



## Interface Configuration Commands

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Use the following commands to configure and monitor the interfaces on the Cisco ONS 15540 ESPx.

# clock rate

To configure the signal clock rate without an associated protocol on a transparent interface, use the **clock rate** command. To disable the clock rate, use the **no** form of this command.

**clock rate** *value*

**no clock rate**

<b>Syntax Description</b>	<i>value</i>	Specifies the signal rate. The range is 16000 to 2500000 kHz.
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<b>Defaults</b>	Disabled
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<b>Command Modes</b>	Interface configuration
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<b>Command History</b>	This table includes the following release-specific history entries:
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- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

## Usage Guidelines

You can configure the signal clock rate with either the **cdl defect-indication force hop-endpoint** command or the **clock rate** command, but not both. Protocol monitoring cannot be enabled on the interface when the **clock rate** command is configured because no protocol is specified.

[Table 3-1](#) lists the clock rates for well-known protocols supported by the 2.5-Gbps transponder module.

**Table 3-1** Supported Clock Rates for Well-Known Protocols

Well-Known Protocol	Clock Rate (in kbps)
DS3	44,736
DV1 <sup>1</sup> in ADI <sup>2</sup> mode	270,000
E3	34,368
ESCON	200,000
Fibre Channel (1 Gbps)	1,062,500

**Table 3-1** Supported Clock Rates for Well-Known Protocols (continued)

Well-Known Protocol	Clock Rate (in kbps)
Fibre Channel (2 Gbps)	2,125,000
FICON (1 Gbps)	1,062,500
FICON (2 Gbps)	2,125,000
Gigabit Ethernet	1,250,000
ISC compatibility mode (ISC-1)	1,062,500
ISC peer mode (ISC-3)	2,125,000
SONET OC-1	51,840
SONET OC-3/SDH STM-1	155,520
SONET OC-12/SDH STM-4	622,080
SONET OC-24	933,120
SONET OC-48/SDH STM-16	2,488,320

1. DV = digital video
2. ADI = Asynchronous Digital Interface

**Note**

Error-free transmission of some D1 video signals (defined by the SMPTE 259M standard) and test patterns (such as Matrix SDI) cannot be guaranteed by the Cisco ONS 15500 Series because of the pathological pattern in D1 video. This well-known limitation is usually overcome by the D1 video equipment vendor, who uses a proprietary, second level of scrambling. No standards exist at this time for the second level of scrambling.

The following ranges are not supported by the SM transponder module hardware and the MM transponder module hardware:

- 851,000 kbps to 999,999 kbps
- 1,601,000 kbps to 1,999,999 kbps

For clock rate values outside of these unsupported ranges and not listed in [Table 3-1](#), contact your SE (systems engineer) at Cisco Systems.

**Caution**

The selectable transceivers supported by the extended range transponder modules yield optimal performance at the data rates for which the transceivers are explicitly designed. Configuring a protocol encapsulation or clock rate outside of the clock rate specifications for the transceiver could result in suboptimal performance, depending on the transceiver characteristics (such as receiver sensitivity and output power).

For information on transceiver specifications, refer to the [Cisco ONS 15540 ESPx Hardware Installation Guide](#).

**Examples**

The following example shows how to configure the signal clock rate on an interface.

```
Switch# configure terminal
Switch(config)# interface transparent 10/0/0
```

## ■ clock rate

```
Switch(config-if)# clock rate 125000
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">clear performance history</a>	Specifies the protocol encapsulation for a transparent interface.
<a href="#">show interfaces</a>	Displays interface information.

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# cdl defect-indication force hop-endpoint

To configure an interface as an end-of-hop, use the **cdl defect-indication force hop-endpoint** command. To disable end-of-hop configuration on an interface, use the **no** form of this command.

**cdl defect-indication force hop-endpoint**

**no cdl defect-indication force hop-endpoint**

**Syntax Description** This command has no other arguments or keywords.

**Defaults** Disabled

**Command Modes** Interface configuration

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV2	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** Use this command to configure the interface as a hop endpoint for in-band message channel defect indications.

**Examples** The following example shows how to enable hop endpoint on an interface.

```
Switch# configure terminal
Switch(config)# interface waveethernetphy 8/0
Switch(config-if)# cdl defect-indication force hop-endpoint
```

Related Commands	Command	Description
	<a href="#">debug cdl defect-indication</a>	Initiates debugging of defect indication on in-band message channel capable interfaces.
	<a href="#">show cdl defect-indication</a>	Displays defect indication information on in-band message channel capable interfaces.
	<a href="#">show interfaces</a>	Displays interface information.

# cdl enable

To enable in-band message channel functionality on an interface, use the **cdl enable** command. To disable in-band message channel functionality, use the **no** form of this command.

**cdl enable**

**no cdl enable**

**Syntax Description** *This command has no other arguments or keywords.*

**Defaults** Disabled

**Command Modes** Interface configuration

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV2	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** This command is used to enable and disable the in-band message channel on tengigethernetphy interfaces when connected to a Cisco ONS 15530 or any other system that supports the in-band message channel. When the in-band message channel is enabled on a tengigethernetphy interface, ethernetdcc slot/subcard/1 becomes available for configuration.

**Examples** The following example shows how to enable in-band message channel on an interface.

```
Switch# configure terminal
Switch(config)# interface tengigethernetphy 10/0
Switch(config-if)# cdl enable
```

Related Commands	Command	Description
	<a href="#">cdl defect-indication force hop-endpoint</a>	Configures an interface as an end-of-hop.
	<a href="#">clear performance history</a>	Specifies the in-band message channel flow identifier value.
	<a href="#">debug cdl defect-indication</a>	Initiates debugging of the defect indication on in-band message channel capable interfaces.
	<a href="#">show cdl defect-indication</a>	Displays defect indication information on in-band message channel capable interfaces.
	<a href="#">show interfaces</a>	Displays interface information.



# clear performance history

To clear and reset the performance history counters, use the **clear performance history** command.

**clear performance history** [*interface*]

<b>Syntax Description</b>	<i>interface</i> Specifies the interface on which the command is to be executed.								
<b>Defaults</b>	Clears all the performance history counters (the current counter, all 15-minute history counters, and the 24-hour counter) for all Cisco ONS 15540 ESPx interfaces.								
<b>Command Modes</b>	EXEC and privileged EXEC.								
<b>Command History</b>	This table includes the following release-specific history entries: <table border="1"> <thead> <tr> <th>SV-Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.2(29)SV</td> <td>This command was introduced.</td> </tr> </tbody> </table>	SV-Release	Modification	12.2(29)SV	This command was introduced.				
SV-Release	Modification								
12.2(29)SV	This command was introduced.								
<b>Usage Guidelines</b>	Use this command to clear and reset the performance history counters.								
<b>Examples</b>	The following example shows how to clear the performance history counters for a transparent interface. <pre>Switch# clear performance history transparent 8/0/0 Reset performance history on interface?[confirm] Switch#</pre>								
<b>Related Commands</b>	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><a href="#">show performance</a></td> <td>Displays the performance history counters for the specified interface.</td> </tr> <tr> <td><b>clear counters</b></td> <td>Clears all the interface counters.</td> </tr> <tr> <td><b>auto-sync counters interface</b></td> <td>Enables the automatic synchronization of the performance history counters and interface counters.</td> </tr> </tbody> </table>	Command	Description	<a href="#">show performance</a>	Displays the performance history counters for the specified interface.	<b>clear counters</b>	Clears all the interface counters.	<b>auto-sync counters interface</b>	Enables the automatic synchronization of the performance history counters and interface counters.
Command	Description								
<a href="#">show performance</a>	Displays the performance history counters for the specified interface.								
<b>clear counters</b>	Clears all the interface counters.								
<b>auto-sync counters interface</b>	Enables the automatic synchronization of the performance history counters and interface counters.								

# encapsulation

To configure the protocol encapsulation for the client signal on a transparent interface, use the **encapsulation** command. To disable the encapsulation for the client signal, use the **no** form of this command.

