IP Event Dampening

The IP Event Dampening feature introduces a configurable exponential decay mechanism to suppress the effects of excessive interface flapping events on routing protocols and routing tables in the network. This feature allows the network operator to configure a router to automatically identify and selectively dampen a local interface that is flapping.

Feature History for the IP Event Dampening feature

Release	Modification
12.0(22)S	This feature was introduced.
12.2(14)S	This feature was integrated into Cisco IOS Release 12.2(14)S.
12.2(13)T	This feature was integrated into Cisco IOS Release 12.2(13)T.
12.2(18)SXD	This feature was integrated into Cisco IOS Release 12.2(18)SXD.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

Contents

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Restrictions for IP Event Dampening

Subinterface Restrictions

Only primary interfaces can be configured with this feature. IP Event Dampening does not track the flapping of individual subinterfaces on an interface.

Virtual Templates Not Supported

Copying a dampening configuration from virtual templates to virtual access interfaces is not supported because dampening has limited usefulness to existing applications that use virtual templates. Virtual access interfaces are released when an interface flaps, and new connections and virtual access interfaces are acquired when the interface comes up and is made available to the network. Since dampening states are attached to the interface, the dampening states would not survive an interface flap.

IPX Routing Protocols Not Supported

IPX protocols are not supported by the IP Event Dampening feature. However, IPX variants of these protocols will still receive up and down state event information when this feature is enabled. This should not create any problems or routing issues.

Information About IP Event Dampening

IP Event Dampening Overview

Interface state changes occur when interfaces are administratively brought up or down or if an interface changes state. When an interface changes state or flaps, routing protocols are notified of the status of the routes that are affected by the change in state. Every interface state change requires all affected devices in the network to recalculate best paths, install or remove routes from the routing tables, and then advertise valid routes to peer routers. An unstable interface that flaps excessively can cause other devices in the network to consume substantial amounts of system processing resources and cause routing protocols to lose synchronization with the state of the flapping interface.

The IP Event Dampening feature introduces a configurable exponential decay mechanism to suppress the effects of excessive interface flapping events on routing protocols and routing tables in the network. This feature allows the network operator to configure a router to automatically identify and selectively dampen a local interface that is flapping. Dampening an interface removes the interface from the network until the interface stops flapping and becomes stable. Configuring the IP Event Dampening feature improves convergence times and stability throughout the network by isolating failures so that disturbances are not propagated, which reduces the utilization of system processing resources by other devices in the network and improves overall network stability.

Interface State Change Events

This section describes the interface state change events of the IP Event Dampening features. This feature employs a configurable exponential decay mechanism that is used to suppress the effects of excessive interface flapping or state changes. When the IP Event Dampening feature is enabled, flapping interfaces are dampened from the perspective of the routing protocol by filtering excessive route updates. Flapping interfaces are identified, assigned penalties, suppressed if the necessary, and made available to the network when the interface stabilizes. Figure 1 is a chart that displays interface state events as they are perceived by routing protocols.

Suppress Threshold

The suppress threshold is the value of the accumulated penalty that triggers the router to dampen a flapping interface. The flapping interface is identified by the router and assigned a penalty for each up and down state change, but the interface is not automatically dampened. The router tracks the penalties that a flapping interface accumulates. When the accumulated penalty reaches the default or preconfigured suppress threshold, the interface is placed in a dampened state.

Half-Life Period

The half-life period determines how fast the accumulated penalty can decay exponentially. When an interface is placed in a dampened state, the router monitors the interface for additional up and down state changes. If the interface continues to accumulate penalties and the interface remains in the suppress threshold range, the interface will remain dampened. If the interface stabilizes and stops flapping, the penalty is reduced by half after each half-life period expires. The accumulated penalty will be reduced until the penalty drops to the reuse threshold. The configurable range of the half-life period timer is from 1 to 30 seconds. The default half-life period timer is 5 seconds.

Reuse Threshold

When the accumulated penalty decreases until the penalty drops to the reuse threshold, the route is unsuppressed and made available to the other devices on the network. The range of the reuse value is from 1 to 20000 penalties. The default value is 1000 penalties.

