



# BGP Attribute Filter and Enhanced Attribute Error Handling

---

The BGP Attribute Filter feature allows you to “treat-as-withdraw” updates that contain specific path attributes. The prefixes contained in the update are removed from the routing table. The feature also allows you to remove specific path attributes from incoming updates. Both behaviors provide an increased measure of security. The BGP Enhanced Attribute Error Handling feature prevents peer sessions from flapping due to errors from any malformed update, thereby saving resources.

- [Finding Feature Information, on page 1](#)
- [Information About BGP Attribute Filtering, on page 1](#)
- [How to Filter BGP Path Attributes, on page 3](#)
- [Configuration Examples for BGP Attribute Filter, on page 6](#)
- [Additional References, on page 7](#)
- [Feature Information for BGP Attribute Filter and Enhanced Attribute Error Handling, on page 7](#)

## 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 at the end of this module.

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Information About BGP Attribute Filtering

### BGP Attribute Filter and Enhanced Attribute Error Handling

The BGP Attribute Filter feature provides two ways to achieve an increased measure of security:

- The feature allows you to treat-as-withdraw an Update coming from a specified neighbor if the Update contains a specified attribute type. When an Update is treat-as-withdraw, the prefixes in the Update are removed from the BGP routing table (if they existed in the routing table).

- The feature also allows you to drop specified path attributes from an Update, and then the system processes the rest of the Update as usual.

The BGP Enhanced Attribute Error Handling feature prevents peer sessions from flapping due to a malformed Update. The malformed Update is treat-as-withdraw and does not cause the BGP session to be reset. This feature is enabled by default, but can be disabled.

The features are implemented in the following order:

1. Received Updates that contain user-specified path attributes are treat-as-withdraw (as long as the NLRI can be parsed successfully). If there is an existing prefix in the BGP routing table, it will be removed. The **neighbor path-attribute treat-as-withdraw** command configures this feature.
2. User-specified path attributes are discarded from received Updates, and the rest of the Update is processed normally. The **neighbor path-attribute discard** command configures this feature.
3. Received Updates that are malformed are treat-as-withdraw. This feature is enabled by default; it can be disabled by configuring the **no bgp enhanced-error** command.

#### Details About Specifying Attributes as Treat-as-Withdraw

Attribute types 1, 2, 3, 4, 8, 14, 15, and 16 cannot be configured for path attribute treat-as-withdraw.

Attribute type 5 (localpref), type 9 (Originator,) and type 10 (Cluster-id) can be configured for treat-as-withdraw for eBGP neighbors only.

Configuring path attributes to be treated as withdrawn will trigger an inbound Route Refresh to ensure that the routing table is up to date.

#### Details About Specifying Attributes as Discard

Attribute types 1, 2, 3, 4, 8, 14, 15, and 16 cannot be configured for path attribute discard.

Attribute type 5 (localpref), type 9 (Originator), and type 10 (Cluster-id) can be configured for discard for eBGP neighbors only.

Configuring path attributes to be discarded will trigger an inbound Route Refresh to ensure that the routing table is up to date.

#### Details About Enhanced Attribute Error Handling

If a malformed Update is received, it is treat-as-withdraw to prevent peer sessions from flapping due to the processing of BGP path attributes. This feature applies to eBGP and iBGP peers. This feature is enabled by default; it can be disabled.

If the BGP Enhanced Attribute Error Handling feature is enabled or disabled, BGP places the MP\_REACH attribute (attribute 14) at the beginning of an attribute list while formatting an update. Enhanced attribute error handling functions more easily when the MP\_REACH attribute is at the beginning of the attribute list.