```
encapsulation { fastethernet |
  fddi |
  gigabitethernet |
  escon |
  sysplex { clo | etr | isc { compatibility | peer [1g | 2g]} }
  ficon { 1g | 2g } |
  sonet { oc3 | oc12 | oc48 } |
  sdh { stm-1 | stm-4 | stm-16 } |
  fibrechannel { 1g | 2g } [ofc { enable | disable } ] }
```

**no encapsulation**

Syntax Description		
<b>fastethernet</b>		Specifies Fast Ethernet encapsulation. The OFC (open fiber control) safety protocol is disabled.
<b>fddi</b>		Specifies FDDI encapsulation. OFC is disabled.
<b>gigabitethernet</b>		Specifies Gigabit Ethernet encapsulation. OFC is disabled.
<b>escon</b>		Specifies ESCON encapsulation. OFC is disabled.
<b>sysplex</b>		Specifies Sysplex encapsulation.
	<b>Note</b>	This encapsulation is only supported on multimode transponder modules.
<b>clo</b>		Specifies CLO (control link oscillator) timing. OFC is disabled. Forward laser control is enabled on both the transparent and wave interfaces.
<b>etr</b>		Specifies ETR (external timer reference) timing. OFC is disabled.
<b>isc</b>		Specifies ISC (InterSystem Channel) encapsulation.
<b>compatibility</b>		Specifies ISC compatibility mode (ISC1) with rate of 1.0625 Gbps. OFC is enabled.
<b>peer [1g   2g]</b>		Specifies ISC peer mode (ISC3) and rate. OFC is disabled. The default rate is 2.1 Gbps.
<b>ficon { 1g   2g }</b>		Specifies FICON encapsulation and rate. OFC is disabled.
<b>sonet { oc3   oc12   oc48 }</b>		Specifies SONET encapsulation and rate. OFC is disabled.
<b>sdh { stm-1   stm-4   stm-16 }</b>		Specifies SDH encapsulation and rate. OFC is disabled.
<b>fibrechannel rate { 1g   2g }</b>		Specifies Fibre Channel encapsulation and rate.
<b>ofc { enable   disable }</b>		Enables or disables OFC. The default OFC state is disabled. (Optional)

## Defaults

Encapsulation is disabled.

The default rate for ISC peer mode is **2g**.

See the “Syntax Description” section for the default OFC state.

**Command Modes** Interface configuration

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
12.1(12c)EV1	Added support for 2-Gbps FC and FICON.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
12.2(23)SV	Added support for 1-Gbps ISC links peer mode.
S-Release	Modification
12.2(22)S	This command was integrated in this release.
12.2(25)S	Added support for 1-Gbps ISC links peer mode.

**Usage Guidelines**

Use this command to provide clocking for the client signal for specific protocols. The protocol encapsulation must be configured for the transparent interface to allow signal monitoring to be enabled with the **monitor enable** command. The following protocol encapsulation types are supported in 3R mode plus protocol monitoring:

- ESCON (200 Mbps) SM and MM
- Fibre Channel (1 Gbps and 2 Gbps) SM
- FICON (Fiber Connection) (1 Gbps and 2 Gbps) SM
- Gigabit Ethernet (1250 Mbps) SM
- ISC (InterSystem Channel) links compatibility mode
- ISC links peer mode (1 Gbps and 2 Gbps)
- SDH (Synchronous Digital Hierarchy) STM-1 SM and MM
- SDH STM-4 SM and MM
- SDH STM-16 SM
- SONET OC-3 SM and MM
- SONET OC-12 SM and MM
- SONET OC-48 SM

The following protocol encapsulation types are supported in 3R mode without protocol monitoring:

- Fast Ethernet
- FDDI

- Sysplex CLO (control link oscillator)
- Sysplex ETR (external timer reference)

To specify the signal clock rate without specifying a protocol, use the **clock rate** command.

Sysplex CLO and Sysplex ETR are supported outside the nominal range of the clock rates for the Cisco ONS 15540 ESPx because of the nature of the traffic type.

**Note**

Encapsulation cannot be changed without first disabling monitoring using the **no monitor enable** command.

Removing the encapsulation on a transparent interface with the **no encapsulation** command does not turn off the laser. To turn off the transmit laser to the client equipment, use the **show performance** command.

**Caution**

The selectable transceivers supported by the extended range transponder modules yield optimal performance at the data rates for which the transceivers are explicitly designed. Configuring a protocol encapsulation or clock rate outside of the clock rate specifications for the transceiver could result in suboptimal performance, depending on the transceiver characteristics (such as receiver sensitivity and output power).

For information on transceiver specifications, refer to the [Cisco ONS 15540 ESPx Hardware Installation Guide](#).

**Examples**

The following example shows how to configure SONET encapsulation at a rate of OC-3 on a transparent interface.

```
Switch# configure terminal
Switch(config)# interface transparent 2/0/0
Switch(config-if)# encapsulation sonet oc3
```

**Related Commands**

Command	Description
<b>clock rate</b>	Configures a clock rate on a transparent interface.
<b>monitor enable</b>	Enables signal monitoring for certain protocol encapsulations.
<b>show interfaces</b>	Displays interface information.
<b>show performance</b>	Disables an interface.

# laser control forward enable

To enable forward laser control, which automatically shuts down transponder lasers when a Loss of Light failure occurs, use the **laser control forward enable** command. To disable this feature, use the **no** form of this command.

**laser control forward enable**

**no laser control forward**

**Syntax Description** This command has no other arguments or keywords.

**Defaults** Disabled

**Command Modes** Interface configuration

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** Use this command to enable forward laser control on both the client side and trunk side interfaces of a transponder module and on the OSC wave interfaces. If configured on a transparent interface, the client side laser of the transponder shuts down when the trunk side receiver detects a Loss of Light. If configured on the wave interface, the trunk side laser of the transponder shuts down when client side receiver detects a Loss of Light.



**Note**

To function correctly, configure forward laser control on both the client side and trunk side interfaces on a transponder module. [CSCdu42900](#) For y-cable protection, configure forward laser control on both the client side and trunk side interfaces on both transponder modules.

Automatically shutting down the laser prevents the transmission of unreliable data. However, when the laser is shut down, fault isolation is more difficult.

This feature is convenient for configurations, such as Sysplex, where signal protection is performed in the client hardware and quick laser shutdown causes quick path switchover.

**Caution**

Do not configure forward laser control when OFC is enabled. Combining these features interferes with the OFC protocol.

**Examples**

The following example shows how to enable forward laser control on a transparent interface.

```
Switch# configure terminal
Switch(config)# interface transparent 3/2/0
Switch(config-if)# laser control forward enable
```

The following example shows how to enable forward laser control on a wave interface.

```
Switch# configure terminal
Switch(config)# interface wave 2/0
Switch(config-if)# laser control forward enable
```

**Related Commands**

Command	Description
<a href="#">show interfaces</a>	Displays interface information.

# laser control safety enable

To enable laser safety control on a wave interface, use the **laser control safety enable** command. To disable laser safety control, use the **no** form of this command.

**laser control safety enable**

**no laser control safety**

**Syntax Description** This command has no other arguments or keywords.

**Defaults** Disabled

**Command Modes** Interface configuration

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** Use this command to automatically shut down the lasers transmitting to the trunk fiber when a Loss of Light failure occurs, such as a trunk fiber cut. Enable laser safety control on all wave interfaces in the shelf, including the OSC wave interface.

Laser safety control uses the same protocol state machine as OFC, but not the same timing. Laser safety control uses the pulse interval and pulse durations timers compliant with the ALS (automatic laser shutdown) standard (ITU-T G.664).



**Note**

This command is not supported on waveethernetphy interfaces.



**Caution**

Do not configure laser safety control when OFC is enabled. Combining these features interferes with the OFC safety protocol operation.

**Caution**


---

Use this command only with line card protected configurations or unprotected configurations.

---

**Examples**

The following example shows how to enable laser safety control on a wave interface.

```
Switch# configure terminal
Switch(config)# interface wave 2/0
Switch(config-if)# laser control safety enable
```

**Related Commands**

Command	Description
<a href="#">show interfaces</a>	Displays interface information.



# laser frequency

To select the desired channel frequency on a transparent transponder, use the **laser frequency** command. To revert to the default value, use the **no** form of the command.

**laser frequency** *value*

**no laser frequency**

<b>Syntax Description</b>	value	Laser frequency in GHz.
---------------------------	-------	-------------------------

**Defaults** The lower frequency for the interface is the default.

**Command Modes** Interface configuration

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** The transparent transponders can be tuned to support one of two channel frequencies. The **laser frequency** command allows the user to change the laser tuning from the default lower frequency to the higher frequency, and back.

The change from one frequency to another takes about 10 seconds. Do not expect traffic to transit the system until the frequency selection completes. Also, successive **laser frequency** commands are ignored until after the new channel frequency stabilizes.

**Examples** The following example shows how to select the channel frequency on a transponder wave interface.

```
Switch(config)# interface wave 3/0
Switch(config-if)# laser frequency 192300
```

■ laser frequency

Related Commands	Command	Description
	<a href="#">show connect</a>	Displays optical connection information.
	<a href="#">show interfaces</a>	Displays interface information.

# laser shutdown

To turn off the laser on an interface supporting the in-band message channel, use the **laser shutdown** command. To turn the laser on, use the **no** form of this command.

**laser shutdown**

**no laser shutdown**

**Syntax Description** This command has no other arguments or keywords.

**Defaults** The laser is on.

**Command Modes** Interface configuration

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV2	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** Use this command to explicitly shut down the laser. The interface **shutdown** command disables data traffic; however, the control traffic carried over in-band message channel continues to flow. Use this command to turn off the laser and stop all traffic.



**Note** The interface **shutdown** command must precede the **laser shutdown** command. To bring the interface administratively up, the **no laser shutdown** must precede the **no shutdown** command.



**Note** If you turn off the laser on an interface and save the configuration to the startup configuration, the interface comes up with the laser turned off when the system boots.



**Note** A 10-Gbps laser on a waveethernetphy interface must warm up for 2 minutes before carrying traffic.

---

**Examples**

The following example shows how to turn off the laser on a waveethernetphy interface.

