

# Junos<sup>®</sup> OS for EX Series Ethernet Switches

## BGP Feature Guide for EX Series Switches

Release

15.1



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## 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:

- EX 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 xi 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 xi 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.	<pre>user@host&gt; show chassis alarms</pre> <p>No alarms currently active</p>
<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.	<p>Configure the machine's domain name:</p> <pre>[edit] root@# set system domain-name domain-name</pre>
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 <code>[edit protocols ospf area area-id]</code> hierarchy level.</li> <li>The console port is labeled <b>CONSOLE</b>.</li> </ul>
< > (angle brackets)	Encloses optional keywords or variables.	<b>stub</b> <default-metric <i>metric</i> >;
(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</b>   <b>multicast</b> <i>(string1   string2   string3)</i>
# (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 [ community-ids ]</b>
Indentation and braces ( { } )	Identifies a level in the configuration hierarchy.	<pre>[edit] routing-options {   static {     route default {       nexthop address;       retain;     }   } }</pre>
;(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 of the Juniper Networks TechLibrary 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 <http://www.juniper.net/techpubs/feedback/>.
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## Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or Partner Support Service support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- 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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For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>

- Download the latest versions of software and review release notes:  
<http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications:  
<http://kb.juniper.net/InfoCenter/>
- 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

- [Layer 3 Protocols on page 3](#)





## CHAPTER 1

# Layer 3 Protocols

- [Layer 3 Protocols Supported on EX Series Switches](#) on page 3
- [Layer 3 Protocols Not Supported on EX Series Switches](#) on page 4

### Layer 3 Protocols Supported on EX Series Switches

EX Series switches support the Junos OS Layer 3 features and configuration statements listed in [Table 3](#) on page 3:

**Table 3: Supported Junos OS Layer 3 Protocol Statements and Features**

Protocol	Notes	For More Information
BGP	Fully supported.	<a href="#">Junos OS Routing Protocols Configuration Guide</a>
BFD	Fully supported.	<a href="#">Junos OS Routing Protocols Configuration Guide</a>
ICMP	Fully supported.	<a href="#">Junos OS Routing Protocols Configuration Guide</a>
IGMPv1, v2, and v3	Fully supported.	<a href="#">Junos OS Multicast Protocols Configuration Guide</a>
IS-IS	Supported, with the exceptions noted in “ <a href="#">Layer 3 Protocols Not Supported on EX Series Switches</a> ” on page 4.	<a href="#">Junos OS Routing Protocols Configuration Guide</a>
MLD	Fully supported (MLD versions 1 and 2).	<a href="#">Junos OS Multicast Protocols Configuration Guide</a>
MPLS	Supported, with the exceptions noted in “ <a href="#">Layer 3 Protocols Not Supported on EX Series Switches</a> ” on page 4.	<a href="#">Junos OS MPLS Applications Configuration Guide</a>
OSPFv1, v2 and v3	Supported, with the exceptions noted in “ <a href="#">Layer 3 Protocols Not Supported on EX Series Switches</a> ” on page 4.	<a href="#">Junos OS Routing Protocols Configuration Guide</a>
PIM	Fully supported.	<a href="#">Junos OS Multicast Protocols Configuration Guide</a>
PPM	Supported. See <i>EX Series Switch Software Features Overview</i> for specific platform information.	<a href="#">Junos OS Routing Protocols Configuration Guide</a>

Table 3: Supported Junos OS Layer 3 Protocol Statements and Features (*continued*)

Protocol	Notes	For More Information
RIP	Fully supported.	<a href="#">Junos OS Routing Protocols Configuration Guide</a>
RIPng	Fully supported.	<a href="#">Junos OS Routing Protocols Configuration Guide</a>
SNMP	Fully supported.	<a href="#">Junos OS Network Management Configuration Guide</a>
VRRP	Fully supported.	See <a href="#">Understanding VRRP on EX Series Switches</a> . See also <a href="#">Junos OS High Availability Guide</a> .

- Related Documentation**
- [Layer 3 Protocols Not Supported on EX Series Switches on page 4](#)
  - [EX Series Switch Software Features Overview](#)

## Layer 3 Protocols Not Supported on EX Series Switches

EX Series switches do not support the Junos OS Layer 3 protocols and features listed in [Table 4 on page 4](#):

Table 4: Junos OS Layer 3 Protocol Statements and Features That Are Not Supported

Feature	Configuration Statements Not Supported on EX Series Switches
DVMRP	<ul style="list-style-type: none"> <li>• <b>dvmp</b> and subordinate statements</li> </ul>
Flow aggregation (cflowd)	<ul style="list-style-type: none"> <li>• <b>cflow</b> and subordinate statements</li> </ul>
IPsec	<ul style="list-style-type: none"> <li>• <b>[edit services]</b> statements related to IPsec</li> </ul>
IS-IS: <ul style="list-style-type: none"> <li>• ES-IS</li> <li>• IPv6 in multicast routing protocols</li> </ul>	<ul style="list-style-type: none"> <li>• <b>clns-routing</b> statement</li> <li>• <b>ipv6-multicast</b> statement</li> <li>• <b>lsp-interval</b> statement</li> <li>• <b>label-switched-path</b> statement</li> <li>• <b>lsp-lifetime</b> statement</li> <li>• <b>te-metric</b> statement</li> </ul>
Logical routers	<ul style="list-style-type: none"> <li>• <b>logical-routers</b> and subordinate statements</li> </ul>

Table 4: Junos OS Layer 3 Protocol Statements and Features That Are Not Supported (*continued*)

Feature	Configuration Statements Not Supported on EX Series Switches
MPLS: <ul style="list-style-type: none"> <li>Fast Reroute (FRR)</li> <li>Label Distribution Protocol (LDP) (except on EX8200 switches)</li> <li>Layer 3 VPNs (except on EX8200 switches)</li> <li>Multiprotocol BGP (MP-BGP) for VPN-IPv4 family</li> <li>Pseudowire emulation (PWE3)</li> <li>Routing policy statements related to Layer 3 VPNs and MPLS (except on EX8200 switches)</li> <li>Virtual Private LAN Service (VPLS)</li> </ul>	<ul style="list-style-type: none"> <li><b>ldp</b> and all subordinate statements (except on EX8200 switches)</li> </ul>
Network Address Translation (NAT)	<ul style="list-style-type: none"> <li><b>nat</b> and subordinate statements</li> <li>Policy statements related to NAT</li> </ul>
OSPF	<ul style="list-style-type: none"> <li><b>demand-circuit</b> statement</li> <li><b>label-switched-path</b> and subordinate statements</li> <li><b>neighbor</b> statement within an OSPF area</li> <li><b>peer-interface</b> and subordinate statements within an OSPF area</li> <li><b>sham-link</b> statement</li> <li><b>te-metric</b> statement</li> </ul>
PPM	<ul style="list-style-type: none"> <li>Not supported on EX2200 and EX3300 switches</li> </ul>
Routing instances: <ul style="list-style-type: none"> <li>Routing instance forwarding</li> </ul>	<ul style="list-style-type: none"> <li><b>l2vpn</b> and subordinate statements (except on EX4500, EX4550, and EX8200 switches)</li> <li><b>ldp</b> and subordinate statements (except on EX8200 switches)</li> <li><b>vpls</b> and subordinate statements</li> </ul>
Routed VLAN interfaces (RVIs)	<ul style="list-style-type: none"> <li><b>family mpls</b> statement</li> </ul>
SAP and SDP	<ul style="list-style-type: none"> <li><b>sap</b> and all subordinate statements</li> </ul>
General routing options in the <b>routing-options</b> hierarchy: <ul style="list-style-type: none"> <li>MPLS and label-switched-paths</li> </ul>	<ul style="list-style-type: none"> <li><b>auto-export</b> and subordinate statements</li> <li><b>dynamic-tunnels</b> and subordinate statements</li> <li><b>lsp-next-hop</b> and subordinate statements</li> <li><b>multicast</b> and subordinate statements</li> <li><b>p2mp-lsp-next-hop</b> and subordinate statements</li> <li><b>route-distinguisher-id</b> statement (except on EX8200 switches)</li> </ul>

Table 4: Junos OS Layer 3 Protocol Statements and Features That Are Not Supported (*continued*)

Feature	Configuration Statements Not Supported on EX Series Switches
Traffic sampling and forwarding in the <b>forwarding-options</b> hierarchy	<ul style="list-style-type: none"> <li>• <b>accounting</b> and subordinate statements</li> <li>• <b>family mpls</b> and <b>family multiservice</b> under <b>hash-key</b> hierarchy</li> <li>• Under <b>monitoring group-name</b> family inet output hierarchy: <ul style="list-style-type: none"> <li>• <b>cflowd</b> statement</li> <li>• <b>export-format-cflowd-version-5</b> statement</li> <li>• <b>flow-active-timeout</b> statement</li> <li>• <b>flow-export-destination</b> statement</li> <li>• <b>flow-inactive-timeout</b> statement</li> <li>• <b>interface</b> statement</li> </ul> </li> <li>• <b>port-mirroring</b> statement (On EX Series switches, port mirroring is implemented using the <b>analyzer (Port Mirroring)</b> statement.)</li> <li>• <b>sampling</b> and subordinate statements</li> </ul>

- Related Documentation**
- [Layer 3 Protocols Supported on EX Series Switches on page 3](#)
  - [EX Series Switch Software Features Overview](#)

## PART 2

# Configuration

- [Configuration Tasks on page 9](#)
- [Configuration Statements on page 15](#)



## CHAPTER 2

# Configuration Tasks

- [Configuring BGP Sessions \(J-Web Procedure\)](#) on page 9

## Configuring BGP Sessions (J-Web Procedure)

---



**NOTE:** This topic applies only to the J-Web Application package.

You can use the J-Web interface to create BGP peering sessions on a routing device.



**NOTE:** To configure BGP sessions, you must have a license for BGP installed on the EX Series switch.

To configure a BGP peering session:

1. Select **Configure > Routing > BGP**.



**NOTE:** After you make changes to the configuration on this page, you must commit the changes for them to take effect. To commit all changes to the active configuration, select **Commit Options > Commit**. See [Using the Commit Options to Commit Configuration Changes](#) for details about all commit options.

2. Click one of the following options:

- **Add**—Adds a BGP group. Enter information into the configuration page as described in [Table 5 on page 10](#).
- **Edit**—Modifies an existing BGP group. Enter information into the configuration page as described in [Table 5 on page 10](#).
- **Delete**—Deletes an existing BGP group.
- **Disable**—Disables BGP configuration.

3. To modify BGP global settings, click **Edit** in the Global Information section. Enter information as described in [Table 6 on page 11](#).

Table 5: BGP Routing Configuration Summary

Field	Function	Your Action
<b>General tab</b>		
Group Type	Specifies whether the group is an internal BGP (IBGP) group or an external BGP (EBGP) group.	Select the option: <b>Internal</b> or <b>External</b> .
Group Name	Specifies the name for the group.	Type a new name or select and edit the name.
ASN	Sets the unique numeric identifier of the AS in which the routing device is configured.	Type the routing device's 32-bit AS number, in dotted decimal notation.  If you enter an integer, the value is converted to a 32-bit equivalent. For example, if you enter <b>3</b> , the value assigned to the AS is <b>0.0.0.3</b> .
Preference	Specifies the degree of preference for an external route. The route with the highest local preference value is preferred.	Type or select and edit the value.
Cluster Id	Specifies the cluster identifier to be used by the route reflector cluster in an internal BGP group.	Type or select and edit the IPv6 or IPv4 address to be used as the identifier.
Description	Specifies the text description of the global, group, or neighbor configuration.	Type or select and edit the description.
Damping	Specifies whether route flap damping is enabled or not.	To enable route flap damping, select the check box.  To disable route flap damping do not select the check box.
Advertise Inactive Routes	Specifies whether BGP advertises the best route even if the routing table did not select it to be an active route.	To enable advertising inactive routes, select the check box.  To disable advertising inactive routes, do not select the check box.
Advertise Peer AS Routes	Specifies whether to disable the default behavior of suppressing AS routes.	To enable advertising peer AS routes, select the check box.  To disable advertising peer AS routes, do not select the check box.
<b>Neighbors tab</b>		
Dynamic Neighbors	Configures a neighbor (peer).	Type the IPv4 address of the peer.



Table 5: BGP Routing Configuration Summary (*continued*)

Field	Function	Your Action
Static Neighbors	Configures the system's peers statically.	<p>To configure a static neighbor:</p> <ol style="list-style-type: none"> <li>1. Specify the IP address.</li> <li>2. Specify the address of the local end of a BGP session.</li> <li>3. Specify the degree of preference for an external route.</li> <li>4. Enter a description.</li> <li>5. Specify the hold-time value to use when negotiating a connection with the peer.</li> <li>6. Specify how long a route must be present in the routing table before it is exported to BGP. Use this time delay to help bundle routing updates.</li> <li>7. Select <b>Passive</b> if you do not want to send active open messages to the peer.</li> <li>8. Select the option to compare the AS path of an incoming advertised route with the AS number of the BGP peer under the group and replace all occurrences of the peer AS number in the AS path with its own AS number before advertising the route to the peer.</li> <li>9. Specify an import policy and export policy.</li> <li>10. Click <b>OK</b>.</li> </ol>
<b>Policies tab</b>		
Import Policy	Specifies one or more routing policies to routes being imported into the routing table from BGP.	<p>Click <b>Add</b> to add an import policy. Select the policy and click <b>OK</b>.</p> <p>Click <b>Move up</b> or <b>Move down</b> to move the selected policy up or down the list of policies.</p> <p>Select the policy and click <b>Remove</b>.</p>
Export Policy	Specifies one or more policies to routes being exported from the routing table into BGP.	<p>Click <b>Add</b> to add an export policy. Select the policy and click <b>OK</b>.</p> <p>Click <b>Move up</b> or <b>Move down</b> to move the selected policy up or down the list of policies.</p> <p>Select the policy and click <b>Remove</b>.</p>

Table 6: BGP Global Settings

Field	Function	Your Action
<b>General tab</b>		
Router ASN	Specifies the routing device's AS number.	Type or select and edit the value.
Router Identifier	Specify the routing device's IP address.	Type or select and edit the IP address.

Table 6: BGP Global Settings (*continued*)

Field	Function	Your Action
BGP Status	Enables or disables BGP.	<ul style="list-style-type: none"> <li>To enable BGP, select <b>Enabled</b>.</li> <li>To disable BGP, select <b>Disabled</b>.</li> </ul>
Description	Describes of the global, group, or neighbor configuration.	Type or select and edit the description.
Confederation Number	Specifies the routing device's confederation AS number.	Type or select and edit the value.
Confederation Members	Specifies the AS numbers for the confederation members.	<p>To add a member AS number, click <b>Add</b> and enter the number in the <b>Member ASN</b> box. Click <b>OK</b>.</p> <p>To modify a confederation member's AS number, select the member click <b>Edit</b> and, enter the number and click <b>OK</b>.</p> <p>To delete a confederation member, select the member and click <b>Remove</b>.</p>
Advance Options	<p>You can configure the following:</p> <ul style="list-style-type: none"> <li><b>Keep routes</b>—Specifies whether routes learned from a BGP peer must be retained in the routing table even if they contain an AS number that was exported from the local AS.</li> <li><b>TCP MSS</b>—Configures the maximum segment size (MSS) for the TCP connection for BGP neighbors.</li> <li><b>MTU Discovery</b>—Select to configure MTU discovery.</li> <li><b>Remove Private ASN</b>—Select to have the local system strip private AS numbers from the AS path when advertising AS paths to remote systems.</li> <li><b>Graceful Restart</b>—Specifies the time period when the restart is expected to be complete. Specify the maximum time that stale routes are kept during restart.</li> <li><b>Multihop</b>—Configures the maximum time-to-live (TTL) value for the TTL in the IP header of BGP packets.</li> <li><b>Authentication Type</b>—Select the authentication algorithm: None, MD5, SHA1, AES.</li> </ul>	<p>Select <b>All</b> or <b>None</b> to configure Keep Routes.</p> <p>Enter a value in the <b>TCP MSS</b> box.</p> <p>Click to enable <b>MTU Discovery</b>.</p> <p>Click to enable <b>Remove Private ASN</b>.</p> <p>Enter the time period for a graceful restart and the maximum time that stale routes must be kept.</p> <p>To configure Multihop, select <b>Nextthop Change</b> to allow unconnected third-party next hops. Enter a TTL value.</p> <p>Select the authentication algorithm. If you select None, specify an authentication key (password).</p>
<b>Policies tab</b>		
Import Policy	Specifies one or more routing policies to routes being imported into the routing table from BGP.	<p>Click <b>Add</b> to add an import policy.</p> <p>Click <b>Move up</b> or <b>Move down</b> to move the selected policy up or down the list of policies.</p> <p>Click <b>Remove</b> to remove an import policy.</p>

Table 6: BGP Global Settings (*continued*)

Field	Function	Your Action
Export Policy	Specifies one or more policies to routes being exported from the routing table into BGP.	<p>Click <b>Add</b> to add an export policy.</p> <p>Click <b>Move up</b> or <b>Move down</b> to move the selected policy up or down the list of policies.</p> <p>Click <b>Remove</b> to remove an export policy.</p>
<b>Trace Options tab</b>		
File Name	Specifies the name of the file to receive the output of the tracing operation.	Type or select and edit the name.
Number of Files	Specifies the maximum number of trace files.	Type or select and edit the value.
File Size	Specifies the maximum size for each trace file.	Type or select and edit the value.
World Readable	Specifies whether the trace file can be read by any user or not.	<p>Select <b>True</b> to allow any user to read the file.</p> <p>Select <b>False</b> to disallow all users being able to read the file.</p>
Flags	Specifies the tracing operation to perform.	Select a value from the list.

- Related Documentation**
- [Monitoring BGP Routing Information on page 119](#)
  - [Layer 3 Protocols Supported on EX Series Switches on page 3](#)



## CHAPTER 3

# Configuration Statements

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- [accept-remote-nexthop on page 27](#)
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- [type](#) (Protocols BGP) on page 116

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## [\[edit protocols bgp\]](#) Configuration Statement Hierarchy on EX Series Switches

This topic lists supported and unsupported configuration statements in the [\[edit protocols bgp\]](#) hierarchy level on EX Series switches.

- *Supported* statements are those that you can use to configure some aspect of a software feature on the switch.
- *Unsupported* statements are those that appear in the command-line interface (CLI) on the switch, but that have no effect on switch operation if you configure them.
- Not all features are supported on all switch platforms. For detailed information about feature support on specific EX Series switch platforms, see [Feature Explorer](#).

This topic lists:

- [Supported Statements in the \[edit protocols bgp\] Hierarchy Level on page 17](#)
- [Unsupported Statements in the \[edit protocols bgp\] Hierarchy Level on page 25](#)

## Supported Statements in the [edit protocols bgp] Hierarchy Level

The following hierarchy shows the **[edit protocols bgp]** configuration statements supported on EX Series switches:

```

protocols {
  bgp {
    accept-remote-nexthop;
    advertise-external <conditional>;
    advertise-inactive;
    (advertise-peer-as | no-advertise-peer-as);
    authentication-algorithm (hmac-sha-1-96 | md5);
    authentication-key key;
    bfd-liveness-detection {
      authentication {
        algorithm algorithm-name;
        loose-check;
      }
      detection-time {
        threshold milliseconds;
      }
      hold-down-interval milliseconds;
      minimum-interval milliseconds;
      minimum-receive-interval milliseconds;
      multiplier number;
      no-adaptation;
      session-mode (automatic | multihop | single-hop);
      transmit-interval {
        threshold milliseconds;
        minimum-interval milliseconds;
      }
      version (1 | automatic);
    }
    cluster cluster-identifier;
    damping;
    description text-description;
    disable;
    export [ policy-names ];
    family inet {
      any {
        loops number;
        prefix-limit {
          maximum number;
          teardown <percentage> <idle-timeout (forever | minutes)>;
        }
        rib-group group-name;
      }
      flow {
        loops number;
        prefix-limit {

```

```

        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
}
multicast {
    loops number;
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
}
unicast {
    loops number;
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
    topology name {
        community target identifier;
    }
}
}
family inet6 {
    any {
        loops number;
        prefix-limit {
            maximum number;
            teardown <percentage> <idle-timeout (forever | minutes)>;
        }
        rib-group group-name;
    }
    labeled-unicast {
        aggregate-label {
            community community-name;
        }
        explicit-null connected-only;
        loops number;
        per-group-label;
        prefix-limit {
            maximum number;
            teardown <percentage> <idle-timeout (forever | minutes)>;
        }
    }
    rib-group group-name;
    traffic-statistics {
        file filename <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
        interval seconds;
    }
}
multicast {
    loops number;
    prefix-limit {

```



```

        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
}
unicast {
    loops number;
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
    topology name {
        community target identifier;
    }
}
} # end of [edit protocols bgp family]
graceful-restart {
    disable;
    restart-time seconds;
    stale-routes-time seconds;
}
group group-name {
    advertise-external <conditional>;
    advertise-inactive;
    (advertise-peer-as | no-advertise-peer-as);
    allow [ all ip-prefix</prefix-length> ];
    as-override;
    authentication-algorithm (hmac-sha-1-96 | md5);
    authentication-key key;
    bfd-liveness-detection {
        authentication {
            algorithm (keyed-md5 | keyed-sha-1 | meticulous-keyed-md5 |
                meticulous-keyed-sha-1 | simple-password);
            loose-check;
        }
        holddown-interval milliseconds;
        minimum-interval milliseconds;
        minimum-receive-interval milliseconds;
        multiplier number;
        no-adaptation;
        session-mode (automatic | multihop | single-hop);
        transmit-interval {
            minimum-interval milliseconds;
            threshold milliseconds;
        }
        version (1 | automatic);
    }
    cluster cluster-identifier;
    damping;
    description text-description;
    export [ policy-names ];
    family inet {
        any {
            loops number;
            prefix-limit {

```

```

        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
}
flow {
    loops number;
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
}
multicast {
    loops number;
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
}
unicast {
    loops number;
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
    topology name {
        community target identifier;
    }
}
}
family inet6 {
    any {
        loops number;
        prefix-limit {
            maximum number;
            teardown <percentage> <idle-timeout (forever | minutes)>;
        }
        rib-group group-name;
    }
    labeled-unicast {
        aggregate-label {
            community community-name;
        }
        explicit-null connected-only;
        loops number;
        per-group-label;
        prefix-limit {
            maximum number;
            teardown <percentage> <idle-timeout (forever | minutes)>;
        }
        rib-group group-name;
        traffic-statistics {

```

```

        file filename <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
        interval seconds;
    }
}
multicast {
    loops number;
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
}
unicast {
    loops number;
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    rib-group group-name;
    topology name {
        community target identifier;
    }
}
} # end of [edit protocols bgp group family]
graceful-restart {
    disable;
    restart-time seconds;
    stale-routes-time seconds;
}
hold-time seconds;
idle-after-switch-over (seconds | forever);
import [ policy-names ];
include-mp-next-hop;
keep (all | none);
local-interface interface-name;
local-preference local-preference;
log-updown;
metric-out (metric | igp (delay-med-update | offset) | minimum-igp offset);
mtu-discovery;
multihop {
    no-nexthop-change;
    ttl tll-value;
}
neighboraddress {
    advertise-external <conditional>;
    advertise-inactive;
    (advertise-peer-as | no-advertise-peer-as);
    as-override;
    authentication-algorithm algorithm;
    authentication-key key;
    bfd-liveness-detection {
        authentication {
            algorithm (keyed-md5 | keyed-sha-1 | meticulous-keyed-md5 |
                meticulous-keyed-sha-1 | simple-password);
            loose-check;
        }
    }
}

```

```

}
holddown-interval milliseconds;
minimum-interval milliseconds;
minimum-receive-interval milliseconds;
multiplier number;
no-adaptation;
session-mode (automatic | multihop | single-hop);
transmit-interval {
    minimum-interval milliseconds;
    threshold milliseconds;
}
version (1 | automatic);
}
cluster cluster-identifier;
damping;
description text-description;
export [ policy-names ];
family {
    (inet | inet6 | inet-mvpn | inet6-mpvn | inet-vpn | inet6-vpn | iso-vpn | l2-vpn)
    {
        (any | flow | multicast | unicast | signaling) {
            accepted-prefix-limit {
                maximum number;
                teardown <percentage> <idle-timeout (forever | minutes)>;
            }
            damping;
            prefix-limit {
                maximum number;
                teardown <percentage> <idle-timeout (forever | minutes)>;
            }
            rib-group group-name;
            topology name {
                community {
                    target identifier;
                }
            }
        }
    }
    flow {
        no-validate policy-name;
    }
    labeled-unicast {
        accepted-prefix-limit {
            maximum number;
            teardown <percentage> <idle-timeout (forever | minutes)>;
        }
        aggregate-label {
            community community-name;
        }
        explicit-null {
            connected-only;
        }
        prefix-limit {
            maximum number;
            teardown <percentage> <idle-timeout (forever | minutes)>;
        }
    }
    resolve-vpn;
}

