BGP AS-Override Split-Horizon

The BGP AS-Override Split-Horizon feature enables a Provider Edge (PE) device using split-horizon to avoid advertisement of routes propagated by a Customer Edge (CE) device to the same CE device. The BGP AS-Override Split-Horizon feature also enables a PE or CE device to send route updates to a specific PE or CE device in the same replication group.

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 AS-Override Split-Horizon

BGP AS-Override Split-Horizon Overview

When you configure split-horizon on a device, the Provider Edge (PE) device may advertise routes propagated from a Customer Edge (CE) device to the same CE device. The BGP AS-Override Split Horizon feature groups all the BGP neighbors into separate replication-groups, even when they are in the same update-group, and ensures that the route updates propagated from a CE device are not sent to the same CE device.

The BGP AS-Override Split Horizon feature enables a PE or CE device to selectively send and block updates to one or more neighboring PE or CE devices in the same update-group. The PE or CE device sends or blocks

a message to a neighboring PE or CE device based on the type of the message and on whether the originator of the message matches the router ID of the PE or CE device.

How to Configure BGP AS-Override Split-Horizon

Configuring BGP AS-Override Split-Horizon

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *autonomous-system-number*
4. **address family ipv4 vrf** *vrf-name*
5. **neighbor** *ip-address* **remote-as** *autonomous-system-number*
6. **neighbor** *ip-address* **activate**
7. **neighbor** *ip-address* **as-override split-horizon**
8. Repeat Step 5 to Step 7 to enable split-horizon for different neighbors in a virtual routing and forwarding (VRF) instance.
9. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**router bgp** *autonomous-system-number* **Example:** `Device(config)# router bgp 21`	Configures the Border Gateway Protocol (BGP) routing process and enters router configuration mode.
Step 4	**address family ipv4 vrf** *vrf-name* **Example:** `Device(config-router)# address-family ipv4 vrf vrf1`	Specifies the name of the VPN routing and forwarding (VRF) instance to associate with subsequent IPv4 address family configuration mode commands and enters address-family configuration mode.

	Command or Action	Purpose
Step 5	**neighbor** *ip-address* **remote-as** *autonomous-system-number* **Example:** `Device(config-router-af)# neighbor 192.0.2.1 remote-as 1`	Configures peering with a BGP neighbor in the specified autonomous system.
Step 6	**neighbor** *ip-address* **activate** **Example:** `Device(config-router-af)# neighbor 192.0.2.1 activate`	Enables the neighbor to exchange prefixes for the IPv4 address family with the local device.
Step 7	**neighbor** *ip-address* **as-override split-horizon** **Example:** `Device(config-router-af)# neighbor 192.0.2.1 as-override split-horizon`	Enables split-horizon per neighbor in a VRF instance.
Step 8	Repeat Step 5 to Step 7 to enable split-horizon for different neighbors in a virtual routing and forwarding (VRF) instance.	—
Step 9	**end** **Example:** `Device(config-router-af)# end`	Exits router address-family configuration mode and enters privileged EXEC mode.

Verifying BGP AS-Override Split-Horizon

SUMMARY STEPS

1. **enable**
2. **show ip bgp vpn4 all update-group**
3. **show ip bgp vpnv4 all neighbors** *ip-address*
4. **show ip bgp vpnv4 all neighbors** *ip-address* **policy**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	**show ip bgp vpn4 all update-group** **Example:** `Device# show ip bgp vpn4 all update-group`	Displays information on update groups.
Step 3	**show ip bgp vpnv4 all neighbors** *ip-address* **Example:** `Device# show ip bgp vpnv4 all neighbors 192.0.2.1`	Displays details about neighbor connections.
Step 4	**show ip bgp vpnv4 all neighbors** *ip-address* **policy** **Example:** `Device# show ip bgp vpnv4 all neighbors 192.0.2.1 policy`	Displays neighbor policies per address-family.

Configuration Examples for BGP AS-Override Split-Horizon

Example: BGP AS-Override Split-Horizon Configuration

```
Device> enable
Device# configure terminal
Device(config)# router bgp 21
Device(config-router)# address-family ipv4 vrf vrf1
Device(config-router-af)# neighbor 192.0.2.1 remote-as 1
Device(config-router-af)# neighbor 192.0.2.1 activate
Device(config-router-af)# neighbor 192.0.2.1 as-override split-horizon
Device(config-router-af)# neighbor 198.51.100.1 remote-as 1
Device(config-router-af)# neighbor 198.51.100.1 activate
Device(config-router-af)# neighbor 198.51.100.1 as-override split-horizon
Device(config-router-af)# end
```

Example: Verifying BGP AS-Override Split-Horizon

Sample output for the show ip bgp vpn4 all update-group command

To display information about update groups, use the **show ip bgp vpn4 all update-group** command in privileged EXEC mode.

```
Device> enable
Device# show ip bgp vpn4 all update-group
BGP version 4 update-group 3, external, Address Family: VPNv4 Unicast
  BGP Update version : 5/0, messages 0 active RGs: 2 <<<<<<<<<<<<<<
  Overrides the neighbor AS 1 with my AS before sending updates
  Topology: blue, highest version: 5, tail marker: 5
  Format state: Current working (OK, last not in list)
                Refresh blocked (not in list, last not in list)
  Update messages formatted 1, replicated 2, current 0, refresh 0, limit 1000
  Number of NLRIs in the update sent: max 4, min 0
```

```
  Minimum time between advertisement runs is 0 seconds
  Has 2 members:
   192.0.2.1         198.51.100.1
```