```
Switch(config)# interface waveethernetphy 4/0
Switch(config-if)# laser shutdown
```

---

**Related Commands**

Command	Description
<a href="#">show interfaces</a>	Displays interface information.

---

# loopback

To configure a signal loopback on transponder module interfaces, use the **loopback** command. To disable interface loopback, use the **no** form of this command.

**loopback**

**no loopback**

**Syntax Description** This command has no other arguments or keywords.

**Defaults** Disabled

**Command Modes** Interface configuration

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** Use this command to configure internal loopbacks on transponder module interfaces. For any given transponder module, you can configure an internal loopback on either the client side interface or the trunk side interface, but not both simultaneously.

An internal loopback differs from an external loopback where you simply run a cable from the output of a given interface to its input. Using the **loopback** command, you can set loopbacks *without* the need to change the cabling. This is useful for remote testing, configuration, and troubleshooting.



**Note**

If you enable loopback on an interface and save the configuration to NVRAM, the interface comes up with loopback enabled when the system boots.

**Examples** The following example shows how to enable loopback on a transparent interface.

```
Switch# configure terminal
```

```
Switch(config)# interface transparent 2/0/0
Switch(config-if)# loopback
```

The following example shows how to enable loopback on a wave interface.

```
Switch# configure terminal
Switch(config)# interface wave 10/0
Switch(config-if)# loopback
```

---

**Related Commands**

Command	Description
<a href="#">show interfaces</a>	Displays interface information.

---

# monitor enable

To monitor signal quality and protocol error statistics in the transponder module, use the **monitor enable** command. To disable monitoring, use the **no** form of this command.

**monitor enable**

**no monitor**

**Syntax Description** This command has no other arguments or keywords.

**Defaults** Disabled

**Command Modes** Interface configuration

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release and added monitoring support for 2-Gbps Fibre Channel and FICON.
12.2(22)SV	Added monitoring support for 2-Gbps ISC links peer mode.
12.2(23)SV	Added monitoring support for 1-Gbps ISC links peer mode.
S-Release	Modification
12.2(22)S	This command was integrated in this release.
12.2(25)S	Added monitoring support for 1-Gbps ISC links peer mode.

**Usage Guidelines** Use this command to collect error statistics on signal quality in the transponder module. The following protocols can be monitored:

- ESCON (200 Mbps) SM and MM
- Fibre Channel (1 Gbps and 2 Gbps) SM
- FICON (Fiber Connection) (1 Gbps and 2 Gbps) SM
- Gigabit Ethernet (1250 Mbps) SM
- ISC (InterSystem Channel) links compatibility mode
- ISC links peer mode (1 Gbps and 2 Gbps)

- SDH (Synchronous Digital Hierarchy) STM-1 SM and MM
- SDH STM-4 SM and MM
- SDH STM-16 SM
- SONET OC-3 SM and MM
- SONET OC-12 SM and MM
- SONET OC-48 SM

When monitoring is enabled on the transparent interface, it is automatically enabled on the corresponding wave interface.

For GE, FC, and FICON traffic, the Cisco ONS 15540 ESPx monitors the following conditions:

- CVRD (code violation running disparity) error counts
- Loss of Sync
- Loss of Lock
- Loss of Light

For SONET errors, the Cisco ONS 15540 ESPx monitors the SONET section overhead only, not the SONET line overhead. Specifically, the Cisco ONS 15540 ESPx monitors the B1 byte and the framing bytes. The system can detect the following defect conditions:

- Loss of Light
- Loss of Lock (when the clock cannot be recovered from the received data stream)
- Severely Errored Frame
- Loss of Frame

For SONET performance, the system monitors the B1 byte, which is used to compute the four SONET section layer performance monitor parameters:

[The source of the acronym definitions is the Telcordia SONET standard spec, GR-253-CORE, Issue 3, September 2000, page 6-110,](#)

- SEFS-S (section severely errored framing seconds)
- CV-S (section code violations)
- ES-S (section errored seconds)
- SES-S (section severely errored seconds)

For ISC traffic, the system monitors the following conditions:

- CVRD error counts
- Loss of CDR (clock data recovery) Lock
- Loss of Light



#### Note

Before monitoring can be enabled, you must configure protocol encapsulation for the interface using the **cdl defect-indication force hop-endpoint** command.

Monitoring signal error statistics is useful for isolating system and network faults.

#### Examples

The following example shows how to monitor error counters on a transparent interface.



```
Switch# configure terminal
Switch(config)# interface transparent 2/0/0
Switch(config-if)# monitor enable
```

---

**Related Commands**

Command	Description
<a href="#">clear performance history</a>	Configures the encapsulation of the client signal on the transparent interface.
<a href="#">show interfaces</a>	Displays interface information.

## optical threshold power receive

To set the receive optical threshold power for alarms on wdm, thru, and wavepatch interfaces, use the **optical threshold power receive** command. To revert to the default values, use the **no** form of the command.

**optical threshold power receive** {low | high} {alarm | warning} *value* [severity {critical | major | minor | not alarmed | not reported}]

**no optical threshold power receive**

Syntax Description		
low		Specifies a low threshold value.
high		Specifies a high threshold value.
alarm		Indicates that an alarm is raised when the threshold is exceeded.
warning		Indicates that a warning is reported when the threshold is exceeded. The severity of a warning threshold must be less than the severity of the corresponding alarm threshold.
<i>value</i>		Sets the threshold value in tenths of a dBm. The range is –80 to –280 for 2.5-Gbps transponder modules and –80 to –220 for 10-GE transponder modules.
severity		Specifies the severity for the threshold.
critical		Indicates the threshold level for service-affecting conditions that require immediate corrective action.
major		Indicates the threshold level for hardware or software conditions that cause serious service disruption, or malfunctioning or failure of important hardware. These problems require the immediate attention and response of a technician to restore or maintain system capability. The urgency is less than in critical situations because of a lesser immediate or impending effect on service or system performance. This is the default value for alarms.
minor		Indicates the threshold level for problems that do not have a serious effect on service, or for problems in hardware that do not affect the essential operation of the system.
not alarmed		Indicates the threshold level for negligible discrepancies, and that do not cause alarm notifications to be generated. The information for these events is retrievable from the network element. This is the default value for warnings.
not reported		Indicates the threshold level for negligible discrepancies, and that do not cause notifications to be generated. The information for these events is retrievable from the network element.

### Defaults

Alarm severity: **major**

Warning severity: **not alarmed**

Interface Type	Low Alarm	Low Warning	High Warning	High Alarm
Wavepatch on a 2.5-Gbps transponder module	-28 dBm	-24 dBm	-10 dBm	-8 dBm
Wavepatch on a 10-GE transponder module	-22 dBm	-20 dBm	-10 dBm	-8 dBm
wdm	-30 dBm	-	18 dBm	-
thru	-30 dBm	-	18 dBm	-

### Command Modes

Interface configuration

### Command History

This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
12.1(12c)EV2	The default values for the 10-GE transponder module high warning and high alarm were changed.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

### Usage Guidelines

The default value for high alarm threshold corresponds to the receiver saturation level for the transponder module.

The default value for low alarm threshold corresponds to the Loss of Light condition. Exceeding the low alarm threshold on the active wavepatch interface causes a protection switchover to the standby wavepatch interface, provided that the standby interface is up and operating normally prior to the protection switchover.

The default values cover most network configurations. However, when optical amplifiers are used in the network in the receive direction as preamplifiers, the low alarm threshold value should be reconfigured, since the amplified noise level might be higher than the sensitivity of the receiver and the protection switchover might not be triggered. In such cases, we recommend setting the low alarm threshold to 10 dB below the power level measured at the interface when a signal exists or to -28 dB, whichever value is higher.



#### Note

For this command to function correctly, the functional image version must be 1.A0 (or later) for multimode 2.5-Gbps transponder modules and 1.A1 (or later) for single-mode 2.5-Gbps transponder modules. Use the [show hardware](#) detail command to verify the functional image version.

---

**Examples**

The following example shows how to set the optical power low alarm threshold.

```
Switch(config)# interface wavepatch 8/0/0
Switch(config-if)# optical threshold power receive low alarm -210
```

---

**Related Commands**

Command	Description
<a href="#">show interfaces</a>	Displays interface information.

# patch

To configure the patch connections within a shelf, use the **patch** command. To remove the patch connection configuration, use the **no** form of this command.