```

```

    rib inet.3;
    rib-group group-name;
    topology name {
        community {
            target identifier;
        }
    }
}
route-target {
    advertise-default;
    external-paths number;
    accepted-prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
}
signaling {
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
}
}
graceful-restart {
    disable;
    restart-time seconds;
    stale-routes-time seconds;
}
hold-time seconds;
import [ policy-names ];
ipsec-sa ipsec-sa;
keep (all | none);
local-address address;
local-as autonomous-system <private>;
local-interface interface-name;
local-preference preference;
log-updown;
metric-out (metric | minimum-igp <offset> | igp <offset>);
mtu-discovery;
multihop <ttl-value>;
multipath {
    multiple-as;
}
no-aggregator-id;
no-client-reflect;
out-delay seconds;
passive;
peer-as autonomous-system;
preference preference;
tcp-mss segment-size;
traceoptions {

```

```

        file filename <files number> <size size> <world-readable |
            no-world-readable>;
        flag flag <flag-modifier> <disable>;
    }
}
no-aggregator-id;
no-client-reflect;
out-delay seconds;
outbound-route-filter {
    bgp-orf-cisco-mode;
    prefix-based {
        accept {
            inet;
            inet6;
        }
    }
}
passive;
peer-as autonomous-system;
preference preference;
remove-private;
tcp-mss segment-size;
traceoptions {
    file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
    flag flag <flag-modifier> <disable>;
}
type (external | internal);
}
hold-time seconds;
idle-after-switch-over (seconds | forever);
import [ policy-names ];
include-mp-next-hop;
keep (all | none);
local-address address;
local-as autonomous-system <loops number> < alias> <no-prepend-global-as>
    <private>;
local-interface interface-name;
local-preference local-preference;
log-updown;
metric-out (metric | igp (delay-med-update | offset) | minimum-igp offset);
mtu-discovery;
multihop {
    no-nexthop-change;
    ttl tvl-value;
}
multipath;
no-aggregator-id;
no-client-reflect;
out-delay seconds;
outbound-route-filter {
    bgp-orf-cisco-mode;
    prefix-based {
        accept {
            inet;
            inet6;
        }
    }
}

```

```

    }
  }
}
passive;
path-selection {
  always-compare-med;
  as-path-ignore;
}
peer-as autonomous-system;
precision-timers | no-precision-timers:
preference preference;
remove-private;
tcp-mss segment-size;
traceoptions {
  file filename <files number> <size maximum-file-size> <world-readable |
    no-world-readable>;
  flag flag <flag-modifier> <disable>;
}
}
}

```

### Unsupported Statements in the [edit protocols bgp] Hierarchy Level

All statements in the [edit protocols bgp] hierarchy level that are displayed in the command-line interface (CLI) on the switch are supported on the switch and operate as documented with the following exceptions:

**Table 7: Unsupported [edit protocols bgp] Configuration Statements on EX Series Switches**

Statement	Hierarchy Level
NOTE: Variables, such as <i>family-name</i> , are not shown in the statements or hierarchies.	
accepted-prefix-limit	[edit protocols bgp family]
add-path	[edit protocols bgp family]
authentication-key-chain	[edit protocols bgp] [edit protocols bgp group] [edit protocols bgp group neighbor]
cisco-non-deterministic	[edit protocols bgp path-selection]
eternal-router-id	[edit protocols bgp path-selection]
igmp-multiplier	[edit protocols bgp path-selection]
ipsec-sa	[edit protocols bgp] [edit protocols bgp group]
key-chain	[edit protocols bgp bfd-liveness-detection authentication] [edit protocols bgp group bfd-liveness-detection authentication] [edit protocols bgp group neighbor bfd-liveness-detection authentication]

Table 7: Unsupported [edit protocols bgp] Configuration Statements on EX Series Switches (*continued*)

Statement	Hierarchy Level
maximum	[edit protocols bgp family accepted-prefix-limit]
med-multiplier	[edit protocols bgp path-selection]
med-plus-igp	[edit protocols bgp path-selection]
no-validate	[edit protocols bgp family inet flow]
path-count	[edit protocols bgp family add-path send]
prefix-policy	[edit protocols bgp family add-path send]
receive	[edit protocols bgp family add-path]
send	[edit protocols bgp family add-path]
teardown	[edit protocols bgp family accepted-prefix-limit]
vpn-apply-export	[edit protocols bgp] [edit protocols bgp group neighbor]

- Related Documentation**
- *BGP Feature Guide for Routing Devices*
  - *[edit protocols] Configuration Statement Hierarchy on EX Series Switches*



## accept-remote-nexthop

<b>Syntax</b>	accept-remote-nexthop;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp group <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 8.5.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify that a single-hop EBGP peer accepts a remote next hop with which it does not share a common subnet. Configure a separate import policy on the EBGP peer to specify the remote next hop.</p> <p>For Junos OS Release 13.3 and later releases, specify that a multihop EBGP peer accepts a remote next hop with which it does not share a common subnet. This allows working around current resolver limitations to realize multipath forwarding in recursive next-hop resolution scenarios.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Configuring Single-Hop EBGP Peers to Accept Remote Next Hops</i></li> <li>• <i>Configuring Routing Policies to Control BGP Route Advertisements</i></li> <li>• <a href="#">multipath on page 91</a></li> </ul>

## advertise-external

<b>Syntax</b>	<code>advertise-external {conditional};</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit protocols bgp group <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>neighbor-address</i>]</p>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 9.3.</p> <p>Statement introduced in Junos OS Release 9.3 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify BGP to advertise the best external route into an IBGP mesh group, a route reflector cluster, or an AS confederation even if the best route is an internal route.</p> <p>In general, deployed BGP implementations do not advertise the external route with the highest local preference value to internal peers unless it is the best route. Although this behavior was required by an earlier version of the BGP version 4 specification, RFC 1771, it was typically not followed in order to minimize the amount of advertised information and to prevent routing loops. However, there are scenarios in which advertising the best external route is beneficial, in particular, situations that can result in IBGP route oscillation.</p> <p>The <b>advertise-external</b> statement is supported at both the group and neighbor level. If you configure the statement at the neighbor level, you must configure it for all neighbors in a group. Otherwise, the group is automatically split into different groups.</p> <p>In a confederation, when advertising a route to a confederation border router, any route from a different confederation sub-AS is considered external. When configuring the <b>advertise-external</b> statement for an AS confederation, it is recommended that EBGP peers belonging to different autonomous systems are configured in a separate EBGP peer group. This ensures consistency while BGP sends the best external route to peers in the configured peer group.</p> <p>To configure the <b>advertise-external</b> statement on a route reflector, you must disable intracluster reflection with the <b>no-client-reflect</b> statement.</p> <p>When a routing device is configured as a route reflector for a cluster, a route advertised by the route reflector is considered internal if it is received from an internal peer with the same cluster identifier or if both peers have no cluster identifier configured. A route received from an internal peer that belongs to another cluster, that is, with a different cluster identifier, is considered external.</p>

The **conditional** option causes BGP to advertise the external route only if the route selection process reaches the point where the multiple exit discriminator (MED) metric is evaluated. As a result, an external route with an AS path longer than that of the active path is not advertised.

Junos OS also provides support for configuring a BGP export policy that matches on the state of an advertised route. You can match on either active or inactive routes.

**Default** BGP does not advertise the external route with the highest local preference value to internal peers unless it is the best route.

**Options** **conditional**—(Optional) Advertise the best external path only if the route selection process reaches the point at which the multiple exit discriminator (MED) metric is evaluated. The **conditional** option restricts advertisement to when the best external path and the active path are equal until the MED step of the route selection process. This implies that external routes with a longer AS path length than the active path, for instance, are not advertised. The criteria used for selecting the best external path is the same whether or not the **conditional** option is configured.

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

**Related Documentation**

- *Example: Configuring a Routing Policy to Advertise the Best External Route to Internal Peers*
- [advertise-inactive on page 30](#)

## advertise-inactive

<b>Syntax</b>	advertise-inactive;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Configure the routing table to export to BGP the best route learned by BGP even if Junos OS did not select this route to be an active route.</p> <p>One way to achieve multivendor compatibility is to include the <b>advertise-inactive</b> statement in the external BGP (EBGP) configuration. By default, BGP stores the route information it receives from update messages in the Junos OS routing table, and the routing table exports only active routes into BGP, which BGP then advertises to its peers. The <b>advertise-inactive</b> statement causes Junos OS to advertise the best BGP route that is inactive because of IGP preference. When you use the <b>advertise-inactive</b> statement, the Junos OS device uses, for example, the OSPF route for forwarding, and the other vendor's device uses the EBGP route for forwarding. However, from the perspective of an EBGP peer in a neighboring AS, both vendors' devices appear to behave the same way.</p>
<b>Default</b>	By default, BGP stores the route information it receives from update messages in the Junos OS routing table, and the routing table exports only active routes into BGP, which BGP then advertises to its peers.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Configuring the Preference Value for BGP Routes</i></li> <li>• <i>Configuring Routing Policies to Control BGP Route Advertisements</i></li> <li>• <a href="#">advertise-external on page 28</a></li> </ul>

## advertise-peer-as



<b>Syntax</b>	advertise-peer-as;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Disable the default behavior of suppressing AS routes.</p> <p>If you include the <b>advertise-peer-as</b> statement in the configuration, BGP advertises routes learned from one external BGP (EBGP) peer back to another EBGP peer in the same autonomous system (AS) but not back to the originating peer.</p> <p>Another way to disable the route suppression default behavior is with the <b>as-override</b> statement. If you include both the <b>as-override</b> and <b>no-advertise-peer-as</b> statements in the configuration, the <b>no-advertise-peer-as</b> statement is ignored.</p>
<b>Default</b>	By default, Junos OS does not advertise the routes learned from one EBGP peer back to the same external BGP (EBGP) peer. In addition, the software does not advertise those routes back to any EBGP peers that are in the same AS as the originating peer, regardless of the routing instance.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Enabling BGP Route Advertisements</i></li> <li>• <i>Example: Configuring a Layer 3 VPN with Route Reflection and AS Override</i></li> <li>• <i>no-advertise-peer-as</i></li> </ul>

## aggregate-label


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<b>Syntax</b>	<pre>aggregate-label {     community <i>community-name</i>; }</pre>
<b>Hierarchy Level</b>	[edit logical-systems <i>logical-system-name</i> protocols bgp family inet labeled-unicast], [edit logical-systems <i>logical-system-name</i> protocols bgp family inet6 labeled-unicast], [edit logical-systems <i>logical-system-name</i> protocols bgp family inet-vpn unicast], [edit logical-systems <i>logical-system-name</i> protocols bgp family inet-vpn6 unicast], [edit protocols bgp family inet labeled-unicast], [edit protocols bgp family inet6 labeled-unicast], [edit protocols bgp family inet-vpn unicast], [edit protocols bgp family inet6-vpn unicast]
<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>	Specify matching criteria (in the form of a community) such that all routes which match are assigned the same VPN label, selected from one of the several routes in the set defined by this criteria. This reduces the number of VPN labels that the router must consider, and aggregates the received labels.
<b>Options</b>	<b>community <i>community-name</i></b> —Specify the name of the community to which to apply the aggregate label.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Configuring Aggregate Labels for VPNs</i></li></ul>

## allow

<b>Syntax</b>	<code>allow (all   [ <i>network/mask-length</i> ] );</code>
<b>Hierarchy Level</b>	[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> ], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> ], [edit protocols bgp <b>group</b> <i>group-name</i> ], [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> ]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 11.3 for the QFX Series.
<b>Description</b>	Implicitly configure BGP peers, allowing peer connections from any of the specified networks or hosts. To configure multiple BGP peers, configure one or more networks and hosts within a single <b>allow</b> statement or include multiple <b>allow</b> statements.
<div>  <b>NOTE:</b> You cannot define a BGP group with dynamic peers with BGP authentication enabled. </div>	
<b>Options</b>	<p><b>all</b>—Allow all addresses, which is equivalent to <b>0.0.0.0/0</b> (or <b>::/0</b>).</p> <p><b><i>network/mask-length</i></b>—IPv6 or IPv4 network number of a single address or a range of allowable addresses for BGP peers, followed by the number of significant bits in the subnet mask.</p>
<div>  <b>NOTE:</b> You cannot define a BGP group with dynamic peers with authentication enabled. </div>	
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">neighbor on page 92</a></li> </ul>

## as-override

<b>Syntax</b>	as-override;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p>
<b>Description</b>	Compare the AS path of an incoming advertised route with the AS number of the BGP peer under the group and replace all occurrences of the peer AS number in the AS path with its own AS number before advertising the route to the peer.
<div>  <p><b>NOTE:</b> The <b>as-override</b> statement is specific to a particular BGP group. This statement does not affect peers from the same remote AS configured in different groups.</p> </div>	
<p>Enabling the AS override feature allows routes originating from an AS to be accepted by a router residing in the same AS. Without AS override enabled, the routing device refuses the route advertisement once the AS path shows that the route originated from its own AS. This is done by default to prevent route loops. The <b>as-override</b> statement overrides this default behavior.</p> <p>Note that enabling the AS override feature may result in routing loops. Use this feature only for specific applications that require this type of behavior, and in situations with strict network control. One application is the IGP protocol between the provider edge routing device and the customer edge routing device in a virtual private network.</p>	
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Configuring a Layer 3 VPN with Route Reflection and AS Override</i></li> <li>• <i>Junos OS VPNs Library for Routing Devices</i></li> </ul>



## authentication-algorithm

**Syntax** authentication-algorithm *algorithm*;

**Hierarchy Level** [edit logical-systems *logical-system-name* protocols bgp],  
 [edit logical-systems *logical-system-name* protocols bgp **group** *group-name*],  
 [edit logical-systems *logical-system-name* protocols bgp **group** *group-name* neighbor *address*],  
 [edit logical-systems *logical-system-name* protocols ldp session *session-address*],  
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols bgp],  
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols bgp **group** *group-name*],  
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols bgp group *group-name* **neighbor** *address*],  
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols ldp session *session-address*],  
 [edit logical-systems *logical-system-name* routing-options bmp],  
 [edit logical-systems *logical-system-name* routing-options bmp station *station-name*],  
 [edit protocols bgp],  
 [edit protocols bgp **group** *group-name*],  
 [edit protocols bgp group *group-name* **neighbor** *address*],  
 [edit protocols ldp session *session-address*],  
 [edit routing-instances *routing-instance-name* protocols bgp],  
 [edit routing-instances *routing-instance-name* protocols bgp **group** *group-name*],  
 [edit routing-instances *routing-instance-name* protocols bgp group *group-name* **neighbor** *address*],  
 [edit routing-instances *routing-instance-name* protocols ldp session *session-address*],  
 [edit routing-options bmp],  
 [edit routing-options bmp station *station-name*]

**Release Information** Statement introduced in Junos OS Release 7.6.  
 Statement introduced for BGP in Junos OS Release 8.0.  
 Statement introduced in Junos OS Release 9.0 for EX Series switches.  
 Statement introduced in Junos OS Release 12.3X50 for the QFX Series.  
 Statement introduced for BMP in Junos OS Release 13.2X51-D15 for the QFX Series.  
 Statement introduced for BMP in Junos OS Release 13.3.  
 Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Configure an authentication algorithm type.



**NOTE:** Keep the following points in mind when you configure the authentication algorithm in an IPsec proposal:

- When both ends of an IPsec VPN tunnel contain the same IKE proposal but different IPsec proposals, an error occurs and the tunnel is not established in this scenario. For example, if one end of the tunnel contains router 1 configured with the authentication algorithm as hmac-sha-256-128 and the other end of the tunnel contains router 2 configured with the authentication algorithm as hmac-md5-96, the VPN tunnel is not established.

- When both ends of an IPsec VPN tunnel contain the same IKE proposal but different IPsec proposals, and when one end of the tunnel contains two IPsec proposals to check whether a less secure algorithm is selected or not, an error occurs and the tunnel is not established. For example, if you configure two authentication algorithms for an IPsec proposal as `hmac-sha-256-128` and `hmac-md5-96` on one end of the tunnel, router 1, and if you configure the algorithm for an IPsec proposal as `hmac-md5-96` on the other end of the tunnel, router 2, the tunnel is not established and the number of proposals mismatch.
  - When you configure two IPsec proposals at both ends of a tunnel, such as the `authentication-algorithm hmac-sha-256-128` and `authentication-algorithm hmac-md5-96` statements at the `[edit services ipsec-vpn ipsec proposal proposal-name]` hierarchy level on one of the tunnel, router 1 (with the algorithms in two successive statements to specify the order), and the `authentication-algorithm hmac-md5-96` and `authentication-algorithm hmac-sha-256-128` statements at the `[edit services ipsec-vpn ipsec proposal proposal-name]` hierarchy level on one of the tunnel, router 2 (with the algorithms in two successive statements to specify the order, which is the reverse order of router 1), the tunnel is established in this combination as expected because the number of proposals is the same on both ends and they contain the same set of algorithms. However, the authentication algorithm selected is `hmac-md5-96` and not the stronger algorithm of `hmac-sha-256-128`. This method of selection of the algorithm occurs because the first matching proposal is selected. Also, for a default proposal, regardless of whether the router supports the Advanced Encryption Standard (AES) encryption algorithm, the `3des-cbc` algorithm is chosen and not the `aes-cfb` algorithm, which is because of the first algorithm in the default proposal being selected. In the sample scenario described here, on router 2, if you reverse the order of the algorithm configuration in the proposal so that it is the same order as the one specified on router 1, `hmac-sha-256-128` is selected as the authentication method.
  - You must be aware of the order of proposals in an IPsec policy at the time of configuration if you want the matching of proposals to happen in a certain order of preference, such as the strongest algorithm to be considered first when a match is made when both policies from the two peers have a proposal.
-

**Options** *algorithm*—Specify one of the following types of authentication algorithms:

- **aes-128-cmac-96**—Cipher-based message authentication code (AES128, 96 bits).
- **hmac-sha-1-96**—Hash-based message authentication code (SHA1, 96 bits).
- **md5**—Message digest 5.

**Default:** hmac-sha-1-96



**NOTE:** The default is not displayed in the output of the `show bgp bmp` command unless a key or key-chain is also configured.

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

**Related Documentation**

- *Example: Configuring Route Authentication for BGP*
- *Configuring BGP Monitoring Protocol Version 3*

## authentication-key (Protocols BGP and BMP)

<b>Syntax</b>	authentication-key <i>key</i> ;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-options bmp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-options bmp station <i>station-name</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-options bmp],</p> <p>[edit routing-options bmp station <i>station-name</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced for BMP in Junos OS Release 13.2X51-D15 for the QFX Series.</p> <p>Statement introduced for BMP version 3 in Junos OS Release 13.3.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Configure an MD5 authentication key (password). Neighboring routing devices use the same password to verify the authenticity of BGP packets sent from this system.
<b>Options</b>	<b>key</b> —Authentication password. It can be up to 126 characters. Characters can include any ASCII strings. If you include spaces, enclose all characters in quotation marks (" ").
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Configuring Route Authentication for BGP</i></li> <li>• <i>Configuring BGP Monitoring Protocol Version 3</i></li> </ul>

## authentication-key-chain (Protocols BGP and BMP)

<b>Syntax</b>	authentication-key-chain <i>key-chain</i> ;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-options bmp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-options bmp station <i>station-name</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-options bmp],</p> <p>[edit routing-options bmp station <i>station-name</i>]</p>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 8.0.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced for BMP in Junos OS Release 13.2X51-D15 for the QFX Series.</p> <p>Statement introduced for BMP in Junos OS Release 13.3.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Apply and enable an authentication keychain to the routing device. Note that the referenced key chain must be defined. When configuring the authentication key update feature for BGP, you cannot commit the <b>0.0.0.0/allow</b> statement with authentication keys or key chains. The CLI issues a warning and fails to commit the configuration.
<b>Options</b>	<b>key-chain</b> —Authentication keychain name. It can be up to 126 characters. Characters can include any ASCII strings. If you include spaces, enclose all characters in quotation marks (" ").
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Configuring Route Authentication for BGP</i></li> <li>• <i>Example: Configuring BFD Authentication for Securing Static Routes</i></li> <li>• <i>Configuring the Authentication Key Update Mechanism for BGP and LDP Routing Protocols</i></li> <li>• <i>Configuring BGP Monitoring Protocol Version 3</i></li> </ul>

## autonomous-system

<b>Syntax</b>	<pre>autonomous-system <i>autonomous-system</i> &lt;asdot-notation&gt; &lt;loops <i>number</i>&gt; {     independent-domain &lt;no-attrset&gt;; }</pre>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> routing-options],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-options],</p> <p>[edit routing-instances <i>routing-instance-name</i> routing-options],</p> <p>[edit routing-options]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>asdot-notation</b> option introduced in Junos OS Release 9.3.</p> <p><b>asdot-notation</b> option introduced in Junos OS Release 9.3 for EX Series switches.</p> <p><b>no-attrset</b> option introduced in Junos OS Release 10.4.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 12.3 for ACX Series routers.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify the routing device's AS number.</p> <p>An autonomous system (AS) is a set of routing devices that are under a single technical administration and that generally use a single interior gateway protocol (IGP) and metrics to propagate routing information within the set of routing devices. An AS appears to other ASs to have a single, coherent interior routing plan and presents a consistent picture of what destinations are reachable through it. ASs are identified by a number that is assigned by the Network Information Center (NIC) in the United States (<a href="http://www.isi.edu">http://www.isi.edu</a>).</p> <p>If you are using BGP on the routing device, you must configure an AS number.</p> <p>The AS path attribute is modified when a route is advertised to an EBGP peer. Each time a route is advertised to an EBGP peer, the local routing device prepends its AS number to the existing path attribute, and a value of 1 is added to the AS number.</p> <p>In Junos OS Release 9.1 and later, the numeric range is extended to provide BGP support for 4-byte AS numbers as defined in RFC 4893, <i>BGP Support for Four-octet AS Number Space</i>. RFC 4893 introduces two new optional transitive BGP attributes, AS4_PATH and AS4_AGGREGATOR. These new attributes are used to propagate 4-byte AS path information across BGP speakers that do not support 4-byte AS numbers. RFC 4893 also introduces a reserved, well-known, 2-byte AS number, AS 23456. This reserved AS number is called AS_TRANS in RFC 4893. All releases of Junos OS support 2-byte AS numbers.</p> <p>In Junos OS Release 9.3 and later, you can also configure a 4-byte AS number using the AS-dot notation format of two integer values joined by a period: <i>&lt;16-bit high-order value in decimal&gt;.&lt;16-bit low-order value in decimal&gt;</i>. For example, the 4-byte AS number of 65,546 in plain-number format is represented as 1.10 in the AS-dot notation format.</p>
<b>Options</b>	<p><b><i>autonomous-system</i></b>—AS number. Use a number assigned to you by the NIC.</p>

**Range:** 1 through 4,294,967,295 ( $2^{32} - 1$ ) in plain-number format for 4-byte AS numbers

In this example, the 4-byte AS number 65,546 is represented in plain-number format:

```
[edit]
routing-options {
  autonomous-system 65546;
}
```

**Range:** 0.0 through 65535.65535 in AS-dot notation format for 4-byte numbers

In this example, 1.10 is the AS-dot notation format for 65,546:

```
[edit]
routing-options {
  autonomous-system 1.10;
}
```

**Range:** 1 through 65,535 in plain-number format for 2-byte AS numbers (this is a subset of the 4-byte range)

In this example, the 2-byte AS number 60,000 is represented in plain-number format:

```
[edit]
routing-options {
  autonomous-system 60000;
}
```

**asdot-notation**—(Optional) Display the configured 4-byte autonomous system number in the AS-dot notation format.

**Default:** Even if a 4-byte AS number is configured in the AS-dot notation format, the default is to display the AS number in the plain-number format.

**loops number**—(Optional) Specify the number of times detection of the AS number in the AS\_PATH attribute causes the route to be discarded or hidden. For example, if you configure **loops 1**, the route is hidden if the AS number is detected in the path one or more times. This is the default behavior. If you configure **loops 2**, the route is hidden if the AS number is detected in the path two or more times.

**Range:** 1 through 10

**Default:** 1



**NOTE:** When you specify the same AS number in more than one routing instance on the local routing device, you must configure the same number of loops for the AS number in each instance. For example, if you configure a value of 3 for the loops statement in a VRF routing instance that uses the same AS number as that of the master instance, you must also configure a value of 3 loops for the AS number in the master instance.

Use the **independent-domain** option if the loops statement must be enabled only on a subset of routing instances.

The remaining statement is explained separately.

