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Junos<sup>®</sup> OS

# Layer 2 Device Security Feature Guide for MX Series Routers

Release  
15.1



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*Junos<sup>®</sup> OS Layer 2 Device Security Feature Guide for MX Series Routers*

15.1

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# Table of Contents

	About the Documentation . . . . .	vii
	Documentation and Release Notes . . . . .	vii
	Supported Platforms . . . . .	vii
	Using the Examples in This Manual . . . . .	vii
	Merging a Full Example . . . . .	viii
	Merging a Snippet . . . . .	viii
	Documentation Conventions . . . . .	ix
	Documentation Feedback . . . . .	xi
	Requesting Technical Support . . . . .	xi
	Self-Help Online Tools and Resources . . . . .	xi
	Opening a Case with JTAC . . . . .	xii
<b>Part 1</b>	<b>Overview</b>	
<b>Chapter 1</b>	<b>Storm Control Overview . . . . .</b>	<b>3</b>
	Understanding Storm Control on Switching Devices . . . . .	3
<b>Part 2</b>	<b>Configuration</b>	
<b>Chapter 2</b>	<b>Configuration Examples . . . . .</b>	<b>9</b>
	Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers . . . . .	9
<b>Chapter 3</b>	<b>Rate Limiting . . . . .</b>	<b>15</b>
	Configuring or Disabling Storm Control (CLI Procedure) . . . . .	15
	Configuring Storm Control . . . . .	16
	Disabling Storm Control on Broadcast Traffic . . . . .	16
	Disabling Storm Control on All Multicast Traffic . . . . .	17
	Disabling Storm Control on Registered Multicast Traffic . . . . .	17
	Disabling Storm Control on Unregistered Multicast Traffic . . . . .	18
	Disabling Storm Control on Unknown Unicast Traffic . . . . .	18
	Disabling Storm Control on Multiple Types of Traffic . . . . .	18
	Configuring Autorecovery from the Disabled State on Secure or Storm Control Interfaces (CLI Procedure) . . . . .	20
	Configuring Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages . . . . .	21
<b>Chapter 4</b>	<b>Configuration Statements . . . . .</b>	<b>23</b>
	action-shutdown . . . . .	24
	bandwidth-level . . . . .	26
	bandwidth-percentage . . . . .	27
	icmpv4-rate-limit . . . . .	28

	no-broadcast . . . . .	29
	no-multicast . . . . .	31
	no-registered-multicast . . . . .	33
	no-unknown-unicast . . . . .	34
	no-unregistered-multicast . . . . .	36
	recovery-timeout . . . . .	37
	storm-control . . . . .	38
	storm-control-profiles . . . . .	39
<b>Part 3</b>	<b>Administration</b>	
<b>Chapter 5</b>	<b>Operational Commands . . . . .</b>	<b>43</b>
	clear bridge recovery-timeout . . . . .	44
<b>Part 4</b>	<b>Index</b>	
	Index . . . . .	47

# List of Tables

<b>About the Documentation</b> .....	<b>vii</b>
Table 1: Notice Icons .....	ix
Table 2: Text and Syntax Conventions .....	ix



# About the Documentation

- Documentation and Release Notes on page vii
- Supported Platforms on page vii
- Using the Examples in This Manual on page vii
- Documentation Conventions on page ix
- Documentation Feedback on page xi
- Requesting Technical Support on page xi

## Documentation and Release Notes

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To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

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## Supported Platforms

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For the features described in this document, the following platforms are supported:

- MX Series

## Using the Examples in This Manual

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If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

## Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xml;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

## Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

```
commit {
  file ex-script-snippet.xml; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:



```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see the *CLI User Guide*.

## Documentation Conventions

Table 1 on page ix defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page ix defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
<b>Bold text like this</b>	Represents text that you type.	To enter configuration mode, type the <b>configure</b> command:  user@host> <b>configure</b>

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> <b>show chassis alarms</b>  No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"><li>Introduces or emphasizes important new terms.</li><li>Identifies guide names.</li><li>Identifies RFC and Internet draft titles.</li></ul>	<ul style="list-style-type: none"><li>A policy <i>term</i> is a named structure that defines match conditions and actions.</li><li><i>Junos OS CLI User Guide</i></li><li>RFC 1997, <i>BGP Communities Attribute</i></li></ul>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name:  [edit] root@# <b>set system domain-name</b> <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"><li>To configure a stub area, include the <b>stub</b> statement at the [edit protocols ospf area area-id] hierarchy level.</li><li>The console port is labeled <b>CONSOLE</b>.</li></ul>
< > (angle brackets)	Encloses optional keywords or variables.	<b>stub &lt;default-metric <i>metric</i>&gt;;</b>
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	<b>broadcast   multicast</b>  <b>(<i>string1</i>   <i>string2</i>   <i>string3</i>)</b>
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	<b>rsvp { # Required for dynamic MPLS only</b>
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	<b>community name members [</b> <i>community-ids</i> <b>]</b>
Indentation and braces ( { } )	Identifies a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
<b>GUI Conventions</b>		
<b>Bold text like this</b>	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"><li>In the Logical Interfaces box, select <b>All Interfaces</b>.</li><li>To cancel the configuration, click <b>Cancel</b>.</li></ul>

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select <b>Protocols&gt;Ospf</b> .

## Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

- Online feedback rating system—On any page at the Juniper Networks Technical Documentation site at <http://www.juniper.net/techpubs/index.html>, simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>.
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- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>

- Download the latest versions of software and review release notes:  
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- Search technical bulletins for relevant hardware and software notifications:  
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- Join and participate in the Juniper Networks Community Forum:  
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

## Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <http://www.juniper.net/support/requesting-support.html>.

## PART 1

# Overview

- [Storm Control Overview on page 3](#)



## CHAPTER 1

# Storm Control Overview

- [Understanding Storm Control on Switching Devices on page 3](#)

## Understanding Storm Control on Switching Devices

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**NOTE:** This topic uses Junos OS with support for the Enhanced Layer 2 Software (ELS) configuration style. If your switching device is an EX Series switch and runs software that does not support ELS, see *Understanding Storm Control on EX Series Switches*. If your switching device is an EX Series switch and runs software that does support ELS, see *Getting Started with Enhanced Layer 2 Software*.

A traffic storm is generated when messages are broadcast on a network and each message prompts a receiving node to respond by broadcasting its own messages on the network. This, in turn, prompts further responses, creating a snowball effect. The LAN is suddenly flooded with packets, creating unnecessary traffic that leads to poor network performance or even a complete loss of network service.

Storm control enables the switching device to monitor traffic levels and to drop broadcast, multicast, and unknown unicast packets when a specified traffic level—called the *storm control level* or *storm control bandwidth*—is exceeded, thus preventing packets from proliferating and degrading the LAN. As an alternative to having the switching device drop packets, you can configure storm control to shut down interfaces or temporarily disable interfaces (see the [action-shutdown](#) statement and the [recovery-timeout](#) statement) when the storm control level is exceeded.



