BGP—Support for iBGP Local-AS

Prior to the BGP—Support for iBGP Local-AS feature, the **neighbor local-as** command was used on a BGP speaker to change the AS negotiated for an eBGP neighbor and to modify the AS_PATH sent and/or received. The **neighbor local-as** command can now be used to do the same on an iBGP session. AS negotiation creates an iBGP session and we enable sending iBGP attributes (LOCAL_PREF, ORIGINATOR_ID, and CLUSTER_LIST) over it, and accept this attributes when received from this session. This functionality is useful when merging two autonomous systems into one.

Restrictions for Support for iBGP Local-AS

- This feature is not supported for a peer that belongs to a confederation.

- Nonlocal-AS iBGP neighbors that are in a single AS are put into a separate update group from iBGP neighbors that are configured with the iBGP Local-AS feature.

- Two iBGP neighbors that are in two different autonomous systems and that are configured as iBGP Local-AS neighbors are put into separate update groups.

Information About Support for iBGP Local-AS

Support for iBGP Local-AS

Prior to the Support for iBGP Local-AS feature, when a peer (or peer group) was configured with the **neighbor local-as** command and the **neighbor remote-as** command that specified the same AS number, the session would be negotiated as an iBGP session (this happens when the advertised ASes in both OPEN messages are the same). However, updates were propagated as in an eBGP session (LOCAL_PREF, ORIGINATOR_ID and CLUSTER_LIST were not propagated), and could cause errors if they were received via this session. Thus, iBGP local-AS was not fully supported.

The Support for iBGP Local-AS feature means all those iBGP attributes are propogated. Additionally, as in any iBGP session, the AS is not prepended in AS_PATH attribute when advertising routes to an iBGP local-as session.

The figure below illustrates a scenario where this feature is being used to facilitate the merging of two autonomous systems. The route reflector R3 and R4 belong to AS 1000; R1 and R6 belong to AS 3000. The RR is configured with **neighbor local-as 3000** and **neighbor remote-as 3000** commands. Even though the routers belong to two different autonomous systems, attributes like the LOCAL_PREF are preserved in the updates from R6 to R4 and R6 to R1 (as show in the figure), and also in the updates from R4 to R1 and R4 to R6 (not shown in the figure).

Figure 1: Support for iBGP Local-AS to Preserve iBGP Policies Between Two Autonomous Systems
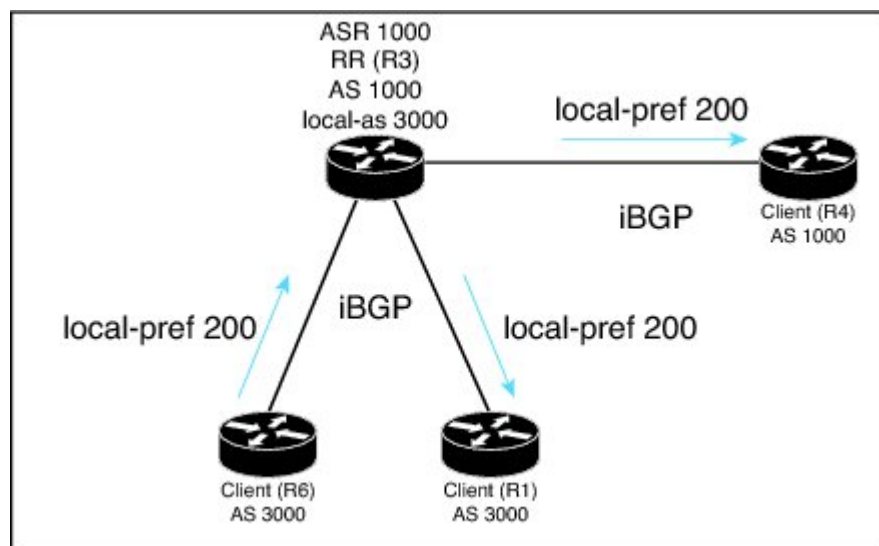
Benefits of iBGP Local-AS

This feature is used when merging two ISPs that have different autonomous system numbers. It is desirable to preserve attributes that are considered internal (LOCAL_PREF, ORIGINATOR_ID, and CLUSTER_LIST) in the routes that are being propogated to other autonomous system.