<b>Required Privilege</b>	routing—To view this statement in the configuration.
<b>Level</b>	routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Examples: Configuring External BGP Peering</i></li><li>• <i>Examples: Configuring Internal BGP Peering</i></li></ul>



## bfd-liveness-detection (Protocols BGP)

**Syntax** `bfd-liveness-detection {`  
     `authentication {`  
         `algorithm algorithm-name;`  
         `key-chain key-chain-name;`  
         `loose-check;`  
     `}`  
     `detection-time {`  
         `threshold milliseconds;`  
     `}`  
     `hold-down-interval milliseconds;`  
     `minimum-interval milliseconds;`  
     `minimum-receive-interval milliseconds;`  
     `multiplier number;`  
     `no-adaptation;`  
     `session-mode (automatic | multihop | single-hop);`  
     `transmit-interval {`  
         `minimum-interval milliseconds;`  
         `threshold milliseconds;`  
     `}`  
     `version (1 | automatic);`  
`}`

**Hierarchy Level** `[edit logical-systems logical-system-name protocols bgp],`  
`[edit logical-systems logical-system-name protocols bgp group group-name],`  
`[edit logical-systems logical-system-name protocols bgp group group-name neighbor address],`  
`[edit logical-systems logical-system-name routing-instances routing-instance-name protocols`  
`bgp],`  
`[edit logical-systems logical-system-name routing-instances routing-instance-name protocols`  
`bgp group group-name],`  
`[edit logical-systems logical-system-name routing-instances routing-instance-name protocols`  
`bgp group group-name neighbor address],`  
`[edit protocols bgp],`  
`[edit protocols bgp group group-name],`  
`[edit protocols bgp group group-name neighbor address],`  
`[edit routing-instances routing-instance-name protocols bgp],`  
`[edit routing-instances routing-instance-name protocols bgp group group-name],`  
`[edit routing-instances routing-instance-name protocols bgp group group-name neighbor`  
`address]`

**Release Information** Statement introduced in Junos OS Release 8.1.  
 Statement introduced in Junos OS Release 9.0 for EX Series switches.  
**detection-time threshold** and **transmit-interval threshold** options introduced in Junos OS Release 8.2  
 Support for logical routers introduced in Junos OS Release 8.3.  
 Support for IBGP and multihop EBGp sessions introduced in Junos OS Release 8.3.  
**holddown-interval** statement introduced in Junos OS Release 8.5. You can configure this statement only for EBGp peers at the `[edit protocols bgp group group-name neighbor address]` hierarchy level.  
**no-adaptation** statement introduced in Junos OS Release 9.0.  
 Support for BFD authentication introduced in Junos OS Release 9.6.

Support for BFD on IPv6 interfaces with BGP introduced in Junos OS Release 11.2.  
Statement introduced in Junos OS Release 12.1 for the QFX Series.  
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Configure bidirectional failure detection (BFD) timers and authentication for BGP.

For IBGP and multihop EBGP support, configure the **bfd-liveness-detection** statement at the global **[edit bgp protocols]** hierarchy level. You can also configure IBGP and multihop support for a routing instance or a logical system.

**Options** **authentication algorithm** *algorithm-name* (Optional)—Configure the algorithm used to authenticate the specified BFD session: **simple-password**, **keyed-md5**, **keyed-sha-1**, **meticulous-keyed-md5**, **meticulous-keyed-sha-1**.

**authentication key-chain** *key-chain-name* (Optional)—Associate a security key with the specified BFD session using the name of the security keychain. The keychain name must match one of the keychains configured in the **authentication-key-chains key-chain** statement at the **[edit security]** hierarchy level.

**authentication loose-check**—(Optional) Configure loose authentication checking on the BFD session. Use only for transitional periods when authentication may not be configured at both ends of the BFD session.

**detection-time threshold** *milliseconds* (Optional)—Configure a threshold. When the BFD session detection time adapts to a value equal to or greater than the threshold, a single trap and a single system log message are sent.

**holddown-interval** *milliseconds* (Optional)—Configure an interval specifying how long a BFD session must remain up before a state change notification is sent. When you configure the hold-down interval for the BFD protocol for EBGp, the BFD session is unaware of the BGP session during this time. In this case, if the BGP session goes down during the configured hold-down interval, BFD already assumes it is down and does not send a state change notification. The **holddown-interval** statement is supported only for EBGp peers at the **[edit protocols bgp group group-name neighbor address]** hierarchy level. If the BFD session goes down and then comes back up during the configured hold-down interval, the timer is restarted. You must configure the hold-down interval on both EBGp peers. If you configure the hold-down interval for a multihop EBGp session, you must also configure a local IP address by including the **local-address** statement at the **[edit protocols bgp group group-name]** hierarchy level.

**Range:** 0 through 255,000

**Default:** 0

**minimum-interval** *milliseconds* (Required)—Configure the minimum intervals at which the local routing device transmits hello packets and then expects to receive a reply from a neighbor with which it has established a BFD session. This value represents the minimum interval at which the local routing device transmits hello packets as well as the minimum interval that the routing device expects to receive a reply from a neighbor with which it has established a BFD session. You can configure a value in the range from 1 through 255,000 milliseconds. Optionally, instead of using this statement, you can specify the minimum transmit and receive intervals separately (using the **minimum-receive-interval** and **transmit-interval** statements).

**Range:** 1 through 255,000

**minimum-receive-interval** *milliseconds* (Optional)—Configure only the minimum interval at which the local routing device expects to receive a reply from a neighbor with which it has established a BFD session.

**Range:** 1 through 255,000

**multiplier *number*** (Optional)—Configure the number of hello packets not received by a neighbor that causes the originating interface to be declared down.

**Range:** 1 through 255

**Default:** 3

**no-adaptation** (Optional)—Configure BFD sessions not to adapt to changing network conditions. We recommend that you not disable BFD adaptation unless it is preferable to not to have BFD adaptation enabled in your network.

**transmit-interval threshold *milliseconds*** (Optional)—Configure a threshold. When the BFD session transmit interval adapts to a value greater than the threshold, a single trap and a single system message are sent. The interval threshold must be greater than the minimum transmit interval.

**Range:** 0 through 4,294,967,295 ( $2^{32} - 1$ )

**transmit-interval minimum-interval *milliseconds*** (Optional)—Configure only the minimum interval at which the local routing device transmits hello packets to a neighbor with which it has established a BFD session.

**Range:** 1 through 255,000

**version** (Optional)—Configure the BFD version to detect.

**Range:** 1 or **automatic** (autodetect the BFD version)

**Default:** **automatic**

The remaining statements are explained separately.

<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
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<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Example: Configuring BFD for Static Routes</i></li><li>• <i>Example: Configuring BFD Authentication for Securing Static Routes</i></li><li>• <i>Example: Configuring BFD on Internal BGP Peer Sessions</i></li><li>• <i>Example: Configuring BFD Authentication for BGP</i></li><li>• <i>Understanding BFD for BGP</i></li></ul>
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**bgp**

---

<b>Syntax</b>	<code>bgp { ... }</code>
<b>Hierarchy Level</b>	[edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp], [edit protocols], [edit routing-instances <i>routing-instance-name</i> protocols]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 11.3 for the QFX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
<b>Description</b>	Enable BGP on the routing device or for a routing instance.
<b>Default</b>	BGP is disabled.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	

## bgp-orf-cisco-mode

<b>Syntax</b>	<code>bgp-orf-cisco-mode;</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>outbound-route-filter</b>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> <b>outbound-route-filter</b>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>outbound-route-filter</b>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>outbound-route-filter</b>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>outbound-route-filter</b>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>outbound-route-filter</b>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> routing-options <b>outbound-route-filter</b>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-options <b>outbound-route-filter</b>],</p> <p>[edit protocols bgp <b>outbound-route-filter</b>],</p> <p>[edit protocols bgp group <i>group-name</i> <b>outbound-route-filter</b>],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>outbound-route-filter</b>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>outbound-route-filter</b>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>outbound-route-filter</b>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>outbound-route-filter</b>],</p> <p>[edit routing-instances <i>routing-instance-name</i> routing-options <b>outbound-route-filter</b>],</p> <p>[edit routing-options <b>outbound-route-filter</b>]</p>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 9.2.</p> <p>Statement introduced in Junos OS Release 9.2 for EX Series switches.</p> <p>Support for the BGP group and neighbor hierarchy levels introduced in Junos OS Release 9.2.</p> <p>Support for the BGP group and neighbor hierarchy levels introduced in Junos OS Release 9.3 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 12.3 for ACX Series routers.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Enable interoperability with routing devices that use the vendor-specific outbound route filter compatibility code of 130 and code type of 128.
	<p> <b>NOTE:</b> To enable interoperability for all BGP peers configured on the routing device, include the statement at the [edit routing-options outbound-route-filter] hierarchy level.</p>
<b>Default</b>	Disabled

<b>Required Privilege</b>	routing—To view this statement in the configuration.
<b>Level</b>	routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Example: Configuring BGP Prefix-Based Outbound Route Filtering</i></li></ul>

## cluster

<b>Syntax</b>	<code>cluster <i>cluster-identifier</i>;</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Specify the cluster identifier to be used by the route reflector cluster in an internal BGP group.



### CAUTION:

If you configure both route reflection and VPNs on the same routing device, the following modifications to the route reflection configuration cause current BGP sessions to be reset:

- Adding a cluster ID—If a BGP session shares the same AS number with the group where you add the cluster ID, all BGP sessions are reset regardless of whether the BGP sessions are contained in the same group.
- Creating a new route reflector—If you have an IBGP group with an AS number and create a new route reflector group with the same AS number, all BGP sessions in the IBGP group and the new route reflector group are reset.



**NOTE:** If you change the address family specified in the [edit protocols bgp family] hierarchy level, all current BGP sessions on the routing device are dropped and then reestablished.



<b>Options</b>	<i>cluster-identifier</i> —4-byte number (such as an IPv4 address).
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Example: Configuring BGP Route Reflectors</i></li><li>• <i>Understanding External BGP Peering Sessions</i></li><li>• <a href="#">no-client-reflect on page 97</a></li></ul>

## damping (Protocols BGP)

<b>Syntax</b>	damping;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp family <i>family</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp family <i>family</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> family <i>family</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i> family <i>family</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i> family <i>family</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp family <i>family</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp family <i>family</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> family <i>family</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> family <i>family</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i> family <i>family</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> family <i>family</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i> family <i>family</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp family <i>family</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> family <i>family</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i> family <i>family</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Support for flap damping at the address family level introduced in Junos OS Release 12.2.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Enable route flap damping. BGP route flapping describes the situation in which BGP systems send an excessive number of update messages to advertise network reachability

information. Flap damping reduces the number of update messages sent between BGP peers, thereby reducing the load on these peers, without adversely affecting the route convergence time for stable routes.

You typically apply flap damping to external BGP (EBGP) routes (that is, to routes in different ASs). You can also apply it within a confederation, between confederation member ASs. Because routing consistency within an AS is important, do not apply flap damping to internal BGP (IBGP) routes. (If you do, it is ignored.) The exception to this rule is when flap damping is applied at the address family level. When you apply flap damping at the address family level, it works for both IBGP and EBGP.

**Default** Flap damping is disabled on the routing device.

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

**Related Documentation**

- *Examples: Configuring BGP Flap Damping*
- *Example: Configuring BGP Route Flap Damping Based on the MBGP MVPN Address Family*

## description (Protocols BGP)

<b>Syntax</b>	<code>description text-description;</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Provide a description of the global, group, or neighbor configuration. If the text includes one or more spaces, enclose it in quotation marks (" "). The text is displayed in the output of the <b>show</b> command and has no effect on the configuration.
<b>Options</b>	<b>text-description</b> —Text description of the configuration. It is limited to 255 characters.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>BGP Feature Guide for Routing Devices</i></li> </ul>

## disable (Protocols BGP)

---

<b>Syntax</b>	disable;
<b>Hierarchy Level</b>	[edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp], [edit protocols bgp], [edit routing-instances <i>routing-instance-name</i> protocols bgp]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 11.3 for the QFX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
<b>Description</b>	Disable BGP on the system.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## explicit-null (Protocols BGP)

<b>Syntax</b>	explicit-null;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols mpls],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <i>family</i> inet labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <i>family</i> inet6 labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> <i>family</i> inet labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> <i>family</i> inet6 labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <i>family</i> inet labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <i>family</i> inet6 labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols ldap],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>instance-name</i> protocols bgp <i>family</i> inet labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>instance-name</i> protocols bgp <i>family</i> inet6 labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>instance-name</i> protocols bgp group <i>group-name</i> <i>family</i> inet labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>instance-name</i> protocols bgp group <i>group-name</i> <i>family</i> inet6 labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <i>family</i> inet labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <i>family</i> inet6 labeled-unicast],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>instance-name</i> protocols ldap],</p> <p>[edit protocols mpls],</p> <p>[edit protocols bgp <i>family</i> inet labeled-unicast],</p> <p>[edit protocols bgp <i>family</i> inet6 labeled-unicast],</p> <p>[edit protocols bgp group <i>group-name</i> <i>family</i> inet labeled-unicast],</p> <p>[edit protocols bgp group <i>group-name</i> <i>family</i> inet6 labeled-unicast],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i> <i>family</i> inet labeled-unicast],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i> <i>family</i> inet6 labeled-unicast],</p> <p>[edit protocols ldap],</p> <p>[edit routing-instances <i>instance-name</i> protocols bgp <i>family</i> inet labeled-unicast],</p> <p>[edit routing-instances <i>instance-name</i> protocols bgp <i>family</i> inet6 labeled-unicast],</p> <p>[edit routing-instances <i>instance-name</i> protocols bgp group <i>group-name</i> <i>family</i> inet labeled-unicast],</p> <p>[edit routing-instances <i>instance-name</i> protocols bgp group <i>group-name</i> <i>family</i> inet6 labeled-unicast],</p> <p>[edit routing-instances <i>instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <i>family</i> inet labeled-unicast],</p> <p>[edit routing-instances <i>instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <i>family</i> inet6 labeled-unicast],</p> <p>[edit routing-instances <i>instance-name</i> protocols ldap]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 14.1X53-D30 for QFX Series switches.</p>
<b>Description</b>	Advertise label 0 to the egress routing device of an LSP.

<b>Default</b>	If you do not include the <b>explicit-null</b> statement in the configuration, label 3 (implicit null) is advertised.
<b>Required Privilege</b>	routing—To view this statement in the configuration.
<b>Level</b>	routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Advertising Explicit Null Labels to BGP Peers</i></li></ul>

## export (Protocols BGP)

<b>Syntax</b>	<code>export [ <i>policy-names</i> ];</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Apply one or more policies to routes being exported from the routing table into BGP.</p> <p>If you specify more than one policy, they are evaluated in the order specified, from left to right, and the first matching filter is applied to the route. If no routes match the filters, the routing table exports into BGP only the routes that it learned from BGP. If an action specified in one of the policies manipulates a route characteristic, the policy framework software carries the new route characteristic forward during the evaluation of the remaining policies. For example, if the action specified in the first policy of a chain sets a route's metric to 500, this route matches the criterion of <b>metric 500</b> defined in the next policy.</p>
<b>Options</b>	<i>policy-names</i> —Name of one or more policies.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>Configuring Routing Policies to Control BGP Route Advertisements</i></li> <li><i>Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices</i></li> <li><a href="#">import on page 71</a></li> </ul>



## family

```
Syntax  family {
    (inet | inet6 | inet-vpn | inet6-vpn | iso-vpn) {
        (any | flow | labeled-unicast | multicast | unicast) {
            accepted-prefix-limit {
                maximum number;
                teardown <percentage-threshold> idle-timeout (forever | minutes);
            }
            add-path {
                send {
                    path-count number;
                    prefix-policy [ policy-names ];
                }
                receive;
            }
            algp [disable];
            loops number;
            prefix-limit {
                maximum number;
                teardown <percentage> <idle-timeout (forever | minutes)>;
            }
            protection;
            rib-group group-name;
            topology name {
                community {
                    target identifier;
                }
            }
            flow {
                no-install;
                no-validate policy-name;
            }
            labeled-unicast {
                accepted-prefix-limit {
                    maximum number;
                    teardown <percentage> <idle-timeout (forever | minutes)>;
                }
                aggregate-label {
                    community community-name;
                }
                explicit-null {
                    connected-only;
                }
                prefix-limit {
                    maximum number;
                    teardown <percentage> <idle-timeout (forever | minutes)>;
                }
                resolve-vpn;
                rib inet.3;
                rib-group group-name;
                traffic-statistics {
                    file filename <world-readable | no-world-readable>;
                    interval seconds;
                }
            }
        }
    }
}
```

```

    }
  }
}
route-target {
  accepted-prefix-limit {
    maximum number;
    proxy-generate <route-target-policy route-target-policy-name>;
    teardown <percentage> <idle-timeout (forever | minutes)>;
  }
  advertise-default;
  external-paths number;
  prefix-limit {
    maximum number;
    teardown <percentage> <idle-timeout (forever | minutes)>;
  }
}
(inet-mdt | inet-mvpn | inet6-mvpn | l2vpn) {
  signaling {
    accepted-prefix-limit {
      maximum number;
      teardown <percentage-threshold> idle-timeout (forever | minutes);
    }
  }
  add-path {
    send {
      path-count number;
      prefix-policy [ policy-names ];
    }
    receive;
  }
  aigp [disable];
  damping;
  loops number;
  prefix-limit {
    maximum number;
    teardown <percentage> <idle-timeout (forever | minutes)>;
  }
  rib-group group-name;
}
}
traffic-engineering;
}

```

<b>Hierarchy Level</b>	<pre>[edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>], [edit protocols bgp], [edit protocols bgp <b>group</b> <i>group-name</i>], [edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp], [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</pre>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>inet-mvpn</b> and <b>inet6-mvpn</b> statements introduced in Junos OS Release 8.4.</p> <p><b>inet-mdt</b> statement introduced in Junos OS Release 9.4.</p> <p>Support for the <b>loops</b> statement introduced in Junos OS Release 9.6.</p> <p><b>evpn</b> statement introduced in Junos OS Release 13.2.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>traffic-engineering</b> statement introduced in Junos OS Release 14.2.</p>
<b>Description</b>	<p>Enable multiprotocol BGP (MP-BGP) by configuring BGP to carry network layer reachability information (NLRI) for address families other than unicast IPv4, to specify MP-BGP to carry NLRI for the IPv6 address family, or to carry NLRI for VPNs.</p>

- Options**
- any**—Configure the family type to be both unicast and multicast.
  - evpn**—Configure NLRI parameters for Ethernet VPNs (EVPNs).
  - inet**—Configure NLRI parameters for IPv4.
  - inet6**—Configure NLRI parameters for IPv6.
  - inet-mdt**—Configure NLRI parameters for the multicast distribution tree (MDT) subaddress family identifier (SAFI) for IPv4 traffic in Layer 3 VPNs.
  - inet-mvpn**—Configure NLRI parameters for IPv4 for multicast VPNs.
  - inet6-mvpn**—Configure NLRI parameters for IPv6 for multicast VPNs.
  - inet-vpn**—Configure NLRI parameters for IPv4 for Layer 3 VPNs.
  - inet6-vpn**—Configure NLRI parameters for IPv6 for Layer 3 VPNs.
  - iso-vpn**—Configure NLRI parameters for IS-IS for Layer 3 VPNs.
  - l2vpn**—Configure NLRI parameters for IPv4 for MPLS-based Layer 2 VPNs and VPLS.
  - labeled-unicast**—Configure the family type to be labeled-unicast. This means that the BGP peers are being used only to carry the unicast routes that are being used by labeled-unicast for resolving the labeled-unicast routes. This statement is supported only with **inet** and **inet6**.
  - multicast**—Configure the family type to be multicast. This means that the BGP peers are being used only to carry the unicast routes that are being used by multicast for resolving the multicast routes.
  - unicast**—Configure the family type to be unicast. This means that the BGP peers only carry the unicast routes that are being used for unicast forwarding purposes. The default family type is **unicast**.

The remaining statements are explained separately.


**Required Privilege Level**

- routing—To view this statement in the configuration.
- routing-control—To add this statement to the configuration.

**Related Documentation**

- *Configuring IBGP Sessions Between PE Routers in VPNs*
- *Understanding Multiprotocol BGP*
- [autonomous-system on page 40](#)
- [local-as on page 80](#)
- *Understanding Multiprotocol BGP*

## graceful-restart (Protocols BGP)

<b>Syntax</b>	<pre> graceful-restart {   disable;   restart-time <i>seconds</i>;   stale-routes-time <i>seconds</i>; } </pre>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],  [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],  [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],  [edit protocols bgp],  [edit protocols bgp <b>group</b> <i>group-name</i>],  [edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.  Statement introduced in Junos OS Release 9.0 for EX Series switches.  Statement introduced in Junos OS Release 12.1 for the QFX Series.  Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Configure graceful restart for BGP. Graceful restart allows a routing device undergoing a restart to inform its adjacent neighbors and peers of its condition. Graceful restart is disabled by default. However, helper mode, the ability to assist a neighboring router attempting a graceful restart, is enabled by default.</p> <p>To configure the duration of the BGP graceful restart period, include the <b>restart-time</b> statement at the [edit protocols bgp graceful-restart] hierarchy level. To set the length of time the router waits to receive messages from restarting neighbors before declaring them down, include the <b>stale-routes-time</b> statement at the [edit protocols bgp graceful-restart] hierarchy level.</p> <hr/> <div>  <p><b>NOTE:</b> If you configure graceful restart after a BGP session has been established, the BGP session restarts and the peers negotiate graceful restart capabilities.</p> </div> <hr/> <p>Configure graceful restart globally at the [edit routing-options] or [edit routing-instances <i>instance-name</i> routing-options] hierarchy level to enable the feature. You cannot enable graceful restart for specific protocols unless graceful restart is also enabled globally. You can, optionally, modify the global settings at the individual protocol level.</p> <p>The remaining statements are explained separately.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.  routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>Configuring Graceful Restart Options for BGP</li> <li>Configuring Graceful Restart for QFabric Systems</li> </ul>

- *Junos OS High Availability Library for Routing Devices*

## group (Protocols BGP)

```
Syntax  group group-name {
    advertise-inactive;
    allow [ network/mask-length ];
    authentication-key key;
    cluster cluster-identifier;
    damping;
    description text-description;
    enforce-first-as;
    export [ policy-names ];
    family {
        (inet | inet6 | inet-vpn | inet6-vpn | l2-vpn) {
            (any | multicast | unicast | signaling) {
                accepted-prefix-limit {
                    maximum number;
                    teardown <percentage> <idle-timeout (forever | minutes)>;
                }
            }
            add-path {
                send {
                    path-count number;
                    prefix-policy [ policy-names ];
                }
                receive;
            }
            aigp [disable];
            damping;
            prefix-limit {
                maximum number;
                teardown <percentage> <idle-timeout (forever | minutes)>;
            }
            rib-group group-name;
            topology name {
                community {
                    target identifier;
                }
            }
        }
    }
    flow {
        no-validate policy-name;
    }
    labeled-unicast {
        accepted-prefix-limit {
            maximum number;
            teardown <percentage> <idle-timeout (forever | minutes)>;
        }
        explicit-null {
            connected-only;
        }
        prefix-limit {
            maximum number;
            teardown <percentage> <idle-timeout (forever | minutes)>;
        }
    }
    resolve-vpn;
}
```

```

        rib inet.3;
        rib-group group-name;
    }
}
route-target {
    accepted-prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    advertise-default;
    external-paths number;
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
}
}
graceful-restart {
    long-lived {
        receiver {
            enable;
            disable;
        }
        advertise-to-non-llgr-neighbor {
            omit-no-export;
        }
    }
}
graceful-restart {
    long-lived {
        disable-notification-flag;
        disable-notification-extensions {
            omit-no-export;
        }
        forwarding-state-bit (from-fib | set); /* Configurable to be common for all address
        families */
        forwarding-state-bit (as-rr-client | from-fib); /* Configurable for each address family
        */
        restarter {
            disable;
            stale-time interval;
        }
    }
}
hold-time seconds;
import [ policy-names ];
ipsec-sa ipsec-sa;
keep (all | none);
local-address address;
local-as autonomous-system <private>;
local-preference local-preference;
log-updown;
metric-out metric;
multihop <tth-value>;
multipath {
    multiple-as;

```



```

}
mvpn-iana-rt-import;
no-aggregator-id;
no-client-reflect;
out-delay seconds;
passive;
peer-as autonomous-system;
preference preference;
remove-private;
tcp-aggressive-transmission;
tcp-mss segment-size;
traceoptions {
    file filename <files number> <size size> <world-readable | no-world-readable>;
    flag flag <flag-modifier> <disable>;
}
type type;
neighbor address {
    ... peer-specific-options ...
}
}

```

**Hierarchy Level** [edit logical-systems *logical-system-name* protocols bgp],  
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols  
bgp],  
[edit protocols bgp],  
[edit routing-instances *routing-instance-name* protocols bgp]

**Release Information** Statement introduced before Junos OS Release 7.4.  
Statement introduced in Junos OS Release 9.0 for EX Series switches.  
Statement introduced in Junos OS Release 11.3 for the QFX Series.  
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Define a BGP peer group. BGP peer groups share a common type, peer autonomous system (AS) number, and cluster ID, if present. To configure multiple BGP groups, include multiple **group** statements.

By default, the group's options are identical to the global BGP options. To override the global options, include group-specific options within the **group** statement.

