



BGP Soft Reset

BGP Soft Reset feature provides automatic support for dynamic soft reset of inbound BGP routing table updates that is not dependent upon stored routing table update information. The new method requires no preconfiguration (as with the **neighbor soft-reconfiguration** command) and requires much less memory than the previous soft reset method for inbound routing table updates.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

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

Information About BGP Soft Reset

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.

Routing Policy Change Management

Routing policies for a peer include all the configurations for elements such as a route map, distribute list, prefix list, and filter list that may impact inbound or outbound routing table updates. Whenever there is a change in the routing policy, the BGP session must be soft-cleared, or soft-reset, for the new policy to take effect. Performing inbound reset enables the new inbound policy configured on the device to take effect. Performing outbound reset causes the new local outbound policy configured on the device to take effect without resetting the BGP session. As a new set of updates is sent during outbound policy reset, a new inbound policy of the neighbor can also take effect. This means that after changing inbound policy, you must do an inbound reset on the local device or an outbound reset on the peer device. Outbound policy changes require an outbound reset on the local device or an inbound reset on the peer device.

There are two types of reset: hard reset and soft reset. The table below lists their advantages and disadvantages.

Table 1: Advantages and Disadvantages of Hard and Soft Resets

Type of Reset	Advantages	Disadvantages
Hard reset	No memory overhead.	The prefixes in the BGP, IP, and Forwarding Information Base (FIB) tables provided by the neighbor are lost. A hard reset is not recommended.
Outbound soft reset	No configuration, and no storing of routing table updates.	Does not reset inbound routing table updates.

Type of Reset	Advantages	Disadvantages
Dynamic inbound soft reset	<p>Does not clear the BGP session and cache.</p> <p>Does not require storing of routing table updates, and has no memory overhead.</p>	<p>Both BGP devices must support the route refresh capability.</p> <p>Note Does not reset outbound routing table updates.</p>
Configured inbound soft reset (uses the neighbor soft-reconfiguration router configuration command)	<p>Can be used when both BGP devices do not support the automatic route refresh capability.</p> <p>The bgp soft-reconfig-backup command was introduced to configure inbound soft reconfiguration for peers that do not support the route refresh capability.</p>	<p>Requires preconfiguration.</p> <p>Stores all received (inbound) routing policy updates without modification; is memory-intensive.</p> <p>Recommended only when absolutely necessary, such as when both BGP devices do not support the automatic route refresh capability.</p> <p>Note Does not reset outbound routing table updates.</p>

Once you have defined two devices to be BGP neighbors, they will form a BGP connection and exchange routing information. If you subsequently change a BGP filter, weight, distance, version, or timer, or if you make a similar configuration change, you must reset BGP connections in order for the configuration change to take effect.

A soft reset updates the routing table for inbound and outbound routing updates. Cisco software supports soft reset without any prior configuration. This soft reset allows the dynamic exchange of route refresh requests and routing information between BGP devices, and allows the subsequent readvertisement of the respective outbound routing table. There are two types of soft reset:

- When soft reset is used to generate inbound updates from a neighbor, it is called dynamic inbound soft reset.
- When soft reset is used to send a new set of updates to a neighbor, it is called outbound soft reset.

To use soft reset without preconfiguration, both BGP peers must support the soft route refresh capability, which is advertised in the OPEN message sent when the peers establish a TCP session.

How to Configure BGP Soft Reset

Performing BGP Dynamic Inbound Soft Reset

SUMMARY STEPS

1. **enable**
2. **clear ip bgp** *{* | autonomous-system-number | neighbor-address}* **soft in**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	clear ip bgp <i>{* autonomous-system-number neighbor-address}</i> soft in Example: Device# clear ip bgp 192.168.1.2 soft in	Performs a dynamic soft reset on the connection specified.

Performing BGP Outbound Soft Reset

SUMMARY STEPS

1. enable
2. clear ip bgp *{* | autonomous-system-number | neighbor-address}* soft out

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	clear ip bgp <i>{* autonomous-system-number neighbor-address}</i> soft out Example: Device# clear ip bgp 192.168.1.2 soft out	Performs an outbound soft reset on the connection specified.

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

	Command or Action	Purpose
Step 3	router bgp <i>autonomous-system-number</i> Example: Device(config)# router bgp 45000	Enters router configuration mode for the specified routing process.
Step 4	bgp log-neighbor-changes Example: Device(config-router)# bgp log-neighbor-changes	Enables logging of BGP neighbor resets.
Step 5	bgp soft-reconfig-backup Example: Device(config-router)# bgp soft-reconfig-backup	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"> 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.
Step 6	neighbor { <i>ip-address</i> <i>peer-group-name</i> } remote-as <i>autonomous-system-number</i> Example: Device(config-router)# neighbor 192.168.1.2 remote-as 40000	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	neighbor { <i>ip-address</i> <i>peer-group-name</i> } soft-reconfiguration [inbound] Example: Device(config-router)# neighbor 192.168.1.2 soft-reconfiguration inbound	Configures the Cisco software to start storing updates. <ul style="list-style-type: none"> 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.
Step 8	neighbor { <i>ip-address</i> <i>peer-group-name</i> } route-map <i>map-name</i> { in out } Example: Device(config-router)# neighbor 192.168.1.2 route-map LOCAL in	Applies a route map to incoming or outgoing routes. <ul style="list-style-type: none"> In this example, the route map named LOCAL will be applied to incoming routes.
Step 9	Repeat Steps 6 through 8 for every peer that is to be configured with inbound soft reconfiguration.	—

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

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	Cisco IOS Master Command List, All Releases
BGP commands	Cisco IOS IP Routing: BGP Command Reference

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.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for BGP Soft Reset

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.

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Table 2: Feature Information for BGP Soft Reset

Feature Name	Releases	Feature Information
BGP Soft Reset	Cisco IOS XE Release 3.2SE Cisco IOS XE Release 3.3SE	<p>BGP Soft Reset feature provides automatic support for dynamic soft reset of inbound BGP routing table updates that is not dependent upon stored routing table update information. The new method requires no preconfiguration (as with the neighbor soft-reconfiguration command) and requires much less memory than the previous soft reset method for inbound routing table updates.</p> <p>In Cisco IOS XE Release 3.3SE, support was added for the Cisco Catalyst 3650 Series Switches and Cisco Catalyst 3850 Series Switches.</p>