**NOTE:** On Juniper Networks EX4300 Ethernet Switches, the factory default configuration enables storm control on all Layer 2 interfaces, with the storm control level set to 80 percent of the combined broadcast, multicast, and unknown unicast traffic streams.

Storm control is not enabled by default on Juniper Networks EX9200 Ethernet Switches.

Storm control is not enabled by default on Juniper Networks MX Series routers.

You can customize the storm control level for a specific interface by explicitly configuring either bandwidth level or bandwidth percentage.

- **Bandwidth level**—Configures the storm control level as the bandwidth in kilobits per second of the applicable traffic streams on that interface.
- **Bandwidth percentage**—Configures the storm control level as a percentage of the available bandwidth used by the combined applicable traffic streams that are subject to storm control on that interface.



**NOTE:** You cannot configure both bandwidth level and bandwidth percentage for the same interface.

---

You can disable storm control selectively for broadcast, multicast, or unknown unicast traffic, or any combination of traffic types. When disabling storm control for multicast traffic, you can specify the traffic to be either registered multicast or unregistered multicast. Registered multicast MAC addresses are multicast MAC addresses that are within the range 01-00-5E-00-00-00 through 01-00-5E-7F-FF-FF. This range has been reserved by the Internet Assigned Numbers Association (IANA) for multicast Ethernet addresses. Multicast MAC addresses that are outside this range are called unregistered multicast addresses.

The sending and receiving of broadcast, multicast, and unicast packets are part of normal LAN operation. Therefore, to recognize a storm, you must be able to identify when traffic has reached a level that is abnormal for your LAN. Suspect a storm when operations begin timing out and network response times slow down. As more packets flood the LAN, network users might be unable to access servers or e-mail.

Monitor the level of broadcast, multicast, and unknown unicast traffic in the LAN when it is operating normally. Use this data as a benchmark to determine when traffic levels are too high. Then configure storm control to set the level at which you want the switching device to drop broadcast traffic, multicast traffic, unknown unicast traffic, or two or all three of those traffic types.



**NOTE:** When you configure storm control level on an aggregated Ethernet interface, the storm control level for each member of the aggregated Ethernet interface is set to that bandwidth or level. For example, if you configure a storm control level of 15,000 Kbps on ae1, and ae1 has two members, ge-0/0/0 and ge-0/0/1, each member has a storm control level of 15,000 Kbps. Thus, the storm control level on ae1 allows a traffic rate of up to 30,000 Kbps of combined traffic streams. Traffic might include broadcast, multicast, and unknown unicast traffic, depending upon the configuration.

---

**Related Documentation**

- *Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches*
- [Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers on page 9](#)



- [Configuring Autorecovery from the Disabled State on Secure or Storm Control Interfaces \(CLI Procedure\) on page 20](#)
- [Configuring or Disabling Storm Control \(CLI Procedure\) on page 15](#)



## PART 2

# Configuration

- [Configuration Examples on page 9](#)
- [Rate Limiting on page 15](#)
- [Configuration Statements on page 23](#)



## CHAPTER 2

# Configuration Examples

- [Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers on page 9](#)

### Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers

Storm control enables you to prevent network outages caused by broadcast storms on the LAN. You can configure storm control on an MX Series router to rate-limit broadcast traffic, multicast traffic, and unknown unicast traffic at a specified level and to have packets dropped when the specified traffic level is exceeded, thereby preventing packets from proliferating and degrading the LAN.

Storm control is not enabled by default on MX Series routers.

This example shows how to configure storm control on an pair of MX Series routers running Junos OS with Enhanced Layer 2 Software (ELS).

- [Requirements on page 9](#)
- [Overview and Topology on page 9](#)
- [Configuration on page 10](#)
- [Verification on page 12](#)

### Requirements

This example uses the following hardware and software components:

- Two MX Series routers
- Junos OS Release 14.1 or later with ELS
- A traffic generator that can send broadcast and unknown unicast traffic at a rate that exceeds 100 Kbps
- A second host

### Overview and Topology

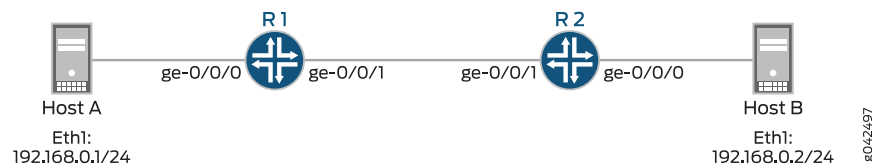
A storm is generated when messages are broadcast on a network and each message prompts a receiving node to respond by broadcasting its own messages on the network.

This, in turn, prompts further responses, creating a snowball effect and resulting in a broadcast storm that can cause network outages.

You can use storm control to prevent broadcast storms by specifying the amount, also known as the *storm control level*, of broadcast traffic, multicast traffic, and unknown unicast traffic to be allowed on an interface. You specify the storm control level as the traffic rate in kilobits per second (Kbps) of the combined applicable traffic streams or as the percentage of available bandwidth used by the combined applicable traffic streams.

Storm control monitors the level of applicable incoming traffic and compares it with the level that you specify. If the combined level of the applicable traffic exceeds the specified level, the router drops packets for the controlled traffic types. As an alternative to having the router drop packets, you can configure storm control to shut down interfaces or temporarily disable interfaces (see the [action-shutdown](#) statement or the [recovery-timeout](#) statement) when the storm control level is exceeded.

This example shows how to configure the storm control level on interface ge-0/0/1 by setting the level to a traffic rate of 100 Kbps. The topology used consists of two routers that could be connected to various network devices. If the combined traffic exceeds this level, the router drops packets for the controlled traffic types to prevent a network outage.



## Configuration

This example excludes multicast traffic from the storm traffic. Many protocols use multicast for control traffic and for that reason network administrators and operators may want to keep multicast working to avoid obstructing protocol operation.

### CLI Quick Configuration

To quickly configure storm control based on the traffic rate in Kbps of the combined traffic streams, copy the following commands and paste them into the terminal window. The configurations of routers R1 and R2 are exactly the same:

```

set interfaces ge-0/0/0 unit 0 family bridge interface-mode access
set interfaces ge-0/0/0 unit 0 family bridge vlan-id 15
set interfaces ge-0/0/1 vlan-tagging
set interfaces ge-0/0/1 unit 0 family bridge interface-mode trunk
set interfaces ge-0/0/1 unit 0 family bridge vlan-id-list 15
set interfaces ge-0/0/1 unit 0 family bridge storm-control sc
set interfaces ge-0/0/1 unit 0 family bridge recovery-timeout 120
set bridge-domains bd1 domain-type bridge vlan-id 15
set forwarding-options storm-control-profiles sc all bandwidth-level 100 no multicast
set forwarding-options storm-control-profiles sc action-shutdown
  
```

**Step-by-Step Procedure**

To configure storm control:

1. Configure a storm control profile, **sc**, and specify the traffic rate in Kbps of the combined traffic streams. Exclude multicast traffic from the storm control profile.

```
[edit]
user@host# set forwarding-options storm-control-profiles sc all bandwidth-level
100 no-multicast
user@host# set forwarding-options storm-control-profiles sc action-shutdown
```

