



Threshold Commands

Interface alarm thresholds provide a way to monitor the quality of the client signal. Use the following commands to configure and monitor interface alarm threshold operations.

aps trigger

To enable y-cable line card protection signal switchover when the alarm thresholds are exceeded, use the **aps trigger** command. To disable y-cable protection signal switchover, use the **no** form of this command.

aps trigger

no aps trigger

Syntax Description This command has no other arguments or keywords.

Defaults Disabled

Command Modes Threshold 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 in a y-cable protection configuration to cause a signal switchover when the active signal error rates exceed the alarm thresholds. The signal switchover occurs only if the standby signal is acceptable.



Note

The threshold list must be applied to both interfaces in the associated pair.

Examples The following example shows how to configure an APS switchover trigger for an alarm threshold.

```
Switch(config)# threshold-list sonet-alarms
Switch(config-t-list)# threshold name sonet-sdh section cv failure
Switch(config-threshold)# value rate 6
Switch(config-threshold)# aps trigger
Switch(config-threshold)# exit
```

```

Switch(config-t-list)# exit
Switch(config)# redundancy
Switch(config-red)# associate group chicago
Switch(config-red-aps)# aps working transparent 3/0/0
Switch(config-red-aps)# aps protection transparent 5/0/0
Switch(config-red-aps)# aps y-cable
Switch(config-red-aps)# aps revertive
Switch(config-red-aps)# aps enable
Switch(config-red-aps)# exit
Switch(config-red)# exit
Switch(config)# interface transparent 3/0/0
Switch(config-if)# encaps sonet oc3
Switch(config-if)# monitor enable
Switch(config-if)# threshold-group sonet-alarms
Switch(config-if)# exit
Switch(config)# interface transparent 5/0/0
Switch(config-if)# encaps sonet oc3
Switch(config-if)# monitor enable
Switch(config-if)# threshold-group sonet-alarms

```

| Related Commands | Command | Description |
|------------------|-------------------------------------|--|
| | monitor enable | Enables protocol performance monitoring. |
| | show threshold-list | Displays the contents of a threshold list. |
| | threshold | Selects alarm threshold to modify and enters threshold configuration mode. |
| | threshold-group | Associates a threshold list to an interface. |
| | threshold-list | Creates a threshold list with a name or allows an existing list to be modified. Switches from configuration mode to threshold-list configuration mode. |

description

To configure a alarm threshold description, use the **description** command. To remove a threshold description, use the **no** form of the command.

description *text*

no description

Syntax Description

| | |
|------|------------------------------------|
| text | Threshold description for the MIB. |
|------|------------------------------------|

Defaults

None

Command Modes

Threshold 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

First use the **threshold-list** command to enter threshold list configuration mode and create a threshold list. Then use the **threshold** command to specify a threshold to modify and enter threshold configuration mode. This description can be accessed and displayed by network management systems that support SNMP.

Examples

The following example shows how to create a description for a threshold in a threshold list named temp.

```
Switch# configure terminal
Switch(config)# threshold-list temp
Switch(config-t-list)# threshold name sonet-sdh section cv degrade
Switch(config-threshold)# description This threshold is for SONET and SDH BIP1 errors
```

| Related Commands | Command | Description |
|------------------|------------------------|---|
| | threshold | Selects alarm threshold to modify and enters threshold configuration mode. |
| | threshold-group | Associates a threshold list with an interface. |
| | threshold-list | Creates a threshold list with a name or allows an existing list to be modified. Switches from configuration mode to threshold-list configuration mode. |

notification-throttle timer

To modify the alarm threshold notification throttle timer, use the **notification-throttle timer** command. To return the notification throttle timer interval to its default value, use the **no** form of the command.

notification-throttle timer *seconds*

no notification-throttle timer

| | | |
|---------------------------|----------------|--|
| Syntax Description | <i>seconds</i> | Specifies, in seconds, the interval in which no more than one threshold alarm notification can be generated. If more than one notification is generated during the hold-down period, the extra notifications are delayed. The range is 5 to 500 seconds. |
|---------------------------|----------------|--|

| | |
|-----------------|-----------|
| Defaults | 5 seconds |
|-----------------|-----------|

| | |
|----------------------|------------------------------|
| Command Modes | Threshold list 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 control the amount of alarm threshold notification activity that is generated on the system. |
|-------------------------|--|