```
patch interface1 [transmit / receive] interface2
```

```
no patch interface1 [transmit / receive] interface2
```

## Syntax Description

<i>interface1</i>	Specifies the first patched interface. See the “Usage Guidelines” section for valid interface types.
<b>transmit</b>	Indicates that <i>interface1</i> is patched to <i>interface2</i> in the transmit direction.
<b>receive</b>	Indicates that <i>interface1</i> is patched to <i>interface2</i> in the receive direction.
<i>interface2</i>	Specifies the second patched interface. See the “Usage Guidelines” section for valid interface types.

## Defaults

Both directions

## Command Modes

Global configuration

## Command History

This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

## Usage Guidelines

Use this command to describe the patch connections between the mux/demux modules.

Valid patch connections between modules are:

- Wdm interface to thru interface between mux/demux modules  
**wdm** *slot/subcard1* **thru** *slot/subcard2*
- Thru interface to wdm interface between mux/demux modules  
**thru** *slot/subcard1* **wdm** *slot/subcard2*
- OSC wave interface to OSC oscfilter interface

- **wave slot oscfilter slot/subcard**
- OSC oscfilter interface to OSC wave interface  
**oscfilter slot/subcard wave slot**
- Thru interface to thru interface between mux/demux modules  
**thru slot1/subcard1 thru slot2/subcard2**
- Mux/demux wdm interface to PSM wdmrelay interface  
**wdm slot/subcard wdmrelay slot/subcard/port**
- Wavepatch interface to filter interface  
**wavepatch slot/subcard/port filter slot/subcard/port**
- Filter interface to wavepatch interface  
**filter slot/subcard/port wavepatch slot/subcard/port**

You cannot preconfigure a patch connection. The interfaces must exist on the shelf before configuring them.

The order of the interfaces in the command does not affect the patch connect configuration. For example, configuring **patch wdm 0/1 thru 0/0** is equivalent to configuring **patch thru 0/0 wdm 0/1**.

In case of an optical interface where the transmitted and received signals travel on two different strands of fiber, it is possible that each fiber is patched to a different interface. The direction keywords **receive** and **transmit** indicate whether *interface1* is patched to *interface2* in the receive direction or the transmit direction. The absence of a keyword indicates the patch connection is bidirectional.

When one interface in a patch connection is physically removed from the shelf, the patch connection configuration persists but does not appear in the **show running-config** output. A subsequent **patch** command that includes the remaining interface overwrites the previous patch connection configuration.



#### Note

When a patch connection between a mux/demux module and a PSM is configured, topology learning on the wdm interface is disabled.

#### Examples

The following example shows how to patch a connection between two mux/demux modules in the same slot.

```
Switch# configure terminal
Switch(config)# patch wdm 1/0 thru 1/1
```

#### Related Commands

Command	Description
<a href="#">debug ports</a>	Enables debugging of optical port activity.
<a href="#">show optical filter</a>	Displays the channels supported by the mux/demux modules.
<a href="#">show patch</a>	Displays optical patch connection configuration.
<a href="#">snmp-server enable traps patch</a>	Enables SNMP trap notifications for patch connection activity.

# show cdl defect-indication

To display the defect indication information on in-band message channel capable interfaces, use the **show cdl defect-indication** command.

**show cdl defect-indication** [*interface interface* | **detail**]

Syntax Description	detail	Displays the defect indication information for in-band message channel capable interfaces.
	<i>interface interface</i>	Displays the defect indication information for a specific interface.

**Defaults** Displays a defect indication summary.

**Command Modes** EXEC and privileged EXEC

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV2	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** This command displays the defect indication information on in-band message channel capable interfaces.

**Examples** The following example shows how to display in-band message channel defect indication information. (See [Table 3-2](#) for field descriptions.)

```
Switch# show cdl defect-indication
CDL Defect-Indication Status Summary
Interface  Interface  DI      Defect-Indication      Defect-Indication
Name      Status    Status  Receive                 Transmit
-----
WaveE3/0  up        up      None                    None
WaveE4/0  up        up      None                    None
WaveE9/0  up        up      None                    None
WaveE10/0 up        up      None                    None
```

**Table 3-2** *show cdl defect-indication Field Descriptions*

Field	Description
Interface Name	Shows the interface identifier.
Interface Status	Shows the interface status.
DI Status	Shows the defect indication status.
Defect-Indication Receive	Shows the defect indication on the receive signal.
Defect-Indication Transmit	Shows the defect indication on the transmit signal.

The following example shows how to display the defect indication information for in-band message channel capable interfaces.

```
Switch# show cdl defect-indication detail
```

```
Interface WaveEthernetPhy3/0
Oper. Status: up
Admin. Status: up
Configured Node Behavior: Hop Terminating
Current Node Behavior : Hop Terminating
Defect Indication Receive : None
Defect Indication Transmit: None
```

```
Interface WaveEthernetPhy4/0
Oper. Status: up
Admin. Status: up
Configured Node Behavior: Hop Terminating
Current Node Behavior : Hop Terminating
Defect Indication Receive : None
Defect Indication Transmit: None
```

**Related Commands**

Command	Description
<a href="#">cdl defect-indication force hop-endpoint</a>	Configures an interface as an end-of-hop.
<a href="#">cdl enable</a>	Enables in-band message channel functionality.
<a href="#">clear performance history</a>	Specifies the in-band message channel flow identifier value.
<a href="#">debug cdl defect-indication</a>	Initiates debugging of defect indication on in-band message channel capable interfaces.



# show cdl flow defect-indication

To display in-band message channel defect indication information on a per-flow basis, use the **show cdl flow defect-indication** command.

**show cdl flow defect-indication** [**interface** *interface*]

<b>Syntax Description</b>	<code>interface <i>interface</i></code> Displays defect indication information for a specific interface.
---------------------------	--

<b>Defaults</b>	Shows defect indications for all flows on the system
-----------------	--

<b>Command Modes</b>	EXEC and privileged EXEC
----------------------	--------------------------

<b>Command History</b>	This table includes the following release-specific history entries:
------------------------	---

- SV-Release
- S-Release

SV-Release	Modification
12.2(18)SV	This command was first introduced.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

<b>Usage Guidelines</b>	This command is used to display the defect indication information on in-band message channel capable interfaces.
-------------------------	--

<b>Examples</b>	The following example shows how to display in-band message channel flow identifier information. (See <a href="#">Table 3-3</a> for field descriptions.)
-----------------	---

```
Switch# show cdl flow defect-indication
```

```
DI = Defect Indication
```

```
Interface           DI Received           DI Transmitted
                   from CDL network      to CDL network
-----
```

```
Tengig8/0
```

**Table 3-3** *show cdl flow defect-indication* Field Descriptions

Field	Description
Interface	Shows the interface identifier.

*Table 3-3 show cdl flow defect-indication Field Descriptions (continued)*

Field	Description
DI Received from CDL network	Shows the defect indications received for the flow.
DI Transmitted to CDL network	Shows the defect indications transmitted for the flow.

**Related Commands**

Command	Description
<a href="#">cdl defect-indication force hop-endpoint</a>	Configures an interface as an end-of-hop.
<a href="#">cdl enable</a>	Enables in-band message channel functionality.
<a href="#">debug cdl defect-indication</a>	Initiates debugging of defect indication on in-band message channel capable interfaces.

# show connect

To display the connection relationships between the interfaces in the shelf, use the **show connect** command.

**show connect** {**edges** | **intermediate** [**sort-channel** | **interface** *interface*]}

Syntax Description		
<b>edges</b>		Displays the connections between the client-side interfaces and trunk-side interfaces of the shelf.
<b>intermediate</b>		Displays the complete connections between the client-side interfaces and trunk-side interfaces of the shelf, including all the intermediate internal interfaces.
<b>sort-channel</b>		Sorts the display by channel number.
<b>interface</b> <i>interface</i>		Displays the intermediate connection information for a specific interface.

**Defaults** None

**Command Modes** EXEC and privileged EXEC

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** This command shows the relationships between the interfaces in the shelf. Use this command to trace a single channel from the client side interface to the trunk side mux/demux interface.

**Examples** The following example shows how to display edge connection information. (See [Table 3-4](#) for field descriptions.)

```
Switch# show connect edges
client/
wave      wdm  channel
-----  ---  -----
```

```

Trans3/0/0 1/0 26
Trans3/1/0 1/0 27
Trans3/2/0 1/0 28
Trans3/3/0 1/0 29

```

**Table 3-4** *show connect edges Field Descriptions*

Field	Description
client/wave	Shows the client side interface identifier.
wdm	Shows the wdm interface identifier.
channel	Shows the ITU wavelength number supported by this connection.

The following example shows how to display intermediate connection information. (See [Table 3-5](#) for field descriptions.)

```

Switch# show connect intermediate
client/      wave      wave      filter    wdm
wave        client    patch     trk       channel
-----
Trans3/0/0  Wave3/0   3/0/0*   0/0/4    0/0      5
              3/0/1
Trans3/1/0  Wave3/1   3/1/0*   0/0/5    0/0      6
              3/1/1
Trans3/2/0  Wave3/2   3/2/0*   0/0/6    0/0      7
              3/2/1
Trans3/3/0  Wave3/3   3/3/0*   0/0/7    0/0      8
              3/3/1

```

**Table 3-5** *show connect intermediate Field Descriptions*

Field	Description
client/wave	Shows the client side interface identifier.
wave client	Shows the wave interface identifier.
wave patch	Shows the wavepatch interface identifier. The interface with the asterisk (*) carries the active signal.
filter	Shows the filter interface identifier.
wdm trk	Shows the wdm interface identifier.
channel	Shows the channel number supported by this connection.

The following example shows how to display interface connection information. (See [Table 3-6](#) for field descriptions.)