2. Bind the storm control profile **sc** to a logical interface. Remember to do this for both interfaces between the routers.

```
[edit]
user@host#set interfaces ge-0/0/1 unit 0 family bridge storm-control sc
```

3. Configure interface **ge-0/0/1** (the interface between routers). Do this for both interfaces between the routers..

```
[edit]
user@host# set interfaces ge-0/0/1 vlan-tagging
user@host#set interfaces ge-0/0/1 unit 0 family bridge interface-mode trunk
user@host#set interfaces ge-0/0/1 unit 0 family bridge vlan-id-list 15
user@host#set interfaces ge-0/0/1 unit 0 family bridge recovery-timeout 120
```

4. Configure interface **ge-0/0/0** (the interface from host to router). Remember to do this for both interfaces between the routers.

```
[edit]
user@host# set interfaces ge-0/0/0 unit 0 family bridge interface-mode access
user@host# set interfaces ge-0/0/0 unit 0 family bridge vlan-id 15
```

5. Set the bridge domain domain type and VLAN ID.

```
[edit]
user@host# set bridge-domains bd1 domain-type bridge vlan-id 15
```

**Results** Display the results of the configuration:

```
[edit forwarding-options]
user@router> show storm-control-profiles sc
all {
  bandwidth-level 100;
  no-multicast;
}
action-shutdown;

[edit]
user@router> show interfaces ge-0/0/0
unit 0 {
  family bridge {
    interface-mode access;
    vlan-id 15;
  }
}

[edit]
user@router> show interfaces ge-0/0/1
vlan-tagging;
```

```

unit 0 {
  family bridge {
    interface-mode trunk;
    vlan-id-list 15;
    storm-control sc;
    recovery-timeout 120;
  }
}

[edit]
user@router> show bridge-domains bd1
domain-type bridge;
vlan-id 15;

```

## Verification

### Verifying That the Storm Control Configuration Is in Effect

**Purpose** Confirm that storm control is limiting the rate of traffic on the interface.

- Action**
1. From Host A to Host B, use a traffic generator to send broadcast and unknown unicast traffic at a rate that exceeds 100 Kbps.
  2. Verify on Device R1's ge-0/0/0 interface that traffic is entering at a rate that exceeds 100 Kbps.

```

user@R1# run show interfaces detail ge-0/0/0
Physical interface: ge-0/0/0, Enabled, Physical link is Up
  Interface index: 137, SNMP ifIndex: 513, Generation: 140
  Link-level type: Ethernet-Bridge, MTU: 1514, MRU: 1522, Speed: 1000mbps,
  BPDU Error: None, MAC-REWRITE Error: None, Loopback: Disabled,
  Source filtering: Disabled, Flow control: Enabled
  Pad to minimum frame size: Disabled
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x20004000
  Link flags     : None
  CoS queues    : 8 supported, 8 maximum usable queues
  Hold-times    : Up 0 ms, Down 0 ms
  Current address: 00:05:86:71:6a:00, Hardware address: 00:05:86:71:6a:00
  Last flapped   : 2014-05-20 14:43:25 PDT (1w1d 01:20 ago)
  Statistics last cleared: 2014-05-28 15:59:39 PDT (00:04:02 ago)
  Traffic statistics:
    Input bytes :          830088          180432 bps
    Output bytes :             0             0 bps
    Input packets:          8472          230 pps
    Output packets:           0             0 pps
  IPv6 transit statistics:
    Input bytes :             0
    Output bytes :             0
    Input packets:             0
    Output packets:             0
  Active alarms : None
  Active defects : None
  Interface transmit statistics: Disabled

```

The Input bytes field shows the ingress traffic rate in bytes per second (bps). The input rate is within the storm control limit of 100 Kbps.

3. Verify that interface ge-0/0/1 on R1 is down (Admin down).



```
user@R1# run show interfaces ge-0/0/1.0 terse
```

Interface	Admin	Link	Proto	Local	Remote
ge-0/0/1.0	down	up	bridge		

Because the link remains up, control traffic continues to flow.

4. After the timeout period of 120 seconds (2 minutes), verify that the interface comes back up.

```
user@R1# run show interfaces ge-0/0/1.0 terse
```

Interface	Admin	Link	Proto	Local	Remote
ge-0/0/1.0	up	up	bridge		

#### Related Documentation

- [Configuring or Disabling Storm Control \(CLI Procedure\) on page 15](#)
- [Configuring Autorecovery from the Disabled State on Secure or Storm Control Interfaces \(CLI Procedure\) on page 20](#)



## CHAPTER 3

# Rate Limiting

- [Configuring or Disabling Storm Control \(CLI Procedure\) on page 15](#)
- [Configuring Autorecovery from the Disabled State on Secure or Storm Control Interfaces \(CLI Procedure\) on page 20](#)
- [Configuring Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages on page 21](#)

### Configuring or Disabling Storm Control (CLI Procedure)

---



**NOTE:** This task uses Junos OS with support for the Enhanced Layer 2 Software (ELS) configuration style. If your switching device is an EX Series switch and runs software that does not support ELS, see *Understanding Storm Control on EX Series Switches*. If your switching device is an EX Series switch and runs software that does support ELS, see *Getting Started with Enhanced Layer 2 Software*.

On EX4300 switches, the factory default configuration enables storm control on all Layer 2 switch interfaces. The default storm control level is set to 80 percent of the available bandwidth used by the combined broadcast, multicast, and unknown unicast traffic streams.

Storm control is not enabled by default on EX9200 switches or MX Series routers.

You can customize the storm control level for a specific interface. You specify the storm control level as the traffic rate in kilobits per second (Kbps) of the combined traffic streams or as the percentage of available bandwidth used by the combined traffic streams.

You can selectively disable storm control for broadcast, multicast, or unknown unicast traffic on all interfaces or on a specified interface. You can additionally disable storm control on registered or unregistered multicast traffic.

In the tasks described in this topic, you use the `[edit interfaces interface-name unit 0 family ethernet-switching]` hierarchy level to bind the storm control profile for EX Series switches

and the `[edit interfaces interface-name unit 0 family bridge]` hierarchy level to bind the storm control profile for MX Series routers.

- [Configuring Storm Control on page 16](#)
- [Disabling Storm Control on Broadcast Traffic on page 16](#)
- [Disabling Storm Control on All Multicast Traffic on page 17](#)
- [Disabling Storm Control on Registered Multicast Traffic on page 17](#)
- [Disabling Storm Control on Unregistered Multicast Traffic on page 18](#)
- [Disabling Storm Control on Unknown Unicast Traffic on page 18](#)
- [Disabling Storm Control on Multiple Types of Traffic on page 18](#)

## Configuring Storm Control

You can configure storm control for a specific interface. The storm control level can be customized by explicitly configuring either the bandwidth level or the bandwidth percentage.