The **group** statement is one of the statements you must include in the configuration to run BGP on the routing device.

Each group must contain at least one peer.

**Options** *group-name*—Name of the BGP group.

The remaining statements are explained separately.

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

**Related Documentation**

- *Understanding BGP*

## hold-time (Protocols BGP)

<b>Syntax</b>	<code>hold-time seconds;</code>
<b>Hierarchy Level</b>	<pre>[edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> protocols bgp <i>group group-name</i>], [edit logical-systems <i>logical-system-name</i> protocols bgp <i>group group-name</i> <i>neighbor address</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name neighbor address</i>], [edit protocols bgp], [edit protocols bgp <i>group group-name</i>], [edit protocols bgp <i>group group-name neighbor address</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp], [edit routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name</i> <i>neighbor address</i>]</pre>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify the hold-time value to use when negotiating a connection with the peer. The hold-time value is advertised in open packets and indicates to the peer the length of time that it should consider the sender valid. If the peer does not receive a keepalive, update, or notification message within the specified hold time, the BGP connection to the peer is closed and routing devices through that peer become unavailable.</p> <p>The hold time is three times the interval at which keepalive messages are sent.</p> <p>BGP on the local routing device uses the smaller of either the local hold-time value or the peer's hold-time value received in the open message as the hold time for the BGP connection between the two peers.</p> <p>Starting in Junos OS Release 12.3, the BGP hold-time value can be zero (0). This implies that the speaker does not expect keepalive messages from its peer to maintain the BGP session. When negotiating between two peers, if one side requests a nonzero hold time and the other requests a zero hold time, the negotiation settles on the nonzero value and keepalive intervals are determined accordingly. Both sides must be set to zero for keepalive messages to stop being sent.</p>
<b>Options</b>	<p><b>seconds</b>—Hold time.</p> <p><b>Range:</b> 10 through 65,535 seconds (or 0 for infinite hold time)</p> <p><b>Default:</b> 90 seconds</p>



**TIP:** When you set a hold-time value of 1 through 19 seconds, we recommend that you also configure the BGP `precision-timers` statement. The `precision-timers` statement ensures that if scheduler slip messages occur, the routing device continues to send keepalive messages. When the `precision-timers` statement is included, keepalive message generation is performed in a dedicated kernel thread, which helps to prevent BGP session flaps.

<b>Required Privilege Level</b>	routing—To view this statement in the configuration.
	routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	• <i>BGP Messages Overview</i>
	• <i>precision-timers</i>

## idle-after-switch-over

---

<b>Syntax</b>	<code>idle-after-switch-over (forever   seconds);</code>
<b>Hierarchy Level</b>	[edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> ], [edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> ], [edit protocols bgp], [edit protocols bgp group <i>group-name</i> ], [edit protocols bgp group <i>group-name</i> neighbor <i>address</i> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 9.5. Statement introduced in Junos OS Release 9.5 for EX Series switches. Statement introduced in Junos OS Release 11.3 for the QFX Series.
<b>Description</b>	Configure the routing device so that it does not automatically reestablish BGP peer sessions after a nonstop active routing (NSR) switchover. This feature is particularly useful if you are using dynamic routing policies because the dynamic database is not synchronized with the backup Routing Engine when NSR is enabled.
<b>Options</b>	<b>forever</b> —Do not reestablish a BGP peer session after an non-stop routing switchover until the <b>clear bgp neighbor</b> command is issued.  <b>seconds</b> —Do not reestablish a BGP peer session after an non-stop routing switchover until after the specified period. <b>Range:</b> 1 through 4,294,967,295 ( $2^{32} - 1$ )
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Preventing Automatic Reestablishment of BGP Peer Sessions After NSR Switchovers</i></li><li>• <i>Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices</i></li><li>• <i>Junos OS High Availability Library for Routing Devices</i></li></ul>

## import

<b>Syntax</b>	<code>import [ <i>policy-names</i> ];</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Apply one or more routing policies to routes being imported into the Junos OS routing table from BGP.</p> <p>If you specify more than one policy, they are evaluated in the order specified, from left to right, and the first matching filter is applied to the route. If no match is found, BGP places into the routing table only those routes that were learned from BGP routing devices. The policy framework software evaluates the routing policies in a chain sequentially. If an action specified in one of the policies manipulates a route characteristic, the policy framework software carries the new route characteristic forward during the evaluation of the remaining policies. For example, if the action specified in the first policy of a chain sets a route's metric to 500, this route matches the criterion of <b>metric 500</b> defined in the next policy.</p> <p>It is also important to understand that in Junos OS, although an import policy (inbound route filter) might reject a route, not use it for traffic forwarding, and not include it in an advertisement to other peers, the router retains these routes as hidden routes. These hidden routes are not available for policy or routing purposes. However, they do occupy memory space on the router. A service provider filtering routes to control the amount of information being kept in memory and processed by a router might want the router to entirely drop the routes being rejected by the import policy.</p> <p>Hidden routes can be viewed by using the <b>show route receive-protocol bgp neighbor-address hidden</b> command. The hidden routes can then be retained or dropped from the routing</p>

table by configuring the **keep all | none** statement at the **[edit protocols bgp]** or **[edit protocols bgp group *group-name*]** hierarchy level.

The rules of BGP route retention are as follows:

- By default, all routes learned from BGP are retained, except those where the AS path is looped. (The AS path includes the local AS.)
- By configuring the **keep all** statement, all routes learned from BGP are retained, even those with the local AS in the AS path.
- By configuring the **keep none** statement, all routes received are discarded. When this statement is configured and the inbound policy changes, Junos OS re-advertises all the routes advertised by the peer.

**Options**    *policy-names*—Name of one or more policies.

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

**Related Documentation**

- *Example: Configuring BGP Interactions with IGPs*
- *Configuring Routing Policies to Control BGP Route Advertisements*
- *Understanding Routing Policies*
- [export on page 58](#)

## include-mp-next-hop

<b>Syntax</b>	include-mp-next-hop;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Enable multiprotocol updates to contain next-hop reachability information.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Configuring IPv6 BGP Routes over IPv4 Transport</i></li> <li>• <i>Enabling Layer 2 VPN and VPLS Signaling</i></li> <li>• <i>Understanding Multiprotocol BGP</i></li> </ul>

## keep

<b>Syntax</b>	keep (all   none);
<b>Hierarchy Level</b>	<pre> [edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>], [edit protocols bgp], [edit protocols bgp <b>group</b> <i>group-name</i>], [edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp], [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>] </pre>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Control whether or not Junos OS keeps in memory and hides certain routes.</p> <p>If the <b>keep none</b> statement is used, Junos OS does not retain in memory and hide routes that are rejected because of a BGP import policy. Nor does BGP keep in memory and hide routes that are declared unfeasible due to BGP sanity checks. The <b>keep none</b> statement causes Junos OS to discard from memory the routes that are rejected due to BGP-specific logic or BGP evaluation. When a route is rejected because of some non-BGP-specific reason, the <b>keep none</b> statement has no effect on this route. This rejected route is retained in memory and hidden even though <b>keep none</b> is configured. An example of this type of hidden route is a route for which the protocol nexthop is unresolved.</p> <p>The routing table can retain the route information learned from BGP in one of the following ways:</p> <ul style="list-style-type: none"> <li>• Default (omit the <b>keep</b> statement)—Keep all route information that was learned from BGP, except for routes whose AS path is looped and whose loop includes the local AS.</li> <li>• <b>keep all</b>—Keep all route information that was learned from BGP.</li> <li>• <b>keep none</b>—Discard routes that were received from a peer and that were rejected by import policy or other sanity checking, such as AS path or next hop. When you configure <b>keep none</b> for the BGP session and the inbound policy changes, Junos OS forces readvertisement of the full set of routes advertised by the peer.</li> </ul>



In an AS path healing situation, routes with looped paths theoretically could become usable during a soft reconfiguration when the AS path loop limit is changed. However, there is a significant memory usage difference between the default and **keep all**.

Consider the following scenarios:

- A peer readadvertises routes back to the peer from which it learned them.

This can happen in the following cases:

- Another vendor's routing device advertises the routes back to the sending peer.
- The Junos OS peer's default behavior of not readvertising routes back to the sending peer is overridden by configuring **advertise-peer-as**.
- A provider edge (PE) routing device discards any VPN route that does not have any of the expected route targets.

When **keep all** is configured, the behavior of discarding routes received in the above scenarios is overridden.



**CAUTION:** If you add or remove **keep all** or **keep none** and the peer does not support session restart, the associated BGP sessions are restarted (flapped). To determine if a peer supports refresh, check for **Peer supports Refresh capability** in the output of the **show bgp neighbor** command.

<b>Default</b>	By default, BGP retains incoming rejected routes in memory and hides them. If you do not include the <b>keep</b> statement, most routes are retained in the routing table. BGP keeps all route information that was learned from BGP, except for routes whose AS path is looped and whose loop includes the local AS.
<b>Options</b>	<p><b>all</b>—Retain all routes.</p> <p><b>none</b>—Discard routes that were received from a peer and that were rejected by import policy or other sanity checking. When <b>keep none</b> is configured for the BGP session and the inbound policy changes, Junos OS forces readvertisement of the full set of routes advertised by the peer.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">out-delay on page 100</a></li> <li>• <i>Interprovider VPN Example—MP-EBGP Between ISP Peer Routers</i></li> <li>• <i>Example: Configuring a Routing Policy for Conditional Advertisement of Prefixes in a Routing Table</i></li> </ul>

## labeled-unicast (Protocols BGP)

<b>Syntax</b>	<pre> labeled-unicast {     accepted-prefix-limit {         maximum <i>number</i>;         teardown &lt;<i>percentage</i>&gt; &lt;idle-timeout (forever   <i>minutes</i>)&gt;;     }     aggregate-label {         community <i>community-name</i>;     }     entropy-label {         import <i>policy-name</i>;         no-next-hop-validation;     }     explicit-null {         connected-only;     }     prefix-limit {         maximum <i>number</i>;         teardown &lt;<i>percentage</i>&gt; &lt;idle-timeout (forever   <i>minutes</i>)&gt;;     }     protection;     resolve-vpn;     rib (inet.3   inet6.3);     rib-group <i>group-name</i>; } </pre>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>family</b> (inet   inet6)],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> <b>family</b> (inet   inet6)],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> (inet   inet6)],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>family</b> (inet   inet6)],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>family</b> (inet   inet6)],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> (inet   inet6)],</p> <p>[edit protocols bgp <b>family</b> (inet   inet6)],</p> <p>[edit protocols bgp group <i>group-name</i> <b>family</b> (inet   inet6)],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> (inet   inet6)],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>family</b> (inet   inet6)],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>family</b> (inet   inet6)],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> (inet   inet6)]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p>
<b>Description</b>	<p>Configure the family type to be labeled-unicast.</p> <p>The remaining statements are explained separately.</p>

<b>Required Privilege</b>	routing—To view this statement in the configuration.
<b>Level</b>	routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Example: Configuring IPv6 BGP Routes over IPv4 Transport</i></li><li>• <i>Enabling Layer 2 VPN and VPLS Signaling</i></li><li>• <i>Understanding Multiprotocol BGP</i></li></ul>

## local-address (Protocols BGP)

<b>Syntax</b>	<code>local-address address;</code>
<b>Hierarchy Level</b>	<pre>[edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> protocols bgp <i>group group-name</i>], [edit logical-systems <i>logical-system-name</i> protocols bgp <i>group group-name</i> <i>neighbor address</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name neighbor address</i>], [edit protocols bgp], [edit protocols bgp <i>group group-name</i>], [edit protocols bgp <i>group group-name neighbor address</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp], [edit routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name</i> <i>neighbor address</i>]</pre>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify the address of the local end of a BGP session. This address is used to accept incoming connections to the peer and to establish connections to the remote peer. When none of the operational interfaces are configured with the specified local address, a session with a BGP peer is placed in the idle state.</p> <p>You generally configure a local address to explicitly configure the system's IP address from BGP's point of view. This IP address can be either an IPv6 or IPv4 address. Typically, an IP address is assigned to a loopback interface, and that IP address is configured here.</p> <p>For internal BGP (IBGP) peering sessions, generally the loopback interface (lo0) is used to establish connections between the IBGP peers. The loopback interface is always up as long as the device is operating. If there is a route to the loopback address, the IBGP peering session stays up. If a physical interface address is used instead and that interface goes up and down, the IBGP peering session also goes up and down. Thus, the loopback interface provides fault tolerance in case the physical interface or the link goes down, if the device has link redundancy.</p> <p>When a device peers with a remote device's loopback interface address, the local device expects BGP update messages to come from (be sourced by) the remote device's loopback interface address. The <b>local-address</b> statement enables you to specify the source information in BGP update messages. If you omit the <b>local-address</b> statement, the expected source of BGP update messages is based on the device's source address selection rules, which normally result in the egress interface address being the expected source of update messages. When this happens, the peering session is not established</p>

because a mismatch exists between the expected source address (the egress interface of the peer) and the actual source (the loopback interface of the peer). To ensure that the expected source address matches the actual source address, specify the loopback interface address in the **local-address** statement.



**NOTE:** Although a BGP session can be established when only one of the paired routing devices has **local-address** configured, we strongly recommend that you configure **local-address** on both paired routing devices for IBGP and multihop EBGP sessions. The **local-address** statement ensures that deterministic fixed addresses are used for the BGP session end-points.

If you include the **default-address-selection** statement in the configuration, the software chooses the system default address as the source for most locally generated IP packets. For protocols in which the local address is unconstrained by the protocol specification, for example IBGP and multihop EBGP, if you do not configure a specific local address when configuring the protocol, the local address is chosen using the same methods as other locally generated IP packets.

**Default** If you do not configure a local address, BGP uses the routing device's source address selection rules to set the local address.

**Options** **address**—IPv6 or IPv4 address of the local end of the connection.

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

**Related Documentation**

- *Example: Configuring Internal BGP Peering Sessions on Logical Systems*
- *Example: Configuring Internal BGP Peer Sessions*
- *Understanding Internal BGP Peering Sessions*
- *router-id*

## local-as

<b>Syntax</b>	<code>local-as <i>autonomous-system</i> &lt;loops <i>number</i>&gt; &lt;private   alias&gt; &lt;no-prepend-global-as&gt;;</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <i>group group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <i>group group-name</i> neighbor <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <i>group group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <i>group group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p><b>alias</b> option introduced in Junos OS Release 9.5.</p> <p><b>no-prepend-global-as</b> option introduced in Junos OS Release 9.6.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify the local autonomous system (AS) number. An AS is a set of routing devices that are under a single technical administration and generally use a single interior gateway protocol (IGP) and metrics to propagate routing information within the set of routing devices.</p> <p>Internet service providers (ISPs) sometimes acquire networks that belong to a different AS. When this occurs, there is no seamless method for moving the BGP peers of the acquired network to the AS of the acquiring ISP. The process of configuring the BGP peers with the new AS number can be time-consuming and cumbersome. In this case, it might not be desirable to modify peer arrangements or configuration. During this kind of transition period, it can be useful to configure BGP-enabled devices in the new AS to use the former AS number in BGP updates. This former AS number is called a <i>local</i> AS.</p>



**NOTE:** If you are using BGP on the routing device, you must configure an AS number before you specify the local as number.

In Junos OS Release 9.1 and later, the AS numeric range in plain-number format is extended to provide BGP support for 4-byte AS numbers, as defined in RFC 4893, *BGP Support for Four-octet AS Number Space*.

In Junos OS Release 9.3 and later, you can also configure a 4-byte AS number using the AS-dot notation format of two integer values joined by a period:

*<16-bit high-order value in decimal>.<16-bit low-order value in decimal>.* For example, the 4-byte AS number of 65546 in plain-number format is represented as 1.10 in the AS-dot notation format.

**Options** **alias**—(Optional) Configure the local AS as an alias of the global AS number configured for the router at the **[edit routing-options]** hierarchy level. As a result, a BGP peer considers any local AS to which it is assigned as equivalent to the primary AS number configured for the routing device. When you use the **alias** option, only the AS (global or local) used to establish the BGP session is prepended in the AS path sent to the BGP neighbor.

**autonomous-system**—AS number.

**Range:** 1 through 4,294,967,295 ( $2^{32} - 1$ ) in plain-number format

**Range:** 0.0 through 65535.65535 in AS-dot notation format

**loops number**—(Optional) Specify the number of times detection of the AS number in the AS\_PATH attribute causes the route to be discarded or hidden. For example, if you configure **loops 1**, the route is hidden if the AS number is detected in the path one or more times. This is the default behavior. If you configure **loops 2**, the route is hidden if the AS number is detected in the path two or more times.



**NOTE:** If you configure the local AS values for any BGP group, the detection of routing loops is performed using both the AS and the local AS values for all BGP groups.

If the local AS for the EBGP or IBGP peer is the same as the current AS, do not use the **local-as** statement to specify the local AS number.

When you configure the local AS within a VRF, this impacts the AS path loop-detection mechanism. All of the **local-as** statements configured on the device are part of a single AS domain. The AS path loop-detection mechanism is based on looking for a matching AS present in the domain.

**Range:** 1 through 10

**Default:** 1

**no-prepend-global-as**—(Optional) Specify to strip the global AS and to prepend only the local AS in AS paths sent to external peers.

**private**—(Optional) Configure to use the local AS only during the establishment of the BGP session with a BGP neighbor but to hide it in the AS path sent to external BGP peers. Only the global AS is included in the AS path sent to external peers.



**NOTE:** The **private** and **alias** options are mutually exclusive. You cannot configure both options with the same **local-as** statement.

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

**Related Documentation**

- *Examples: Configuring BGP Local AS*
- *Example: Configuring a Local AS for EBGp Sessions*
- [autonomous-system on page 40](#)
- [family on page 59](#)

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## local-interface (IPv6)

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**Syntax** local-interface *interface-name*;

**Hierarchy Level** [edit logical-systems *logical-system-name* protocols bgp [group](#) *group-name* [neighbor](#) *ipv6-link-local-address*],  
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols bgp group *group-name* [neighbor](#) *ipv6-link-local-address*],  
[edit protocols bgp group *group-name* [neighbor](#) *ipv6-link-local-address*],  
[edit routing-instances *routing-instance-name* protocols bgp group *group-name* [neighbor](#) *ipv6-link-local-address*]

**Release Information** Statement introduced before Junos OS Release 7.4.  
Statement introduced in Junos OS Release 9.0 for EX Series switches.

**Description** Specify the interface name of the EBGp peer that uses IPv6 link-local addresses. This peer is link-local in scope.

**Options** *interface-name*—Interface name of the EBGp IPv6 peer.

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

**Related Documentation**

- *Example: Configuring Internal BGP Peering Sessions on Logical Systems*
- *Example: Configuring Internal BGP Peer Sessions*
- *Example: Configuring External BGP on Logical Systems with IPv6 Interfaces*
- *Understanding Internal BGP Peering Sessions*



## local-preference

<b>Syntax</b>	<code>local-preference local-preference;</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],          [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit protocols bgp],          [edit protocols bgp <b>group</b> <i>group-name</i>],          [edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit routing-instances <i>routing-instance-name</i> protocols bgp],          [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Modify the value of the <b>LOCAL_PREF</b> path attribute, which is a metric used by IBGP sessions to indicate the degree of preference for an external route. The route with the highest local preference value is preferred.</p> <p>The <b>LOCAL_PREF</b> path attribute always is advertised to internal BGP peers and to neighboring confederations. It is never advertised to external BGP peers.</p>
<b>Default</b>	If you omit this statement, the <b>LOCAL_PREF</b> path attribute, if present, is not modified.
<b>Options</b>	<p><b>local-preference</b>—Preference to assign to routes learned from BGP or from the group or peer.</p> <p><b>Range:</b> 0 through 4,294,967,295 (<math>2^{32} - 1</math>)</p> <p><b>Default:</b> If the <b>LOCAL_PREF</b> path attribute is present, do not modify its value. If a BGP route is received without a <b>LOCAL_PREF</b> attribute, the route is handled locally (it is stored in the routing table and advertised by BGP) as if it were received with a <b>LOCAL_PREF</b> value of 100. By default, non-BGP routes that are advertised by BGP are advertised with a <b>LOCAL_PREF</b> value of 100.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Configuring the Local Preference Value for BGP Routes</i></li> <li>• <i>Understanding Internal BGP Peering Sessions</i></li> </ul>

- [preference on page 106](#)

## log-updown

<b>Syntax</b>	log-updown;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <i>group</i> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp <i>group</i> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <i>group</i> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify to generate a log a message whenever a BGP peer makes a state transition. Messages are logged using the system logging mechanism located at the <b>[edit system syslog]</b> hierarchy level.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Preventing BGP Session Resets</i></li> <li>• <i>Configuring System Logging of BGP Peer State Transitions</i></li> <li>• <a href="#">traceoptions on page 113</a></li> </ul>

## metric-out

<b>Syntax</b>	<code>metric-out (<i>metric</i>   minimum-igp <i>offset</i>   igp (delay-med-update   <i>offset</i>);</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],          [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit protocols bgp],          [edit protocols bgp <b>group</b> <i>group-name</i>],          [edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit routing-instances <i>routing-instance-name</i> protocols bgp],          [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Option <b>delay-med-update</b> introduced in Junos OS Release 9.0.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify the metric for all routes sent using the multiple exit discriminator (MED, or <b>MULTI_EXIT_DISC</b>) path attribute in update messages. This path attribute is used to discriminate among multiple exit points to a neighboring AS. If all other factors are equal, the exit point with the lowest metric is preferred.</p> <p>You can specify a constant metric value by including the <b>metric</b> option. For configurations in which a BGP peer sends third-party next hops that require the local system to perform next-hop resolution—IBGP configurations, configurations within confederation peers, or EBGP configurations that include the <b>multihop</b> command—you can specify a variable metric by including the <b>minimum-igp</b> or <b>igp</b> option.</p> <p>You can increase or decrease the variable metric calculated from the IGP metric (either from the <b>igp</b> or <b>minimum-igp</b> statement) by specifying a value for <b>offset</b>. The metric is increased by specifying a positive value for <b>offset</b>, and decreased by specifying a negative value for <b>offset</b>.</p> <p>In Junos OS Release 9.0 and later, you can specify that a BGP group or peer not advertise updates for the MED path attributes used to calculate IGP costs for BGP next hops unless the MED is lower. You can also configure an interval to delay when MED updates are sent by including the <b>med-igp-update-interval</b> <i>minutes</i> statement at the [edit routing-options] hierarchy level.</p>

**Options** **delay-med-update**—Specify that a BGP group or peer configured with the **metric-out igp** statement not advertise MED updates unless the current MED value is lower than the previously advertised MED value, or another attribute associated with the route has changed, or the BGP peer is responding to a refresh route request.



**NOTE:** You cannot configure the **delay-med-update** statement at the global BGP level.

**igp**—Set the metric to the most recent metric value calculated in the IGP to get to the BGP next hop. Routes learned from an EBGP peer usually have a next hop on a directly connected interface and thus the IGP value is equal to zero. This is the value advertised.

**metric**—Primary metric on all routes sent to peers.

**Range:** 0 through 4,294,967,295 ( $2^{32} - 1$ )

**Default:** No metric is sent.

**minimum-igp**—Set the metric to the minimum metric value calculated in the IGP to get to the BGP next hop. If a newly calculated metric is greater than the minimum metric value, the metric value remains unchanged. If a newly calculated metric is lower, the metric value is lowered to that value. When you change a neighbor's export policy from any configuration to a configuration that sets the minimum IGP offset on an exported route, the advertised MED is not updated if the value would increase as a result, even if the previous configuration does not use a minimum IGP-based MED value. This behavior helps to prevent unnecessary route flapping when an IGP cost changes, by not forcing a route update if the metric value increases past the previous lowest known value.