Maximum Suppress Time

The maximum suppress time represents the maximum amount of time an interface can remain dampened when a penalty is assigned to an interface. The maximum suppress time can be configured from 1 to 20000 seconds. The default of the maximum penalty timer is 20 seconds or four times the default half-life period (5 seconds). The maximum value of the accumulated penalty is calculated, based on the maximum suppress time, reuse threshold, and half-life period.

Figure 1 Interface State Change Events Perceived by the Routing Protocols
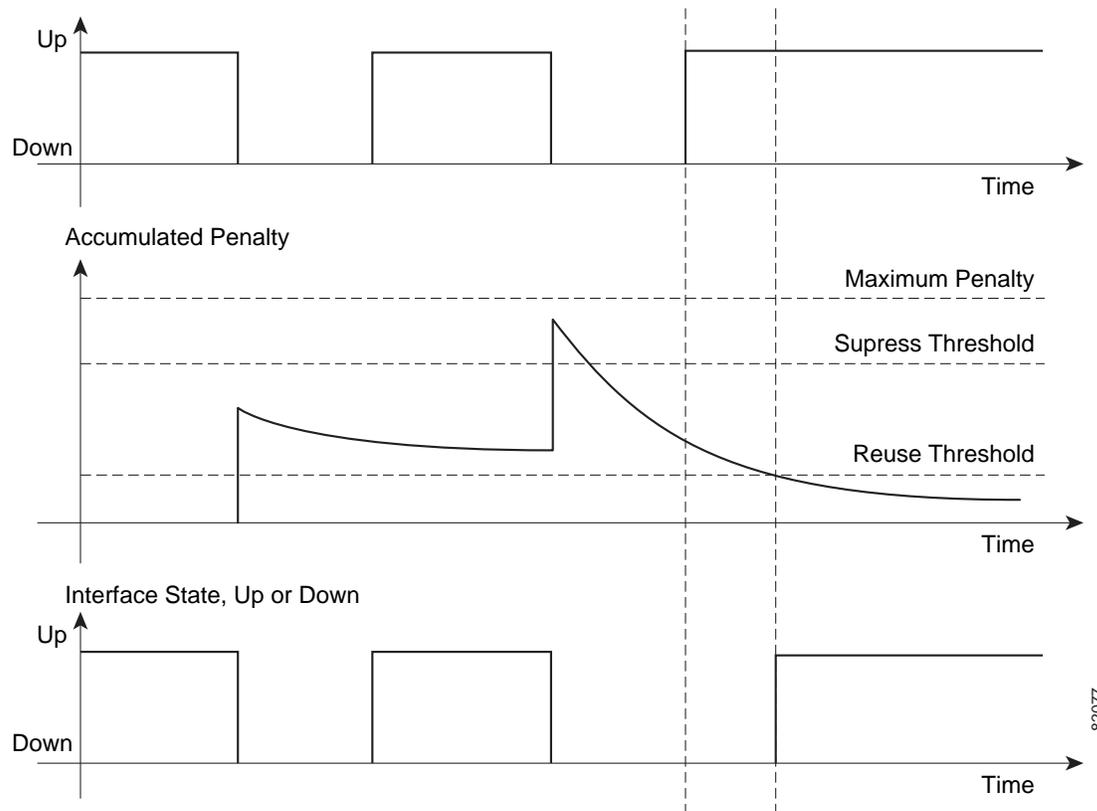
Affected Components

When an interface is not configured with dampening, or when an interface is configured with dampening but is not suppressed, the routing protocol behavior as a result of interface state transitions is not changed by the IP Event Dampening feature. However, if an interface is suppressed, the routing protocols and routing tables are immune to any further state transitions of the interface until it is unsuppressed.

Route Types

The following interfaces are affected by the configuration of this feature:

- Connected routes:
  - The connected routes of dampened interfaces are not installed into the routing table.
  - When a dampened interface is unsuppressed, the connected routes will be installed into the routing table if the interface is up.
- Static routes:
  - Static routes assigned to a dampened interface are not installed into the routing table.
  - When a dampened interface is unsuppressed, the static route will be installed to the routing table if the interface is up.