- **bandwidth-level**—Configures the storm control level as the bandwidth in kilobits per second of the combined traffic streams.
- **bandwidth-percentage**—Configures the storm control level as a percentage of the available bandwidth used by the combined traffic streams.

To configure storm control:

1. Create a storm control profile and set the storm control level as the traffic rate in kilobits per second of the combined traffic streams:

```
[edit forwarding-options]
user@device# set storm-control-profiles profile-name all bandwidth-level kbps
```



**NOTE:** The name of the storm control profile can contain no more than 127 characters.

2. Bind the storm control profile to a logical interface:

For EX Series switches:

```
[edit]
user@switch# set interfaces interface-name unit 0 family ethernet-switching storm-control
profile-name
```

For MX Series routers:

```
[edit]
user@device# set interfaces interface-name unit 0 family bridge storm-control profile-name
```

## Disabling Storm Control on Broadcast Traffic

To disable storm control on broadcast traffic:

1. Create a storm control profile with the storm control level set as the traffic rate in kilobits per second of the combined traffic streams and exclude broadcast traffic:

```
[edit forwarding-options]
user@device# set storm-control-profiles profile-name all bandwidth-level kbps no-broadcast
```

2. Bind the storm control profile to a logical interface:

For EX Series switches:

```
[edit]
user@switch# set interfaces interface-name unit 0 family ethernet-switching storm-control
profile-name
```

For MX Series routers:

```
[edit]
user@device# set interfaces interface-name unit 0 family bridge storm-control profile-name
```

## Disabling Storm Control on All Multicast Traffic

To disable storm control on all multicast traffic:

1. Create a storm control profile with the storm control level set as the traffic rate in kilobits per second of the combined traffic streams, but exclude multicast traffic:

```
[edit forwarding-options]
user@device# set storm-control-profiles profile-name all bandwidth-level kbps no-multicast
```

2. Bind the storm control profile to a logical interface:

For EX Series switches:

```
[edit]
user@switch# set interfaces interface-name unit 0 family ethernet-switching storm-control
profile-name
```

For MX Series routers:

```
[edit]
user@device# set interfaces interface-name unit 0 family bridge storm-control profile-name
```

## Disabling Storm Control on Registered Multicast Traffic

To disable storm control on only registered multicast traffic:

1. Create a storm control profile with the storm control level set as the traffic rate in kilobits per second of the combined traffic streams, but exclude registered multicast traffic:

```
[edit forwarding-options]
user@device# set storm-control-profiles profile-name all bandwidth-level kbps
no-registered-multicast
```

2. Bind the storm control profile to a logical interface:

For EX Series switches:

```
[edit]
user@switch# set interfaces interface-name unit 0 family ethernet-switching storm-control
profile-name
```

For MX Series routers:

```
[edit]
user@device# set interfaces interface-name unit 0 family bridge storm-control profile-name
```

## Disabling Storm Control on Unregistered Multicast Traffic

To disable storm control on only unregistered multicast traffic:

1. Create a storm control profile with the storm control level set as the traffic rate in kilobits per second of the combined traffic streams, but exclude unregistered multicast traffic:

```
[edit forwarding-options]
user@device# set storm-control-profiles profile-name all bandwidth-level kbps
no-unregistered-multicast
```

2. Bind the storm control profile to a logical interface:

For EX Series switches:

```
[edit]
user@switch# set interfaces interface-name unit 0 family ethernet-switching storm-control
profile-name
```

For MX Series routers:

```
[edit]
user@device# set interfaces interface-name unit 0 family bridge storm-control profile-name
```

## Disabling Storm Control on Unknown Unicast Traffic

To disable storm control on only unknown unicast traffic:

1. Create a storm control profile with the storm control level set as the traffic rate in kilobits per second of the combined traffic streams, but exclude unregistered multicast traffic:

```
[edit forwarding-options]
user@device# set storm-control-profiles profile-name all bandwidth-level kbps
no-unknown-unicast
```

2. Bind the storm control profile to a logical interface:

For EX Series switches:

```
[edit]
user@switch# set interfaces interface-name unit 0 family ethernet-switching storm-control
profile-name
```

For MX Series routers:

```
[edit]
user@device# set interfaces interface-name unit 0 family bridge storm-control profile-name
```

## Disabling Storm Control on Multiple Types of Traffic

To disable storm control on multiple types of traffic; for example, broadcast and multicast traffic:

1. Create a storm control profile with the storm control level set as the traffic rate in kilobits per second of the combined traffic streams but exclude broadcast and multicast traffic:

```
[edit forwarding-options]
```

```
user@device# set storm-control-profiles profile-name all bandwidth-level kbps no-broadcast no-multicast
```

2. Bind the storm control profile to a logical interface:

For EX Series switches:

```
[edit]
user@switch# set interfaces interface-name unit 0 family ethernet-switching storm-control profile-name
```

For MX Series routers:

```
[edit]
user@device# set interfaces interface-name unit 0 family bridge storm-control profile-name
```

#### Related Documentation

- [Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches](#)
- [Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers on page 9](#)
- [Understanding Storm Control on Switching Devices on page 3](#)

## Configuring Autorecovery from the Disabled State on Secure or Storm Control Interfaces (CLI Procedure)



**NOTE:** This example uses Junos OS with support for the Enhanced Layer 2 Software (ELS) configuration style. If your switching device is an EX Series switch and runs software that does not support ELS, see *Understanding Storm Control on EX Series Switches*. If your switching device is an EX Series switch and runs software that does support ELS, see *Getting Started with Enhanced Layer 2 Software*.

An Ethernet switching access interface on a switching device might shut down or be disabled as a result of one of the following port-security or storm-control configurations:

- MAC limiting—(Not supported on MX Series routers) The **mac-limit** statement is configured with the **action-shutdown** statement.
- MAC move limiting—(Not supported on MX Series routers) The **mac-move-limit** statement is configured with the **action-shutdown** statement.
- Storm control—The **storm-control** statement is configured with the **action-shutdown** statement.

You can configure the switching device to automatically restore the disabled interfaces to service after a specified period of time. The specified time configured in the **recovery-timeout** statement applies to all the interfaces that have been disabled due to MAC limiting, MAC move limiting, or storm control errors.



**NOTE:** To enable autorecovery, specify the recovery timeout value for the interfaces to recover automatically. There is no default recovery timeout. If you do not specify a timeout value, you need to use the `clear ethernet-switching recovery-timeout` command for EX Series switches and the `clear bridge recovery-timeout` command for MX Series routers to clear the errors and restore the interfaces to service.

To specify the recovery timeout period for the interface:

- Set the **recovery-timeout** statement.

