Configuring Traffic Storm Control

This chapter describes how to configure the traffic storm control feature on the Catalyst 6500 series switches.

Note For complete syntax and usage information for the commands used in this chapter, refer to the *Cisco IOS Master Command List*, Release 12.2SX at this URL:

http://www.cisco.com/en/US/docs/ios/mcl/allreleasemcl/all_book.html

This chapter consists of these sections:

Tip For additional information about Cisco Catalyst 6500 Series Switches (including configuration examples and troubleshooting information), see the documents listed on this page:

http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html

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Understanding Traffic Storm Control

A traffic storm occurs when packets flood the LAN, creating excessive traffic and degrading network performance. The traffic storm control feature prevents LAN ports from being disrupted by a broadcast, multicast, or unicast traffic storm on physical interfaces.

Traffic storm control (also called traffic suppression) monitors incoming traffic levels over a 1-second traffic storm control interval and, during the interval, compares the traffic level with the traffic storm control level that you configure. The traffic storm control level is a percentage of the total available bandwidth of the port. Each port has a single traffic storm control level that is used for all types of traffic (broadcast, multicast, and unicast).

Traffic storm control monitors the level of each traffic type for which you enable traffic storm control in 1-second traffic storm control intervals. Within an interval, when the ingress traffic for which traffic storm control is enabled reaches the traffic storm control level that is configured on the port, traffic storm control drops the traffic until the traffic storm control interval ends.

Figure 39-1 shows the broadcast traffic patterns on a LAN interface over a given interval. In this example, traffic storm control occurs between times T1 and T2 and between T4 and T5. During those intervals, the amount of broadcast traffic exceeded the configured threshold.

Figure 39-1   Broadcast Suppression

The traffic storm control threshold numbers and the time interval combination make the traffic storm control algorithm work with different levels of granularity. A higher threshold allows more packets to pass through.

Traffic storm control on the Catalyst 6500 series switches is implemented in hardware. The traffic storm control circuitry monitors packets passing from a LAN interface to the switching bus. Using the Individual/Group bit in the packet destination address, the traffic storm control circuitry determines if the packet is unicast or broadcast, keeps track of the current count of packets within the 1-second interval, and when a threshold is reached, filters out subsequent packets.

Because hardware traffic storm control uses a bandwidth-based method to measure traffic, the most significant implementation factor is setting the percentage of total available bandwidth that can be used by controlled traffic. Because packets do not arrive at uniform intervals, the 1-second interval during which controlled traffic activity is measured can affect the behavior of traffic storm control.

The following are examples of traffic storm control behavior:

- If you enable broadcast traffic storm control, and broadcast traffic exceeds the level within a 1-second traffic storm control interval, traffic storm control drops all broadcast traffic until the end of the traffic storm control interval.

- If you enable broadcast and multicast traffic storm control, and the combined broadcast and multicast traffic exceeds the level within a 1-second traffic storm control interval, traffic storm control drops all broadcast and multicast traffic until the end of the traffic storm control interval.

- If you enable broadcast and multicast traffic storm control, and broadcast traffic exceeds the level within a 1-second traffic storm control interval, traffic storm control drops all broadcast and multicast traffic until the end of the traffic storm control interval.

- If you enable broadcast and multicast traffic storm control, and multicast traffic exceeds the level within a 1-second traffic storm control interval, traffic storm control drops all broadcast and multicast traffic until the end of the traffic storm control interval.

Default Traffic Storm Control Configuration

Traffic storm control is disabled by default.

Traffic Storm Control Guidelines and Restrictions

When configuring traffic storm control, follow these guidelines and restrictions:

- FlexWAN Fast Ethernet port adapters and all WAN modules supporting Ethernet SPAs do not support traffic storm control.

- The following LAN switching modules do not support traffic storm control:
    - WS-X6148A-GE-45AF
    - WS-X6148A-GE-TX
    - WS-X6148-GE-45AF
    - WS-X6148-GE-TX
    - WS-X6148V-GE-TX
    - WS-X6548-GE-45AF
    - WS-X6548-GE-TX
    - WS-X6548V-GE-TX

- The switch supports multicast and unicast traffic storm control on Gigabit and 10 Gigabit Ethernet LAN ports. Most FastEthernet switching modules do not support multicast and unicast traffic storm control, with the exception of WS-X6148A-RJ-45 and the WS-X6148-SFP.

- The switch supports broadcast traffic storm control on all LAN ports except on those modules previously noted.

- Except for BPDUs, traffic storm control does not differentiate between control traffic and data traffic.

- When multicast suppression is enabled, traffic storm control suppresses BPDUs when the multicast suppression threshold is exceeded on these modules:
    - WS-X6748-SFP
    - WS-X6724-SFP
    - WS-X6748-GE-TX
    - WS-X6748-GE-TX
    - WS-X6704-10GE
    - WS-SUP32-GE-3B
    - WS-SUP32-10GE-3B

When multicast suppression is enabled on the listed modules, do not configure traffic storm control on STP-protected ports that need to receive BPDUs.

