



## BGP 4 Soft Configuration

BGP4 soft configuration allows BGP4 policies to be configured and activated without clearing the BGP session, hence without invalidating the forwarding cache.

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## Information About BGP 4 Soft Configuration

### BGP Session Reset

Whenever the routing policy changes due to a configuration change, BGP peering sessions must be reset by using the **clear ip bgp** command. Cisco software supports the following three mechanisms to reset BGP peering sessions:

- **Hard reset**—A hard reset tears down the specified peering sessions including the TCP connection and deletes routes coming from the specified peer.
- **Soft reset**—A soft reset uses stored prefix information to reconfigure and activate BGP routing tables without tearing down existing peering sessions. Soft reconfiguration uses stored update information, at the cost of additional memory for storing the updates, to allow you to apply new BGP policy without disrupting the network. Soft reconfiguration can be configured for inbound or outbound sessions.
- **Dynamic inbound soft reset**—The route refresh capability, as defined in RFC 2918, allows the local device to reset inbound routing tables dynamically by exchanging route refresh requests to supporting peers. The route refresh capability does not store update information locally for nondisruptive policy changes. It instead relies on dynamic exchange with supporting peers. Route refresh must first be advertised through BGP capability negotiation between peers. All BGP devices must support the route refresh capability. To determine if a BGP device supports this capability, use the **show ip bgp neighbors** command. The following message is displayed in the output when the device supports the route refresh capability:

```
Received route refresh capability from peer.
```

The **bgp soft-reconfig-backup** command was introduced to configure BGP to perform inbound soft reconfiguration for peers that do not support the route refresh capability. The configuration of this command allows you to configure BGP to store updates (soft reconfiguration) only as necessary. Peers that support the route refresh capability are unaffected by the configuration of this command.

## How to Configure BGP 4 Soft Configuration

### Configuring Inbound Soft Reconfiguration When Route Refresh Capability Is Missing

Perform this task to configure inbound soft reconfiguration using the **bgp soft-reconfig-backup** command for BGP peers that do not support the route refresh capability. BGP peers that support the route refresh capability are unaffected by the configuration of this command. Note that the memory requirements for storing the inbound update information can become quite large.

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *autonomous-system-number*
4. **bgp log-neighbor-changes**
5. **bgp soft-reconfig-backup**
6. **neighbor** {*ip-address* | *peer-group-name*} **remote-as** *autonomous-system-number*
7. **neighbor** {*ip-address* | *peer-group-name*} **soft-reconfiguration** [**inbound**]
8. **neighbor** {*ip-address* | *peer-group-name*} **route-map** *map-name* {**in** | **out**}
9. Repeat Steps 6 through 8 for every peer that is to be configured with inbound soft reconfiguration.
10. **exit**
11. **route-map** *map-name* [**permit** | **deny**] [*sequence-number*]
12. **set ip next-hop** *ip-address*
13. **end**
14. **show ip bgp neighbors** [*neighbor-address*]
15. **show ip bgp** [*network*] [*network-mask*]

#### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	<b>router bgp</b> <i>autonomous-system-number</i> <b>Example:</b> <pre>Device(config)# router bgp 45000</pre>	Enters router configuration mode for the specified routing process.
Step 4	<b>bgp log-neighbor-changes</b> <b>Example:</b> <pre>Device(config-router)# bgp log-neighbor-changes</pre>	Enables logging of BGP neighbor resets.
Step 5	<b>bgp soft-reconfig-backup</b> <b>Example:</b> <pre>Device(config-router)# bgp soft-reconfig-backup</pre>	Configures a BGP speaker to perform inbound soft reconfiguration for peers that do not support the route refresh capability. <ul style="list-style-type: none"> <li>This command is used to configure BGP to perform inbound soft reconfiguration for peers that do not support the route refresh capability. The configuration of this command allows you to configure BGP to store updates (soft reconfiguration) only as necessary. Peers that support the route refresh capability are unaffected by the configuration of this command.</li> </ul>
Step 6	<b>neighbor</b> { <i>ip-address</i>   <i>peer-group-name</i> } <b>remote-as</b> <i>autonomous-system-number</i> <b>Example:</b> <pre>Device(config-router)# neighbor 192.168.1.2 remote-as 40000</pre>	Adds the IP address of the neighbor in the specified autonomous system to the IPv4 multiprotocol BGP neighbor table of the local device.
Step 7	<b>neighbor</b> { <i>ip-address</i>   <i>peer-group-name</i> } <b>soft-reconfiguration [inbound]</b> <b>Example:</b> <pre>Device(config-router)# neighbor 192.168.1.2 soft-reconfiguration inbound</pre>	Configures the Cisco software to start storing updates. <ul style="list-style-type: none"> <li>All the updates received from this neighbor will be stored unmodified, regardless of the inbound policy. When inbound soft reconfiguration is done later, the stored information will be used to generate a new set of inbound updates.</li> </ul>
Step 8	<b>neighbor</b> { <i>ip-address</i>   <i>peer-group-name</i> } <b>route-map</b> <i>map-name</i> { <b>in</b>   <b>out</b> } <b>Example:</b> <pre>Device(config-router)# neighbor 192.168.1.2 route-map LOCAL in</pre>	Applies a route map to incoming or outgoing routes. <ul style="list-style-type: none"> <li>In this example, the route map named LOCAL will be applied to incoming routes.</li> </ul>
Step 9	Repeat Steps 6 through 8 for every peer that is to be configured with inbound soft reconfiguration.	—
Step 10	<b>exit</b> <b>Example:</b>	Exits router configuration mode and enters global configuration mode.