**offset**—Increases or decreases the metric by this value.

**Range:**  $-2^{31}$  through  $2^{31} - 1$

**Default:** None

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

**Related Documentation**


- *Example: Associating the MED Path Attribute with the IGP Metric and Delaying MED Updates*
- *Examples: Configuring BGP MED*
- *Example: Configuring the MED Attribute Directly*
- *Understanding the MED Attribute That Determines the Exit Point in an AS*
- *med-igp-update-interval*

## mtu-discovery

<b>Syntax</b>	mtu-discovery;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Configure TCP path maximum transmission unit (MTU) discovery.</p> <p>TCP path MTU discovery enables BGP to automatically discover the best TCP path MTU for each BGP session. In Junos OS, TCP path MTU discovery is disabled by default for all BGP neighbor sessions.</p> <p>When MTU discovery is disabled, TCP sessions that are not directly connected transmit packets of 512-byte maximum segment size (MSS). These small packets minimize the chances of packet fragmentation at a device along the path to the destination. However, because most links use an MTU of at least 1500 bytes, 512-byte packets do not result in the most efficient use of link bandwidth. For directly connected EBGP sessions, MTU mismatches prevent the BGP session from being established. As a workaround, enable path MTU discovery within the EBGP group.</p> <p>Path MTU discovery dynamically determines the MTU size on the network path between the source and the destination, with the goal of avoiding IP fragmentation. Path MTU discovery works by setting the Don't Fragment (DF) bit in the IP headers of outgoing packets. When a device along the path has an MTU that is smaller than the packet, the device drops the packet. The device also sends back an ICMP Fragmentation Needed (Type 3, Code 4) message that contains the device's MTU, thus allowing the source to reduce its path MTU appropriately. The process repeats until the MTU is small enough to traverse the entire path without fragmentation.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

- Related Documentation**
- *Example: Limiting TCP Segment Size for BGP*
  - *Configuring Junos OS for IPv6 Path MTU Discovery*
  - *Configuring the Junos OS for Path MTU Discovery on Outgoing GRE Tunnel Connections*

## multihop


<b>Syntax</b>	<pre>multihop {     no-nexthop-change;     ttl <i>ttl-value</i>; }</pre>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],          [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit protocols bgp],          [edit protocols bgp <b>group</b> <i>group-name</i>],          [edit protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit routing-instances <i>routing-instance-name</i> protocols bgp],          [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.          Statement introduced in Junos OS Release 9.0 for EX Series switches.          Statement introduced in Junos OS Release 11.3 for the QFX Series.          Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Configure an EBGp multihop session.</p> <p>For Layer 3 VPNs, you configure the EBGp multihop session between the PE and CE routing devices. This allows you to configure one or more routing devices between the PE and CE routing devices.</p> <p>An external confederation peer is a special case that allows unconnected third-party next hops. You do not need to configure multihop sessions explicitly in this particular case because multihop behavior is implied.</p> <p>If you have external BGP confederation peer-to-loopback addresses, you still need the multihop configuration.</p>
	<div>  <p><b>NOTE:</b> You cannot configure the <code>accept-remote-nexthop</code> statement at the same time.</p> </div>
<b>Default</b>	<p>If you omit this statement, all EBGp peers are assumed to be directly connected (that is, you are establishing a nonmultihop, or “regular,” BGP session), and the default time-to-live (TTL) value is 1.</p>

The remaining statements are explained separately.

<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Example: Configuring EBGp Multihop Sessions</i></li><li>• <i>Configuring EBGp Multihop Sessions Between PE and CE Routers in Layer 3 VPNs</i></li><li>• <a href="#">accept-remote-nextthop on page 27</a></li><li>• <i>no-nextthop-change</i></li><li>• <i>tth</i></li></ul>



## multipath (Protocols BGP)

<b>Syntax</b>	<pre> multipath {   multiple-as;   vpn-unequal-cost equal-external-internal; } </pre>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p>
<b>Description</b>	<p>Allow load sharing among multiple EBGP paths and multiple IBGP paths. A path is considered a BGP equal-cost path (and will be used for forwarding) if a tie-break is performed. The tie-break is performed after the BGP route path selection step that chooses the next-hop path that is resolved through the IGP route with the lowest metric. All paths with the same neighboring AS, learned by a multipath-enabled BGP neighbor, are considered.</p>
	<div>  <p><b>NOTE:</b> BGP multiple path options must be consistent for all routes forming a BGP multiple path. If BGP multiple path options differ, the multiple path feature chooses a preference, and the multiple path feature might not function as intended.</p> </div>
<b>Options</b>	<p><b>multiple-as</b>—Disable the default check requiring that paths accepted by BGP multipath must have the same neighboring AS.</p> <p><b>vpn-unequal-cost equal-external-internal</b>—Enable load-balancing in a Layer 3 VPN with unequal cost paths.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Understanding BGP Path Selection</i></li> <li>• <i>Example: Load Balancing BGP Traffic</i></li> </ul>

## neighbor (Protocols BGP)

```
Syntax  neighbor address {
    accept-remote-nexthop;
    advertise-bgp-static
    advertise-external <conditional>;
    advertise-inactive;
    (advertise-peer-as | no-advertise-peer-as);
    as-override;
    authentication-algorithm algorithm;
    authentication-key key;
    authentication-key-chain key-chain;
    cluster cluster-identifier;
    damping;
    description text-description;
    export [ policy-names ];
    enforce-first-as;
    family {
        (inet | inet6 | inet-mvpn | inet6-mpvn | inet-vpn | inet6-vpn | iso-vpn | l2-vpn) {
            (any | flow | multicast | unicast | signaling) {
                accepted-prefix-limit {
                    maximum number;
                    teardown <percentage> <idle-timeout (forever | minutes)>;
                }
                damping;
                prefix-limit {
                    maximum number;
                    teardown <percentage> <idle-timeout (forever | minutes)>;
                }
                rib-group group-name;
                topology name {
                    community {
                        target identifier;
                    }
                }
            }
        }
        flow {
            no-validate policy-name;
        }
        labeled-unicast {
            accepted-prefix-limit {
                maximum number;
                teardown <percentage> <idle-timeout (forever | minutes)>;
            }
            aggregate-label {
                community community-name;
            }
            explicit-null {
                connected-only;
            }
            prefix-limit {
                maximum number;
                teardown <percentage> <idle-timeout (forever | minutes)>;
            }
        }
    }
}
```

```

    resolve-vpn;
    rib inet.3;
    rib-group group-name;
    topology name {
        community {
            target identifier;
        }
    }
}
route-target {
    advertise-default;
    external-paths number;
    accepted-prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
}
signaling {
    prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
    }
}
}
graceful-restart {
    disable;
    restart-time seconds;
    stale-routes-time seconds;
}
graceful-restart {
    long-lived {
        receiver {
            enable;
            disable;
        }
        advertise-to-non-llgr-neighbor {
            omit-no-export;
        }
    }
}
graceful-restart {
    disable-notification-flag;
    disable-notification-extensions {
        omit-no-export;
    }
}
forwarding-state-bit (from-fib | set); /* Configurable to be common for all address
families */
forwarding-state-bit (as-rr-client | from-fib); /* Configurable for each address family */
long-lived {
    restarter {
        disable;
    }
}

```

```

        stale-time interval;
    }
}
hold-time seconds;
import [ policy-names ];
ipsec-sa ipsec-sa;
keep (all | none);
local-address address;
local-as autonomous-system <private>;
local-interface interface-name;
local-preference preference;
log-updown;
metric-out (metric | minimum-igp <offset> | igp <offset>);
mtu-discovery;
multihop <ttl-value>;
multipath {
    multiple-as;
}
no-aggregator-id;
no-client-reflect;
out-delay seconds;
passive;
peer-as autonomous-system;
preference preference;
tcp-aggressive-transmission;
tcp-mss segment-size;
traceoptions {
    file filename <files number> <size size> <world-readable | no-world-readable>;
    flag flag <flag-modifier> <disable>;
}
vpn-apply-export;
}

```

**Hierarchy Level** [edit logical-systems *logical-system-name* protocols bgp **group** *group-name*],  
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols  
bgp **group** *group-name*],  
[edit protocols bgp **group** *group-name*],  
[edit routing-instances *routing-instance-name* protocols bgp **group** *group-name*]

**Release Information** Statement introduced before Junos OS Release 7.4.  
Statement introduced in Junos OS Release 9.0 for EX Series switches.  
Statement introduced in Junos OS Release 11.3 for the QFX Series.  
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Explicitly configure a neighbor (peer). To configure multiple BGP peers, include multiple **neighbor** statements.

By default, the peer's options are identical to those of the group. You can override these options by including peer-specific option statements within the **neighbor** statement.

The **neighbor** statement is one of the statements you can include in the configuration to define a minimal BGP configuration on the routing device. (You can include an **allow all** statement in place of a **neighbor** statement.)

**Options**    *address*—IPv6 or IPv4 address of a single peer.

The remaining statements are explained separately.

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

**Related**    • *BGP Feature Guide for Routing Devices*  
**Documentation**

## no-aggregator-id

<b>Syntax</b>	no-aggregator-id;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Prevent different routing devices within an AS from creating aggregate routes that contain different AS paths.</p> <p>Junos OS performs route aggregation, which is the process of combining the characteristics of different routes so that only a single route is advertised. Aggregation reduces the amount of information that BGP must store and exchange with other BGP systems. When aggregation occurs, the local routing device adds the local AS number and the router ID to the aggregator path attribute. The <b>no-aggregator-id</b> statement causes Junos OS to place a 0 in the router ID field and thus eliminate the possibility of having multiple aggregate advertisements in the network, each with different path information.</p>
<b>Default</b>	If you omit this statement, the router ID is included in the BGP aggregator path attribute.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>BGP Messages Overview</i></li> </ul>

## no-client-reflect

<b>Syntax</b>	no-client-reflect;
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Disable intracluster route redistribution by the system acting as the route reflector. Include this statement when the client cluster is fully meshed to prevent the sending of redundant route advertisements. Route reflection provides a way to decrease BGP control traffic and minimizing the number of update messages sent within the AS.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Configuring BGP Route Reflectors</i></li> <li>• <a href="#">cluster on page 50</a></li> </ul>

## no-validate

---

<b>Syntax</b>	<code>no-validate <i>policy-name</i>;</code>
<b>Hierarchy Level</b>	<code>[edit protocols bgp group <i>group-name</i> <i>family</i> (inet   inet flow)],</code> <code>[edit protocols bgp group <i>group-name</i> neighbor address <i>family</i> (inet   inet flow)],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <i>family</i> (inet   inet flow)],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor address <i>family</i> (inet   inet flow)]</code>
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 11.3 for the QFX Series.
<b>Description</b>	<p>When BGP is carrying flow-specification network layer reachability information (NLRI) messages, the <b>no-validate</b> statement omits the flow route validation procedure after packets are accepted by a policy.</p> <p>The receiving BGP-enabled device accepts a flow route if it passes the following criteria:</p> <ul style="list-style-type: none"><li>• The originator of a flow route matches the originator of the best match unicast route for the destination address that is embedded in the route.</li><li>• There are no more specific unicast routes, when compared to the destination address of the flow route, for which the active route has been received from a different next-hop autonomous system.</li></ul> <p>The first criterion ensures that the filter is being advertised by the next-hop used by unicast forwarding for the destination address embedded in the flow route. For example, if a flow route is given as 10.1.1.1, proto=6, port=80, the receiving BGP-enabled device selects the more specific unicast route in the unicast routing table that matches the destination prefix 10.1.1.1/32. On a unicast routing table containing 10.1/16 and 10.1.1/24, the latter is chosen as the unicast route to compare against. Only the active unicast route entry is considered. This follows the concept that a flow route is valid if advertised by the originator of the best unicast route.</p> <p>The second criterion addresses situations in which a given address block is allocated to different entities. Flows that resolve to a best-match unicast route that is an aggregate route are only accepted if they do not cover more specific routes that are being routed to different next-hop autonomous systems.</p> <p>You can bypass the validation process and use your own specific import policy. To disable the validation procedure and use an import policy instead, include the <b>no-validate</b> statement in the configuration.</p> <p>Flow routes configured for VPNs with family <b>inet-vpn</b> are not automatically validated, so the <b>no-validate</b> statement is not supported at the <code>[edit protocols bgp group <i>group-name</i> family <i>inet-vpn</i>]</code> hierarchy level. No validation is needed if the flow routes are configured locally between devices in a single AS.</p>



**Options**    *policy-name*—Import policy to match NLRI messages.

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

**Related**    • *Example: Enabling BGP to Carry Flow-Specification Routes*  
**Documentation**    • *Understanding BGP Flow Routes for Traffic Filtering*

## out-delay

<b>Syntax</b>	<code>out-delay seconds;</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Control how often BGP and the routing table exchange route information by specifying how long a route must be present in the Junos OS routing table before it is exported to BGP. Use this time delay to help bundle routing updates and to avoid sending updates too often.</p> <p>Alternatively or in addition, external BGP (EBGP) sessions can also use the route-flap damping mechanism upon the reception of BGP messages coming from an external neighbor.</p> <p>BGP stores the route information it receives from update messages in the routing table, and the routing table exports active routes from the routing table into BGP. BGP then advertises the exported routes to its peers. The <b>out-delay</b> statement enables a form of rate limiting. The delay is added to each update for each prefix individually. When a routing device changes its best path to a destination prefix, the device does not inform its peer about the change unless the route has been present in its routing table for the specified <b>out-delay</b>. If you use <b>out-delay</b> to perform rate-limiting, you can expect a less bursty pattern of updates. You will see a pattern in which updates arrive in a steady flow, and two updates for the same prefix are always spaced by at least the <b>out-delay</b> timer value (for example, 30 seconds). Thus, the <b>out-delay</b> setting is useful for limiting oscillation (sometimes called <i>churn</i>) in a network. Keep in mind that, regardless of the <b>out-delay</b> setting, BGP peers exchange routes immediately after neighbor establishment. The <b>out-delay</b> setting is only designed to delay the exchange of routes between BGP and the local routing table.</p>

Caution is warranted because an **out-delay** can delay convergence. If your network is configured in a way that avoids oscillation, setting an **out-delay** is not necessary.

When configured, the **out-delay** value displays as **Outbound Timer** when using **show bgp group** or **show bgp group neighbor** commands.


**Default** By default, the exchange of route information between BGP and the routing table occurs immediately after the routes are received. This immediate exchange of route information might cause instabilities in the network reachability information. If you omit this statement, routes are exported to BGP immediately after they have been added to the routing table.

**Options** *seconds*—Output delay time.  
**Range:** 0 through 65,535 seconds  
**Default:** 0 seconds

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

**Related Documentation** • [keep on page 74](#)

## outbound-route-filter

<b>Syntax</b>	<pre> outbound-route-filter {     <b>bgp-orf-cisco-mode</b>;     prefix-based {         accept {             (inet   inet6);         }     } } </pre>
<b>Hierarchy Level</b>	<pre> [edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols   bgp], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols   bgp group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols   bgp group <i>group-name</i> neighbor <i>address</i>], [edit protocols bgp], [edit protocols bgp group <i>group-name</i>], [edit protocols bgp group <i>group-name</i> neighbor <i>address</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp], [edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor   <i>address</i>] </pre>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 9.2.</p> <p>Statement introduced in Junos OS Release 9.2 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Configure a BGP peer to accept outbound route filters from a remote peer.
<b>Options</b>	<p><b>accept</b>—Specify that outbound route filters from a BGP peer be accepted.</p> <p><b>inet</b>—Specify that IPv4 prefix-based outbound route filters be accepted.</p> <p><b>inet6</b>—Specify that IPv6 prefix-based outbound route filters be accepted.</p>
	<p> <b>NOTE:</b> You can specify that both IPv4 and IPv6 outbound route filters be accepted.</p>
	<p><b>prefix-based</b>—Specify that prefix-based filters be accepted.</p> <p>The <b>bgp-orf-cisco-mode</b> statement is explained separately.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

- Related Documentation**
- *Example: Configuring BGP Prefix-Based Outbound Route Filtering*

## passive (Protocols BGP)

<b>Syntax</b>	passive;
<b>Hierarchy Level</b>	<pre>[edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> <b>neighbor</b> <i>address</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <i>group</i> <i>group-name</i> <b>neighbor</b> <i>address</i>], [edit protocols bgp], [edit protocols bgp <b>group</b> <i>group-name</i>], [edit protocols bgp <i>group</i> <i>group-name</i> <b>neighbor</b> <i>address</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp], [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp <i>group</i> <i>group-name</i> <b>neighbor</b> <i>address</i>]</pre>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Configure the routing device so that active open messages are not sent to the peer. Once you configure the routing device to be passive, the routing device will wait for the peer to issue an open request before a message is sent.
<b>Default</b>	If you omit this statement, all explicitly configured peers are active, and each peer periodically sends open requests until its peer responds.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Preventing BGP Session Flaps When VPN Families Are Configured</i></li> </ul>

## peer-as (Protocols BGP)


<b>Syntax</b>	<code>peer-as <i>autonomous-system</i>;</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],          [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> neighbor <i>address</i>],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit protocols bgp],          [edit protocols bgp <b>group</b> <i>group-name</i>],          [edit protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],          [edit routing-instances <i>routing-instance-name</i> protocols bgp],          [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],          [edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify the neighbor (peer) autonomous system (AS) number.</p> <p>For EBGP, the peer is in another AS, so the AS number you specify in the <b>peer-as</b> statement must be different from the local router's AS number, which you specify in the <b>autonomous-system</b> statement. For IBGP, the peer is in the same AS, so the two AS numbers that you specify in the <b>autonomous-system</b> and <b>peer-as</b> statements must be the same.</p> <p>The AS numeric range in plain-number format has been extended in Junos OS Release 9.1 to provide BGP support for 4-byte AS numbers, as defined in RFC 4893, <i>BGP Support for Four-octet AS Number Space</i>. RFC 4893 introduces two new optional transitive BGP attributes, AS4_PATH and AS4_AGGREGATOR. These new attributes are used to propagate 4-byte AS path information across BGP speakers that do not support 4-byte AS numbers. RFC 4893 also introduces a reserved, well-known, 2-byte AS number, AS 23456. This reserved AS number is called AS_TRANS in RFC 4893. All releases of the Junos OS support 2-byte AS numbers.</p> <p>In Junos OS Release 9.2 and later, you can also configure a 4-byte AS number using the AS-dot notation format of two integer values joined by a period: <i>&lt;16-bit high-order value in decimal&gt;.&lt;16-bit low-order value in decimal&gt;</i>. For example, the 4-byte AS number of 65,546 in plain-number format is represented as 1.10 in the AS-dot notation format.</p> <p>With the introduction of 4-byte AS numbers, you might have a combination of routers that support 4-byte AS numbers and 2-byte AS numbers. For more information about what happens when establishing BGP peer relationships between 4-byte and 2-byte capable routers, see the following topics:</p>

- *Using 4-Byte Autonomous System Numbers in BGP Networks Technology Overview.*

**Options**    *autonomous-system*—AS number.  
**Range:** 1 through 4,294,967,295 ( $2^{32} - 1$ ) in plain-number format for 4-byte AS numbers  
**Range:** 1 through 65,535 in plain-number format for 2-byte AS numbers (this is a subset of the 4-byte range)  
**Range:** 0.0 through 65535.65535 in AS-dot notation format for 4-byte AS numbers

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

## preference (Protocols BGP)

<b>Syntax</b>	<code>preference <i>preference</i>;</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> neighbor <i>address</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit protocols bgp],</p> <p>[edit protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>neighbor</b> <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Specify the preference for routes learned from BGP.</p> <p>At the BGP global level, the preference statement sets the preference for routes learned from BGP. You can override this preference in a BGP group or peer preference statement.</p> <p>At the group or peer level, the preference statement sets the preference for routes learned from the group or peer. Use this statement to override the preference set in the BGP global preference statement when you want to favor routes from one group or peer over those of another.</p>
<div>  <b>NOTE:</b> Do not set preference2 for BGP route-policy.         </div>	
<b>Options</b>	<p><b>preference</b>—Preference to assign to routes learned from BGP or from the group or peer.</p> <p><b>Range:</b> 0 through 4,294,967,295 (<math>2^{32} - 1</math>)</p> <p><b>Default:</b> 170 for the primary preference</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">local-preference on page 83</a></li> <li>• <i>Example: Configuring the Preference Value for BGP Routes</i></li> </ul>



## prefix-limit

<b>Syntax</b>	<pre> prefix-limit {     maximum <i>number</i>;     teardown &lt;<i>percentage</i>&gt; &lt;idle-timeout (forever   <i>minutes</i>)&gt;; } </pre>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit protocols bgp <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit protocols bgp group <i>group-name</i> <b>family</b> (inet   inet6) (any   labeled-unicast   multicast   unicast)],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> (inet   inet6) (any   flow   labeled-unicast   multicast   unicast)]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p>
<b>Description</b>	<p>Limit the number of prefixes received on a BGP peer session and a rate-limit logging when injected prefixes exceed a set limit.</p> <p>This functionality is identical to the <b>accepted-prefix-limit</b> functionality except that it operates against received prefixes rather than accepted prefixes.</p>
<b>Options</b>	<p><b>maximum <i>number</i></b>—When you set the maximum number of prefixes, a message with peer address, address family and instance name is logged when that number is exceeded.</p> <p><b>Range:</b> 1 through 4,294,967,295 (<math>2^{32} - 1</math>)</p> <p><b>teardown &lt;<i>percentage</i>&gt;</b>—If you include the <b>teardown</b> statement, the session is torn down when the maximum number of prefixes is reached. If you specify a percentage, messages are logged when the number of prefixes exceeds that percentage. After the session is torn down, it is reestablished in a short time unless you include the <b>idle-timeout</b> statement. Then the session can be kept down for a specified amount</p>

of time, or forever. If you specify **forever**, the session is reestablished only after you issue a **clear bgp neighbor** command.

**Range:** 1 through 100


**idle-timeout (*forever* | *timeout-in-minutes*)**—(Optional) If you include the **idle-timeout** statement, the session is torn down for a specified amount of time, or forever. If you specify a period of time, the session is allowed to reestablish after this timeout period. If you specify **forever**, the session is reestablished only after you intervene with a **clear bgp neighbor** command.

**Range:** 1 through 2400

<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
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<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>accepted-prefix-limit</i></li><li>• <i>Understanding Multiprotocol BGP</i></li></ul>
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## remove-private

<b>Syntax</b>	<code>remove-private;</code>
<b>Hierarchy Level</b>	<pre>[edit logical-systems <i>logical-system-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> protocols bgp <i>group</i> <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> protocols bgp <i>group</i> <i>group-name</i> neighbor <i>address</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <i>group</i> <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <i>group</i> <i>group-name</i> neighbor <i>address</i>], [edit protocols bgp], [edit protocols bgp <i>group</i> <i>group-name</i>], [edit protocols bgp <i>group</i> <i>group-name</i> neighbor <i>address</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp], [edit routing-instances <i>routing-instance-name</i> protocols bgp <i>group</i> <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp <i>group</i> <i>group-name</i> neighbor <i>address</i>]</pre>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>no-peer-loop-check</b> option added in Junos OS Release 15.1.</p>
<b>Description</b>	<p>When advertising AS paths to remote systems, have the local system strip private AS numbers from the AS path. The numbers are stripped from the AS path starting at the left end of the AS path (the end where AS paths have been most recently added). The routing device stops searching for private ASs when it finds the first nonprivate AS or a peer's private AS. If the AS path contains the AS number of the external BGP (EBGP) neighbor, BGP does not remove the private AS number.</p>
<div>  <p><b>NOTE:</b> As of Junos OS 10.0R2 and higher, if there is a need to send prefixes to an EBGP peer that has an AS number that matches an AS number in the AS path, consider using the <b>as-override</b> statement instead of the <b>remove-private</b> statement.</p> </div>	
<p>The operation takes place after any confederation member ASs have already been removed from the AS path, if applicable.</p> <p>Junos OS recognizes the set of AS numbers that is considered private, a range that is defined in the Internet Assigned Numbers Authority (IANA) assigned numbers document.</p> <p>The set of reserved AS numbers is in the range from 64,512 through 65,535.</p>	
<b>Options</b>	<p><b>all</b>—Remove all private AS numbers from the original path. Do not stop the process of removing private AS numbers, even if a public AS number is encountered.</p>

**nearest**—When you use the **all** and **replace** options, choose the last (right-most) public AS number encountered in the original AS path for the replacement value, as the AS path is processed from left to right. If no public AS number is encountered, the default replacement value is used. (See the **replace** option for information about the default replacement value.)

**replace**—When you use the **all** option, instead of removing private AS numbers, perform a replace operation. The default replacement value for the private AS number is the local AS number at the BGP group level for the BGP peer. If you are unsure about the replacement value, check the local AS value displayed in the output of the **show bgp group group-name** command.

**no-peer-loop-check**—Peer loop check is removed. By default, the **remove-private** statement has a peer loop check restriction. If a private AS in the AS path has the same value as the configured **peer-as** for the neighbor, **remove-private** does not remove or replace this private AS number. This restriction provides peer-as loop protection. However, you can remove this restriction using the **no-peer-loop-check** option.

<b>Required Privilege</b>	routing—To view this statement in the configuration.
<b>Level</b>	routing-control—To add this statement to the configuration.