For EX Series switches:

```
[edit interfaces interface-name family unit 0 ethernet-switching]
user@switch# set recovery-timeout seconds
```

For MX Series routers:

```
[edit interfaces interface-name family unit 0 bridge]
user@switch# set recovery-timeout seconds
```

**Related  
Documentation**



- [Configuring MAC Limiting \(CLI Procedure\)](#)
- [Configuring MAC Move Limiting \(CLI Procedure\)](#)
- [Configuring or Disabling Storm Control \(CLI Procedure\)](#) on page 15

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## Configuring Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages

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To limit the rate at which ICMPv4 messages can be generated by the Routing Engine and sent to the Routing Engine, include the **icmpv4-rate-limit** statement at the **[edit system internet-options]** hierarchy level:

**icmpv4-rate-limit** bucket-size *bucket-size* packet-rate *packet-rate*;

The bucket size is the number of seconds in the rate-limiting bucket. The packet rate is the rate-limiting packets earned per second. Specify a **bucket-size** from 0 through 4294967295 seconds. The default value is 5 seconds. Specify a **packet-rate** from 0 through 4,294,967,295. The default value is 1000.

### Related Documentation

- [Configuring Junos OS ICMPv6 Rate Limit for ICMPv6 Routing Engine Messages](#)



## CHAPTER 4

# Configuration Statements

- [action-shutdown on page 24](#)
- [bandwidth-level on page 26](#)
- [bandwidth-percentage on page 27](#)
- [icmpv4-rate-limit on page 28](#)
- [no-broadcast on page 29](#)
- [no-multicast on page 31](#)
- [no-registered-multicast on page 33](#)
- [no-unknown-unicast on page 34](#)
- [no-unregistered-multicast on page 36](#)
- [recovery-timeout on page 37](#)
- [storm-control on page 38](#)
- [storm-control-profiles on page 39](#)

## action-shutdown


---

<b>Syntax</b>	action-shutdown;
<b>Hierarchy Level</b>	<ul style="list-style-type: none"><li>For platforms with Enhanced Layer 2 Software (ELS) (EX Series switches and MX Series routers): [edit forwarding-options <b>storm-control-profiles</b> <i>profile-name</i>]</li><li>For platforms without ELS: [edit ethernet-switching-options storm-control]</li></ul>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 9.6 for EX Series switches.</p> <p>Hierarchy level [edit forwarding-options] introduced in Junos OS Release 13.2X50-D10. (See <i>Getting Started with Enhanced Layer 2 Software</i> for information about ELS.)</p> <p>Statement introduced in Junos OS Release 14.1 for MX Series routers.</p>
<b>Description</b>	<p>Shut down or temporarily disable interfaces when the storm control level is exceeded, as follows:</p> <ul style="list-style-type: none"><li>If you set both the <b>action-shutdown</b> and the <b>port-error-disable</b> statements, the interfaces are disabled temporarily and recover automatically when the disable timeout expires. (The <b>port-error-disable</b> statement is not available for MX Series routers.)</li><li>If you set both the <b>action-shutdown</b> and the <b>recovery-timeout</b> statements, the interfaces are disabled temporarily and recover automatically when the recovery timeout expires.</li><li>If you set the <b>action-shutdown</b> statement and do not specify the <b>port-error-disable</b> statement (the <b>port-error-disable</b> statement is not available for MX Series routers), the interfaces that are enabled for storm control are shut down when the storm control level is exceeded and they do not recover automatically from that port-error condition. You must issue the <b>clear ethernet-switching port-error</b> command to clear the port error and restore the interfaces to service. (The <b>clear ethernet-switching port-error</b> command is not available for MX Series routers.)</li><li>If you set the <b>action-shutdown</b> statement and do not specify the <b>recovery-timeout</b> statement, the interfaces that are enabled for storm control are shut down when the storm control level is exceeded and they do not recover automatically from that port-error condition. For EX Series switches you must issue the <b>clear ethernet-switching recovery-timeout</b> command and for MX Series routers you must issue the <b>clear bridge recovery-timeout</b> command to clear the port error and restore the interfaces to service.</li></ul>
<b>Default</b>	The <b>action-shutdown</b> option is not enabled by default. The switching device drops packets for the controlled traffic types if the ingress rate of the combined traffic streams exceeds the specified storm control level. Depending upon the configuration, applicable traffic could include broadcast, unknown unicast, and multicast traffic.
<b>Required Privilege Level</b>	system—To view this statement in the configuration. system-control—To add this statement to the configuration.


**Related  
Documentation**

- *port-error-disable*
- *disable-timeout*
- [recovery-timeout on page 37](#)
- *clear ethernet-switching port-error*
- [clear bridge recovery-timeout on page 44](#)
- *clear ethernet-switching recovery-timeout*
- *Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches*
- [Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers on page 9](#)
- *Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches*
- *Configuring Autorecovery From the Disabled State on Secure or Storm Control Interfaces (CLI Procedure)*
- [Configuring Autorecovery from the Disabled State on Secure or Storm Control Interfaces \(CLI Procedure\) on page 20](#)

## bandwidth-level

<b>Syntax</b>	<code>bandwidth-level <i>kbps</i>;</code>
<b>Hierarchy Level</b>	[edit forwarding-options <a href="#">storm-control-profiles</a> <i>profile-name</i> all]
<b>Release Information</b>	Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches. Statement introduced in Junos OS Release 13.2 for the QFX Series. Statement introduced in Junos OS Release 14.1 for MX Series routers.
<b>Description</b>	Configure the storm control level as the bandwidth in kilobits per second of the available bandwidth used by the combined broadcast, multicast, and unknown unicast traffic streams.
<div>  <p><b>NOTE:</b> When you configure storm control level on an aggregated Ethernet interface, the storm control level for each member of the aggregated Ethernet interface is set to that bandwidth. For example, if you configure a storm control level of 15,000 Kbps on ae1, and ae1 has two members, ge-0/0/0 and ge-0/0/1, each member has a storm control level of 15,000 Kbps. Thus, the storm control level on ae1 allows a traffic rate of up to 30,000 Kbps of combined broadcast, multicast, and unknown unicast traffic.</p> </div>	
<b>Default</b>	<p>On EX4300 switches—If you do not specify the storm control level using either the <b>bandwidth-level</b> or the <b>bandwidth-percentage</b> statements, the storm control level defaults to 80 percent of the available bandwidth used by the combined broadcast, unknown unicast, and multicast traffic streams.</p> <p>On EX9200 switches—Storm control is not enabled by default.</p> <p>On MX Series routers—Storm control is not enabled by default.</p>
<b>Options</b>	<p><b>bandwidth-level <i>kbps</i></b>—Traffic rate in kilobits per second of the combined broadcast, multicast, and unknown unicast traffic streams.</p> <p><b>Range:</b> 100 through 10,000,000</p> <p><b>Default:</b> None</p>
<b>Required Privilege Level</b>	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">bandwidth-percentage on page 27</a></li> <li>• <a href="#">Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches</a></li> <li>• <a href="#">Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers on page 9</a></li> <li>• <a href="#">Configuring or Disabling Storm Control (CLI Procedure) on page 15</a></li> </ul>