	Command or Action	Purpose
	<code>Device(config-router)# exit</code>	
<b>Step 11</b>	<b>route-map</b> <i>map-name</i> [ <b>permit</b>   <b>deny</b> ] [ <i>sequence-number</i> ] <b>Example:</b> <code>Device(config)# route-map LOCAL permit 10</code>	Configures a route map and enters route-map configuration mode. <ul style="list-style-type: none"> <li>In this example, a route map named LOCAL is created.</li> </ul>
<b>Step 12</b>	<b>set ip next-hop</b> <i>ip-address</i> <b>Example:</b> <code>Device(config-route-map)# set ip next-hop 192.168.1.144</code>	Specifies where output packets that pass a match clause of a route map for policy routing. <ul style="list-style-type: none"> <li>In this example, the ip address is set to 192.168.1.144.</li> </ul>
<b>Step 13</b>	<b>end</b> <b>Example:</b> <code>Device(config-route-map)# end</code>	Exits route-map configuration mode and enters privileged EXEC mode.
<b>Step 14</b>	<b>show ip bgp neighbors</b> [ <i>neighbor-address</i> ] <b>Example:</b> <code>Device# show ip bgp neighbors 192.168.1.2</code>	(Optional) Displays information about the TCP and BGP connections to neighbors. <b>Note</b> Only the syntax applicable to this task is used in this example. For more details, see the <i>Cisco IOS IP Routing: BGP Command Reference</i> .
<b>Step 15</b>	<b>show ip bgp</b> [ <i>network</i> ] [ <i>network-mask</i> ] <b>Example:</b> <code>Device# show ip bgp</code>	(Optional) Displays the entries in the BGP routing table. <b>Note</b> Only the syntax applicable to this task is used in this example. For more details, see the <i>Cisco IOS IP Routing: BGP Command Reference</i> .

### Examples

The following partial output from the **show ip bgp neighbors** command shows information about the TCP and BGP connections to the BGP neighbor 192.168.2.1. This peer supports route refresh.

```
BGP neighbor is 192.168.1.2, remote AS 40000, external link
Neighbor capabilities:
  Route refresh: advertised and received(new)
```

The following partial output from the **show ip bgp neighbors** command shows information about the TCP and BGP connections to the BGP neighbor 192.168.3.2. This peer does not support route refresh so the soft-reconfig inbound paths for BGP peer 192.168.3.2 will be stored because there is no other way to update any inbound policy updates.

```
BGP neighbor is 192.168.3.2, remote AS 50000, external link
```

```
Neighbor capabilities:  
Route refresh: advertised
```

The following sample output from the **show ip bgp** command shows the entry for the network 172.17.1.0. Both BGP peers are advertising 172.17.1.0/24, but only the received-only path is stored for 192.168.3.2.

```
BGP routing table entry for 172.17.1.0/24, version 11  
Paths: (3 available, best #3, table Default-IP-Routing-Table, RIB-failure(4))  
Flag: 0x820  
Advertised to update-groups:  
  1  
  50000  
    192.168.3.2 from 192.168.3.2 (172.17.1.0)  
      Origin incomplete, metric 0, localpref 200, valid, external  
  50000, (received-only)  
    192.168.3.2 from 192.168.3.2 (172.17.1.0)  
      Origin incomplete, metric 0, localpref 100, valid, external  
  40000  
    192.168.1.2 from 192.168.1.2 (172.16.1.0)  
      Origin incomplete, metric 0, localpref 200, valid, external, best
```

## Configuration Examples for BGP 4 Soft Configuration

### Examples: BGP Soft Reset

The following examples show two ways to reset the connection for BGP peer 192.168.1.1.

#### Example: Dynamic Inbound Soft Reset

The following example shows the command used to initiate a dynamic soft reconfiguration in the BGP peer 192.168.1.1. This command requires that the peer support the route refresh capability.

```
clear ip bgp 192.168.1.1 soft in
```

#### Example: Inbound Soft Reset Using Stored Information

The following example shows how to enable inbound soft reconfiguration for the neighbor 192.168.1.1. All the updates received from this neighbor will be stored unmodified, regardless of the inbound policy. When inbound soft reconfiguration is performed later, the stored information will be used to generate a new set of inbound updates.

```
router bgp 100  
neighbor 192.168.1.1 remote-as 200  
neighbor 192.168.1.1 soft-reconfiguration inbound
```

The following example clears the session with the neighbor 192.168.1.1:

```
clear ip bgp 192.168.1.1 soft in
```

## Additional References

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Command List, All Releases</a>
BGP commands	<a href="#">Cisco IOS IP Routing: BGP Command Reference</a>

### Standards and RFCs

Standard/RFC	Title
RFC 2918	<i>Route Refresh Capability for BGP-4</i>

### Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for BGP 4 Soft Configuration

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

**Table 1: Feature Information for BGP 4 Soft Configuration**

Feature Name	Releases	Feature Information
BGP 4 Soft Configuration		BGP 4 Soft Configuration allows BGP4 policies to be configured and activated without clearing the BGP session, hence without invalidating the forwarding cache.