```

Switch# show connect interface transparent 2/0/0
Client      :Transparent2/0/0
Wave        :Wave2/0
Wavepatch   :Wavepatch2/0/0 (active)  Wavepatch :Wavepatch2/1/0
Filter      :Filter0/0/0              Filter    :Filter1/0/0
Wdm         :Wdm0/0                   Wdm       :Wdm1/0
Thru        :Thru0/1                  Thru      :Thru1/1
Wdm         :Wdm0/1                   Wdm       :Wdm1/1
Thru        :Thru0/2                  Thru      :Thru1/2
Wdm (trnk) :Wdm0/2                   Wdm       :Wdm1/2

```

**Table 3-6** *show connect interface Field Descriptions*

Field	Description
Client	Shows the client side interface identifier.
Wave	Shows the wave interface identifier.
Wavepatch	Shows the wavepatch interface identifier.
Filter	Shows the filter interface identifier.
Wdm	Shows the wdm interface identifier.
Thru	Shows the thru interface identifier.
Wdm (trnk)	Shows the identifier of the wdm interface attached to the trunk fiber.

**Related Commands**

Command	Description
<a href="#">debug ports</a>	Enables debugging of optical port activity.
<a href="#">show optical filter</a>	Displays information about the channels supported by the mux/demux modules.
<a href="#">show optical wavelength mapping</a>	Displays the mapping of the Cisco ONS 15540 ESPx channels to the ITU grid wavelengths and frequencies.

# show controllers

To display hardware register information for an interface, use the **show controllers** command.

**show controllers** [*type slot[/subcard[/port]]*]

Syntax Description	Parameter	Description
	type	Specifies one of the interface types listed in <a href="#">Table 3-7</a> .
	slot	Specifies a chassis slot.
	subcard	Specifies a subcard position in a motherboard.
	port	Specifies a port.

**Defaults** Displays controller information for all interfaces on the system.

**Command Modes** Privileged EXEC

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
12.1(10)EV2	Support for 10-GE transponder module was added.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** The **show controllers** command displays the contents of hardware registers for the interfaces. This information is useful for troubleshooting system problems.

[Table 3-7](#) shows the interface types for the **show controller** command.

*Table 3-7 Interface Types for the show controller Command*

Type	Description
<b>fastethernet 0</b>	Shows the NME interface information.
<b>filter slot/subcard/port</b>	Shows the filter interface information.
<b>oscfiler slot/subcard</b>	Shows the OSC oscfilter interface information.
<b>thru slot/subcard</b>	Shows the thru interface information.

**Table 3-7** *Interface Types for the show controller Command (continued)*

Type	Description
<b>tengigethernetphy</b> <i>slot/subcard</i>	Shows the tengigethernetphy interface information.
<b>transparent</b> <i>slot/subcard/0</i>	Shows the transparent interface information.
<b>wave</b> <i>slot[/subcard]</i>	Shows the wave interface information.
<b>waveethernetphy</b> <i>slot/subcard</i>	Shows the waveethernetphy interface information.
<b>wavepatch</b> <i>slot/subcard/port</i>	Shows the wavepatch interface information.
<b>wdm</b> <i>slot/subcard</i>	Shows the wdm interface information.

**Examples**

The following example shows how to display hardware register information about a transparent interface. (See [Table 3-8](#) for field descriptions.)

```
Switch# show controllers transparent 3/0/0
Controller info for Transparent interface Transparent3/0/0
  LRC start addr = 0x200000
  hardware port = 1
    RCI0 monitor.....:enabled
    port 1 intr SRC/CPU.....:enabled
    CPU0 MSB MAC.....:0x0
    CPU0 LSB MAC.....:0x0
    CPU1 MSB MAC.....:0x0
    CPU1 LSB MAC.....:0x0
    port error register.....:0x10000
    port ctrl msg intf mask....:0x0
    port APS port fail mask....:0x0
  HuJr start addr = 0x240000
  Optics control and status:
    LSC indication.....:ok
    trunk laser failure alarm...:clear
    LSC indication enable.....:disabled
    trunk laser alarm enable....:disabled
    line transceiver mode.....:non pluggable
    loss of light.....:yes
    trunk laser deviation alarm.:clear
    LSC.....:disabled
    quick shutdown (FLC).....:disabled
    wavelength select.....:n-1 [lo wlen]
  CDR control and status:
    loss of lock.....:yes
    loss of lock enable.....:disabled
  SerDes control and status:
    diags loop back.....:disabled
    line loop back.....:disabled
  GE handler control and status:
    loss of sync.....:no
    loss of sync enable.....:disabled
  FC/ESCON handler control and status:
    loss of sync.....:no
    loss of sync enable.....:disabled
  SONET handler control and status:
    loss of frame.....:yes
    severely errored frame.....:yes
    LOF enable.....:disabled
    SEF enable.....:disabled
```

**Table 3-8** *show controllers Field Descriptions for Transparent Interfaces*

Field	Description
Optics control and status:	Shows control and status information for the optical components in the interface.
LSC indication	Shows laser safety control status (valid only on wave interfaces).
trunk laser failure alarm	Shows the status of the trunk laser alarm. The values are: <ul style="list-style-type: none"> <li>• clear—no failure</li> <li>• indicated—failure</li> </ul>
LSC indication enable	Indicates whether laser safety control has been enabled (valid only on wave interfaces).
trunk laser alarm enable	Shows the status of the trunk laser alarm. If enabled, the system will signal when laser failure occurs.
Loss of Light	Indicates whether there is a Loss of Light condition.
trunk laser deviation alarm	Shows the status of the wavelength deviation alarm. If enabled, the system will signal when there is a deviation in the functioning of the laser.
LSC	Indicates whether laser safety control is enabled from the CLI (valid only on wave interfaces).
quick shutdown (FLC)	Indicates whether forward laser control is enabled on the interface (valid only on wave interfaces).
wavelength select	Indicates whether a transponder module is transmitting the lower wavelength (lo wlen) or the higher wavelength (hi wlen).
CDR control and status:	Shows the CDR (clock and data recovery) control and status information.
Loss of Lock	Indicates whether there is a Loss of Lock condition.
Loss of Lock enable	Indicates whether Loss of Lock monitoring is enabled on the interface via the <b>monitor enable</b> command.
SerDes control and status:	Shows the SerDes (serializer/deserializer) information.
GE handler control and status:	Shows Gigabit Ethernet control and status information.
Loss of Sync	Indicates whether there is a Loss of Synchronization for the signal. This field is only valid if protocol encapsulation is Gigabit Ethernet, and monitoring is enabled.
Loss of Sync enable	Indicates whether Loss of Synchronization monitoring is enabled via the <b>monitor enable</b> command.
FC/ESCON handler control and status:	Shows Fibre Channel and ESCON control and status information.
Loss of Sync	Indicates whether there is a Loss of Synchronization for the signal. This field is only valid if protocol encapsulation is Fibre Channel or ESCON, and monitoring is enabled.
Loss of Sync enable	Indicates whether Loss of Synchronization monitoring is enabled via the <b>monitor enable</b> command.
SONET handler control and status:	Shows SONET control and status information.



**Table 3-8** *show controllers Field Descriptions for Transparent Interfaces (continued)*

Field	Description
Loss of Frame	Indicates whether there is a Loss of Frame for the signal. This field is only valid if protocol encapsulation is SONET, and monitoring is enabled.
severely errored frame	Indicates whether there is a severely errored frame in the signal. This field is only valid if protocol encapsulation is SONET, and monitoring is enabled.
LOF enable	Indicates whether Loss of Frame monitoring is enabled via the <b>monitor enable</b> command.
SEF enable	Indicates whether severely errored frame monitoring is enabled via the <b>monitor enable</b> command.

The following example shows how to display hardware register information about a transponder wave interface. (See [Table 3-8](#) for field descriptions.)

```
Switch# show controllers wave 3/1
Controller info for Wave interface Wave3/1
  LRC start addr = 0x200000
  hardware port = 2
    RC11 monitor.....:enabled
    port 2 intr SRC/CPU.....:enabled
    CPU0 MSB MAC.....:0x0
    CPU0 LSB MAC.....:0x0
    CPU1 MSB MAC.....:0x0
    CPU1 LSB MAC.....:0x0
    port error register.....:0x10000
    port ctrl msg intf mask....:0xF00FC00A
    port APS port fail mask....:0x0
  HuJr start addr = 0x250000
  Optics control and status:
    auto fail-over indication...:normal
    optical switch alarm.....:clear
    line laser degrade alarm...:clear
    optical switch position....:Mux 1
    loss of light.....:no
    BLC and LAS.....:disabled
    LSC.....:disabled
    quick shutdown (FLC).....:disabled
  CDR control and status:
    loss of lock.....:yes
    loss of lock enable.....:enabled
  SerDes control and status:
    diags loop back.....:disabled
    line loop back.....:disabled
  GE handler control and status:
    loss of sync.....:no
    loss of sync enable.....:disabled
  FC/ESCON handler control and status:
    loss of sync.....:no
    loss of sync enable.....:disabled
  SONET handler control and status:
    loss of frame.....:yes
    severely errored frame.....:yes
    LOF enable.....:disabled
    SEF enable.....:disabled
```

The following example shows how to display hardware register information about an OSC wave interface. (See [Table 3-8](#) for field descriptions.)