Examples The following example shows how to set an alarm threshold list notification throttle timer to 10 seconds.

```
Switch# configure terminal
Switch(config)# threshold-list sonet-alarms
Switch(config-t-list)# notification-throttle timer 10
```

| Related Commands | Command | Description |
|------------------|-------------------------------------|--|
| | show threshold-list | Displays the contents of a threshold list. |
| | threshold-list | Groups a set of thresholds with a name. Switches from configuration mode to threshold-list configuration mode. |

show threshold-list

To display information about alarm threshold lists, use the **show threshold-list** command.

show threshold-list [*name*]

| | | |
|---------------------------|-------------|--|
| Syntax Description | <i>name</i> | Specifies the name of an alarm threshold list. |
|---------------------------|-------------|--|

| | | |
|-----------------|---|--|
| Defaults | Displays information about all threshold lists in 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. |
| 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 threshold values configured for all alarm threshold lists or for a specific alarm threshold list. |
|-------------------------|---|

| | |
|-----------------|--|
| Examples | The following example shows how to display information for an alarm threshold list named sonet-counters. (See Table 9-1 for field descriptions.) |
|-----------------|--|

```
Switch# show threshold-list

Threshold List Name: sonet-counters
  Notification throttle timer : 5 (in secs)
  Threshold name : sonet-sdh section cv          Severity : Degrade
    Value : 10e-9
    APS Trigger : Not set
    Description : SONET BIPl counter
  Threshold name : sonet-sdh section cv          Severity : Failure
    Value : 10e-6
    APS Trigger : Set
    Description : SONET BIPl counter
```


Table 9-1 *show threshold-list Field Descriptions*

| Field | Description |
|-----------------------------|---|
| Threshold List Name | Shows the name of the threshold list. |
| Notification throttle timer | Shows, in seconds, the interval in which no more than one threshold alarm notification can be generated. If more than one notification is generated during the hold-down period, the extra notifications are delayed. |
| Threshold name | Shows the name of the threshold counter. See the threshold command for a list of threshold names. |
| Severity | Shows the threshold severity (Degrade or Failure). |
| Value | Shows the threshold rate value for the system to issue an alarm. |
| APS Trigger | Indicates whether the APS switchover trigger is set. |
| Description | Shows the description text for the counter. |

Related Commands

| Command | Description |
|--|--|
| aps trigger | Enables APS switchover trigger for threshold alarms. |
| description | Configures MIB description for threshold alarms. |
| notification-throttle timer | Modifies the alarms threshold notification throttle timer. |
| snmp-server enable traps threshold min-severity | Enables SNMP trap notification for threshold alarms. |
| threshold | Selects alarm threshold to modify and enters threshold configuration mode. |
| threshold-group | Associates a threshold list to an interface. |
| threshold-list | Creates a list of thresholds. |
| value | Configures the value for threshold alarms. |

threshold

To configure an alarm threshold in a threshold list, use the **threshold** command. To remove a threshold from a threshold list, use the **no** form of the command.

```
threshold name {cvrd | cdl hec | crc | sonet-sdh section cv | tx-crc} {degrade | failure} [index value]
```

```
no threshold name {cvrd | cdl hec | crc | sonet-sdh section cv | tx-crc} {degrade | failure} [index value]
```

Syntax Description

| | |
|-----------------------------|--|
| cvrd | Specifies the coding violation and running disparity counter. This counter is monitored for interfaces with the following encapsulation: <ul style="list-style-type: none"> • Gigabit Ethernet • ESCON • Fibre Channel • FICON |
| cdl hec | Specifies the CDL (converged data link) HEC (header error control) error counter. This counter is monitored for wave interfaces that insert and delete CDL headers. |
| crc | Specifies the cyclic redundancy error counter. |
| sonet-sdh section cv | Specifies the bit interleaved parity error. This counter is monitored for interfaces with either SONET or SDH encapsulation. |
| tx-crc | Specifies the transmit cyclic redundancy error counter. |
| degrade | Specifies that a signal degrade threshold alarm is generated. |
| failure | Specifies that a signal failure threshold alarm is generated. |
| index value | Specifies a MIB index. The range is 0 to 63. |

Defaults

None

Command Modes

Threshold-list 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

First use the **threshold-list** command to enter threshold-list configuration mode and create a threshold list. Then use the **threshold** command to enter threshold configuration mode for the specific threshold. In threshold configuration mode, you can modify the threshold attribute values.