Note Only the primary interface can be configured with this feature, and all the subinterfaces are subject to the same dampening configuration as the primary interface. IP Event Dampening does not track the flapping of individual subinterfaces on an interface.

Supported Protocols

The IP Event Dampening feature supports Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Intermediate System-to-Intermediate System (IS-IS), Border Gateway Protocol (BGP), Connectionless Network Services (CLNS), and Hot Standby Routing Protocol (HSRP). The following list provides some general information about the operation of this feature with these protocols.

- RIP, OSPF, EIGRP, IS-IS, and BGP:

  - When an interface is dampened, the interface is considered to be down by the routing protocol. The routing protocol will not hold any adjacencies with this peer router over the dampened interface or generate advertisements of any routes related to this interface to other peer routers.

  - When the interface is unsuppressed and made available to the network, the interface will be considered by the routing protocols to be up. The routing protocols will be notified that the interface is in an up state and routing conditions will return to normal.

- HSRP:

  - When an interface is dampened, it is considered to be down by HSRP. HSRP will not generate HSRP messages out of the dampened interface or respond to any message received by the dampened interface. When the interface is unsuppressed and made available to the network, HSRP will be notified of the up state and will return to normal operations.

- CLNS:

  - When an interface is dampened, the interface is dampened to both IP and CLNS routing equally. The interface is dampened to both IP and CLNS because integrated routing protocols like IS-IS, IP, and CLNS routing are closely interconnected, so it is impossible to apply dampening separately.

Note The IP Event Dampening feature has no effect on any routing protocols if it is not enabled or an interface is not dampened.

Network Deployments

In real network deployments, some routers would not be configured with interface dampening, and not all of the routers would even support this feature. No major routing issues are expected, even if the router at the other end of a point-to-point interface or if routers of the same multicast LAN do not have interface dampening turned on or do not have this feature implemented at all. On the router where the interface is dampened, any routes associated with this interface will not be used. No packets will be sent out of this interface, and no routing protocol activity will be initiated with the routers on the other side of the interface. However, those other routers could still install some routes in their routing tables that are associated with this subnet because those routers recognize that their own interfaces are up and could start forwarding packets to the dampened interface. In this situation, the router with the dampened interface will start forwarding these packets, depending on the routes in its routing table.

The IP Event Dampening feature does not introduce new information into the network. In fact, the effect of dampening is to subtract a subset of all such routing information from the network. Therefore, looping should not occur as a result of dampening.

Benefits of IP Event Dampening

Reduced Processing Load

The IP Event Dampening Feature employs a configurable exponential decay mechanism to suppress the effects of excessive interface flapping events on the routing protocols. Excessive interface up and down state changes that are received in a short period of time are not processed and do not consume system resources. Other routers in the network need not waste system resources because of a flapping route.

Faster Convergence

The IP Event Dampening feature improves convergence times and stability throughout the network by isolating failures so that disturbances are not propagated. Routers that are not experiencing link flap reach convergence sooner, because routing tables are not rebuilt each time the offending router leaves and enters service

Improved Network Stability

The IP Event Dampening feature provides increased network stability. A router with a flapping interface removes the flapping interface from the network until the interface stabilizes, so other routers simply redirect traffic around the affected router until the interface becomes stable, which ensures that the router loses no data packets.

How to Configure IP Event Dampening

This section contains the following tasks:

Enabling IP Event Dampening

The **dampening** command is entered in interface configuration mode to enable the IP Event Dampening feature. If this command is applied to an interface that already has dampening configured, all dampening states are reset and the accumulated penalty will be set to 0. If the interface has been dampened, the accumulated penalty will fall into the reuse threshold range, and the dampened interface will be made available to the network. The flap counts, however, are retained.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **dampening**[*half-life-period reuse-threshold*] [*suppress-threshold max-suppress* [*restart-penalty*]]
5. **end**

DETAILED STEPS

	Command or Action	Purpose

Step 1	`enable`
	
	Example:
	`Router> enable`
		Enables privileged EXEC mode.
		