# How to Filter BGP Path Attributes

## Treat-as-Withdraw BGP Updates Containing a Specified Path Attribute



**Note** Performing this task will trigger an inbound Route Refresh to ensure that the routing table is up to date.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *as-number*
4. **neighbor** *{ip-address | ipv6-address}* **path-attribute treat-as-withdraw** *{attribute-value | range start-value end-value}* **in**
5. Repeat Step 4 to configure other attributes not in a range or to configure a different neighbor.
6. **end**

### DETAILED STEPS

|        | Command or Action   | Purpose  |
|--------|---|--|
| Step 1 | <b>enable</b><br><b>Example:</b><br>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><br><b>Example:</b><br>Device# configure terminal  | Enters global configuration mode.  |
| Step 3 | <b>router bgp</b> <i>as-number</i><br><b>Example:</b><br>Device(config)# router bgp 65000   | Configures a BGP routing process and enters router configuration mode.   |
| Step 4 | <b>neighbor</b> <i>{ip-address   ipv6-address}</i> <b>path-attribute treat-as-withdraw</b> <i>{attribute-value   range start-value end-value}</i> <b>in</b><br><b>Example:</b><br>Device(config-router)# neighbor 2001:DB8:1::1 path-attribute treat-as-withdraw 100 in | Treat-as-withdraw any incoming Update messages that contain the specified path attribute or range of path attributes. <ul style="list-style-type: none"> <li>• Any prefixes in an Update that is treat-as-withdraw are removed from the BGP routing table.</li> <li>• The specific attribute value and the range of attribute values are independent of each other.</li> </ul> |

|               | Command or Action  | Purpose                        |
|---------------|--|--------------------------------|
| <b>Step 5</b> | Repeat Step 4 to configure other attributes not in a range or to configure a different neighbor. |                                |
| <b>Step 6</b> | <b>end</b><br><b>Example:</b><br>Device(config-router)# end                                      | Exits to privileged EXEC mode. |

## Discarding Specific Path Attributes from an Update Message



**Note** Performing this task will trigger an inbound Route Refresh to ensure that the routing table is up to date.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *as-number*
4. **neighbor** {*ip-address* | *ipv6-address*} **path-attribute discard** {*attribute-value* | **range** *start-value end-value*} **in**
5. Repeat Step 4 to configure other attributes not in a range or to configure a different neighbor.
6. **end**

### DETAILED STEPS

|               | Command or Action   | Purpose  |
|---------------|---|--|
| <b>Step 1</b> | <b>enable</b><br><b>Example:</b><br>Device> enable  | Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul> |
| <b>Step 2</b> | <b>configure terminal</b><br><b>Example:</b><br>Device# configure terminal  | Enters global configuration mode.  |
| <b>Step 3</b> | <b>router bgp</b> <i>as-number</i><br><b>Example:</b><br>Device(config)# router bgp 6500  | Configures a BGP routing process and enters router configuration mode.   |
| <b>Step 4</b> | <b>neighbor</b> { <i>ip-address</i>   <i>ipv6-address</i> } <b>path-attribute discard</b> { <i>attribute-value</i>   <b>range</b> <i>start-value end-value</i> } <b>in</b><br><b>Example:</b> | Drops specified path attributes from Update messages from the specified neighbor.                                  |

|               | Command or Action   | Purpose                        |
|---------------|---|--------------------------------|
|               | Device(config-router)# neighbor 2001:DB8:1::1<br>path-attribute discard 128 in                                      |                                |
| <b>Step 5</b> | Repeat Step 4 to configure other attributes not in a range or to configure a different neighbor.<br><b>Example:</b> |                                |
| <b>Step 6</b> | <b>end</b><br><b>Example:</b><br><br>Device(config-router)# end   | Exits to privileged EXEC mode. |

## Displaying Withdrawn or Discarded Path Attributes

Perform any of these steps in any order to display information about treat-as-withdraw, discarded, or unknown path attributes. You can use the **show ip bgp** command with any address family that BGP supports, such as **show ip bgp ipv4 multicast**, **show ip bgp ipv6 unicast**, etc.

### SUMMARY STEPS

1. **enable**
2. **show ip bgp neighbor** [*ip-address* | *ipv6-address*]
3. **show ip bgp path-attribute unknown**
4. **show ip bgp path-attribute discard**
5. **show ip bgp vpv4 all** *prefix*
6. **show ip bgp neighbors** *prefix*