```
Switch# show controllers wave 0
Controller info for OSC wave interface Wave0
LRC start addr = 0x900000
hardware port = 0
  RCI0 monitor.....:enabled
  port 0 intr SRC/CPU.....:enabled
  CPU0 MSB MAC.....:0x0
  CPU0 LSB MAC.....:0x1060000
  CPU1 MSB MAC.....:0x0
  CPU1 LSB MAC.....:0x1070000
  port error register.....:0x8002
  port ctrl msg intf mask.....:0x0
  port APS port fail mask.....:0x0
HuJr start addr = 0x940000
CDL add/drop control and status:
  FIFO overflow indication....:clear
  HEC error threshold exceeded:indicate
  FIFO overflow enable.....:disabled
  HEC error threshold enable..:disabled
  CDL alarm status.....:true alarm
  CDL add enable.....:enabled
  CDL drop enable.....:enabled
Optics control and status:
  LSC indication.....:ok
  trunk laser failure alarm...:indicated
  LSC indication enable.....:disabled
  trunk laser alarm enable....:disabled
  loss of light.....:yes
  wavelength deviation alarm..:clear
  LSC.....:disabled
  wavelength select.....:n [hi wlen]
CDR control and status:
  loss of lock.....:yes
  loss of lock enable.....:disabled
SerDes control and status:
  diags loop back.....:disabled
  network loop back.....:disabled
GE handler control and status:
  loss of sync.....:yes
  loss of sync enable.....:disabled
```

Related Commands	Command	Description
	<a href="#">clear performance history</a>	Specifies the protocol encapsulation for a transparent interface.
	<a href="#">laser control forward enable</a>	Configures forward laser control, which automatically shuts down transponder lasers.
	<a href="#">laser control safety enable</a>	Configures laser safety control on a wave interface.
	<a href="#">laser shutdown</a>	Configures signal loopback on an interface.
	<a href="#">monitor enable</a>	Enables signal monitoring for certain protocol encapsulations.
	<a href="#">show interfaces</a>	Displays interface information.

# show interfaces

To display interface information, use the **show interfaces** command.

```
show interfaces [type slot[/subcard[/port]]]
```

Syntax Description	Parameter	Description
	type	Specifies one of the interface types listed in <a href="#">Table 3-9</a> .
	slot	Specifies a chassis slot.
	subcard	Specifies a subcard position in a motherboard.
	port	Specifies a port.

**Defaults** Displays information for all interfaces on the system.

**Command Modes** EXEC and privileged EXEC

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
12.1(10)EV2	Support for 10-GE transponder module was added.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** [Table 3-9](#) shows the interface types for the **show interfaces** command.

*Table 3-9 Interface Types for the show interfaces Command*

Type	Description
<b>fastethernet 0</b>	Shows the NME interface information.
<b>fastethernet-sby 0</b>	Shows the NME interface information for the standby processor card.
<b>filter slot/subcard/port</b>	Shows the filter interface information.
<b>osfilter slot/subcard</b>	Shows the OSC oscfilter interface information.
<b>tengigethernetphy slot/subcard</b>	Shows the tengigethernetphy interface information.

**Table 3-9** *Interface Types for the show interfaces Command (continued)*

Type	Description
<b>thru</b> <i>slot/subcard</i>	Shows the thru interface information.
<b>transparent</b> <i>slot/subcard/0</i>	Shows the transparent interface information.
<b>wave</b> <i>slot[/subcard]</i>	Shows the wave interface information.
<b>waveethernetphy</b> <i>slot/subcard</i>	Shows the waveethernetphy subinterface information.
<b>wavepatch</b> <i>slot/subcard/port</i>	Shows the wavepatch interface information.
<b>wdm</b> <i>slot/subcard</i>	Shows the wdm interface information.

**Examples**

The following example shows how to display transparent interface information. (See [Table 3-10](#) for field descriptions.)

```
Switch# show interfaces transparent 3/1/0
Transparent3/1/0 is administratively up, line protocol is up
  Signal quality: Loss of lock
  Encapsulation: Sonet      Rate: oc3
  Signal monitoring: on
  Forward laser control: Off
  Configured threshold Group: None
  Threshold monitored for: BIPl error
  Set threshold SF:10e-5  SD:10e-7
  Section code violation error count(bipl): 61286
  Number of errored seconds(es): 2
  Number of severely errored seconds(ses): 2
  Number of severely errored framing seconds(sefs): 273
  Number of times SEF alarm raised: 0
  Number of times SF threshold exceeded: 0
  Number of times SD threshold exceeded: 2
  Loopback not set
  Last clearing of "show interface" counters never
Hardware is transparent
```

**Table 3-10** *show interfaces transparent Field Descriptions*

Field	Description
Transparent3/1/0 is administratively up	Shows the interface state, either up or down.
line protocol is up	Shows the state of the line protocol, either up or down.
Signal quality	Shows signal quality.
Encapsulation	Shows the encapsulation for the interface.
Rate	Shows the encapsulation rate—either the configured clock rate or the protocol clock rate, if the protocol supports multiple rates.
Signal monitoring	Shows whether signal monitoring is enabled.
Forward laser control	Shows whether forward laser control is enabled.
Configured threshold group	Shows whether a threshold group has been configured for the interface.
Threshold monitored for	Shows what the threshold group is monitored for.

**Table 3-10** *show interfaces transparent Field Descriptions (continued)*

Field	Description
Set threshold	Shows alarm thresholds. The output example shows the alarm thresholds for signal failure (SF) and signal degrade (SD).
Section code violation error count (bip1)	Shows the number of BIP1 errors.
Number of errored seconds (es)	Shows the number of errored seconds.
Number of severely errored seconds (ses)	Shows the number of severely errored seconds.
Number of severely errored framing seconds (sefs)	Shows the number of severely errored framing seconds.
Number of times SEF alarm raised	Shows the number of times the SEF alarm was raised.
Number of times SF threshold exceeded	Shows the number of times the signal failure (SF) threshold was exceeded.
Number of times SD threshold exceeded	Shows the number of times the signal degrade (SD) threshold was exceeded.
Loopback not set	Shows whether loopback is enabled.
Last clearing of "show interface" counters	Shows the last time "show interface" counters were cleared.
Hardware is transparent	Shows the hardware type.

The following example shows how to display wave interface information. (See [Table 3-11](#) for field descriptions.)

```
Switch# show interfaces wave 10/0
Wave10/0 is administratively up, line protocol is up
  Channel: 25   Frequency: 195.1 Thz   Wavelength: 1536.61 nm
  Splitter Protected: Yes
  Receiver power level: -37.30 dBm
  Laser safety control: Off
  Forward laser control: Off
  Osc physical port: No
  Wavelength used for inband management: No
  Configured threshold Group: None
  Section code violation error count(bip1): 0
  Number of errored seconds(es): 29
  Number of severely errored seconds(ses): 29
  Number of severely errored framing seconds(sefs): 0
  Number of times SEF alarm raised: 0
  Number of times SF threshold exceeded: 0
  Number of times SD threshold exceeded: 0
  Loopback not set
  Last clearing of "show interface" counters 4d03h
  Hardware is data_only_port
```

**Table 3-11** *show interfaces wave Field Descriptions*

Field	Description
Wave10/0 is administratively up	Shows the interface state, either up or down.
line protocol is up	Shows the state of the line protocol, either up or down.

**Table 3-11** *show interfaces wave Field Descriptions (continued)*

Field	Description
Channel Frequency Wavelength	Shows the channel number, frequency, and wavelength of the wave interface.
Splitter Protected	Shows whether the interface is splitter protected.
Receiver power level	Shows the receiver power level. <b>Note</b> This field is not present in the OSC wave interface output.
Laser safety control	Shows whether laser safety control is enabled.
Forward laser control	Shows whether forward laser control is enabled.
Osc physical port	Shows whether the interface is an OSC physical port.
Wavelength used for inband management	Shows whether the interface is used for inband management.
Configured threshold group	Shows whether a threshold group has been configured for the interface.
Loopback not set	Shows whether loopback is enabled.
Last clearing of “show interface” counters	Shows the last time “show interface” counters were cleared.
Hardware is data_only_port	Shows the interface type.

The following example shows how to display wave interface information. (See [Table 3-11](#) for field descriptions.)