<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Example: Removing Private AS Numbers from AS Paths</i></li></ul>
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## rib-group (Protocols BGP)


<b>Syntax</b>	<code>rib-group group-name;</code>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit protocols bgp <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit protocols bgp group <i>group-name</i> <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> <b>family</b> inet (labeled-unicast   unicast   multicast)],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i> <b>family</b> inet (labeled-unicast   unicast   multicast)]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p>
<b>Description</b>	Add unicast prefixes to unicast and multicast tables.
<b>Options</b>	<b>group-name</b> —Name of the routing table group. The name must start with a letter and can include letters, numbers, and hyphens. You generally specify only one routing table group.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Example: Exporting Specific Routes from One Routing Table Into Another Routing Table</i></li> <li>• <i>Example: Importing Direct and Static Routes Into a Routing Instance</i></li> <li>• <i>Understanding Multiprotocol BGP</i></li> </ul>

## tcp-mss (Protocols BGP)

---

<b>Syntax</b>	<code>tcp-mss <i>segment-size</i>;</code>
<b>Hierarchy Level</b>	<code>[edit logical-systems <i>logical-system-name</i> protocols bgp],</code> <code>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> protocols bgp group <i>group-name</i> neighbor</code> <code>  <i>neighbor-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code>  bgp],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code>  bgp group <i>group-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code>  bgp group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit protocols bgp],</code> <code>[edit protocol bgp group <i>group-name</i>],</code> <code>[edit protocols bgp group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols bgp],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i>],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor</code> <code>  <i>neighbor-name</i>]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 8.1. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 11.3 for the QFX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
<b>Description</b>	Configure the maximum segment size (MSS) for the TCP connection for BGP neighbors.  The MSS is only valid in increments of 2 KB. The value used is based on the value set, but is rounded down to the nearest multiple of 2048.
<b>Options</b>	<b><i>segment-size</i></b> —MSS for the TCP connection. <b>Range:</b> 1 through 4096
<b>Required Privilege Level</b>	<b>routing</b> —To view this statement in the configuration. <b>routing-control</b> —To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Example: Limiting TCP Segment Size for BGP</i></li></ul>

## traceoptions (Protocols BGP)

<b>Syntax</b>	<pre> traceoptions {     file <i>filename</i> &lt;files <i>number</i>&gt; &lt;size <i>size</i>&gt; &lt;world-readable   no-world-readable&gt;;     flag <i>flag</i> &lt;flag-modifier&gt; &lt;disable&gt;; } </pre>
<b>Hierarchy Level</b>	<p>[edit logical-systems <i>logical-system-name</i> protocols bgp],  [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i>],  [edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> neighbor <i>address</i>],  [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp],  [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],  [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>],  [edit protocols bgp],  [edit protocols bgp <b>group</b> <i>group-name</i>],  [edit protocols bgp group <i>group-name</i> neighbor <i>address</i>],  [edit routing-instances <i>routing-instance-name</i> protocols bgp],  [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i>],  [edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>]</p>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.  Statement introduced in Junos OS Release 9.0 for EX Series switches.  Statement introduced in Junos OS Release 11.3 for the QFX Series.  <b>4byte-as</b> statement introduced in Junos OS Release 9.2.  <b>4byte-as</b> statement introduced in Junos OS Release 9.2 for EX Series switches.  Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>Configure BGP protocol-level tracing options. To specify more than one tracing operation, include multiple flag statements.</p>
<div>  <b>NOTE:</b> The <b>traceoptions</b> statement is not supported on QFabric systems. </div>	
<b>Default</b>	<p>The default BGP protocol-level tracing options are inherited from the routing protocols <b>traceoptions</b> statement included at the [edit routing-options] hierarchy level. The default group-level trace options are inherited from the BGP protocol-level <b>traceoptions</b> statement. The default peer-level trace options are inherited from the group-level <b>traceoptions</b> statement.</p>
<b>Options</b>	<p><b>disable</b>—(Optional) Disable the tracing operation. You can use this option to disable a single operation when you have defined a broad group of tracing operations, such as <b>all</b>.</p>

**file name**—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory `/var/log`. We recommend that you place BGP tracing output in the file `bgp-log`.

**files number**—(Optional) Maximum number of trace files. When a trace file named `trace-file.0` reaches its maximum size, it is renamed `trace-file.0`, then `trace-file.1`, and so on, until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. If you specify a maximum number of files, you must also specify a maximum file size with the **size** option.

**Range:** 2 through 1000 files

**Default:** 10 files

**flag**—Tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements.

#### BGP Tracing Flags

- **4byte-as**—4-byte AS events.
- **bfd**—BFD protocol events.
- **damping**—Damping operations.
- **graceful-restart**—Graceful restart events.
- **keepalive**—BGP keepalive messages. If you enable the the BGP **update** flag only, received keepalive messages do not generate a trace message.
- **nsr-synchronization**—Nonstop routing synchronization events.
- **open**—Open packets. These packets are sent between peers when they are establishing a connection.
- **packets**—All BGP protocol packets.
- **refresh**—BGP refresh packets.
- **update**—Update packets. These packets provide routing updates to BGP systems. If you enable only this flag, received keepalive messages do not generate a trace message. Use the **keepalive** flag to generate a trace message for keepalive messages.

#### Global Tracing Flags

- **all**—All tracing operations
- **general**—A combination of the **normal** and **route** trace operations
- **normal**—All normal operations

**Default:** If you do not specify this option, only unusual or abnormal operations are traced.



- **policy**—Policy operations and actions
- **route**—Routing table changes
- **state**—State transitions
- **task**—Routing protocol task processing
- **timer**—Routing protocol timer processing

**flag-modifier**—(Optional) Modifier for the tracing flag. You can specify one or more of these modifiers:

- **detail**—Provide detailed trace information.
- **filter**—Provide filter trace information. Applies only to **route**, **damping**, and **update** tracing flags.
- **receive**—Trace the packets being received.
- **send**—Trace the packets being transmitted.

**no-world-readable**—(Optional) Prevent any user from reading the log file.

**size size**—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named **trace-file** reaches this size, it is renamed **trace-file.0**. When the **trace-file** again reaches its maximum size, **trace-file.0** is renamed **trace-file.1** and **trace-file** is renamed **trace-file.0**. This renaming scheme continues until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

**Syntax:** **xk** to specify KB, **xm** to specify MB, or **xg** to specify GB

**Range:** 10 KB through the maximum file size supported on your system

**Default:** 128 KB

**world-readable**—(Optional) Allow any user to read the log file.

<b>Required Privilege Level</b>	<p>routing and trace—To view this statement in the configuration.</p> <p>routing-control and trace-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">log-updown on page 84</a> statement</li> <li>• <i>Tracing Nonstop Active Routing Synchronization Events</i></li> <li>• <i>Understanding Trace Operations for BGP Protocol Traffic</i></li> <li>• <i>Configuring OSPF Refresh and Flooding Reduction in Stable Topologies</i></li> </ul>

## type (Protocols BGP)

---

<b>Syntax</b>	<code>type type;</code>
<b>Hierarchy Level</b>	[edit logical-systems <i>logical-system-name</i> protocols bgp <b>group</b> <i>group-name</i> ], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> ], [edit protocols bgp <b>group</b> <i>group-name</i> ], [edit routing-instances <i>routing-instance-name</i> protocols bgp <b>group</b> <i>group-name</i> ]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 11.3 for the QFX Series.
<b>Description</b>	<p>Specify the type of BGP peer group.</p> <p>When configuring a BGP group, you can indicate whether the group is an IBGP group or an EBGP group. All peers in an IBGP group are in the same AS, while peers in an EBGP group are in different ASs and normally share a subnet.</p>
<b>Options</b>	<p><b>type</b>—Type of group:</p> <ul style="list-style-type: none"><li>• <b>external</b>—External group, which allows inter-AS BGP routing</li><li>• <b>internal</b>—Internal group, which allows intra-AS BGP routing</li></ul>
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>BGP Feature Guide for Routing Devices</i></li></ul>

## PART 3

# Administration

- [Routine Monitoring on page 119](#)
- [Operational Commands on page 123](#)



## CHAPTER 4

# Routine Monitoring

- [Monitoring BGP Routing Information on page 119](#)

## Monitoring BGP Routing Information

### Purpose



**NOTE:** This topic applies only to the J-Web Application package.

Use the monitoring functionality to monitor BGP routing information on the routing device.

### Action

To view BGP routing information in the J-Web interface, select **Monitor > Routing > BGP Information**.

To view BGP routing information in the CLI, enter the following commands:

- **show bgp summary**
- **show bgp neighbor**

### Meaning

[Table 8 on page 119](#) summarizes key output fields in the BGP routing display in the J-Web interface.

**Table 8: Summary of Key BGP Routing Output Fields**

Field	Values	Additional Information
BGP Peer Summary		
Total Groups	Number of BGP groups.	
Total Peers	Number of BGP peers.	
Down Peers	Number of unavailable BGP peers.	
Unconfigured Peers	Address of each BGP peer.	
RIB Summary tab		
RIB Name	Name of the RIB group.	

Table 8: Summary of Key BGP Routing Output Fields (*continued*)

Field	Values	Additional Information
Total Prefixes	Total number of prefixes from the peer, both active and inactive, that are in the routing table.	
Active Prefixes	Number of prefixes received from the EBGp peers that are active in the routing table.	
Suppressed Prefixes	Number of routes received from EBGp peers currently inactive because of damping or other reasons.	
History Prefixes	History of the routes received or suppressed.	
Dumped Prefixes	Number of routes currently inactive because of damping or other reasons. These routes do not appear in the forwarding table and are not exported by routing protocols.	
Pending Prefixes	Number of pending routes.	
State	Status of the graceful restart process for this routing table: BGP restart is complete, BGP restart in progress, VPN restart in progress, or VPN restart is complete.	
<b>BGP Neighbors</b>		
Details	Click this button to view the selected BGP neighbor details.	
Peer Address	Address of the BGP neighbor.	
Autonomous System	AS number of the peer.	

Table 8: Summary of Key BGP Routing Output Fields (*continued*)

Field	Values	Additional Information
Peer State	<p>Current state of the BGP session:</p> <ul style="list-style-type: none"> <li>• <b>Active</b>—BGP is initiating a TCP connection in an attempt to connect to a peer. If the connection is successful, BGP sends an open message.</li> <li>• <b>Connect</b>—BGP is waiting for the TCP connection to become complete.</li> <li>• <b>Established</b>—The BGP session has been established, and the peers are exchanging BGP update messages.</li> <li>• <b>Idle</b>—This is the first stage of a connection. BGP is waiting for a Start event.</li> <li>• <b>OpenConfirm</b>—BGP has acknowledged receipt of an open message from the peer and is waiting to receive a keepalive or notification message.</li> <li>• <b>OpenSent</b>—BGP has sent an open message and is waiting to receive an open message from the peer.</li> </ul>	<p>Generally, the most common states are <b>Active</b>, which indicates a problem establishing the BGP connection, and <b>Established</b>, which indicates a successful session setup. The other states are transition states, and BGP sessions normally do not stay in those states for extended periods of time.</p>
Elapsed Time	Elapsed time since the peering session was last reset.	
Description	Description of the BGP session.	

**Related  
Documentation**

- [Configuring BGP Sessions \(J-Web Procedure\) on page 9](#)
- [Layer 3 Protocols Supported on EX Series Switches on page 3](#)





## CHAPTER 5

# Operational Commands

- `clear bgp damping`
- `clear bgp neighbor`
- `clear bgp table`
- `show bgp bmp`
- `show bgp neighbor`
- `show bgp summary`
- `show policy damping`

## clear bgp damping

---

<b>List of Syntax</b>	<a href="#">Syntax on page 124</a> <a href="#">Syntax (EX Series Switch and QFX Series) on page 124</a>
<b>Syntax</b>	<code>clear bgp damping</code> <code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code> <code>&lt;<i>prefix</i>&gt;</code>
<b>Syntax (EX Series Switch and QFX Series)</b>	<code>clear bgp damping</code> <code>&lt;<i>prefix</i>&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.3 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
<b>Description</b>	Clear BGP route flap damping information.
<b>Options</b>	<b>none</b> —Clear all BGP route flap damping information.  <b>logical-system (all   <i>logical-system-name</i>)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system.  <b><i>prefix</i></b> —(Optional) Clear route flap damping information for only the specified destination prefix.
<b>Required Privilege Level</b>	clear
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">show policy damping on page 155</a></li><li>• <i>show route damping</i></li></ul>
<b>List of Sample Output</b>	<a href="#">clear bgp damping on page 124</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

### Sample Output

#### clear bgp damping

```
user@host> clear bgp damping
```

## clear bgp neighbor

**List of Syntax**    [Syntax on page 125](#)  
                          [Syntax \(EX Series Switch and QFX Series\) on page 125](#)

**Syntax**    clear bgp neighbor  
                  <all>  
                  <as *as-number*>  
                  <gracefully>  
                  <instance *instance-name*>  
                  <logical-system (all | *logical-system-name*)>  
                  <malformed-route>  
                  <neighbor>  
                  <soft | soft-inbound>  
                  <soft-minimum-igp>  
                  <stale-routes>

**Syntax (EX Series Switch and QFX Series)**    clear bgp neighbor  
                  <all>  
                  <as *as-number*>  
                  <instance *instance-name*>  
                  <malformed-route>  
                  <neighbor>  
                  <soft | soft-inbound>  
                  <soft-minimum-igp>

**Release Information**    Command introduced before Junos OS Release 7.4.  
                                  Command introduced in Junos OS Release 9.0 for EX Series switches.  
                                  Command introduced in Junos OS Release 11.3 for the QFX Series.  
                                  Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.  
                                  **malformed-route** option introduced in Junos OS Release 13.2.  
                                  **all** option introduced in Junos OS Release 14.2.  
                                  **gracefully** and **stale-routes** options introduced in Junos OS Release 15.1.

**Description**    Perform one of the following tasks:

- Change the state of one or more BGP neighbors to **IDLE**. For neighbors in the **ESTABLISHED** state, this command drops the TCP connection to the neighbors and then reestablishes the connection.
- (**soft** keyword only) Reapply export policies and send refresh updates to one or more BGP neighbors without changing their state.
- (**soft-inbound** keyword only) Send a route-refresh message to one or more BGP neighbors without changing their state, and reapply import policies on the received updates.

**Options**    **none | all**—(Optional) Change the state of all BGP neighbors to **IDLE**.  
                  Both **clear bgp neighbor** and **clear bgp neighbor all** function identically.

**as *as-number***—(Optional) Apply this command only to neighbors in the specified autonomous system (AS).

**gracefully**—(Optional) Enable the BGP peer to start graceful-restart receiving-speaker mode. The receiving speaker also sends its own routes to the restarted speaker, and sends an End-of-RIB marker when it completes the update. The **clear bgp neighbor neighbor-address gracefully** command is the same as **clear bgp neighbor hard** (the default for **clear bgp neighbor**), but it does not use the new Hard Reset subcode on the Notify and Cease messages that are sent. This allows the neighbor to enter GR or LLGR helper mode, if negotiated. The session is still cleared on this router, and this router does not enter GR or LLGR helper mode.

**instance instance-name**—(Optional) Apply this command only to neighbors for the specified routing instance.

**logical-system (all | logical-system-name)**—(Optional) Perform this operation on all logical systems or on a particular logical system.

**malformed-route**—(Optional) Remove malformed routes. If a specific neighbor is provided, Junos OS removes malformed routes for that particular neighbor. Otherwise, Junos OS removes malformed routes for all BGP neighbors. To find routes that have malformed attributes, run the **show route hidden** command, and look for routes marked with **MalformedAttr** in the AS path field.

**neighbor**—(Optional) IP address of a BGP peer. Apply this command only to the specified neighbor.

**soft**—(Optional) Reapply any export policies and send refresh updates to neighbors without clearing the state.

**soft-inbound**—(Optional) Send a route-refresh message to BGP neighbors and reapply import policies on the route updates received from the BGP neighbors without clearing the BGP state.

**soft-minimum-igp**—(Optional) Provide soft refresh of the outbound state when the interior gateway protocol (IGP) metric is reset.

**stale-routes**—(Optional) Any stale route currently being held for the specified neighbor because of BGP graceful restart (GR) or long-lived graceful restart (LLGR) receiver mode operations.

**Required Privilege Level**

clear

**Related Documentation**

- [show bgp neighbor on page 132](#)

**List of Sample Output**

[clear bgp neighbor on page 126](#)

**Output Fields**

When you enter this command, you are provided feedback on the status of your request.

## Sample Output

**clear bgp neighbor**

```
user@host> clear bgp neighbor
```



## clear bgp table

---

Syntax	<code>clear bgp table <i>table-name</i></code> <code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code>
Syntax (EX Series Switch and QFX Series)	<code>clear bgp table <i>table-name</i></code>
Release Information	Command introduced in Junos OS Release 9.0. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.3 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Request that BGP refresh routes in a specified routing table.
Options	<b>logical-system (all   <i>logical-system-name</i>)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system.  <b><i>table-name</i></b> —Request that BGP refresh routes in the specified table.
Additional Information	In some cases, a prefix limit is associated with a routing table for a VPN instance. When this limit is exceeded (for example, because of a network misconfiguration), some routes might not be inserted in the table. Such routes need to be added to the table after the network issue is resolved. Use the <b>clear bgp table</b> command to request that BGP refresh routes in a VPN instance table.
Required Privilege Level	clear
List of Sample Output	<a href="#">clear bgp table private.inet.0 on page 128</a> <a href="#">clear bgp table inet.6 logical-system all on page 128</a> <a href="#">clear bgp table private.inet.6 logical-system ls1 on page 128</a> <a href="#">clear bgp table logical-system all inet.0 on page 128</a> <a href="#">clear bgp table logical-system ls2 private.inet.0 on page 129</a>
Output Fields	This command produces no output.

## Sample Output

[clear bgp table private.inet.0](#)

```
user@host> clear bgp table private.inet.0
```

[clear bgp table inet.6 logical-system all](#)

```
user@host> clear bgp table inet.6 logical-system all
```

[clear bgp table private.inet.6 logical-system ls1](#)

```
user@host> clear bgp table private.inet.6 logical-system ls1
```

[clear bgp table logical-system all inet.0](#)

```
user@host> clear bgp table logical-system all inet.0
```

`clear bgp table logical-system ls2 private.inet.0`

`user@host> clear bgp table logical-system ls2 private.inet.0`

## show bgp bmp

<b>Syntax</b>	<b>show bgp bmp</b>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 9.5.</p> <p>Command introduced in Junos OS Release 9.5 for EX Series switches.</p> <p>Command introduced in Junos OS Release 13.2X51-D15 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	Display information about the BGP Monitoring Protocol (BMP).
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show bgp bmp on page 130</a>
<b>Output Fields</b>	<a href="#">Table 9 on page 130</a> lists the output fields for the <b>show bgp bmp</b> command. Output fields are listed in the approximate order in which they appear.

**Table 9: show bgp bmp Output Fields**

Field Name	Field Description
<b>BMP station address/port</b>	IP address and port number of the monitoring station to which BGP Monitoring Protocol (BMP) statistics are sent.
<b>BMP session state</b>	Status of the BMP session: <b>UP</b> or <b>DOWN</b> .
<b>Memory consumed by BMP</b>	Memory used by the active BMP session.
<b>Statistics timeout</b>	Amount of time, in seconds, between transmissions of BMP data to the monitoring station.
<b>Memory limit</b>	Threshold, in bytes, at which the routing device stops collecting BMP data.
<b>Memory-connect retry timeout</b>	Amount of time, in seconds, after which the routing device attempts to resume a BMP session that was ended after the configured memory threshold was exceeded.

## Sample Output

### show bgp bmp

```

user@host> show bgp bmp
  BMP station address/port: 172.24.24.157+5454
  BMP session state: DOWN
  Memory consumed by BMP: 0
  Statistics timeout: 15
  Memory limit: 10485760
  Memory connect retry timeout: 600

```





## show bgp neighbor

---

<b>List of Syntax</b>	<a href="#">Syntax on page 132</a> <a href="#">Syntax (EX Series Switch, QFX Series, and OCX Series) on page 132</a>
<b>Syntax</b>	<pre>show bgp neighbor &lt;exact-instance <i>instance-name</i>&gt; &lt;instance <i>instance-name</i>&gt; &lt;logical-system (all   <i>logical-system-name</i>)&gt; &lt;neighbor-address&gt; &lt;orf (detail   <i>neighbor-address</i>)</pre>
<b>Syntax (EX Series Switch, QFX Series, and OCX Series)</b>	<pre>show bgp neighbor &lt;instance <i>instance-name</i>&gt; &lt;exact-instance <i>instance-name</i>&gt; &lt;neighbor-address&gt; &lt;orf (<i>neighbor-address</i>   detail)</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.3 for the QFX Series. Command introduced in Junos OS Release 14.1x53-D20 for the OCX Series. <b>orf</b> option introduced in Junos OS Release 9.2. <b>exact-instance</b> option introduced in Junos OS Release 11.4.
<b>Description</b>	Display information about BGP peers.
<b>Options</b>	<p><b>none</b>—Display information about all BGP peers.</p> <p><b>exact-instance <i>instance-name</i></b>—(Optional) Display information for the specified instance only.</p> <p><b>instance <i>instance-name</i></b>—(Optional) Display information about BGP peers for all routing instances whose name begins with this string (for example, <b>cust1</b>, <b>cust11</b>, and <b>cust111</b> are all displayed when you run the <b>show bgp neighbor instance cust1</b> command).</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><b>neighbor-address</b>—(Optional) Display information for only the BGP peer at the specified IP address.</p> <p><b>orf (detail   <i>neighbor-address</i>)</b>—(Optional) Display outbound route-filtering information for all BGP peers or only for the BGP peer at the specified IP address. The default is to display brief output. Use the <b>detail</b> option to display detailed output.</p>
<b>Additional Information</b>	For information about the <b>local-address</b> , <b>nlri</b> , <b>hold-time</b> , and <b>preference</b> statements, see the <i>Junos OS Routing Protocols Library for Routing Devices</i> .
<b>Required Privilege Level</b>	view

**Related Documentation** • [clear bgp neighbor on page 125](#)

**List of Sample Output** [show bgp neighbor on page 140](#)  
[show bgp neighbor \(CLNS\) on page 141](#)  
[show bgp neighbor \(Layer 2 VPN\) on page 142](#)  
[show bgp neighbor \(Layer 3 VPN\) \(Not supported on the OCX Series.\) on page 144](#)  
[show bgp neighbor neighbor-address on page 145](#)  
[show bgp neighbor neighbor-address on page 145](#)  
[show bgp neighbor neighbor-address \(BGP Graceful Restart Enabled\) on page 146](#)  
[show bgp neighbor neighbor-address \(BGP Long-Lived Graceful Restart\) on page 147](#)  
[show bgp neighbor orf neighbor-address detail on page 147](#)

**Output Fields** [Table 10 on page 133](#) describes the output fields for the **show bgp neighbor** command. Output fields are listed in the approximate order in which they appear.