Interfaces have no default alarm threshold values. When monitoring is enabled, alarm thresholds are only in effect when a threshold list is associated with the interface.

By default, the **threshold** command uses the next available threshold index number in the threshold list MIB. The **index** keyword and value allow you to explicitly assign an index for the threshold. This is particularly useful as index numbers become available when thresholds are deleted.

Examples

The following example shows how to configure an alarm threshold in a threshold list and enter threshold configuration mode.

```
Switch# configure terminal
Switch(config)# threshold-list temp
Switch(config-t-list)# threshold name cvrd degrade
Switch(config-threshold)#
```

Related Commands

| Command | Description |
|--|--|
| aps trigger | Enables APS switchover when the alarm threshold is crossed. |
| description | Specifies a threshold description for the SNMP MIB. |
| notification-throttle timer | Modifies the alarm threshold notification throttle timer. |
| show threshold-list | Displays the contents of a threshold list. |
| snmp-server enable traps threshold min-severity | Enables SNMP trap notifications for alarm threshold activity. |
| threshold-group | Associates a threshold list to an interface. |
| threshold-list | Groups a set of thresholds with a name. Switches from configuration mode to threshold-list configuration mode. |
| value | Specifies the threshold value. |

threshold-group

To associate a threshold list to an interface, use the **threshold-group** command. To remove a threshold list from an interface, use the **no** form of this command.

threshold-group *name*

no threshold-group *name*

Syntax Description

| | |
|------|--|
| name | Specifies the name of a threshold list and associates it with a specified interface. |
|------|--|

Defaults

None

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 associate a threshold list to a specified interface.

Even though a threshold list might contain the thresholds for all error counters, not all of these thresholds are applicable to the interface. Thresholds are recognized by the interface based on the interface type (for example, wave or waveethernetphy) and the encapsulation type (in the case of transparent interfaces).

You can associate more than one threshold list with an interface. The lists cannot contain overlapping thresholds. The system will not allow you to associate a threshold list if it contains a counter the interface already monitors for another threshold list.

If the interface is not associated with any threshold list, the threshold counters that are monitored on that interface are set to their default values.

**Note**

For y-cable protected transparent and wave interfaces, disable monitoring on the interface with the **no monitor** command before removing an alarm threshold. Use the **show aps** command to determine the protection configuration for the interface.

Examples

The following example shows how to associate a threshold list to a transparent interface.

```
Switch# configure terminal
Switch(config)# interface transparent 2/0/0
Switch(config-if)# threshold-group temp
```

Related Commands

| Command | Description |
|-------------------------------------|--|
| show threshold-list | Displays the contents of a threshold list. |
| threshold | Creates failure and degrade thresholds for different error counters that are monitored on the interface. |
| threshold-list | Creates a threshold list with a name or allows an existing list to be modified. Switches from configuration mode to threshold-list configuration mode. |

threshold-list

To create a list of thresholds, or modify an existing threshold list, use the **threshold-list** command. To delete the threshold list, use the **no** form of this command.

threshold-list *name*

no threshold-list *name*

| | | |
|---------------------------|------|--|
| Syntax Description | name | Specifies the name of the threshold list to be created and associated with a specified interface. The list name cannot begin with the text string “default”. |
|---------------------------|------|--|

| | |
|-----------------|------|
| Defaults | None |
|-----------------|------|

| | |
|----------------------|----------------------|
| 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 create a list, or modify an existing list, of signal degrade and signal failure alarm thresholds for monitored error counters. After entering the command, the CLI enters threshold configuration mode where you can specify the threshold list attributes or threshold counters to add or modify.

Before deleting or modifying a threshold list, remove it from all the interfaces that use it.