```
Switch# show interfaces wave 0
Wave0 is administratively up, line protocol is up
Channel: 0   Frequency: 191.9 Thz   Wavelength: 1562.23 nm
Splitter Protected: No
Laser safety control: Off
Forward laser control: Off
Osc physical port: Yes
Wavelength used for inband management: No
Configured threshold Group: None
Loopback not set
Last clearing of "show interface" counters never
Hardware is OSC_phy_port
MTU 1492 bytes, BW 10000000 Kbit, DLY 0 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation SNAP, loopback not set
    CDL receive header error count: 0
Last input 00:00:02, 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
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
    3447 packets input, 269630 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
```

```
0 output buffer failures, 0 output buffers swapped out
```

The following example shows how to display wdm interface information. (See [Table 3-12](#) for field descriptions.)

```
Switch# show interfaces wdm 0/0
Wdm0/0 is up, line protocol is up
Patched Interface: Thru0/1
Wdm Hw capability: N/A
Num of Wavelengths Add/Dropped: 8
List of Wavelengths: 1, 2, 3, 4, 5, 6, 7, 8,
Hardware is wavelength_add_drop
```

**Table 3-12** *show interfaces wdm Field Descriptions*

Field	Description
Wdm0/0 is up	Shows the interface state, either up or down.
line protocol is up	Shows the state of the line protocol, either up or down.
Patched Interface:	Shows how the mux/demux modules is optically patched.
Num of wavelengths Add/Dropped:	Shows the number of wavelengths added and dropped.
List of Wavelengths:	Shows list of wavelength channel numbers.
Hardware is wavelength_add_drop	Shows the hardware type.

#### Related Commands

Command	Description
<a href="#">laser control forward enable</a>	Configures forward laser control on an interface.
<a href="#">laser control safety enable</a>	Configures laser safety control on wave interfaces.
<a href="#">loopback</a>	Configures loopback on an interface.
<a href="#">show controllers</a>	Displays interface controller information.

# show optical filter

To display information about the channels supported by the mux/demux modules, use the **show optical filter** command.

## show optical filter [detail]

<b>Syntax Description</b>	<b>detail</b>	Shows optical patch connections between the mux/demux modules in addition to the channels supported. This information displays only if the patch connection have been configured with the <b>patch</b> command.
---------------------------	---------------	---

**Defaults** Displays only the channels supported by the mux/demux modules.

**Command Modes** EXEC and privileged EXEC

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** Use this command to verify the channels supported by the mux/demux modules on the system.

**Examples** The following example shows how to display optical filter information. (See [Table 3-13](#) for field descriptions.)

```
Switch# show optical filter
aggregate          filtered
interface          interface
-----          -----
Wdm0/0             0           Oscfilter0/0
Wdm0/0             1           Filter0/0/0
Wdm0/0             2           Filter0/0/1
Wdm0/0             3           Filter0/0/2
Wdm0/0             4           Filter0/0/3
Wdm0/0             5           Filter0/0/4
Wdm0/0             6           Filter0/0/5
```



```

Wdm0/0          7          Filter0/0/6
Wdm0/0          8          Filter0/0/7
Wdm0/2          17         Filter0/2/0
Wdm0/2          18         Filter0/2/1
Wdm0/2          19         Filter0/2/2
Wdm0/2          20         Filter0/2/3
Wdm0/2          21         Filter0/2/4
Wdm0/2          22         Filter0/2/5
Wdm0/2          23         Filter0/2/6
Wdm0/2          24         Filter0/2/7
Wdm1/0          0          Oscfilter1/0
Wdm1/0          1          Filter1/0/0
Wdm1/0          2          Filter1/0/1
Wdm1/0          3          Filter1/0/2
Wdm1/0          4          Filter1/0/3
Wdm1/0          5          Filter1/0/4
Wdm1/0          6          Filter1/0/5
Wdm1/0          7          Filter1/0/6
Wdm1/0          8          Filter1/0/7

```

**Table 3-13** *show optical filter Field Descriptions*

Field	Description
aggregate interface	Shows the aggregate wdm interface.
channels	Shows the channels in the aggregate interface. In the output example, “remaining” indicates that whichever channels have not been dropped are passed to the thru interface.
filtered interface	Shows the filtered interface, which connects to the transponder.
remaining	Indicates that the channels not supported on the mux/demux modules are passed through to the next mux/demux module.
patched mux/demux interface	Shows the patch connection to another mux/demux module.

The following example shows how to display optical filter information on a shelf with add/drop mux/demux modules. (See [Table 3-14](#) for field descriptions.)

```

Switch# show optical filter detail
aggregate          filtered          patched mux/demux
interface          channel(s)       interface         interface
-----
Wdm0/3            0              Oscfilter0/3
Wdm0/3            25             Filter0/3/0
Wdm0/3            26             Filter0/3/1
Wdm0/3            27             Filter0/3/2
Wdm0/3            28             Filter0/3/3
Wdm0/3            29             Filter0/3/4
Wdm0/3            30             Filter0/3/5
Wdm0/3            31             Filter0/3/6
Wdm0/3            32             Filter0/3/7
Wdm0/3            remaining      Thru0/3          Thru1/3
Wdm1/3            0              Oscfilter1/3
Wdm1/3            25             Filter1/3/0
Wdm1/3            26             Filter1/3/1
Wdm1/3            27             Filter1/3/2
Wdm1/3            28             Filter1/3/3
Wdm1/3            29             Filter1/3/4
Wdm1/3            30             Filter1/3/5
Wdm1/3            31             Filter1/3/6

```

## ■ show optical filter

```

Wdm1/3          32          Filter1/3/7
Wdm1/3          remaining    Thru1/3          Thru0/3

```

**Table 3-14** *show optical filter detail Field Descriptions*

Field	Description
aggregate interface	Shows the aggregate wdm interface.
channels	Shows the channels in the aggregate interface. In the output example, “remaining” indicates that whichever channels have not been dropped are passed to the thru interface.
filtered interface	Shows the filtered interface, which connects to the transponder.
remaining	Indicates that the channels not supported on the mux/demux modules are passed through to the next mux/demux module.
patched mux/demux interface	Shows the patch connection to another mux/demux module.

**Related Commands**

Command	Description
<a href="#">patch</a>	Configures patch connections for a shelf.
<a href="#">show connect</a>	Displays optical connection information.
<a href="#">show patch</a>	Displays optical patch connection configuration.

# show optical interface brief

To display the optical characteristics of all the transponders in the system, use the **show optical interface brief** command.

## show optical interface brief

**Syntax Description** This command has no other arguments or keywords.

**Defaults** None

**Command Modes** EXEC and privileged EXEC

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(12c)EV2	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** Use this command to quickly verify the status of the optical signals on the transponder module interfaces. For more detailed information about the interface, use the [show interfaces](#) command.

**Examples** The following example shows how to display optical interface signal information. (See [Table 3-15](#) for field descriptions.)

```
Switch# show optical interface brief
```

I Interface	Status/Prot	Laser	Signal Quality	Rx Power	Speed/Encap
Wave0	down/down	on	Loss of light	n/a	SNAP
Wave1	up/up	on	Good	n/a	SNAP
WdmS0/2/0*	down/down	n/a	Loss of light	< -32.00 dBm	n/a
WdmS0/2/1	down/down	n/a	Loss of light	< -32.00 dBm	n/a
Trans2/2/0	up/up	on	Good	n/a	GigbitEthernet
Wave2/2	up/up	on	Good	-16.78 dBm	n/a
Wavep2/2/0	admin/down	n/a	n/a	Unknown	n/a
Wavep2/2/1*	up/up	n/a	n/a	-16.76 dBm	n/a

■ show optical interface brief

```

TenGE3/1      up/up      on      Good      n/a      10G Ethernet
Ether3/1/1    up/up      n/a     Good      n/a      SNAP
WaveE3/1      up/up      on      Good      -12.45 dBm n/a
Ether3/1/0    up/up      n/a     Good      n/a      SNAP
Wavep3/1/0*   up/up      n/a     n/a       -12.45 dBm n/a
Wavep3/1/1    up/up      n/a     n/a       Unknown   n/a
Trans4/0/0    down/down on      Loss of light n/a      916000 KHz
Wave4/0       down/down on      Loss of light < -33.00 dBm n/a
Wavep4/0/0*   down/down n/a     n/a       < -33.00 dBm n/a
Trans9/0/0    admin/down off     n/a       n/a      SONET oc48
Wave9/0       admin/down off     n/a       < -35.00 dBm n/a
Wavep9/0/0*   down/down n/a     n/a       < -35.00 dBm n/a
Wavep9/0/1    down/down n/a     n/a       Unknown   n/a

```

**Table 3-15** *show optical interface brief Field Descriptions*

Field	Description
Interface	Shows the interface identifier.
Status/Prot	Shows the interface status and the protocol status.
Laser	Shows the laser status.
Signal Quality	Shows the current signal quality.
Rx Power	Shows the receiver power.
Speed/Encap	Shows the signal speed or protocol encapsulation for the interface.

Related Commands

Command	Description
<a href="#">show interfaces</a>	Displays system interfaces.

# show patch

To display the patch connections, use the **show patch** command.

## show patch [detail]

Syntax Description	detail	Displays both the user and automatic local path connections.
--------------------	--------	--

**Defaults** Displays summary patch connection information.

**Command Modes** EXEC and privileged EXEC

**Command History** This table includes the following release-specific history entries:

- EV-Release
- SV-Release
- S-Release

EV-Release	Modification
12.1(10)EV	This command was first introduced.
SV-Release	Modification
12.2(18)SV	This command was integrated in this release.
S-Release	Modification
12.2(22)S	This command was integrated in this release.

**Usage Guidelines** Use this command to display the patch connections on the mux/demux modules configured with the **patch** command.

The error field in the **show patch** command output helps troubleshoot shelf misconfigurations. When there is a channel mismatch between a transponder module and a mux/demux module, “Channel Mismatch” appears for the patch connection. When more than one mux/demux module drops the same channels, “Channel Mismatch” appears for all patch connections.

**Examples** The following example shows how to display patch connection information. (See [Table 3-16](#) for field descriptions.)