		• Enter your password if prompted.

Step 2	`configure terminal`
	
	Example:
	`Router# configure terminal`
		Enters global configuration mode.

Step 3	`interface type number`
	
	Example:
	`Router(config)# interface type number`
		Enters interface configuration mode and configures the specified interface.

Step 4	`dampening [half-life-period reuse-threshold] [suppress-threshold max-suppress [restart-penalty]]`
	
	Example:
	`Router(config-if)# dampening`
		Enables interface dampening.
		
		• Entering the **dampening** command without any keywords or arguments enables interface dampening with the default configuration parameters.
		
		• When manually configuring the timer for the *restart-penalty* argument, the values must be manually entered for all arguments.

Step 5	`end`
	
	Example:
	`Router(config-if)# end`
		Exits interface configuration mode and enters Privileged EXEC mode.

Verifying IP Event Dampening

Use the **show dampening interface** or **show interface dampening** EXEC commands to verify the configuration of the IP Event Dampening feature.

The **clear counters** Privileged EXEC command be used to clear the flap count and reset it to zero. All other parameters and status, including dampening states and accumulated penalties, are not affected by this command.

SUMMARY STEPS

1. **enable**
2. **show dampening interface**
3. **show interface dampening**

DETAILED STEPS

	Command or Action	Purpose

Step 1	`enable`
	
	Example:
	`Router> enable`
		Enables privileged EXEC mode.
		
		• Enter your password if prompted.

Step 2	`show dampening interface`
	
	Example:
	`Router# configure terminal`
		Enters global configuration mode.

Step 3	`show interface dampening`
	
	Example:
	`Router(config)# interface type number`
		Enters interface configuration mode for the specified interface.

Configuration Examples for IP Event Dampening

The following examples show how to configure this feature:

Configuring IP Event Dampening: Example

The following example configures interface dampening on Ethernet interface 0/0 and sets the half life to 30 seconds, the reuse threshold to 1500, the suppress threshold to 10000; and the maximum suppress time to 120 seconds:

```
interface Ethernet 0/0
 dampening 30 1500 10000 120
```

The following example configures interface dampening on ATM interface 6/0 and uses the default interface dampening values:

```
interface atm 6/0
 dampening
```

The following example configures the router to apply a penalty of 500 on Ethernet interface 0/0 when the interface comes up for the first time after the router is reloaded:

```
interface Ethernet 0/0
 dampening 5 500 1000 20 500
```

Verifying IP Event Dampening: Example

The output of the **show dampening interface** command displays a summary of interface dampening. The following is sample output from the **show dampening interface** command:

```
Router# show dampening interface

3 interfaces are configured with dampening.
No interface is being suppressed.
Features that are using interface dampening:
  IP Routing
  CLNS Routing
```

The output of the **show interface dampening** command displays the a summary of the dampening parameters and status. The following is sample output from the **show interface dampening** command.

```
Router# show interface dampening

FastEthernet0/0
  Flaps Penalty    Supp ReuseTm   HalfL   ReuseV   SuppV  MaxSTm    MaxP Restart
      0       0   FALSE       0       5     1000     2000      20   16000       0
ATM2/0
  Flaps Penalty    Supp ReuseTm   HalfL   ReuseV   SuppV  MaxSTm    MaxP Restart
      0       0   FALSE       0       5     1000     2000      20   16000       0
POS6/0
  Flaps Penalty    Supp ReuseTm   HalfL   ReuseV   SuppV  MaxSTm    MaxP Restart
      0       0   FALSE       0       5     1000     2000      20   16000       0
```

Additional References

The following sections provide references related to IP Event Dampening feature.

Related Documents

Related Topic	Document Title
Routing Protocol Commands	• *Cisco IOS IP Command Reference, Volume 2 of 4: Routing Protocols,* Release 12.3T
Routing Protocol Configuration Tasks	• *Cisco IOS IP Configuration Guide,* Release 12.3

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing standards has not been modified by this feature.	—

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

Command Reference

This section documents new commands.