**Table 10: show bgp neighbor Output Fields**

Field Name	Field Description
<b>Peer</b>	Address of the BGP neighbor. The address is followed by the neighbor port number.
<b>AS</b>	AS number of the peer.
<b>Local</b>	Address of the local routing device. The address is followed by the peer port number.
<b>Type</b>	Type of peer: <b>Internal</b> or <b>External</b> .
<b>State</b>	Current state of the BGP session: <ul style="list-style-type: none"> <li>• <b>Active</b>—BGP is initiating a transport protocol connection in an attempt to connect to a peer. If the connection is successful, BGP sends an Open message.</li> <li>• <b>Connect</b>—BGP is waiting for the transport protocol connection to be completed.</li> <li>• <b>Established</b>—The BGP session has been established, and the peers are exchanging update messages.</li> <li>• <b>Idle</b>—This is the first stage of a connection. BGP is waiting for a Start event.</li> <li>• <b>OpenConfirm</b>—BGP has acknowledged receipt of an open message from the peer and is waiting to receive a keepalive or notification message.</li> <li>• <b>OpenSent</b>—BGP has sent an open message and is waiting to receive an open message from the peer.</li> <li>• <b>route reflector client</b>—The BGP session is established with a route reflector client.</li> </ul>

Table 10: show bgp neighbor Output Fields (*continued*)

Field Name	Field Description
<b>Flags</b>	<p>Internal BGP flags:</p> <ul style="list-style-type: none"> <li>• <b>Aggregate Label</b>—BGP has aggregated a set of incoming labels (labels received from the peer) into a single forwarding label.</li> <li>• <b>CleanUp</b>—The peer session is being shut down.</li> <li>• <b>Delete</b>—This peer has been deleted.</li> <li>• <b>Idled</b>—This peer has been permanently idled.</li> <li>• <b>ImportEval</b>—At the last commit operation, this peer was identified as needing to reevaluate all received routes.</li> <li>• <b>Initializing</b>—The peer session is initializing.</li> <li>• <b>SendRtn</b>—Messages are being sent to the peer.</li> <li>• <b>Sync</b>—This peer is synchronized with the rest of the peer group.</li> <li>• <b>RSync</b>—This peer in the backup Routing Engine is synchronized with the BGP peer in the master Routing Engine for nonstop active routing.</li> <li>• <b>TryConnect</b>—Another attempt is being made to connect to the peer.</li> <li>• <b>Unconfigured</b>—This peer is not configured.</li> <li>• <b>WriteFailed</b>—An attempt to write to this peer failed.</li> </ul>
<b>Last state</b>	<p>Previous state of the BGP session:</p> <ul style="list-style-type: none"> <li>• <b>Active</b>—BGP is initiating a transport protocol connection in an attempt to connect to a peer. If the connection is successful, BGP sends an Open message.</li> <li>• <b>Connect</b>—BGP is waiting for the transport protocol connection to be completed.</li> <li>• <b>Established</b>—The BGP session has been established, and the peers are exchanging update messages.</li> <li>• <b>Idle</b>—This is the first stage of a connection. BGP is waiting for a Start event.</li> <li>• <b>OpenConfirm</b>—BGP has acknowledged receipt of an open message from the peer and is waiting to receive a keepalive or notification message.</li> <li>• <b>OpenSent</b>—BGP has sent an open message and is waiting to receive an open message from the peer.</li> </ul>
<b>Last event</b>	<p>Last activity that occurred in the BGP session:</p> <ul style="list-style-type: none"> <li>• <b>Closed</b>—The BGP session closed.</li> <li>• <b>ConnectRetry</b>—The transport protocol connection failed, and BGP is trying again to connect.</li> <li>• <b>HoldTime</b>—The session ended because the hold timer expired.</li> <li>• <b>KeepAlive</b>—The local routing device sent a BGP keepalive message to the peer.</li> <li>• <b>Open</b>—The local routing device sent a BGP open message to the peer.</li> <li>• <b>OpenFail</b>—The local routing device did not receive an acknowledgment of a BGP open message from the peer.</li> <li>• <b>RecvKeepAlive</b>—The local routing device received a BGP keepalive message from the peer.</li> <li>• <b>RecvNotify</b>—The local routing device received a BGP notification message from the peer.</li> <li>• <b>RecvOpen</b>—The local routing device received a BGP open message from the peer.</li> <li>• <b>RecvUpdate</b>—The local routing device received a BGP update message from the peer.</li> <li>• <b>Start</b>—The peering session started.</li> <li>• <b>Stop</b>—The peering session stopped.</li> <li>• <b>TransportError</b>—A TCP error occurred.</li> </ul>

Table 10: show bgp neighbor Output Fields (*continued*)

Field Name	Field Description
Last error	<p>Last error that occurred in the BGP session:</p> <ul style="list-style-type: none"> <li>• <b>Cease</b>—An error occurred, such as a version mismatch, that caused the session to close.</li> <li>• <b>Finite State Machine Error</b>—In setting up the session, BGP received a message that it did not understand.</li> <li>• <b>Hold Time Expired</b>—The session's hold time expired.</li> <li>• <b>Message Header Error</b>—The header of a BGP message was malformed.</li> <li>• <b>Open Message Error</b>—A BGP open message contained an error.</li> <li>• <b>None</b>—No errors occurred in the BGP session.</li> <li>• <b>Update Message Error</b>—A BGP update message contained an error.</li> </ul>
Export	Name of the export policy that is configured on the peer.
Import	Name of the import policy that is configured on the peer.
Options	<p>Configured BGP options:</p> <ul style="list-style-type: none"> <li>• <b>AddressFamily</b>—Configured address family: <b>inet</b> or <b>inet-vpn</b>.</li> <li>• <b>AdvertiseBGPStatic</b>—Configured BGP static routes are advertised.</li> <li>• <b>AuthKeyChain</b>—Authentication key change is enabled.</li> <li>• <b>DropPathAttributes</b>—Certain path attributes are configured to be dropped from neighbor updates during inbound processing.</li> <li>• <b>GracefulRestart</b>—Graceful restart is configured.</li> <li>• <b>HoldTime</b>—Hold time configured with the <b>hold-time</b> statement. The hold time is three times the interval at which keepalive messages are sent.</li> <li>• <b>IgnorePathAttributes</b>—Certain path attributes are configured to be ignored in neighbor updates during inbound processing.</li> <li>• <b>Local Address</b>—Address configured with the <b>local-address</b> statement.</li> <li>• <b>LLGR</b>—BGP long-lived graceful restart capability is configured.</li> <li>• <b>LLGRHelperDisabled</b>—BGP long-lived graceful restart is completely disabled for a neighbor.</li> <li>• <b>Multihop</b>—Allow BGP connections to external peers that are not on a directly connected network.</li> <li>• <b>NLRI</b>—Configured MBGP state for the BGP group: <b>multicast</b>, <b>unicast</b>, or both if you have configured <b>nlri any</b>.</li> <li>• <b>Peer AS</b>—Configured peer autonomous system (AS).</li> <li>• <b>Preference</b>—Preference value configured with the <b>preference</b> statement.</li> <li>• <b>Refresh</b>—Configured to refresh automatically when the policy changes.</li> <li>• <b>Rib-group</b>—Configured routing table group.</li> </ul>
Path-attributes dropped	Path attribute codes that are dropped from neighbor updates.
Path-attributes ignored	Path attribute codes that are ignored during neighbor updates.
Peer does not support LLGR Restarter or Receiver functionality	BGP neighbor does not support long-lived graceful restart (LLGR) restarter mode completely.

Table 10: show bgp neighbor Output Fields (*continued*)

Field Name	Field Description
Peer does not support LLGR Restarter functionality	BGP neighbor does not support long-lived graceful restart (LLGR) restarter mode for any family.
Authentication key change	(appears only if the <b>authentication-keychain</b> statement has been configured) Name of the authentication keychain enabled.
Authentication algorithm	(appears only if the <b>authentication-algorithm</b> statement has been configured) Type of authentication algorithm enabled: <b>hmac</b> or <b>md5</b> .
Address families configured	Names of configured address families for the VPN.
BGP-Static Advertisement Policy	Name of the bgp static policy that is configured on the peer.
Local Address	Address of the local routing device.
Remove-private options	Options associated with the <b>remove-private</b> statement.
Holdtime	Hold time configured with the <b>hold-time</b> statement. The hold time is three times the interval at which keepalive messages are sent.
Flags for NLRI inet-label-unicast	Flags related to labeled-unicast: <ul style="list-style-type: none"> <li>• <b>TrafficStatistics</b>—Collection of statistics for labeled-unicast traffic is enabled.</li> </ul>
Traffic statistics	Information about labeled-unicast traffic statistics: <ul style="list-style-type: none"> <li>• <b>Options</b>—Options configured for collecting statistics about labeled-unicast traffic.</li> <li>• <b>File</b>—Name and location of statistics log files.</li> <li>• <b>size</b>—Size of all the log files, in bytes.</li> <li>• <b>files</b>—Number of log files.</li> </ul>
Traffic Statistics Interval	Time between sample periods for labeled-unicast traffic statistics, in seconds.
Preference	Preference value configured with the <b>preference</b> statement.
Outbound Timer	Time for which the route is available in Junos OS routing table before it is exported to BGP. This field is displayed in the output only if the <b>out-delay</b> parameter is configured to a non-zero value.
Number of flaps	Number of times the BGP session has gone down and then come back up.
Peer ID	Router identifier of the peer.
Group index	Index number for the BGP peer group. The index number differentiates between groups when a single BGP group is split because of different configuration options at the group and peer levels.

Table 10: show bgp neighbor Output Fields (*continued*)

Field Name	Field Description
Peer index	Index that is unique within the BGP group to which the peer belongs.
Local ID	Router identifier of the local routing device.
Local Interface	Name of the interface on the local routing device.
Active holdtime	Hold time that the local routing device negotiated with the peer.
Keepalive Interval	Keepalive interval, in seconds.
BFD	Status of BFD failure detection.
Local Address	Name of directly connected interface over which direct EBGp peering is established.
NLRI and times for LLGR configured on peer	<p>Names of address families and stale time for BGP long-lived graceful restart configured on the BGP peer or neighbor.</p> <p>Times are displayed using the routing protocol daemon (rpd) %#OT format:</p> <p><b>&lt;weeks&gt;w&lt;days&gt;d &lt;hours&gt;:&lt;minutes&gt;:&lt;seconds&gt;</b></p> <p>Zero leading elements are omitted, for example, a value less than one week do not include the weeks.</p>
NLRI and times that peer supports LLGR Restarter for	<p>Names of address families and stale time that the BGP peer supports for restarter mode for BGP long-lived graceful restart.</p> <p>Times are displayed using the routing protocol daemon (rpd) %#OT format:</p> <p><b>&lt;weeks&gt;w&lt;days&gt;d &lt;hours&gt;:&lt;minutes&gt;:&lt;seconds&gt;</b></p> <p>Zero leading elements are omitted, for example, a value less than one week do not include the weeks.</p>
NLRI that peer saved LLGR forwarding for	Name of the address family for which the BGP peer saved BGP long-lived graceful restart forwarding.
Graceful Restart Details	Amount of time that is remaining until LLGR expires and the time remaining on the GR stale timer, along with RIB details, are displayed while LLGR receiver mode is active (a peer that negotiated LLGR has disconnected and not yet reconnected)
NLRI we are holding stale routes for	Names of address families (NLRIs) for which that stale routes are held or preserved when BGP graceful restart receiver mode is active for a neighbor.
Time until end-of-rib is assumed for stale routes	<p>Amount of time remaining on the stale timer until which end-of-RIB (EoR) markers are assumed when BGP graceful restart receiver mode is active for a neighbor.</p> <p>Time is displayed in Coordinated Universal Time (UTC) format (YYYY-MM-DD-HH:MM:SS). Note that the stale timer display ('Time until end-of-rib is assumed') is also present when a session is active, but the neighbor as not yet sent all of the end-of-rib indications.</p>
Time until stale routes are deleted or become long-lived stale	Amount of time up to which stale routes are deleted or become long-lived stale routes when BGP graceful restart receiver mode is active for a neighbor.

Table 10: show bgp neighbor Output Fields (*continued*)

Field Name	Field Description
NLRI for restart configured on peer	Names of address families configured for restart.
NLRI advertised by peer	Address families supported by the peer: <b>unicast</b> or <b>multicast</b> .
NLRI for this session	Address families being used for this session.
Peer supports Refresh capability	Remote peer's ability to send and request full route table readvertisement (route refresh capability). For more information, see RFC 2918, <i>Route Refresh Capability for BGP-4</i> .
Restart time configured on peer	Configured time allowed for restart on the neighbor.
Stale routes from peer are kept for	When graceful restart is negotiated, the maximum time allowed to hold routes from neighbors after the BGP session has gone down.
Peer does not support Restarter functionality	Graceful restart restarter-mode is disabled on the peer.
Peer does not support Receiver functionality	Graceful restart helper-mode is disabled on the peer.
Restart time requested by this peer	Restart time requested by this neighbor during capability negotiation.
Restart flag received from the peer	When this field appears, the BGP speaker has restarted (Restarting), and this peer should not wait for the <b>end-of-rib</b> marker from the speaker before advertising routing information to the speaker.
NLRI that peer supports restart for	Neighbor supports graceful restart for this address family.
NLRI peer can save forwarding state	Neighbor supporting this address family saves all forwarding states.
NLRI that peer saved forwarding for	Neighbor saves all forwarding states for this address family.
NLRI that restart is negotiated for	Router supports graceful restart for this address family.
NLRI of received end-of-rib markers	Address families for which end-of-routing-table markers are received from the neighbor.
NLRI of all end-of-rib markers sent	Address families for which end-of-routing-table markers are sent to the neighbor.
Peer supports 4 byte AS extension (peer-as 1)	Peer understands 4-byte AS numbers in BGP messages. The peer is running Junos OS Release 9.1 or later.



Table 10: show bgp neighbor Output Fields (*continued*)

Field Name	Field Description
NLRIs for which peer can receive multiple paths	<p>Appears in the command output of the local router if the downstream peer is configured to receive multiple BGP routes to a single destination, instead of only receiving the active route.</p> <p>Possible value is <b>inet-unicast</b>.</p>
NLRIs for which peer can send multiple paths: inet-unicast	<p>Appears in the command output of the local router if the upstream peer is configured to send multiple BGP routes to a single destination, instead of only sending the active route.</p> <p>Possible value is <b>inet-unicast</b>.</p>
Table inet.number	<p>Information about the routing table:</p> <ul style="list-style-type: none"> <li>• <b>RIB State</b>—BGP is in the graceful restart process for this routing table: <b>restart is complete</b> or <b>restart in progress</b>.</li> <li>• <b>Bit</b>—Number that represents the entry in the routing table for this peer.</li> <li>• <b>Send state</b>—State of the BGP group: <b>in sync</b>, <b>not in sync</b>, or <b>not advertising</b>.</li> <li>• <b>Active prefixes</b>—Number of prefixes received from the peer that are active in the routing table.</li> <li>• <b>Received prefixes</b>—Total number of prefixes from the peer, both active and inactive, that are in the routing table.</li> <li>• <b>Accepted prefixes</b>—Total number of prefixes from the peer that have been accepted by a routing policy.</li> <li>• <b>Suppressed due to damping</b>—Number of routes currently inactive because of damping or other reasons. These routes do not appear in the forwarding table and are not exported by routing protocols.</li> </ul>
Last traffic (seconds)	Last time any traffic was received from the peer or sent to the peer, and the last time the local routing device checked.
Input messages	Messages that BGP has received from the receive socket buffer, showing the total number of messages, number of update messages, number of times a policy is changed and refreshed, and the buffer size in octets. The buffer size is 16 KB.
Output messages	Messages that BGP has written to the transmit socket buffer, showing the total number of messages, number of update messages, number of times a policy is changed and refreshed, and the buffer size in octets. The buffer size is 16 KB.
Input dropped path attributes	<p>Information about dropped path attributes:</p> <ul style="list-style-type: none"> <li>• <b>Code</b>—Path attribute code.</li> <li>• <b>Count</b>—Path attribute count.</li> </ul>
Input ignored path attributes	<p>Information about ignored path attributes:</p> <ul style="list-style-type: none"> <li>• <b>Code</b>—Path attribute code.</li> <li>• <b>Count</b>—Path attribute count.</li> </ul>

Table 10: show bgp neighbor Output Fields (*continued*)

Field Name	Field Description
<b>Output queue</b>	<p>Number of BGP packets that are queued to be transmitted to a particular neighbor for a particular routing table. Output queue <b>0</b> is for unicast NLRIs, and queue <b>1</b> is for multicast NLRIs.</p> <p>It also specifies the routing table name and the NLRI that the table was advertised through, in the format (<i>routing table name, NLRI</i>).</p> <p><b>NOTE:</b> The output queue of routing tables that are not advertised, will only show up at <b>extensive</b> output level.</p>
<b>Trace options</b>	Configured tracing of BGP protocol packets and operations.
<b>Trace file</b>	Name of the file to receive the output of the tracing operation.
<b>Filter Updates rcv</b>	<p>(<b>orf</b> option only) Number of outbound-route filters received for each configured address family.</p> <p><b>NOTE:</b> The counter is cumulative. For example, the counter is increased after the remote peer either resends or clears the outbound route filtering prefix list.</p>
<b>Immediate</b>	<p>(<b>orf</b> option only) Number of route updates received with the immediate flag set. The immediate flag indicates that the BGP peer should readvertise the updated routes.</p> <p><b>NOTE:</b> The counter is cumulative. For example, the counter is increased after the remote peer either resends or clears the outbound route filtering prefix list.</p>
<b>Filter</b>	( <b>orf</b> option only) Type of prefix filter received: <b>prefix-based</b> or <b>extended-community</b> .
<b>Received filter entries</b>	( <b>orf</b> option only) List of received filters displayed.
<b>seq</b>	( <b>orf</b> option only) Numerical order assigned to this prefix entry among all the received outbound route filter prefix entries.
<b>prefix</b>	( <b>orf</b> option only) Address for the prefix entry that matches the filter.
<b>minlength</b>	( <b>orf</b> option only) Minimum prefix length, in bits, required to match this prefix.
<b>maxlength</b>	( <b>orf</b> option only) Maximum prefix length, in bits, required to match this prefix.
<b>match</b>	( <b>orf</b> option only) For this prefix match, whether to <b>permit</b> or <b>deny</b> route updates.

## Sample Output

### show bgp neighbor

```

user@host > show bgp neighbor
Peer: 10.255.7.250+179 AS 10   Local: 10.255.7.248+63740 AS 10
  Type: Internal   State: Established   Flags: <Sync>
  Last State: OpenConfirm   Last Event: RecvKeepAlive
  Last Error: None
  Export: [ redistrib_static ]
  Options: <Preference LocalAddress PeerAS Refresh>
  Options: <AdvertiseBGPStatic>

```

```

Local Address: 10.255.7.248 Holdtime: 90 Preference: 170 Outbound Timer: 50
Number of flaps: 0
Peer ID: 10.255.7.250    Local ID: 10.255.7.248    Active Holdtime: 90
Keepalive Interval: 30    Group index: 0    Peer index: 0
BFD: disabled, down
NLRI for restart configured on peer: inet-unicast
NLRI advertised by peer: inet-unicast
NLRI for this session: inet-unicast
Peer supports Refresh capability (2)
Stale routes from peer are kept for: 300
Peer does not support Restarter functionality
NLRI that restart is negotiated for: inet-unicast
NLRI of received end-of-rib markers: inet-unicast
NLRI of all end-of-rib markers sent: inet-unicast
Peer supports 4 byte AS extension (peer-as 10)
Peer does not support Addpath
Table inet.0 Bit: 10000
  RIB State: BGP restart is complete
  Send state: in sync
  Active prefixes:          1
  Received prefixes:        1
  Accepted prefixes:        1
  Suppressed due to damping: 0
  Advertised prefixes:      1
Last traffic (seconds): Received 9    Sent 5    Checked 5
Input messages: Total 36    Updates 2    Refreshes 0    Octets 718
Output messages: Total 37    Updates 1    Refreshes 0    Octets 796
Output Queue[0]: 0 (inet.0, inet-unicast)

Peer: 10.255.162.214+52193 AS 100 Local: 10.255.167.205+179 AS 100
  Type: Internal    State: Established (route reflector client)Flags: <Sync>
  Last State: OpenConfirm    Last Event: RecvKeepAlive
  Last Error: None
  Options: <Preference LocalAddress Cluster AddressFamily Rib-group Refresh>
  Address families configured: inet-unicast inet-vpn-unicast route-target
  Local Address: 10.255.167.205 Holdtime: 90 Preference: 170
  Number of flaps: 0
  Peer ID: 10.255.162.214    Local ID: 10.255.167.205    Active Holdtime: 90
  Keepalive Interval: 30    Group index: 0    Peer index: 1

```

### show bgp neighbor (CLNS)

```

user@host> show bgp neighbor
Peer: 10.245.245.1+179 AS 200 Local: 10.245.245.3+3770 AS 100
  Type: External    State: Established    Flags: <ImportEval Sync>
  Last State: OpenConfirm    Last Event: RecvKeepAlive
  Last Error: None
  Options: <Multihop Preference LocalAddress HoldTime AddressFamily PeerAS
  Rib-group Refresh>
  Address families configured: iso-vpn-unicast
  Local Address: 10.245.245.3 Holdtime: 90 Preference: 170
  Number of flaps: 0
  Peer ID: 10.245.245.1    Local ID: 10.245.245.3    Active Holdtime: 90
  Keepalive Interval: 30    Peer index: 0
  NLRI advertised by peer: iso-vpn-unicast
  NLRI for this session: iso-vpn-unicast
  Peer supports Refresh capability (2)
Table bgp.isovpn.0 Bit: 10000
  RIB State: BGP restart is complete
  RIB State: VPN restart is complete
  Send state: in sync
  Active prefixes:          3

```

```

Received prefixes:          3
Suppressed due to damping:  0
Advertised prefixes:       3
Table aaaa.iso.0
RIB State: BGP restart is complete
RIB State: VPN restart is complete
Send state: not advertising
Active prefixes:           3
Received prefixes:         3
Suppressed due to damping:  0
Last traffic (seconds): Received 6    Sent 5    Checked 5
Input messages: Total 1736    Updates 4    Refreshes 0    Octets 33385
Output messages: Total 1738    Updates 3    Refreshes 0    Octets 33305
Output Queue[0]: 0 (bgp.isovpn.0, iso-vpn-unicast)
Output Queue[1]: 0 (aaaa.iso.0, iso-vpn-unicast)

```

### show bgp neighbor (Layer 2 VPN)

```

user@host> show bgp neighbor
Peer: 10.69.103.2      AS 65536 Local: 10.69.103.1      AS 65539
Type: External      State: Active      Flags: <ImportEval>
Last State: Idle      Last Event: Start
Last Error: None
Export: [ BGP-INET-import ]
Options: <Preference LocalAddress HoldTime GracefulRestart AddressFamily PeerAS
Refresh>
Address families configured: inet-unicast
Local Address: 10.69.103.1 Holdtime: 90 Preference: 170
Number of flaps: 0
Peer: 10.69.104.2      AS 65536 Local: 10.69.104.1      AS 65539
Type: External      State: Active      Flags: <ImportEval>
Last State: Idle      Last Event: Start
Last Error: None
Export: [ BGP-L-import ]
Options: <Preference LocalAddress HoldTime GracefulRestart AddressFamily PeerAS
Refresh>
Address families configured: inet-labeled-unicast
Local Address: 10.69.104.1 Holdtime: 90 Preference: 170
Number of flaps: 0
Peer: 10.255.14.182+179 AS 69      Local: 10.255.14.176+2131 AS 69
Type: Internal      State: Established      Flags: <ImportEval>
Last State: OpenConfirm      Last Event: RecvKeepAlive
Last Error: None
Options: <Preference LocalAddress HoldTime GracefulRestart AddressFamily
Rib-group Refresh>
Address families configured: inet-vpn-unicast l2vpn
Local Address: 10.255.14.176 Holdtime: 90 Preference: 170
Number of flaps: 0
Peer ID: 10.255.14.182      Local ID: 10.255.14.176      Active Holdtime: 90
Keepalive Interval: 30
NLRI for restart configured on peer: inet-vpn-unicast l2vpn
NLRI advertised by peer: inet-vpn-unicast l2vpn
NLRI for this session: inet-vpn-unicast l2vpn
Peer supports Refresh capability (2)
Restart time configured on the peer: 120
Stale routes from peer are kept for: 300
Restart time requested by this peer: 120
NLRI that peer supports restart for: inet-vpn-unicast l2vpn
NLRI peer can save forwarding state: inet-vpn-unicast l2vpn
NLRI that peer saved forwarding for: inet-vpn-unicast l2vpn
NLRI that restart is negotiated for: inet-vpn-unicast l2vpn

```

```

NLRI of received end-of-rib markers: inet-vpn-unicast 12vpn
Table bgp.13vpn.0 Bit: 10000
  RIB State: BGP restart in progress
  RIB State: VPN restart in progress
  Send state: in sync
  Active prefixes:          10
  Received prefixes:        10
  Suppressed due to damping: 0
Table bgp.12vpn.0 Bit: 20000
  RIB State: BGP restart in progress
  RIB State: VPN restart in progress
  Send state: in sync
  Active prefixes:          1
  Received prefixes:        1
  Suppressed due to damping: 0
Table BGP-INET.inet.0 Bit: 30000
  RIB State: BGP restart in progress
  RIB State: VPN restart in progress
  Send state: in sync
  Active prefixes:          2
  Received prefixes:        2
  Suppressed due to damping: 0
Table BGP-L.inet.0 Bit: 40000
  RIB State: BGP restart in progress
  RIB State: VPN restart in progress
  Send state: in sync
  Active prefixes:          2
  Received prefixes:        2
  Suppressed due to damping: 0
Table LDP.inet.0 Bit: 50000
  RIB State: BGP restart is complete
  RIB State: VPN restart in progress
  Send state: in sync
  Active prefixes:          1
  Received prefixes:        1
  Suppressed due to damping: 0
Table OSPF.inet.0 Bit: 60000
  RIB State: BGP restart is complete
  RIB State: VPN restart in progress
  Send state: in sync
  Active prefixes:          2
  Received prefixes:        2
  Suppressed due to damping: 0
Table RIP.inet.0 Bit: 70000
  RIB State: BGP restart is complete
  RIB State: VPN restart in progress
  Send state: in sync
  Active prefixes:          2
  Received prefixes:        2
  Suppressed due to damping: 0
Table STATIC.inet.0 Bit: 80000
  RIB State: BGP restart is complete
  RIB State: VPN restart in progress
  Send state: in sync
  Active prefixes:          1
  Received prefixes:        1
  Suppressed due to damping: 0
Table L2VPN.12vpn.0 Bit: 90000
  RIB State: BGP restart is complete
  RIB State: VPN restart in progress
  Send state: in sync

```

```

Active prefixes:          1
Received prefixes:       1
Suppressed due to damping: 0
Last traffic (seconds): Received 0    Sent 0    Checked 0
Input messages: Total 14    Updates 13    Refreshes 0    Octets 1053
Output messages: Total 3    Updates 0    Refreshes 0    Octets 105
Output Queue[0]: 0 (bgp.l3vpn.0, inet-vpn-unicast)
Output Queue[1]: 0 (bgp.l2vpn.0, inet-vpn-unicast)
Output Queue[2]: 0 (BGP-INET.inet.0, inet-vpn-unicast)
Output Queue[3]: 0 (BGP-L.inet.0, inet-vpn-unicast)
Output Queue[4]: 0 (LDP.inet.0, inet-vpn-unicast)
Output Queue[5]: 0 (OSPF.inet.0, inet-vpn-unicast)
Output Queue[6]: 0 (RIP.inet.0, inet-vpn-unicast)
Output Queue[7]: 0 (STATIC.inet.0, inet-vpn-unicast)
Output Queue[8]: 0 (L2VPN.l2vpn.0, inet-vpn-unicast)