## bandwidth-percentage

<b>Syntax</b>	<code>bandwidth-percentage <i>percentage</i>;</code>
<b>Hierarchy Level</b>	[edit forwarding-options <a href="#">storm-control-profiles</a> <i>profile-name</i> all]
<b>Release Information</b>	Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches. Statement introduced in Junos OS Release 13.2 for the QFX series. Statement introduced in Junos OS Release 14.1 for MX Series routers.
<b>Description</b>	Configure the storm control level as the percentage of available bandwidth used by the combined broadcast, multicast, and unknown unicast traffic streams on an interface. The storm control level is configured as part of the storm control profile.
<div>  <p><b>NOTE:</b> When you configure storm control level on an aggregated Ethernet interface, the storm control level for each member of the aggregated Ethernet interface is set to that bandwidth. For example, if you configure a storm control level of 15,000 Kbps on ae1, and ae1 has two members, ge-0/0/0 and ge-0/0/1, each member has a storm control level of 15,000 Kbps. Thus, the storm control level on ae1 allows a traffic rate of up to 30,000 Kbps of combined broadcast, multicast, and unknown unicast traffic.</p> </div>	
<b>Default</b>	<p>On EX4300 switches—The storm control level is 80 percent of the available bandwidth used by the combined broadcast, unknown unicast, and multicast traffic streams.</p> <p>On EX9200 switches—Storm control is not enabled by default.</p> <p>On MX Series routers—Storm control is not enabled by default.</p>
<b>Required Privilege Level</b>	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">bandwidth-level on page 26</a></li> <li>• <a href="#">Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches</a></li> <li>• <a href="#">Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers on page 9</a></li> <li>• <a href="#">Configuring or Disabling Storm Control (CLI Procedure) on page 15</a></li> </ul>

## icmpv4-rate-limit

---

<b>Syntax</b>	<pre>icmpv4-rate-limit {     bucket-size <i>seconds</i>;     packet-rate <i>pps</i>; }</pre>
<b>Hierarchy Level</b>	[edit system internet-options]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
<b>Description</b>	Configure rate-limiting parameters for ICMPv4 messages sent.
<b>Options</b>	<p><b>bucket-size <i>seconds</i></b>—Number of seconds in the rate-limiting bucket. <b>Range:</b> 0 through 4294967295 seconds <b>Default:</b> 5</p> <p><b>packet-rate <i>pps</i></b>—Rate-limiting packets earned per second. <b>Range:</b> 0 through 4294967295 pps <b>Default:</b> 1000</p>
<b>Required Privilege Level</b>	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages on page 21</a></li></ul>



## no-broadcast

<b>Syntax</b>	no-broadcast;
<b>Hierarchy Level</b>	<ul style="list-style-type: none"> <li>For platforms with Enhanced Layer 2 Software (ELS) (EX Series switches and MX Series routers): [edit forwarding-options <b>storm-control-profiles</b> <i>profile-name</i> all]</li> <li>For platforms without ELS: [edit ethernet-switching-options storm-control interface (all   <i>interface-name</i>)]</li> </ul>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 9.1 for EX Series switches.</p> <p>Hierarchy level [edit forwarding-options] introduced in Junos OS Release 13.2X50-D10. (See <i>Getting Started with Enhanced Layer 2 Software</i> for information about ELS.)</p> <p>Statement introduced in Junos OS Release 13.2 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1 for MX Series routers.</p>
<b>Description</b>	Disable storm control for broadcast traffic for the specified interface or for all interfaces.
<b>Default</b>	<ul style="list-style-type: none"> <li>On EX2200, EX3200, EX3300, and EX4200 switches—Storm control does not apply to multicast traffic by default. The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined unknown unicast and broadcast traffic streams. You can selectively disable storm control on broadcast, multicast, or unknown-unicast traffic.</li> <li>On EX4300 switches—The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined broadcast, multicast, and unknown unicast traffic streams. You can selectively disable storm control on any type of traffic.</li> <li>On EX4500 and EX8200 switches—The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined broadcast, multicast, and unknown unicast traffic streams. On EX8200 switches, you can selectively disable storm control on registered multicast traffic, on unregistered multicast traffic, or on both types of multicast traffic.</li> <li>On EX6200 switches—Storm control does not apply to multicast traffic by default. The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined unknown unicast and broadcast traffic streams. You can selectively disable storm control for each type of traffic individually.</li> <li>On EX9200 switches—Storm control is not enabled by default.</li> <li>On MX Series routers—Storm control is not enabled by default.</li> </ul>
<b>Required Privilege Level</b>	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

**Related  
Documentation**

- *Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches*
- *Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches*
- [Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers on page 9](#)
- *Disabling or Enabling Storm Control (CLI Procedure)*
- [Configuring or Disabling Storm Control \(CLI Procedure\) on page 15](#)

## no-multicast

<b>Syntax</b>	no-multicast;
<b>Hierarchy Level</b>	<ul style="list-style-type: none"> <li>For platforms with Enhanced Layer 2 Software (ELS) (EX Series switches and MX Series routers): [edit forwarding-options <b>storm-control-profiles</b> <i>profile-name</i> all]</li> <li>For platforms without ELS: [edit ethernet-switching-options storm-control interface (all   <i>interface-name</i>)]</li> </ul>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 10.3 for EX Series switches.</p> <p>Hierarchy level [edit forwarding-options] introduced in Junos OS Release 13.2X50-D10. (See <i>Getting Started with Enhanced Layer 2 Software</i> for information about ELS.)</p> <p>Statement introduced in Junos OS Release 13.2 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1 for MX Series routers.</p>
<b>Description</b>	Disable storm control for all multicast traffic (both registered multicast and unregistered multicast) for the specified interface or for all interfaces.
<b>Default</b>	<ul style="list-style-type: none"> <li>On EX2200, EX3200, EX3300, and EX4200 switches—Storm control does not apply to multicast traffic by default. The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined unknown unicast and broadcast traffic streams.</li> <li>On EX4300 switches—The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined broadcast, multicast, and unknown unicast traffic streams. You can selectively disable storm control on any type of traffic.</li> <li>On EX4500 and EX8200 switches—The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined broadcast, multicast, and unknown unicast traffic streams. On EX8200 switches, you can selectively disable storm control on registered multicast traffic, on unregistered multicast traffic, or on both types of multicast traffic.</li> <li>On EX6200 switches—Storm control does not apply to multicast traffic by default. The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined unknown unicast and broadcast traffic streams. You can selectively disable storm control for each type of traffic individually.</li> <li>On EX9200 switches—Storm control is not enabled by default.</li> <li>On MX Series routers—Storm control is not enabled by default.</li> </ul>
<b>Required Privilege Level</b>	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

- Related Documentation**
- [no-registered-multicast on page 33](#)
  - [no-unregistered-multicast on page 36](#)
  - *Disabling or Enabling Storm Control (CLI Procedure)*
  - [Configuring or Disabling Storm Control \(CLI Procedure\) on page 15](#)