```
Switch# show patch
Patch Interface      Patch Interface      Type      Dir      Error
-----
Thru0/0              Wdm0/1               USER      Both
Thru0/1              Thru1/0              USER      Both
```

The following example shows how to display detailed patch connection information. (See [Table 3-16](#) for field descriptions.)

```
Switch# show patch detail
Patch Interface      Patch Interface      Type      Error
-----
Wavepatch10/0/0     Filter0/3/0         AUTOMATIC
Wavepatch10/1/0     Filter0/3/1         AUTOMATIC
Wavepatch10/2/0     Filter0/3/2         AUTOMATIC
Wavepatch10/3/0     Filter0/3/3         AUTOMATIC
Wave0                Oscfilter0/0        USER
Wdm0/0              Thru0/1             USER
Wdm0/1              Thru0/2             USER
Wdm0/2              Thru0/3             USER
Thru0/0             Wdm0/3              USER
```

**Table 3-16** *show patch detail Field Descriptions*

Field	Description
Patch Interface	Shows an interface identifier for the patch connection.
Type	Shows how the patch was configured, either by the system or by the user.
Error	Shows patch errors, such as channel mismatches.

#### Related Commands

Command	Description
<a href="#">debug ports</a>	Enables debugging of optical port activity.
<a href="#">patch</a>	Configures patch connections within a shelf.

# show performance

To display the performance history counters, use the **show performance** command.

**show performance** { **current** | **history** | **24-hour** } [*interface*] [*interval number*]

Syntax Description		
	<b>current</b>	Displays the current counter.
	<b>history</b>	Displays the 15-minute history counter.
	<b>24-hour</b>	Displays the 24-hour counter.
	<i>interface</i>	Displays the performance history counter for the specified interface.
	<i>interval number</i>	Displays the performance history counter with the specified interval number (1 to 96).

**Defaults** Displays all performance history counters (the current counter, all 15-minute history counters, and the 24-hour counter) for all Cisco ONS 15540 ESPx interfaces.

**Command Modes** EXEC and privileged EXEC

**Command History** This table includes the following release-specific history entry:

SV-Release	Modification
12.2(29)SV	This command was introduced.

**Usage Guidelines** Use this command to view the performance history counters for the Cisco ONS 15540 ESPx interfaces.

**Examples** The following example shows how to display the current counter for a transparent interface. (See [Table 3-17](#) for field descriptions.)

```
Switch# show performance current transparent 2/2/0
Current 15 minute performance register
-----
Interface      : Transparent2/2/0
Interval Number : 81

Elapsed Time(seconds) : 526
Valid Time(seconds)   : 526

Code violation and running disparity error count : 0
```

**Table 3-17** *show performance current Field Descriptions*

Field	Description
Interface	Shows the interface for which the current counter is displayed.
Interval Number	Shows the current counter's interval number.
Elapsed Time	Shows the elapsed time since the current counter was started.
Valid Time	Shows the time period during which the interface was administratively up. A current counter with zero valid time will not contain any valid data.
Code violation and running disparity error count	Shows the total number of code violation and running disparity (CVRD) errors in the frames that were received from the client device during the elapsed time of the current performance counter.

The following example shows how to display the 15-minute history counter for a tengigethernetphy interface with CDL disabled. (See [Table 3-18](#) for field descriptions.)

```
Switch# show performance history tengigEthernetPhy 10/0 20
15 minute performance history register
-----
Interface      : TenGigEthernetPhy10/0
Interval Number : 20

Total Time(seconds) : 900
Valid Time(seconds) : 900

Code violation and running disparity error count : 0
TenGige Non CDL Pkt count : 0
```

**Table 3-18** *show performance history Field Descriptions*

Field	Description
Interface	Shows the interface for which the 15-minute history counter is displayed.
Interval Number	Shows the 15-minute history counter's interval number.
Total Time	Shows the duration of the 15-minute history counter in seconds.
Valid Time	Shows the time period during which the 15-minute history counter was in the no shutdown state. A 15-minute history counter with zero valid time will not contain any valid data.
Code violation and running disparity error count	Shows the total number of CVRD errors in the GE frames that were received from the client interface during the 15 minute period.
TenGige Non CDL Pkt count	Shows the total number of non CDL type packets that were received from the client side during the 15 minute period.



The following example shows how to display the 24-hour counter for a tengigethernetphy interface with CDL enabled. (See [Table 3-19](#) for field descriptions.)

```
Switch# show performance 24-hour tenGigEthernetPhy 10/1
24 hour performance register
-----
Interface          : TenGigEthernetPhy10/1

Total Time(seconds)   : 86400
Valid Time(seconds)  : 86400

Code violation and running disparity error count : 0
TenGige Non CDL Pkt count : 0
CDL HEC error count      : 0
TenGige CDL idle Pkt count : 0
```

**Table 3-19** *show performance 24-hour Field Descriptions*

Field	Description
Interface	Shows the interface for which the 24-hour counter is displayed.
Total Time	Shows the duration of the 24-hour counter in seconds.
Valid Time	Shows the time period during which the 24-hour counter was in the no shutdown state. A 24-hour counter with zero valid time will not contain any valid data.
Code violation and running disparity error count	Shows the total number of CVRD errors in the GE frames that were received from the fabric during the 24 hour period.
TenGige Non CDL Pkt count	Shows the total number of non CDL type packets that were received from the client side during the 24 hour period.
CDL HEC error count	Shows the total number of GE frames that were received with CDL HEC errors during the 24 hour period.
TenGige CDL idle Pkt count	Shows the total number of CDL idle packets that were received from the client during the 24 hour period.

#### Related Commands

Command	Description
<a href="#">show interfaces</a>	Displays interface information.
<a href="#">auto-sync counters interface</a>	Enables the automatic synchronization of the performance history counters.
<a href="#">clear performance history</a>	Clears the performance history counters.

# shutdown

To disable an interface, use the **shutdown** command. To restart a disabled interface, use the **no** form of this command.

**shutdown**

**no shutdown**

---

**Syntax Description** This command has no other arguments or keywords.

---

**Defaults** Disabled

---

**Command Modes** Interface configuration

---

**Usage Guidelines** This command disables all functions on the specified interface.

This command also marks the interface as unavailable. To check whether an interface is disabled, use the [show interfaces](#) command. An interface that has been shut down is shown as administratively down in the [show interfaces](#) output.

On transparent and wave interfaces, use the **shutdown** command to turn off the transmit lasers. To turn the transmit lasers on, use the **no shutdown** command.

On CDL capable interfaces, such as tengigethernetphy and waveethernetphy interfaces, use the **shutdown** command to stop sending data traffic. To resume sending data traffic, use the **no shutdown** command. On the 10-GE transponder module, use the [laser shutdown](#) command to turn the lasers off and on.

A **shutdown** command issued on a wave interface does not affect administrative status of the corresponding wavepatch interfaces. To administratively shut down the wavepatch interfaces, issue **shutdown** commands directly.

To use splitter protected line card motherboards for line card protection, you must shut down all the wavepatch interfaces connected to one of the mux/demux motherboards. (See the “[Examples](#)” section.)

The [laser shutdown](#) command does not affect the function of the **shutdown** command.

---

**Examples** The following example shows how to shut down a wave interface, which also turns off the laser that transmits to the trunk fiber.

```
Switch# configure terminal
Switch(config)# interface wave0/3
Switch(config-if)# shutdown
```

The following example shows how to reenableView a transparent interface and turn on the laser transmitting to the client equipment.

```
Switch# configure terminal
Switch(config)# interface transparent 8/0/0
Switch(config-if)# no shutdown
```

The following example shows how to disable the east (slot 1) side of the wavepatch interface pair on a splitter protected line card motherboard.

```
Switch# configure terminal  
Switch(config)# interface wavepatch 3/0/1  
Switch(config-if)# shutdown
```

Related Commands	Command	Description
	<a href="#">laser shutdown</a>	Turns off a laser.
	<a href="#">show interfaces</a>	Displays system interfaces.

■ shutdown