### DETAILED STEPS

|               | Command or Action  | Purpose  |
|---------------|--|--|
| <b>Step 1</b> | <b>enable</b><br><b>Example:</b><br><br>Device> enable   | Enables privileged EXEC mode.<br><br>• Enter your password if prompted.  |
| <b>Step 2</b> | <b>show ip bgp neighbor</b> [ <i>ip-address</i>   <i>ipv6-address</i> ]<br><b>Example:</b><br><br>Device# show ip bgp neighbor 2001:DB8:1::1 | (Optional) Displays the configured discard and treat-as-withdraw attribute values for the neighbor, counts of Updates with such attributes discarded or treat-as-withdraw, and the count of malformed treat-as-withdraw Updates. |
| <b>Step 3</b> | <b>show ip bgp path-attribute unknown</b><br><b>Example:</b><br><br>Device# show ip bgp path-attribute unknown                               | (Optional) Displays all prefixes that have an unknown attribute.   |

|               | Command or Action  | Purpose   |
|---------------|--|---|
| <b>Step 4</b> | <b>show ip bgp path-attribute discard</b><br><b>Example:</b><br>Device# show ip bgp path-attribute discard | (Optional) Displays all prefixes for which an attribute has been discarded.                           |
| <b>Step 5</b> | <b>show ip bgp vpnv4 all prefix</b><br><b>Example:</b><br>Device# show ip bgp vpnv4 all 192.168.1.0        | (Optional) Displays the unknown attributes and discarded attributes associated with a prefix.         |
| <b>Step 6</b> | <b>show ip bgp neighbors prefix</b><br><b>Example:</b><br>Device# show ip bgp neighbors 192.168.1.0        | (Optional) Displays the configured discard and treat-as-withdraw attributes associated with a prefix. |

## Configuration Examples for BGP Attribute Filter

### Examples: Withdraw Updates Based on Path Attribute

The following example shows how to configure the device to treat-as-withdraw any Update messages from the specified neighbor that contain the unwanted path attribute 100 or 128:

```
router bgp 65600
 neighbor 2001:DB8:1::2 path-attribute treat-as-withdraw 100 in
 neighbor 2001:DB8:1::2 path-attribute treat-as-withdraw 128 in
```

The following example shows how to configure the device to treat-as-withdraw any Update messages from the specified neighbor that contain the unwanted path attributes in the range from 21 to 255:

```
router bgp 65600
 neighbor 2001:DB8:1::2 path-attribute treat-as-withdraw 21 255 in
```

### Examples: Discard Path Attributes from Updates

The following example shows how to configure the device to discard path attributes 100 and 128 from incoming Update messages from the specified neighbor. The rest of the Update message will be processed as usual.

```
router bgp 65600
 neighbor 2001:DB8:1::1 path-attribute discard 100 in
 neighbor 2001:DB8:1::1 path-attribute discard 128 in
```

The following example shows how to configure the device to discard path attributes in the range from 17 to 255 from incoming Update messages from the specified neighbor. The rest of the Update message will be processed as usual.

```
router bgp 65600
 neighbor 2001:DB8:1::1 path-attribute discard 17 255 in
```

## Additional References

### Related Documents

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

### Standards and RFCs

| Standard/RFC                  | Title  |
|-------------------------------|--|
| draft-ietf-idr-error-handling | <a href="#">Revised Error Handling for BGP Updates from External Neighbors</a> |

### 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 Attribute Filter and Enhanced Attribute Error Handling

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 [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

Table 1: Feature Information for BGP Attribute Filter and Enhanced Attribute Error Handling

| Feature Name   | Releases | Feature Information   |
|--|----------|---|
| BGP Attribute Filter and Enhanced Attribute Error Handling |          | <p>The BGP Attribute Filter allows you to “treat-as-withdraw” updates that contain specific path attributes. The prefixes contained in the update are removed from the routing table. The feature also allows you to remove specific path attributes from incoming updates. Both behaviors provide an increased measure of security. The BGP Enhanced Attribute Error Handling feature prevents peer sessions from flapping due to errors from any malformed update, thereby saving resources.</p> <p>The following commands were introduced: <b>bgp enhanced-error</b>, <b>neighbor path-attribute discard</b>, <b>neighbor path-attribute treat-as-withdraw</b>, <b>show ip bgp path-attribute discard</b>, and <b>show ip bgp path-attribute unknown</b>.</p> <p>The following commands were modified: <b>show ip bgp</b>, <b>show ip bgp neighbor</b>, and <b>show ip bgp vpv4 all</b>.</p> |