## no-registered-multicast

<b>Syntax</b>	no-registered-multicast;
<b>Hierarchy Level</b>	<ul style="list-style-type: none"> <li>For platforms with Enhanced Layer 2 Software (ELS) (EX Series switches and MX Series routers): [edit forwarding-options <b>storm-control-profiles</b> <i>profile-name</i> all]</li> <li>For platforms without ELS: [edit ethernet-switching-options storm-control interface (all   <i>interface-name</i>)]</li> </ul>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 10.3 for EX Series switches.</p> <p>Hierarchy level [edit forwarding-options] introduced in Junos OS Release 13.2X50-D10. (See <i>Getting Started with Enhanced Layer 2 Software</i> for information about ELS.)</p> <p>Statement introduced in Junos OS Release 13.2 for the QFX series.</p> <p>Statement introduced in Junos OS Release 14.1 for MX Series routers.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>(EX8200 switches only) Disable storm control for registered multicast traffic for the specified interface or for all interfaces.</p> <p>(EX4300 and EX9200 switches only) Exclude storm control for registered multicast traffic from a storm control profile.</p> <p>(MX Series routers only) Exclude storm control for registered multicast traffic from a storm control profile.</p>
<b>Default</b>	<p>EX4300 and EX8200 switches—Storm control is enabled for unknown unicast traffic, multicast traffic, and broadcast traffic. The default storm control level is 80 percent of the available bandwidth used by the combined applicable traffic streams.</p> <p>EX9200 switches—Storm control is not enabled by default.</p> <p>MX Series routers—Storm control is not enabled by default.</p>
<b>Required Privilege Level</b>	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">no-multicast on page 31</a></li> <li><a href="#">no-unregistered-multicast on page 36</a></li> <li><i>Understanding Storm Control on EX Series Switches</i></li> <li><a href="#">Understanding Storm Control on Switching Devices on page 3</a></li> </ul>

## no-unknown-unicast

---

<b>Syntax</b>	no-unknown-unicast;
<b>Hierarchy Level</b>	<ul style="list-style-type: none"><li>For platforms with Enhanced Layer 2 Software (ELS) (EX Series switches and MX Series routers): [edit forwarding-options <b>storm-control-profiles</b> <i>profile-name</i> all]</li><li>For platforms without ELS: [edit ethernet-switching-options storm-control interface (all   <i>interface-name</i>)]</li></ul>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 9.1 for EX Series switches.</p> <p>Hierarchy level [edit forwarding-options] introduced in Junos OS Release 13.2X50-D10. (See <i>Getting Started with Enhanced Layer 2 Software</i> for information about ELS.)</p> <p>Statement introduced in Junos OS Release 13.2 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1 for MX Series routers.</p>
<b>Description</b>	Disable storm control for unknown unicast traffic for the specified interface or for all interfaces.
<b>Default</b>	<ul style="list-style-type: none"><li>On EX2200, EX3200, EX3300, and EX4200 switches—Storm control does not apply to multicast traffic by default. The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined unknown unicast and broadcast traffic streams. You can selectively disable storm control on broadcast, multicast, or unknown-unicast traffic.</li><li>On EX4300 switches—The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined broadcast, multicast, and unknown unicast traffic streams. You can selectively disable storm control on any type of traffic.</li><li>On EX4500 and EX8200 switches—The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined broadcast, multicast, and unknown unicast traffic streams. On EX8200 switches, you can selectively disable storm control on registered multicast traffic, on unregistered multicast traffic, or on both types of multicast traffic.</li><li>On EX6200 switches—Storm control does not apply to multicast traffic by default. The factory default configuration enables storm control on all interfaces at 80 percent of the available bandwidth used by the combined unknown unicast and broadcast traffic streams. You can selectively disable storm control for each type of traffic individually.</li><li>On EX9200 switches—Storm control is not enabled by default.</li><li>MX Series routers—Storm control is not enabled by default.</li></ul>
<b>Required Privilege Level</b>	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

**Related  
Documentation**


- *Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches*
- *Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches*
- [Example: Configuring Storm Control to Prevent Network Outages on MX Series Routers on page 9](#)
- *Disabling or Enabling Storm Control (CLI Procedure)*
- [Configuring or Disabling Storm Control \(CLI Procedure\) on page 15](#)

## no-unregistered-multicast

<b>Syntax</b>	no-unregistered-multicast;
<b>Hierarchy Level</b>	<ul style="list-style-type: none"> <li>For platforms with Enhanced Layer 2 Software (ELS) (EX Series switches and MX Series routers): [edit forwarding-options <b>storm-control-profiles</b> <i>profile-name</i> all]</li> <li>For platforms without ELS: [edit ethernet-switching-options storm-control interface (all   <i>interface-name</i>)]</li> </ul>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 10.3 for EX Series switches.</p> <p>Hierarchy level [edit forwarding-options] introduced in Junos OS Release 13.2X50-D10. (See <i>Getting Started with Enhanced Layer 2 Software</i> for information about ELS.)</p> <p>Statement introduced in Junos OS Release 13.2 for the QFX series.</p> <p>Statement introduced in Junos OS Release 14.1 for MX Series routers.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>(EX8200 switches only) Disable storm control for unregistered multicast traffic for the specified interface or for all interfaces.</p> <p>(EX4300 and EX9200 switches only) Exclude storm control for unregistered multicast traffic from a storm control profile.</p> <p>(MX Series routers) Exclude storm control for unregistered multicast traffic from a storm control profile.</p>
<b>Default</b>	<p>EX4300 and EX8200 switches—Storm control is enabled for unknown unicast traffic, multicast traffic, and broadcast traffic. The default storm control level is 80 percent of the available bandwidth used by the combined applicable traffic streams.</p> <p>EX9200 switches—Storm control is not enabled by default.</p> <p>MX Series routers—Storm control is not enabled by default.</p>
<b>Required Privilege Level</b>	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">no-multicast on page 31</a></li> <li><a href="#">no-registered-multicast on page 33</a></li> <li><i>Understanding Storm Control on EX Series Switches</i></li> <li><a href="#">Understanding Storm Control on Switching Devices on page 3</a></li> </ul>