- **dampening**
- **debug dampening**
- **show dampening interface**
- **show interface dampening**

dampening

To configure a router to automatically dampen a flapping interface, use the **dampening** command in interface configuration mode. To disable automatic route dampening, use the **no** form of this command.

dampening [*half-life-period reuse-threshold*] [*suppress-threshold max-suppress* [*restart-penalty*]]

no dampening

Syntax Description		
half-life-period	(optional) Time (in seconds) after which a penalty is decreased. Once the route has been assigned a penalty, the penalty is decreased by half after the half-life period expires. The range of the half-life period is from 1 to 30 seconds. The default time is 5 seconds.	
reuse-threshold	(optional) Reuse value based on the number of penalties. When the accumulated penalty decreases enough to fall below this value, the route is unsuppressed. The range of the reuse value is from 1 to 20000; the default is 1000.	
suppress-threshold	(optional) Value of the accumulated penalty that triggers the router to dampen a flapping interface.A route is suppressed when its penalty exceeds this limit. The range is from 1 to 20000; the default is 2000.	
max-suppress-time	(optional) Maximum time (in seconds) a route can be suppressed. The range is from 1 to 20000; the default is four times the *half-life-period* value. If the *half-life-period* value is allowed to default, the maximum suppress time defaults to 20 seconds.	
restart-penalty	(optional) Penalty to applied to the interface when it comes up for the first time after the router reloads. The configurable range is from 1 to 20000 penalties. The default is 2000 penalties. This argument is not required for any other configurations.	

Defaults

This command is disabled by default. To manually configure the timer for the **restart** keyword, the value for all arguments must be manually entered.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.

Usage Guidelines

The IP Event Dampening feature will function on a subinterface but cannot be configured on only the subinterface. Only primary interfaces can be configured with this feature. Primary interface configuration is applied to all subinterfaces by default.

When an interface is dampened, the interface is dampened to both IP and Connectionless Network Services (CLNS) routing equally. The interface is dampened to both IP and CLNS because integrated routing protocols like Intermediate System-to-Intermediate System (IS-IS), IP, and CLNS routing protocols are closely interconnected, so it is impossible to apply dampening separately.

This occurs because for integrated protocols like Intermediate System-to-Intermediate System (IS-IS), IP, and CLNS routing are closely interconnected, so it is impossible to apply dampening separately.

Copying a dampening configuration from virtual templates to virtual access interfaces is not supported because dampening has limited usefulness to existing applications using virtual templates. Virtual access interfaces are released when an interface flaps, and new connections and virtual access interfaces are acquired when the interface comes up and is made available to the network. Because dampening states are attached to the interface, the dampening states would not survive an interface flap.

If this command is applied to an interface that already has dampening configured, all dampening states are reset and the accumulated penalty will be set to 0. If the interface has been dampened, the accumulated penalty will fall into the reuse threshold range, and the dampened interface will be made available to the network. The flap counts, however, are retained.

Examples

The following example sets the half life to 30 seconds, the reuse threshold to 1500, the suppress threshold to 10000, and the maximum suppress time to 120 seconds:

```
interface Ethernet 0/0
 dampening 30 1500 10000 120
```

The following example configures the router to apply a penalty of 500 on Ethernet interface 0/0 when the interface comes up for the first time after the router is reloaded:

```
interface Ethernet 0/0
 dampening 5 500 1000 20 500
```

Related Commands

Command	Description
clear counters	Clears the interface counters.
show dampening interface	Displays a summary of interface dampening.
show interface dampening	Displays a summary of the dampening parameters and status.

debug dampening

To display debug trace information messages for interface dampening, use the **debug dampening** command in privileged EXEC mode. To disable the debug messages, use the **no** form of this command.

> **debug dampening** [**all** | **interface**]

> **no debug dampening** [**all** | **interface**]

Syntax Description		
all	(optional) Enables trace debugging for all dampening features.	
interface	(optional) Enables trace debugging for IP event dampening.	

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.