```

### show bgp neighbor (Layer 3 VPN) (Not supported on the OCX Series.)

```

user@host> show bgp neighbor
Peer: 192.0.2.0+179    AS 10045 Local: 192.0.2.1+1214    AS 10045
Type: Internal    State: Established    Flags: <ImportEval>
Last State: OpenConfirm    Last Event: RecvKeepAlive
Last Error: None
Export: [ match-all ] Import: [ match-all ]
Options: <Preference LocalAddress HoldTime GracefulRestart AddressFamily
Rib-group Refresh>
Address families configured: inet-vpn-unicast
Local Address: 192.0.2.1 Holdtime: 90 Preference: 170
Flags for NLRI inet-labeled-unicast: TrafficStatistics
Traffic Statistics: Options: all File: /var/log/bstat.log
                                size 131072 files 10

Traffic Statistics Interval: 60
Number of flaps: 0
Peer ID: 192.168.1.110    Local ID: 192.168.1.111    Active Holdtime: 90
Keepalive Interval: 30
NLRI for restart configured on peer: inet-vpn-unicast
NLRI advertised by peer: inet-vpn-unicast
NLRI for this session: inet-vpn-unicast
Peer supports Refresh capability (2)
Restart time configured on the peer: 120
Stale routes from peer are kept for: 300
Restart time requested by this peer: 120
NLRI that peer supports restart for: inet-vpn-unicast
NLRI peer can save forwarding state: inet-vpn-unicast
NLRI that peer saved forwarding for: inet-vpn-unicast
NLRI that restart is negotiated for: inet-vpn-unicast
NLRI of received end-of-rib markers: inet-vpn-unicast
NLRI of all end-of-rib markers sent: inet-vpn-unicast
Table bgp.l3vpn.0 Bit: 10000
  RIB State: BGP restart is complete
  RIB State: VPN restart is complete
  Send state: in sync
  Active prefixes:          2
  Received prefixes:       2
  Suppressed due to damping: 0
Table vpn-green.inet.0 Bit: 20001
  RIB State: BGP restart is complete
  RIB State: VPN restart is complete
  Send state: in sync
  Active prefixes:          2
  Received prefixes:       2

```

```

    Suppressed due to damping: 0
    Last traffic (seconds): Received 15    Sent 20    Checked 20
    Input messages: Total 40    Updates 2    Refreshes 0    Octets 856
    Output messages: Total 44    Updates 2    Refreshes 0    Octets 1066
    Output Queue[0]: 0 (bgp.l3vpn.0, inet-vpn-unicast)
    Output Queue[1]: 0 (vpn-green.inet.0, inet-vpn-unicast)
    Trace options: detail packets
    Trace file: /var/log/bgpgr.log size 131072 files 10

```

### show bgp neighbor neighbor-address

```

user@host> show bgp neighbor 192.168.1.111
Peer: 10.255.245.12+179 AS 35 Local: 10.255.245.13+2884 AS 35
  Type: Internal    State: Established (route reflector client)Flags: <Sync>
  Last State: OpenConfirm    Last Event: RecvKeepAlive
  Last Error: None
  Options: <Preference LocalAddress HoldTime Cluster AddressFamily Rib-group
  Refresh>
  Address families configured: inet-vpn-unicast inet-labeled-unicast
  Local Address: 10.255.245.13 Holdtime: 90 Preference: 170
  Flags for NLRI inet-vpn-unicast: AggregateLabel
  Flags for NLRI inet-labeled-unicast: AggregateLabel
  Number of flaps: 0
  Peer ID: 10.255.245.12    Local ID: 10.255.245.13    Active Holdtime: 90
  Keepalive Interval: 30
  BFD: disabled
  NLRI advertised by peer: inet-vpn-unicast inet-labeled-unicast
  NLRI for this session: inet-vpn-unicast inet-labeled-unicast
  Peer supports Refresh capability (2)
  Restart time configured on the peer: 300
  Stale routes from peer are kept for: 60
  Restart time requested by this peer: 300
  NLRI that peer supports restart for: inet-unicast inet6-unicast
  NLRI that restart is negotiated for: inet-unicast inet6-unicast
  NLRI of received end-of-rib markers: inet-unicast inet6-unicast
  NLRI of all end-of-rib markers sent: inet-unicast inet6-unicast
  Table inet.0 Bit: 10000
    RIB State: restart is complete
    Send state: in sync
    Active prefixes: 4
    Received prefixes: 6
    Suppressed due to damping: 0
  Table inet6.0 Bit: 20000
    RIB State: restart is complete
    Send state: in sync
    Active prefixes: 0
    Received prefixes: 2
    Suppressed due to damping: 0
  Last traffic (seconds): Received 3    Sent 3    Checked 3
  Input messages: Total 9    Updates 6    Refreshes 0    Octets 403
  Output messages: Total 7    Updates 3    Refreshes 0    Octets 365
  Output Queue[0]: 0 (inet.0, inet-unicast)
  Output Queue[1]: 0 (inet6.0, inet6-unicast)
  Trace options: detail packets
  Trace file: /var/log/bgpgr size 131072 files 10

```

### show bgp neighbor neighbor-address

```

user@host> show bgp neighbor 192.168.4.222
Peer: 192.168.4.222+4902 AS 65501 Local: 192.168.4.221+179 AS 65500
  Type: External    State: Established    Flags: <Sync>

```

```

Last State: OpenConfirm   Last Event: RecvKeepAlive
Last Error: Cease
Export: [ export-policy ] Import: [ import-policy ]
Options: <Preference HoldTime AddressFamily PeerAS PrefixLimit Refresh>
Address families configured: inet-unicast inet-multicast
Holdtime: 60000 Preference: 170
Number of flaps: 4
Last flap event: RecvUpdate
Error: 'Cease' Sent: 5 Recv: 0
Peer ID: 10.255.245.6      Local ID: 10.255.245.5      Active Holdtime: 60000
Keepalive Interval: 20000   Peer index: 0
BFD: disabled, down
Local Interface: fxp0.0
NLRI advertised by peer: inet-unicast inet-multicast
NLRI for this session: inet-unicast inet-multicast
Peer supports Refresh capability (2)
Table inet.0 Bit: 10000
  RIB State: BGP restart is complete
  Send state: in sync
  Active prefixes:          8
  Received prefixes:        10
  Accepted prefixes:        10
  Suppressed due to damping: 0
  Advertised prefixes:      3
Table inet.2 Bit: 20000
  RIB State: BGP restart is complete
  Send state: in sync
  Active prefixes:          0
  Received prefixes:        0
  Accepted prefixes:        0
  Suppressed due to damping: 0
  Advertised prefixes:      0
Last traffic (seconds): Received 357 Sent 357 Checked 357
Input messages: Total 4 Updates 2 Refreshes 0 Octets 211
Output messages: Total 4 Updates 1 Refreshes 0 Octets 147
Output Queue[0]: 0 (inet.0, inet-unicast)
Output Queue[1]: 0 (inet.2, inet-multicast)
Trace options: all
Trace file: /var/log/bgp size 10485760 files 10

```

### show bgp neighbor neighbor-address (BGP Graceful Restart Enabled)

```
user@router> show bgp neighbor 10.255.255.16
```

```

Peer: 10.255.255.16 AS 100      Local: 10.255.255.12 AS 100
Type: Internal   State: Active   Flags: <>
Last State: Idle   Last Event: Start
Last Error: None
Options: <Preference LocalAddress AddressFamily Rib-group Refresh>
Options: <LLGR>
Address families configured: 12vpn
Local Address: 10.255.255.12 Holdtime: 90 Preference: 170
NLRI 12vpn:
Number of flaps: 6
Last flap event: Restart
NLRI we are holding stale routes for: inet-vpn-unicast
Time until stale routes are deleted or become long-lived stale: 00:01:57
Time until end-of-rib is assumed for stale routes: 00:04:43
Table bgp.12vpn.0
  RIB State: BGP restart is complete
  RIB State: VPN restart is complete

```



```

Send state: not advertising
Active prefixes:          0
Received prefixes:        7
Accepted prefixes:        7
Suppressed due to damping: 0
Table foo.inet.0 Bit: 30000
RIB State: BGP restart is complete
RIB State: VPN restart is complete
Send state: not in sync
Active prefixes:          0
Received prefixes:        7
Accepted prefixes:        7
Suppressed due to damping: 0

```

### show bgp neighbor neighbor-address (BGP Long-Lived Graceful Restart)

```

user@router> show bgp neighbor 10.4.12.11

Peer: 10.4.12.11 AS 100          Local: 10.6.128.225 AS 100
Type: Internal      State: Active      Flags: <>
Last State: Idle      Last Event: Start
Last Error: None
Export: [ foo ]
Options: <Preference LocalAddress Refresh GracefulRestart>
Options: <LLGR>
Local Address: 10.6.128.225 Holdtime: 90 Preference: 170
Number of flaps: 3
Last flap event: Restart
Error: 'Cease' Sent: 0 Recv: 1
Time until long-lived stale routes deleted: inet-vpn-unicast 10:00:22
route-target 10:00:22
Table bgp.l3vpn.0
RIB State: BGP restart is complete
RIB State: VPN restart is complete
Send state: not advertising
Active prefixes:          0
Received prefixes:        7
Accepted prefixes:        7
Suppressed due to damping: 0
Table foo.inet.0 Bit: 30000
RIB State: BGP restart is complete
RIB State: VPN restart is complete
Send state: not in sync
Active prefixes:          0
Received prefixes:        7
Accepted prefixes:        7
Suppressed due to damping: 0

```

### show bgp neighbor orf neighbor-address detail

```

user@host > show bgp neighbor orf 192.168.165.56 detail
Peer: 192.168.165.56+179 Type: External
Group: ext1

inet-unicast
Filter updates rcv:          1 Immediate:          1
Filter: prefix-based receive
Received filter entries:
seq 1: prefix 2.2.2.2/32: minlen 32: maxlen 32: match deny:

inet6-unicast

```

```
Filter updates rcv:          0 Immediate:          1
Filter: prefix-based receive
Received filter entries:
*:*
```

## show bgp summary

<b>List of Syntax</b>	<a href="#">Syntax on page 149</a> <a href="#">Syntax (EX Series Switch and QFX Series) on page 149</a>
<b>Syntax</b>	<pre>show bgp summary &lt;exact-instance <i>instance-name</i>&gt; &lt;group <i>group-name</i>&gt; &lt;instance <i>instance-name</i>&gt; &lt;logical-system (all   <i>logical-system-name</i>)&gt;</pre>
<b>Syntax (EX Series Switch and QFX Series)</b>	<pre>show bgp summary &lt;exact-instance <i>instance-name</i>&gt; &lt;instance <i>instance-name</i>&gt;</pre>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>exact-instance</b> option introduced in Junos OS Release 11.4.</p> <p><b>group</b> option introduced in Junos OS Release 13.3.</p>
<b>Description</b>	Display BGP summary information.
<b>Options</b>	<p><b>none</b>—Display BGP summary information for all routing instances.</p> <p><b>exact-instance <i>instance-name</i></b>—(Optional) Display information for the specified instance only.</p> <p><b>group</b>—Display overview of bgp information for a particular group</p> <p><b>instance <i>instance-name</i></b>—(Optional) Display information for all routing instances whose name begins with this string (for example, <b>cust1</b>, <b>cust11</b>, and <b>cust111</b> are all displayed when you run the <b>show bgp summary instance cust1</b> command). The instance name can be master for the main instance, or any valid configured instance name or its prefix.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show bgp summary (When a Peer Is Not Established) on page 152</a> <a href="#">show bgp summary (When a Peer Is Established) on page 152</a> <a href="#">show bgp summary (CLNS) on page 152</a> <a href="#">show bgp summary (Layer 2 VPN) on page 153</a> <a href="#">show bgp summary (Layer 3 VPN) on page 153</a> <a href="#">show bgp summary group on page 153</a> <a href="#">show bgp summary (BGP Graceful Restart or Long-Lived Graceful Restart) on page 154</a>

**Output Fields** Table 11 on page 150 describes the output fields for the **show bgp summary** command. Output fields are listed in the approximate order in which they appear.

**Table 11: show bgp summary Output Fields**

Field Name	Field Description
<b>Groups</b>	Number of BGP groups.
<b>Peers</b>	Number of BGP peers.
<b>Down peers</b>	Number of down BGP peers.
<b>Table</b>	Name of routing table.
<b>Tot Paths</b>	Total number of paths.
<b>Act Paths</b>	Number of active routes.
<b>Suppressed</b>	Number of routes currently inactive because of damping or other reasons. These routes do not appear in the forwarding table and are not exported by routing protocols.
<b>History</b>	Number of withdrawn routes stored locally to keep track of damping history.
<b>Damp State</b>	Number of routes with a figure of merit greater than zero, but still active because the value has not reached the threshold at which suppression occurs.
<b>Pending</b>	Routes in process by BGP import policy.
<b>Peer</b>	Address of each BGP peer. Each peer has one line of output.
<b>AS</b>	Peer's AS number.
<b>InPkt</b>	Number of packets received from the peer.
<b>OutPkt</b>	Number of packets sent to the peer.
<b>OutQ</b>	Number of BGP packets that are queued to be transmitted to a particular neighbor. It normally is 0 because the queue usually is emptied quickly.
<b>Flaps</b>	Number of times the BGP session has gone down and then come back up.
<b>Last Up/Down</b>	Last time since the neighbor transitioned to or from the established state.

Table 11: show bgp summary Output Fields (*continued*)

Field Name	Field Description
<b>State #Active /Received/Accepted /Damped</b>	<p>Multipurpose field that displays information about BGP peer sessions. The field's contents depend upon whether a session is established and whether it was established on the main routing device or in a routing instance.</p> <ul style="list-style-type: none"> <li>If a peer is not established, the field shows the state of the peer session: <b>Active</b>, <b>Connect</b>, or <b>Idle</b>. In general, the Idle state is the first stage of a connection. BGP is waiting for a Start event. A session can be idle for other reasons as well. The reason that a session is idle is sometimes displayed. For example: <b>Idle (Removal in progress)</b> or <b>Idle (LicenseFailure)</b>.</li> <li>If a BGP session is established on the main routing device, the field shows the number of active, received, accepted, and damped routes that are received from a neighbor and appear in the <b>inet.0</b> (main) and <b>inet.2</b> (multicast) routing tables. For example, <b>8/10/10/2</b> and <b>2/4/4/0</b> indicate the following: <ul style="list-style-type: none"> <li>8 active routes, 10 received routes, 10 accepted routes, and 2 damped routes from a BGP peer appear in the <b>inet.0</b> routing table.</li> <li>2 active routes, 4 received routes, 4 accepted routes, and no damped routes from a BGP peer appear in the <b>inet.2</b> routing table.</li> </ul> </li> <li>If a BGP session is established in a routing instance, the field indicates the established (<b>Establ</b>) state, identifies the specific routing table that receives BGP updates, and shows the number of active, received, and damped routes that are received from a neighbor. For example, <b>Establ VPN-AB.inet.0: 2/4/0</b> indicates the following: <ul style="list-style-type: none"> <li>The BGP session is established.</li> <li>Routes are received in the <b>VPN-AB.inet.0</b> routing table.</li> <li>The local routing device has two active routes, four received routes, and no damped routes from a BGP peer.</li> </ul> </li> </ul> <p>When a BGP session is established, the peers are exchanging update messages.</p> <p><b>NOTE:</b> When graceful restart or LLGR helper mode is active, the RIB information is now displayed by the <b>show bgp summary</b> command. If a BGP session is established on the main routing device, the field shows the number of active, received, accepted, and damped routes that are received from a neighbor and appear in the <b>inet.0</b> (main) and <b>inet.2</b> (multicast) routing tables. For example, <b>8/10/10/2</b> and <b>2/4/4/0</b> indicate the following:</p> <ul style="list-style-type: none"> <li>8 active routes, 10 received routes, 10 accepted routes, and 2 damped routes from a BGP peer appear in the <b>inet.0</b> routing table.</li> <li>2 active routes, 4 received routes, 4 accepted routes, and no damped routes from a BGP peer appear in the <b>inet.2</b> routing table.</li> </ul>

## Sample Output

### show bgp summary (When a Peer Is Not Established)

```

user@host> show bgp summary
Groups: 2 Peers: 4 Down peers: 1
Table          Tot Paths  Act Paths Suppressed    History Damp State   Pending
inet.0          6          4          0          0          0          0          0
Peer           AS      InPkt    OutPkt    OutQ    Flaps  Last Up/Dwn
State|#Active/Received/Damped...
10.0.0.3        65002      86       90       0        2      42:54 0/0/0

0/0/0
10.0.0.4        65002      90       91       0        1      42:54 0/2/0

0/0/0
10.0.0.6        65002      87       90       0        3          3 Active
10.1.12.1       65001      89       89       0        1      42:54 4/4/0

0/0/0

```

### show bgp summary (When a Peer Is Established)

```

user@host> show bgp summary
Groups: 1 Peers: 3 Down peers: 0
Table          Tot Paths  Act Paths Suppressed    History Damp State   Pending
inet.0          6          4          0          0          0          0          0
Peer           AS      InPkt    OutPkt    OutQ    Flaps  Last Up/Dwn
State|#Active/Received/Damped...
10.0.0.2        65002    88675    88652     0        2      42:38 2/4/0

0/0/0
10.0.0.3        65002    54528    54532     0        1     2w4d22h 0/0/0

0/0/0
10.0.0.4        65002    51597    51584     0        0     2w3d22h 2/2/0

0/0/0

user@host> show bgp summary logical-system R3
Groups: 2 Peers: 2 Down peers: 0
Table          Tot Paths  Act Paths Suppressed    History Damp State   Pending
bgp.13vpn.0      2          2          0          0          0          0          0
Peer           AS      InPkt    OutPkt    OutQ    Flaps  Last Up/Dwn
State|#Active/Received/Accepted/Damped...
1.1.1.2         2       204     206       0        0      1:30:59
Establ
  bgp.13vpn.0: 2/2/2/0
  red.inet.0: 2/2/2/0
10.1.1.10       3       206     207       0        0      1:31:36
Establ
  red.inet.0: 2/2/2/0

```

### show bgp summary (CLNS)

```

user@host> show bgp summary
Groups: 1 Peers: 1 Down peers: 0
Peer           AS      InPkt    OutPkt    OutQ    Flaps  Last Up/Dwn
State|#Active/Received/Damped...
10.245.245.1   200     1735    1737       0        0     14:26:12 Establ

```

```

bgp.isovpn.0: 3/3/0
aaaa.iso.0: 3/3/0

```

### show bgp summary (Layer 2 VPN)

```

user@host> show bgp summary
Groups: 1 Peers: 5 Down peers: 0
Table Tot Paths Act Paths Suppressed History Damp State Pending
bgp.l2vpn.0 1 1 0 0 0
inet.0 0 0 0 0 0
Peer AS InPkt OutPkt OutQ Flaps Last Up/Dwn
State|#Active/Received/Damped...
10.255.245.35 65299 72 74 0 1 19:00 Establ
  bgp.l2vpn.0: 1/1/0
  frame-vpn.l2vpn.0: 1/1/0
10.255.245.36 65299 2164 2423 0 4 19:50 Establ
  bgp.l2vpn.0: 0/0/0
  frame-vpn.l2vpn.0: 0/0/0
10.255.245.37 65299 36 37 0 4 17:07 Establ
  inet.0: 0/0/0
10.255.245.39 65299 138 168 0 6 53:48 Establ
  bgp.l2vpn.0: 0/0/0
  frame-vpn.l2vpn.0: 0/0/0
10.255.245.69 65299 134 140 0 6 53:42 Establ
  inet.0: 0/0/0

```

### show bgp summary (Layer 3 VPN)

```

user@host> show bgp summary
Groups: 2 Peers: 2 Down peers: 0
Table Tot Paths Act Paths Suppressed History Damp State Pending
bgp.l3vpn.0 2 2 0 0 0
Peer AS InPkt OutPkt OutQ Flaps Last Up/Dwn
State|#Active/Received/Damped...
10.39.1.5 2 21 22 0 0 6:26 Establ
  VPN-AB.inet.0: 1/1/0
10.255.71.15 1 19 21 0 0 6:17 Establ
  bgp.l3vpn.0: 2/2/0
  VPN-A.inet.0: 1/1/0
  VPN-AB.inet.0: 2/2/0
  VPN-B.inet.0: 1/1/0

```

### show bgp summary group

```

user@host> show bgp summary group Group2
Groups: 3 Peers: 3 Down peers: 3
Table Tot Paths Act Paths Suppressed History Damp State Pending
inet.0 0 0 0 0 0
Peer AS InPkt OutPkt OutQ Flaps Last Up/Dwn
State|#Active/Received/Accepted/Damped...
10.0.0.1 56 0 0 0 0 51
Idle

user@host> show bgp summary logical-system R3 group toR4
Groups: 2 Peers: 2 Down peers: 0
Table Tot Paths Act Paths Suppressed History Damp State Pending
bgp.l3vpn.0 2 2 0 0 0
Peer AS InPkt OutPkt OutQ Flaps Last Up/Dwn
State|#Active/Received/Accepted/Damped...
10.1.1.10 3 207 207 0 0 1:31:40

```

```
Estab1
red.inet.0: 2/2/2/0
```

#### show bgp summary (BGP Graceful Restart or Long-Lived Graceful Restart)

```
user@router> show route receive-protocol bgp 10.4.12.11 detail
Groups: 2 Peers: 9 Down peers: 1
...
Peer          AS      InPkt    OutPkt    OutQ    Flaps Last Up/Dwn
State|#Active/Received/Accepted/Damped...
10.255.255.16    100        7         6         0         4         4
Idle
  bgp.13vpn.0: 0/7/7/0
  foo.inet.0: 0/7/7/0
```



## show policy damping

<b>List of Syntax</b>	<a href="#">Syntax on page 155</a> <a href="#">Syntax (EX Series Switch and QFX Series) on page 155</a>
<b>Syntax</b>	<pre>show policy damping &lt;logical-system (all   <i>logical-system-name</i>)&gt;</pre>
<b>Syntax (EX Series Switch and QFX Series)</b>	show policy damping
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.3 for the QFX Series.</p>
<b>Description</b>	Display information about BGP route flap damping parameters.
<b>Options</b>	<p><b>none</b>—Display information about BGP route flap damping parameters.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
<b>Additional Information</b>	In the output from this command, figure-of-merit values correlate with the probability of future instability of a routing device. Routes with higher figure-of-merit values are suppressed for longer periods of time. The figure-of-merit value decays exponentially over time. A figure-of-merit value of zero is assigned to each new route. The value is increased each time the route is withdrawn or readvertised, or when one of its path attributes changes.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">clear bgp damping on page 124</a></li> <li>• <a href="#">show route damping</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show policy damping on page 156</a>
<b>Output Fields</b>	<p><a href="#">Table 12 on page 155</a> describes the output fields for the <b>show policy damping</b> command. Output fields are listed in the approximate order in which they appear.</p>

**Table 12: show policy damping Output Fields**

Field Name	Field Description
<b>Halflife</b>	Decay half-life, in minutes. The value represents the period during which the accumulated figure-of-merit value is reduced by half if the route remains stable. If a route has flapped, but then becomes stable, the figure-of-merit value for the route decays exponentially. For example, for a route with a figure-of-merit value of 1500, if no incidents occur, its figure-of-merit value is reduced to 750 after 15 minutes and to 375 after another 15 minutes.

Table 12: show policy damping Output Fields (*continued*)

Field Name	Field Description
<b>Reuse merit</b>	Figure-of-merit value below which a suppressed route can be used again. A suppressed route becomes reusable when its figure-of-merit value decays to a value below a reuse threshold, and the route once again is considered usable and can be installed in the forwarding table and exported from the routing table.
<b>Suppress/cutoff merit</b>	Figure-of-merit value above which a route is suppressed for use or inclusion in advertisements. When a route's figure-of-merit value reaches a particular level, called the cutoff or suppression threshold, the route is suppressed. When a route is suppressed, the routing table no longer installs the route into the forwarding table and no longer exports this route to any of the routing protocols.
<b>Maximum suppress time</b>	Maximum hold-down time, in minutes. The value represents the maximum time that a route can be suppressed no matter how unstable it has been before this period of stability.
<b>Computed values</b>	<ul style="list-style-type: none"> <li>• <b>Merit ceiling</b>—Maximum merit that a flapping route can collect.</li> <li>• <b>Maximum decay</b>—Maximum decay half-life, in minutes.</li> </ul>

## Sample Output

### show policy damping

```

user@host> show policy damping
Default damping information:
  Halflife: 15 minutes
  Reuse merit: 750 Suppress/cutoff merit: 3000
  Maximum suppress time: 60 minutes
  Computed values:
    Merit ceiling: 12110
    Maximum decay: 6193
Damping information for "standard-damping":
  Halflife: 10 minutes
  Reuse merit: 4000 Suppress/cutoff merit: 8000
  Maximum suppress time: 30 minutes
  Computed values:
    Merit ceiling: 32120
    Maximum decay: 12453

```