Examples The following example shows how to create a threshold list called temp.

```
Switch# configure terminal
Switch(config)# threshold-list temp
Switch(config-t-list)#
```

| Related Commands | Command | Description |
|------------------|--|--|
| | aps trigger | Enables APS switchover when the alarm threshold is crossed. |
| | description | Specifies a threshold description for the SNMP MIB. |
| | notification-throttle timer | Modifies the alarm threshold notification throttle timer. |
| | show threshold-list | Displays the contents of a threshold list. |
| | snmp-server enable traps threshold min-severity | Enables SNMP trap notifications for alarm threshold activity. |
| | threshold | Creates failure and degrade thresholds for different error counters that are monitored on the interface. |
| | threshold-group | Associates a threshold list to an interface. |
| | value | Specifies the threshold value. |

value

To configure the values of failure and degrade alarm threshold rates, use the **value** command. To remove an threshold rate, use the **no** form of the command.

value rate *value*

no value

| | | |
|---------------------------|--------------------------|---|
| Syntax Description | rate <i>value</i> | Enters the threshold value as 10^{-x} , where <i>value</i> is x in 10^{-x} . The range is 3 to 9. |
|---------------------------|--------------------------|---|

| | |
|-----------------|------|
| Defaults | None |
|-----------------|------|

| | |
|----------------------|-------------------------|
| Command Modes | Threshold 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 | First use the threshold-list command to enter threshold-list configuration mode and create a threshold list. Then use the threshold command to specify a threshold to modify and enter threshold configuration mode. |
|-------------------------|--|

The degrade rate value for a threshold must always be less than the failure rate value. For example, if the failure rate for a threshold is 7, or 10^{-7} , then the degrade value must be 8 or 9.

[Table 9-2](#) lists the errors per second for the threshold rates for each of the protocol encapsulations.

Table 9-2 *Thresholds for Monitored Protocols (Errors Per Second)*

| Rate | SONET OC-3 / SDH STM-1 | SONET OC-12 / SDH STM-4 | SONET OC-48 / SDH STM-16 | GE CVRD |
|------|------------------------|-------------------------|--------------------------|---------|
| 3 | 31,753 | 32,000 | 32,000 | 125000 |
| 4 | 12,318 | 27,421 | 31,987 | 12500 |
| 5 | 1518 | 5654 | 17,296 | 1250 |
| 6 | 155 | 616 | 2394 | 125 |
| 7 | 15.5 | 62 | 248 | 13 |
| 8 | 1.55 | 6.2 | 24.8 | 1.3 |
| 9 | 0.155 | 0.62 | 2.48 | 0.13 |

| Rate | ESCON | FC/FICON 1G CVRD | FC/FICON 2G CVRD | ISC ¹ |
|------|---------|------------------|------------------|------------------|
| 3 | 199,102 | 110000 | 220000 | 1,057,731 |
| 4 | 19,991 | 11000 | 22000 | 106,202 |
| 5 | 2000 | 1100 | 2200 | 10,625 |
| 6 | 200 | 110 | 220 | 1062 |
| 7 | 20 | 11 | 22 | 106 |
| 8 | 2 | 1.1 | 2.2 | 10.6 |
| 9 | 0.2 | 0.11 | 0.22 | 1.06 |

1. Compatibility mode only.

Table 9-3 lists the threshold error rates in errors per second for waveethernetphy interfaces on 10-Gbps ITU trunk card.

Table 9-3 *Threshold Values for Monitored Rates on 10-Gbps Signals in Errors Per Second*

| Rate | 10-Gigabit CVRD | 10-Gigabit CDL HEC |
|------|-----------------|--------------------|
| 3 | 12,443,900 | 6512 |
| 4 | 1,249,438 | 665 |
| 5 | 124,944 | 67 |
| 6 | 10,312 | 7 |
| 7 | 1031 | 0.7 |
| 8 | 103 | 0.07 |
| 9 | 10 | 0.007 |

Examples

The following example shows how to create thresholds within a threshold list (temp) with the SONET and SDH section code violation error threshold signal degrade rate of 9 and signal failure rate of 7.

```
Switch# configure terminal
Switch(config)# threshold-list temp
Switch(config-t-list)# threshold name sonet-sdh section cv degrade
Switch(config-threshold)# value rate 9
```

value

```
Switch(config-threshold)# exit
Switch(config-t-list)# threshold name sonet-sdh section cv failure
Switch(config-threshold)# value rate 7
Switch(config-threshold)# end
Switch#
```

Related Commands

| Command | Description |
|------------------------|--|
| threshold | Selects alarm threshold to modify and enters threshold configuration mode. |
| threshold-group | Associates a threshold list with an interface. |
| threshold-list | Creates a threshold list with a name or allows an existing list to be modified. Switches from configuration mode to threshold-list configuration mode. |