Except on the listed modules, traffic storm control does not suppress BPDUs.

Enabling Traffic Storm Control

To enable traffic storm control, perform this task:

	Command	Purpose
Step 1	Router(config)# **interface** {{*type*[1] *slot/port*} | {**port-channel** *number*}}	Selects an interface to configure.
Step 2	Router(config-if)# **storm-control broadcast level** *level*[.*level*]	Enables broadcast traffic storm control on the interface, configures the traffic storm control level, and applies the traffic storm control level to all traffic storm control modes enabled on the interface.
	Router(config-if)# **no storm-control broadcast level**	Disables broadcast traffic storm control on the interface.
Step 3	Router(config-if)# **storm-control multicast level** *level*[.*level*] **Note** The **storm-control multicast** command is supported only on Gigabit Ethernet interfaces.	Enables multicast traffic storm control on the interface, configures the traffic storm control level, and applies the traffic storm control level to all traffic storm control modes enabled on the interface.
	Router(config-if)# **no storm-control multicast level**	Disables multicast traffic storm control on the interface.
Step 4	Router(config-if)# **storm-control unicast level** *level*[.*level*] **Note** The **storm-control unicast** command is supported only on Gigabit Ethernet interfaces.	Enables unicast traffic storm control on the interface, configures the traffic storm control level, and applies the traffic storm control level to all traffic storm control modes enabled on the interface.
	Router(config-if)# **no storm-control unicast level**	Disables unicast traffic storm control on the interface.
Step 5	Router(config-if)# **end**	Exits configuration mode.
Step 6	Router# **show running-config** *interface*	Verifies the configuration.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

When configuring the traffic storm control level, note the following information:

- You can configure traffic storm control on an EtherChannel (a port channel interface).

- Do not configure traffic storm control on ports that are members of an EtherChannel. Configuring traffic storm control on ports that are configured as members of an EtherChannel puts the ports into a suspended state.

- Specify the level as a percentage of the total interface bandwidth:

    – The level can be from 0 to 100.

    – The optional fraction of a level can be from 0 to 99.

    – 100 percent means no traffic storm control.

    – 0.0 percent suppresses all traffic.

- On these modules, these levels suppress all traffic:

    – WS-X6704-10GE: 0.33 percent or less

    – WS-X6724-SFP 10Mbps ports: 0.33 percent or less

    – WS-X6748-SFP 100Mbps ports: 0.03 percent or less

- WS-X6748-GE-TX 100Mbps ports: 0.03 percent or less

- WS-X6716-10G-3C / 3CXL Oversubscription Mode: 0.29 percent or less

Because of hardware limitations and the method by which packets of different sizes are counted, the level percentage is an approximation. Depending on the sizes of the frames making up the incoming traffic, the actual enforced level might differ from the configured level by several percentage points.

This example shows how to enable multicast traffic storm control on Gigabit Ethernet interface 3/16 and how to configure the traffic storm control level at 70.5 percent:

```
Router# configure terminal
Router(config)# interface gigabitethernet 3/16
Router(config-if)# storm-control multicast level 70.5
Router(config-if)# end
```

This example shows how the traffic storm control level configured for one mode affects all other modes that are already configured on the Gigabit Ethernet interface 4/10:

```
Router# show run inter gig4/10
Building configuration...

Current configuration : 176 bytes
!
Router# interface GigabitEthernet4/10
Router# switchport
Router# switchport mode access
Router# storm-control broadcast level 70.00
Router# storm-control multicast level 70.00
Router# spanning-tree portfast edge
Router# end

Router# configure terminal
Router(config)# interface gigabitethernet 4/10
Router(config-if)# storm-control unicast level 20
Router(config-if)# end

Router# show interfaces gig4/10 counters storm-control

Port       UcastSupp %    McastSupp %    BcastSupp %  TotalSuppDiscards
Gi4/10      20.00          20.00          20.00               0

Router#
```

Displaying Traffic Storm Control Settings

To display traffic storm control information, use the commands described in Table 39-1.

Table 39-1   Commands for Displaying Traffic Storm Control Status and Configuration

Command	Purpose
Router# **show interfaces** [{*type*[1] *slot/port*} | {**port-channel** *number*}] **switchport**	Displays the administrative and operational status of all Layer 2 LAN ports or the specified Layer 2 LAN port.
Router# **show interfaces** [{*type*[1] *slot/port*} | {**port-channel** *number*}] **counters storm-control** Router# **show interfaces counters storm-control** [**module** *slot_number*]	Displays the total number of packets discarded for all three traffic storm control modes, on all interfaces or on the specified interface.

1.   *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

Note   The **show interfaces** [{*interface_type slot/port*} | {**port-channel** *number*}] **counters** command does not display the discard count. You must use the **storm-control** keyword to display the discard count.

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