-number of 1:

```
Router(config)# interface pos 0
Router(config-if)# spr-intf-id 1
```

Related Commands   interface spr 1

spr station-id

spr wrap

[no] spr load-balance {auto | port-based}

Use this command to specify the Cisco proprietary RPR load-balancing scheme for unicast packets.

Syntax Description

Parameter	Description
auto	The default **auto** option balances the load based on the MAC addresses or source and destination addresses of the IP packet.
port-based	The **port-based** load balancing option maps even ports to the POS 0 interface and odd ports to the POS 1 interface.

Defaults   The default setting is auto.

Command Modes   SPR interface configuration

Examples   The following example configures an SPR interface to use port-based load balancing:

```
Router(config)# interface spr 1
Router(config-if)# spr load-balance port-based
```

Related Commands interface spr 1

spr station-id *station-id-number*

Use this command to configure a station ID.

	Parameter	Description
Syntax Description	*station-id-number*	The user must configure a different number for each SPR interface that attaches to the Cisco proprietary RPR. Valid station ID numbers range from 1 to 254.

Defaults   N/A

Command Modes   SPR interface configuration

Usage Guidelines   The different ML-Series cards attached to the RPR all have the same interface type and number, spr1. The station ID helps to differentiate the SPR interfaces.

Examples   The following example sets an ML-Series card SPR station ID to 100:

```
Router(config)# interface spr 1
Router(config-if)# spr station-id 100
```

Related Commands   interface spr 1

spr-intf-id

spr wrap

spr wrap {immediate | delayed}

Use this command to set the Cisco proprietary RPR wrap mode to either wrap traffic the instant it detects a link state change or to wrap traffic after the carrier delay, which gives the SONET protection time to register the defect and declare the link down.

Syntax Description

Parameter	Description
immediate	Wraps Cisco proprietary RPR traffic the instant it detects a link state change.
delayed	Wraps Cisco proprietary RPR traffic after the carrier delay time expires.

Defaults The default setting is immediate.

Command Modes SPR interface configuration

Usage Guidelines Immediate should be used if Cisco proprietary RPR is running over unprotected SONET/SDH circuits. Delayed should be run for SONET protected circuits, such as BLSR or path protection, or SDH protected circuits, such as subnetwork connection protection (SNCP) or multiplex section-shared protection ring (MS-SPRing).

Examples The following example sets an ML-Series card to delayed:

```
Router(config)# interface spr 1
Router(config-if)# spr wrap delayed
```

Related Commands interface spr 1

spr-intf-id

spr station-id

[no] xconnect [*destination*] [*vc-id*] [encapsulation mpls]

Use this command at customer-edge (CE) or service provider-edge customer-located equipment (PE-CLE) ingress and egress Ethernet ports, or at dot1Q VLAN subinterfaces with a destination and virtual connection identifier (VC ID) to route Layer 2 packets over a specified point-to-point VC by using Ethernet over multiprotocol label switching (EoMPLS). Use the no form of this command on both edge devices to delete the VC.

Note   This command replaces the **mpls l2transport route** command.

Syntax Description

destination	The *destination* label distribution protocol (LDP) IP address of the remote provider edge device. The IP address cannot be an IP address on the route on which the command is entered. The *destination* is required for the standard form of the command. It cannot be used with the no form of the command.
vc-id	Assign a *vc-id* for the virtual connection between the two peer provider edge devices. The range is 1 to 4294967295. The *vc-id* is required for the standard form of the command. It cannot be used with the no form of the command.
encapsulation mpls	Specify the MPLS data encapsulation method.

Note   Though visible in the command-line help strings, the **pw-class** keyword is not supported.

Defaults   No point-to-point connections are configured by default.

Command Modes   Interface configuration

Usage Guidelines   An MPLS VC runs across an MPLS cloud to connect Ethernet interfaces on two PE-CLE devices at each edge of the service provider network. You must enter the command at the PE device at each edge of the service provider network to establish a bidirectional virtual connection, which consists of two unidirectional label-switched paths (LSPs). A VC is not established if it is not properly defined from both ends.

For the *destination* parameter, specify the LDP IP address of the other PE-CLE device; do not specify the IP address of the device on which you are entering the command.

The *vc-id* must be unique for each pair of provider edge devices. Therefore, in large networks, you should keep track of the VC ID assignments to ensure that a VC ID is not assigned more than once.

Examples   This example shows how to establish an EoMPLS tunnel between the PE1 VLAN 3 interfaces and the PE2 VLAN 4 interface. PE1 has IP address 10.0.0.1/32 that PE2 discovers through routing and PE2 has IP address 20.0.0.1/32 that PE1 discovers through routing.

At the PE1 interface:

```
Switch(config)# interface vlan 3
Switch(config-if)# xconnect 20.0.0.1 123 encapsulation mpls
```

At the PE2 interface:

```
Switch(config)# interface vlan 4
Switch(config-if)# xconnect 10.0.0.1 123 encapsulation mpls
```

Related Commands   **show** mpls l2transport route

■   **[no] xconnect [destination] [vc-id] [encapsulation mpls]**