Sample output for the show ip bgp vpnv4 all neighbors *ip-address* command

To display details about neighbor connections, use the **show ip bgp vpnv4 all neighbors** *ip-address* command in privileged EXEC mode.

```
Device> enable
Device# show ip bgp vpnv4 all neighbors 209.165.200.228
BGP neighbor is 209.165.200.228,  vrf vrf1,  remote AS 1, external link
  BGP version 4, remote router ID 209.165.201.28
  BGP state = Established, up for 00:01:26
  Last read 00:00:35, last write 00:00:28, hold time is 180, keepalive interval is 60 seconds

  Neighbor sessions:
    1 active, is not multisession capable (disabled)
  Neighbor capabilities:
    Route refresh: advertised and received(new)
    Four-octets ASN Capability: advertised and received
    Address family IPv4 Unicast: advertised and received
    Enhanced Refresh Capability: advertised and received
    Multisession Capability:
    Stateful switchover support enabled: NO for session 1
  Message statistics:
    InQ depth is 0
    OutQ depth is 0

                         Sent       Rcvd
    Opens:                  1          1
    Notifications:          0          0
    Updates:                6          2
    Keepalives:             3          3
    Route Refresh:          0          0
    Total:                 12          6
  Default minimum time between advertisement runs is 0 seconds

 For address family: VPNv4 Unicast
  Translates address family IPv4 Unicast for VRF vrf1
  Session: 209.165.200.228
  BGP table version 40, neighbor version 40/0
  Output queue size : 0
  Index 1, Advertise bit 1
  1 update-group member
  Overrides the neighbor AS with my AS before sending updates
  Split horizon processing before sending updates
  Slow-peer detection is disabled
  Slow-peer split-update-group dynamic is disabled
                               Sent       Rcvd
  Prefix activity:             ----       ----
    Prefixes Current:            10          2 (Consumes 160 bytes)
    Prefixes Total:              10          2
    Implicit Withdraw:            0          0
    Explicit Withdraw:            0          0
    Used as bestpath:           n/a          2
    Used as multipath:          n/a          0
Outbound    Inbound
  Local Policy Denied Prefixes:    --------    -------
    Total:                                0          0
  Number of NLRIs in the update sent: max 5, min 0
  Last detected as dynamic slow peer: never
  Dynamic slow peer recovered: never
  Refresh Epoch: 1
```

```
  Last Sent Refresh Start-of-rib: 00:01:26
  Last Sent Refresh End-of-rib: 00:01:26
  Refresh-Out took 0 seconds
  Last Received Refresh Start-of-rib: never
  Last Received Refresh End-of-rib: never
                                    Sent       Rcvd
        Refresh activity:           ----       ----
          Refresh Start-of-RIB       1          0
          Refresh End-of-RIB         1          0

  Address tracking is enabled, the RIB does have a route to 209.165.200.228
  Connections established 3; dropped 2
  Last reset 00:01:35, due to split-horizon config change of session 1
  Transport(tcp) path-mtu-discovery is enabled
  Graceful-Restart is disabled
Connection state is ESTAB, I/O status: 1, unread input bytes: 0
Connection is ECN Disabled
Mininum incoming TTL 0, Outgoing TTL 1
Local host: 209.165.200.225, Local port: 22789
Foreign host: 209.165.200.228, Foreign port: 179
Connection tableid (VRF): 2
```

Sample output for the show ip bgp vpnv4 all neighbors *ip-address* policy command

To display neighbor policies per address-family, use the **show ip bgp vpnv4 all neighbors** *ip-address* **policy** command in privileged EXEC mode.

```
Device> enable
Device# show ip bgp vpnv4 all neighbors 209.165.200.228
Neighbor: 209.165.200.228, Address-Family: VPNv4 Unicast (vrf1)
 Locally configured policies:
  as-override split-horizon
```

Additional References for BGP AS-Override Split-Horizon

Related Documents

Related Topic	Document Title
Cisco IOS commands	*Cisco IOS Master Command List, All Releases*

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

Feature Information for BGP AS-Override Split-Horizon

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. An account on Cisco.com is not required.

Table 1: Feature Information for BGP AS-Override Split-Horizon

Feature Name	Releases	Feature Information
BGP AS-Override Split-Horizon	15.5(2)T	The BGP AS-Override Split-Horizon feature enables a Provider Edge (PE) device using split-horizon to avoid advertisement of routes propagated by a Customer Edge (CE) device to the same CE device. The BGP AS-Override Split-Horizon feature also enables a PE or CE device to send route updates to specific PE or CE device in the same replication group. The following command was introduced or modified: **neighbor** *ip-address* **as-override split-horizon**.