## recovery-timeout

<b>Syntax</b>	<code>recovery-timeout seconds;</code>
<b>Hierarchy Level (EX Series and QFX Series)</b>	[edit interfaces <i>interface-name</i> unit 0 family ethernet-switching]
<b>Hierarchy Level (MX Series)</b>	[edit interfaces <i>interface-name</i> unit 0 family bridge]
<b>Release Information</b>	Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches. Statement introduced in Junos OS Release 13.2 for the QFX Series. Statement introduced in Junos OS Release 14.1 for the MX Series routers.
<b>Description</b>	<p>Configure an interface to be temporarily disabled when MAC limiting, MAC move limiting, or rate-limiting is in effect with the action of <b>shutdown</b>. This enables the affected interface to recover automatically from the error condition after the specified period of time:</p> <ul style="list-style-type: none"> <li>• If you have configured MAC limiting with the <b>shutdown</b> option and you enable <b>recovery-timeout</b>, the interface is temporarily disabled when the MAC address limit is reached.</li> <li>• If you have enabled MAC move limiting with the <b>shutdown</b> option or the <b>vlan-member-shutdown</b> option and you enable <b>recovery-timeout</b>, the interface is temporarily disabled when the maximum number of MAC address moves is reached.</li> <li>• If you have enabled storm control with the <b>action-shutdown</b> option and you enable <b>recovery-timeout</b>, the interface is temporarily disabled when applicable traffic exceeds the specified levels. Depending upon the configuration, applicable traffic could include broadcast, unknown unicast, and multicast traffic.</li> </ul>
	<div>  <p><b>NOTE:</b> The <b>recovery-timeout</b> configuration does not apply to pre-existing error conditions. It impacts only error conditions that are detected after the <b>recovery-timeout</b> statement has been enabled and committed. To clear a pre-existing error condition and restore the interface to service, use the operational mode command <code>clear ethernet-switching recovery-timeout</code> for EX Series and QFX Series and <code>clear bridge recovery-timeout</code> for MX Series routers.</p> </div>
<b>Default</b>	Not enabled.
<b>Options</b>	<p><b>seconds</b>— Number of seconds that the interface remains in a disabled state due to a port error prior to automatic recovery.</p> <p><b>Range:</b> 10 through 3600</p>
<b>Required Privilege Level</b>	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

- Related Documentation**
- [action-shutdown on page 24](#)
  - [Configuring MAC Limiting \(CLI Procedure\)](#)
  - [Configuring MAC Move Limiting \(CLI Procedure\)](#)
  - [Configuring or Disabling Storm Control \(CLI Procedure\) on page 15](#)

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## storm-control

---

<b>Syntax</b>	<code>storm-control storm-control-profile;</code>
<b>Hierarchy Level</b>	[edit interfaces <i>interface-name</i> unit <i>number</i> family ethernet-switching], [edit interfaces <i>interface-name</i> unit <i>number</i> family bridge]
<b>Release Information</b>	Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches. Statement introduced in Junos OS Release 13.2 for the QFX series. Statement introduced in Junos OS Release 14.1 for the MX Series routers.
<b>Description</b>	<p>Bind a storm control profile to a logical interface.</p> <p>On switches running ELS software, storm control is enabled by default on all switch interfaces at a level of 80 percent of the combined broadcast and unknown unicast streams. (For the equivalent statement for platforms running non-ELS software, see <i>storm-control</i>.)</p>
<b>Required Privilege Level</b>	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches</a></li><li>• <a href="#">Understanding Storm Control on Switching Devices on page 3</a></li></ul>

## storm-control-profiles

**Syntax** `storm-control-profiles profile-name {  
     action-shutdown;  
     all {  
         bandwidth-level;  
         bandwidth-percentage;  
         no-broadcast;  
         no-multicast;  
         no-registered-multicast;  
         no-unknown-unicast;  
         no-unregistered-multicast;  
     }  
 }`

**Hierarchy Level** [edit forwarding-options]

**Release Information** Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.  
 Statement introduced in Junos OS Release 13.2 for the QFX Series.  
 Statement introduced in Junos OS Release 14.1 for MX Series routers.

**Description** Configure a storm control profile on a switch or router. Storm control is used to prevent network outages that are caused by broadcast traffic storms. Storm control enables the switching device to monitor traffic levels and to drop broadcast, multicast, and unknown unicast packets when a specified traffic level—called the storm control level or storm control bandwidth—is exceeded, thus preventing packets from proliferating and degrading the LAN.



**NOTE:** The name of the storm control profile can contain no more than 127 characters.

The remaining statements are explained separately.

**Required Privilege Level** system—To view this statement in the configuration.  
 system-control—To add this statement to the configuration.

**Related Documentation**

- *Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches*
- [Understanding Storm Control on Switching Devices on page 3](#)



## PART 3

# Administration

- [Operational Commands on page 43](#)



## CHAPTER 5

# Operational Commands

- `clear bridge recovery-timeout`

## clear bridge recovery-timeout

---

<b>Syntax</b>	clear bridge recovery-timeout <interface <i>interface-name</i> >
<b>Release Information</b>	Command introduced in Junos OS Release 14.1 for MX Series routers.
<b>Description</b>	Clear all storm control errors from all the Ethernet switching interfaces on the switch, and restore the interfaces to service.
<b>Options</b>	<b>interface <i>interface-name</i></b> —Clear all storm control errors from the Ethernet switching interfaces on the interface specified in the command and restore this interface to service.
<b>Required Privilege Level</b>	clear
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Autorecovery from the Disabled State on Secure or Storm Control Interfaces (CLI Procedure)</a> on page 20</li></ul>
<b>List of Sample Output</b>	<a href="#">clear bridge recovery-timeout (interface interface-name) on page 44</a>

### Sample Output

#### clear bridge recovery-timeout (interface interface-name)

```
user@host> clear bridge recovery-timeout interface ae0.0
user@host> clear bridge recovery-timeout interface ae0.0
```



## PART 4

# Index

- [Index on page 47](#)



# Index

## Symbols

#, comments in configuration statements.....	x
( ), in syntax descriptions.....	x
< >, in syntax descriptions.....	x
[ ], in configuration statements.....	x
{ }, in configuration statements.....	x
(pipe), in syntax descriptions.....	x

## A

action-shutdown statement.....	24
autorecovery	
for storm controlled interfaces.....	20

## B

bandwidth-level statement.....	26
bandwidth-percentage statement.....	27
braces, in configuration statements.....	x
brackets	
angle, in syntax descriptions.....	x
square, in configuration statements.....	x
bucket-size statement	
ICMPv4.....	28
usage guidelines.....	21

## C

clear bridge recovery-timeout command.....	44
comments, in configuration statements.....	x
conventions	
text and syntax.....	ix
curly braces, in configuration statements.....	x
customer support.....	xi
contacting JTAC.....	xi

## D

documentation	
comments on.....	xi

## E

ELS See Enhanced Layer 2 Software (ELS)	
Enhanced Layer 2 Software (ELS)	
and storm control.....	3

## F

font conventions.....	ix
-----------------------	----

## I

icmpv4-rate-limit statement.....	28
usage guidelines.....	21
internet-options statement	
usage guidelines.....	21

## M

MAC move limiting.....	20
MAC-limiting.....	20
manuals	
comments on.....	xi

## N

network outages	
preventing.....	9
no-broadcast statement.....	29
no-multicast statement.....	31
no-registered-multicast statement.....	33
no-unknown-unicast statement.....	34
no-unregistered-multicast statement.....	36

## P

packet-rate statement	
ICMPv4.....	28
usage guidelines.....	21
parentheses, in syntax descriptions.....	x
port security	
and autorecovery from disabled state.....	20

## R

recovery-timeout statement.....	37
---------------------------------	----

## S

storm control	
and autorecovery from disabled state.....	20
and devices supporting Enhance Layer 2	
Software.....	3
configuring to prevent network outages.....	9
example for MX Series routers.....	9
storm-control statement.....	38
storm-control-profiles statement.....	39
support, technical See technical support	
syntax conventions.....	ix

## T

technical support

contacting JTAC.....xi