Examples   The following sample output is similar to the output that will be displayed when the **debug dampening** command is entered with the **interface** keyword. The sample output shows the following information:

- Ethernet interface 1/1 is configured with the IP Event Dampening feature. The half-life period is set to 30 seconds, the reuse threshold to 500, the suppress threshold to 1000, and the restart penalty to 90.

- The **shutdown** command and then the **no shutdown** command was entered on Ethernet interface 1/1. The interface was suppressed and then reused by the IP Event Dampening feature.

```
router# debug dampening interface

00:07:17:IF-EvD(Ethernet1/1):CLNS Routing reports state transition from UP to DOWN
00:07:17:EvD(Ethernet1/1):charge penalty 1000, new accum. penalty 1000, flap count 1
00:07:17:EvD(Ethernet1/1):accum. penalty 1000, now suppressed with a reuse intervals of 30
00:07:17:IF-EvD(Ethernet1/1):update CLNS Routing state to DOWN, interface is suppressed
00:07:17:IF-EvD(Ethernet1/1):IP Routing reports state transition from DOWN to DOWN
00:07:17:IF-EvD(Ethernet1/1):update IP Routing state to DOWN, interface is suppressed
00:07:17:IF-EvD(Ethernet1/1):CLNS Routing reports state transition from DOWN to UP
00:07:17:IF-EvD(Ethernet1/1):CLNS Routing reports state transition from UP to DOWN
00:07:17:EvD(Ethernet1/1):accum. penalty decayed to 1000 after 0 second(s)
00:07:17:EvD(Ethernet1/1):charge penalty 1000, new accum. penalty 2000, flap count 2
00:07:17:EvD(Ethernet1/1):accum. penalty 2000, now suppressed with a reuse intervals of 60
00:07:17:IF-EvD(Ethernet1/1):CLNS Routing reports state transition from DOWN to UP
00:07:17:IF-EvD(Ethernet1/1):CLNS Routing reports state transition from UP to DOWN
00:07:17:EvD(Ethernet1/1):accum. penalty decayed to 2000 after 0 second(s)
00:07:17:EvD(Ethernet1/1):charge penalty 1000, new accum. penalty 3000, flap count 3
```

```
00:07:17:EvD(Ethernet1/1):accum. penalty 3000, now suppressed with a reuse intervals of 78
00:07:17:IF-EvD(Ethernet1/1):CLNS Routing reports state transition from DOWN to UP
00:07:17:IF-EvD(Ethernet1/1):IP Routing reports state transition from UP to UP
00:07:17:IF-EvD(Ethernet1/1):IP Routing reports state transition from UP to UP
00:07:17:IF-EvD(Ethernet1/1):IP Routing reports state transition from UP to UP
00:07:17:IF-EvD(Ethernet1/1):IP Routing reports state transition from UP to UP
00:07:17:IF-EvD(Ethernet1/1):IP Routing reports state transition from UP to UP
00:07:20:IF-EvD(Ethernet1/1):CLNS Routing reports state transition from UP to UP
00:07:20:IF-EvD(Ethernet1/1):IP Routing reports state transition from UP to UP
00:07:47:IF-EvD:unsuppress interfaces
00:08:36:IF-EvD:unsuppress interfaces
00:08:36:EvD(Ethernet1/1):accum. penalty decayed to 483 after 79 second(s)
00:08:36:EvD(Ethernet1/1):accum. penalty 483, now unsuppressed
00:08:36:IF-EvD(Ethernet1/1):update IP Routing state to UP, interface is not suppressed
00:08:36:IF-EvD(Ethernet1/1):update CLNS Routing state to UP, interface is not suppressed
00:08:36:IF-EvD(Ethernet1/1):CLNS Routing reports state transition from UP to UP
```

Table 1 describes the significant fields shown in the sample output of the **debug dampening** command.

