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# 1 Configuring IP Event Dampening

## 1.1 Introduction

When an L3 network interface frequently goes Up or Down due to manual enabling/disabling or other external causes, the routing table on the device flaps repeatedly. If a routing protocol is configured, the protocol may extend the flap to the entire network, causing repeated updates and recalculation of neighboring routes. As a result, this wastes network bandwidth and destabilizes the network. Repeated route updates and recalculation on devices consume many CPU resources, and thus affect the normal running of customer networks.

The function of IP Event Dampening detects abnormal Up/Down flapping and automatically suppresses frequent interface state changes, which prevents a routing protocol from propagating single-point link failures. When an interface is restored to stable, it is automatically released, thus reducing network flaps and CPU resource consumption while improving network stability.

### 1.1.1 Basic Concepts

#### 1. Penalty

IP Event Dampening uses the penalty method to perceive and control interface changes. Whenever an interface goes Up or Down, the penalty accumulates, but when the interface is stable, the penalty decreases exponentially. In this way, interface behaviors can be sensed and processed intelligently.

#### 2. Suppress threshold

To identify an interface flap event, the function of IP Event Dampening configures a suppress threshold. When the cumulative penalty of an interface exceeds a suppress threshold, the interface is considered to flap and is suppressed.

#### 3. Half-life period

The half-life period is the period for the penalty to decrease to half of the original value when an interface becomes stable. It defines the speed at which the penalty decays exponentially. The shorter the half-life period, the faster the penalty decays, and the faster the interface is detected to be stable, but the flap detection sensitivity is reduced more greatly.

#### 4. Reuse threshold

When an interface does not flap and its penalty decays to a certain degree (below the suppress threshold), the interface is considered to be stable and is released.

#### 5. Maximum suppress time

When an interface keeps flapping and reaches a very large penalty, the interface is not usable for a long time. To avoid this problem, we define the maximum suppress time to ensure that the interface suppression duration is less than the maximum suppress time no matter how long the interface has flapped.

## 6. Interface flap suppression

- An interface configured with IP Event Dampening is assigned a penalty. The interface gets a penalty of 1000 whenever it goes Down, and the penalty decreases with time. If the interface goes Down again, the penalty increases. When the cumulative penalty exceeds the suppress threshold, the interface is suppressed. For the affected upper-layer protocol, the suppressed interface is always Down regardless of the interface state. When the penalty decreases to the reuse threshold, the interface is released and restored to its real state.
- If an L3 interface is not configured with IP Event Dampening or is not suppressed, the routing protocol or other protocols concerned about the interface state still work normally. When the interface is configured with IP Event Dampening and is suppressed, the upper-layer protocol considers the interface to be Down. During this process, any state change of the interface does not affect the routing table or the route calculation and advertisement performed by the upper-layer routing protocol until the interface is released.

### 1.1.2 Protocols and Standards

- RFC 2439: BGP Route Flap Dampening

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**Note**

The suppression algorithm core used by IP Event Dampening is the same as that used by Border Gateway Protocol (BGP) Route Flap Dampening stipulated in RFC 2439.

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## 1.2 Restrictions and Guidelines

- The function of IP Event Dampening is supported only on L3 interfaces.

## 1.3 Configuring IP Event Dampening

### 1.3.1 Overview

When an interface configured with IP Event Dampening keeps flapping until the predefined threshold is exceeded, the interface is set to Down.

### 1.3.2 Restrictions and Guidelines

- When an L3 interface on a device is converted into an L2 interface, the IP Event Dampening command configured on the interface is deleted.
- IP Event Dampening cannot be configured on **virtual templates**.

### 1.3.3 Procedure

- (1) Enter the privileged EXEC mode.  
**enable**
- (2) Enter the global configuration mode.  
**configure terminal**
- (3) Enter the interface configuration mode.  
**interface** *interface-type interface-number*



### 3. Notes

- Enable IP Event Dampening on interface GigabitEthernet 0/1 on Device A and Device B respectively, and set the half-time period to 30s, the reuse threshold to 1500, the suppress threshold to 10,000, and the maximum suppress time to 120s.

### 4. Procedure

Configure IP Event Dampening on Device A.

```
DeviceA> enable
DeviceA# configure terminal
DeviceA(config)# interface gigabitethernet 0/1
DeviceA(config-if-GigabitEthernet 0/1)# dampening 30 1500 10000 100
```

Configure IP Event Dampening on Device B.

```
DeviceB# configure terminal
DeviceB(config)# interface gigabitethernet 0/1
DeviceB(config-if-GigabitEthernet 0/1)# dampening 30 1500 10000 100
```

### 5. Verification

Run the **show interfaces dampening** command to display the detailed information about Event Dampening on an interface.

```
DeviceA# show interfaces dampening
GigabitEthernet 0/1
  Flaps Penalty Supp      ReuseTm HalfL   ReuseV  SuppV   MaxSTm  MaxP   Restart
  0      0      FALSE    0        30        1500    1000    100     15119  0
```

### 6. Configuration Files

- Device A configuration file

```
hostname DeviceA
!
interface GigabitEthernet 0/1
  no switchport
  dampening 30 1500 10000 100
!
end
```

- Device B configuration file

```
hostname DeviceA
!
interface GigabitEthernet 0/1
  no switchport
  dampening 30 1500 10000 100
!
end
```

### 7. Common Errors

- IP Event Dampening is configured for an interface on an L3 device before the interface is converted to a

routed interface by running the **no swithport** command.