Table 1   debug dampening Field Descriptions

Field	Description
... Routing reports state transition from UP to DOWN	Displays the status of the specified interface from the perspective of the specified protocol. Interface state changes are displayed. The interface is specified within parens. The protocol is specified at the beginning of the message.
charge penalty 1000, new accum. penalty 1000, flap count 1	Displays the penalty assigned to the flapping interface and amount of penalty that is added to the accumulated penalty. The interface flap count is also displayed.
accum. penalty 1000, now suppressed with a reuse intervals of 30	Displays the status of the interface, accumulated penalty, and configured reuse threshold.
update CLNS Routing state to DOWN, interface is suppressed	Displays the status of the specified interface. Interface state changes and suppression status are displayed.
accum. penalty decayed to 1000 after 0 second(s)	Displays the decay rate of the accumulated penalty.
unsuppress interfaces	Indicates that dampened interfaces have been unsuppressed.

show dampening interface

To display a summary of dampened interfaces, use the **show damping interface** command in EXEC mode.

show dampening interface

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.

Examples

The following is sample output from the **show damping interface** command in EXEC mode:

```
Router# show dampening interface

3 interfaces are configured with dampening.
No interface is being suppressed.
Features that are using interface dampening:
  IP Routing
  CLNS Routing
```

Table 2 describes the significant fields shown in the sample output of the **show dampening interface** command.

Table 2   show dampening interface Field Descriptions

Field	Description
... interfaces are configured with dampening.	Displays the number of interfaces that are configured for event dampening.
No interface is being suppressed.	Displays the suppression status of the interfaces that are configured for event dampening.
Features that are using interface dampening:	Displays the routing protocols that are configured to perceived interface dampening.

Related Commands

Command	Description
clear counters	Clears the interface counters.
dampening	Enables IP event dampening at the interface level.
show interface dampening	Displays a summary of the dampening parameters and status.

show interface dampening

To display dampened interfaces on the local router, use the **show interface dampening** command in EXEC mode.

show interface dampening

Syntax Description   This command has no keywords or arguments.

Command Modes   EXEC

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.

Examples   The following is sample output from the **show interface dampening** command:

```
Router# show interface dampening

Flaps Penalty    Supp ReuseTm   HalfL  ReuseV   SuppV  MaxSTm    MaxP Restart
      0       0   FALSE      0       5   1000    2000      20   16000       0
```

Table 3 describes the significant fields shown in the display.

Table 3   show interface dampening Field Descriptions

Field	Description
Flaps	Displays the number of times that an interface has flapped.
Penalty	Displays the accumulated penalty.
Supp	Indicates if the interface is dampened.
ReuseTm	Displays the reuse timer.
HalfL	Displays the half-life counter.
ReuseV	Displays the reuse threshold timer.
SuppV	Displays the suppress threshold.
MaxSTm	Displays the maximum suppress.
MaxP	Displays the maximum penalty.
Restart	Displays the restart timer.

Related Commands   **clear counters**   Clears the interface counters.

dampening	Enables IP event dampening at the interface level.
show dampening interface	Displays a summary of interface dampening.

Glossary

event dampening—The process in which a router dampens a flapping interface from the perspective of the routing tables and routing protocols of IP and CLNS by filtering the excessive route adjust message because of the interface state change.

Flap—Rapid interface state changes from up to down and down to up within a short period of time.

half life—The rate of the exponential decay of the accumulated penalty is determined by this value.

maximum penalty—The maximum value beyond which the penalty assigned does not increase. It is derived from the maximum suppress time.

maximum suppress time—The maximum amount of time the interface can stay suppressed at the time a penalty is assigned.

penalty—A value assigned to an interface when it flaps. This value increases with each flap and decreases over time. The rate at which it decreases depends on the half life.

reuse threshold—The threshold value after which the interface will be unsuppressed and can be used again.

suppress threshold—Value of the accumulated penalty that triggers the router to dampen a flapping interface. When the accumulated penalty exceeds this value, the interface state is considered to be down from the perspective of the routing protocol.

suppressed—Suppressing an interface removes an interface from the network from the perspective of the routing protocol. An interface enters the suppressed state when it has flapped frequently enough for the penalty assigned to it to cross a threshold limit.

> **Note** Refer to *Internetworking Terms and Acronyms* for terms not included in this glossary.