How to Configure iBGP Local-AS

Configuring iBGP Local-AS

Configure the iBGP Local-AS feature on a BGP speaker for a given neighbor when you want that session to behave as a full iBGP session. This configuration is typically performed on a route reflector, but not exclusively on it. In a route reflector you can optionally configure changing iBGP attributes sent to a neighbor via the command **allow-policy** (this command is not exclusive for this feature and can be used on any RR).

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 unicast-routing**
4. **router bgp** *autonomous-system-number*
5. **neighbor** *peer-group-name* **peer-group**
6. **neighbor** {*ip-address* | *ipv6-address*} **peer-group** *peer-group-name*
7. **neighbor** {*ip-address* | *ipv6-address* | *peer-group*} **remote-as** *as-number*
8. **neighbor** {*ip-address* | *ipv6-address* | *peer-group*} **local-as** *as-number*
9. **neighbor** {*ip-address* | *ipv6-address* | *peer-group*} **route-reflector-client**
10. **address-family vpnv4**
11. **neighbor** {*ip-address* | *ipv6-address* | *peer-group*} **allow-policy**
12. **exit**
13. **address-family vpnv6**
14. **neighbor** {*ip-address* | *ipv6-address* | *peer-group*} **allow-policy**
15. **end**
16. **show ip bgp vpnv4 all neighbors** {*ip-address* | *ipv6-address*} **policy**
17. **show ip bgp vpnv4 all update-group** *update-group*
18. **show ip bgp vpnv4 all neighbors** {*ip-address* | *ipv6-address*}

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	**ipv6 unicast-routing** **Example:** `Device(config)# ipv6 unicast-routing`	Enables the forwarding of IPv6 unicast datagrams.

	Command or Action	Purpose
Step 4	**router bgp** *autonomous-system-number* **Example:** Device(config)# router bgp 1000	Enters router configuration mode to create or configure a BGP routing process.
Step 5	**neighbor** *peer-group-name* **peer-group** **Example:** Device(config-router)# neighbor rr-client-ab peer-group	(Optional) Identifies a peer group.
Step 6	**neighbor** {*ip-address*	*ipv6-address*} **peer-group** *peer-group-name* **Example:** Device(config-router)# neighbor 192.168.3.3 peer-group rr-client-ab	(Optional) Configures a BGP neighbor to be a member of a peer group.
Step 7	**neighbor** {*ip-address*	*ipv6-address*	*peer-group*} **remote-as** *as-number* **Example:** Device(config-router)# neighbor rr-client-ab remote-as 3000	Identifies the AS of the neighbor or peer group.
Step 8	**neighbor** {*ip-address*	*ipv6-address*	*peer-group*} **local-as** *as-number* **Example:** Device(config-router)# neighbor rr-client-ab local-as 3000	Configures the local-AS feature for the neighbor or peer group.
Step 9	**neighbor** {*ip-address*	*ipv6-address*	*peer-group*} **route-reflector-client** **Example:** Device(config-router)# neighbor rr-client-ab route-reflector-client	Configures the local device to be a route reflector and configures the neighbor or peer group to be its client.
Step 10	**address-family vpnv4** **Example:** Device(config-router)# address-family vpnv4	(Optional) Places the router in VPNv4 address family configuration mode.
Step 11	**neighbor** {*ip-address*	*ipv6-address*	*peer-group*} **allow-policy** **Example:** Device(config-router-af)# neighbor rr-client-ab allow-policy	(Optional) Allows the RR to be configured to change iBGP attributes for the specified neighbor or peer group.
Step 12	**exit** **Example:** Device(config-router-af)# exit	Exits address family configuration mode and enters router configuration mode.

	Command or Action	Purpose
Step 13	**address-family vpnv6** **Example:** Device(config-router)# address-family vpnv6	(Optional) Places the router in VPNv6 address family configuration mode.
Step 14	**neighbor** {*ip-address* | *ipv6-address* | *peer-group*} **allow-policy** **Example:** Device(config-router-af)# neighbor rr-client-ab allow-policy	(Optional) Allows the RR to be configured to change iBGP attributes for the specified neighbor or peer group.
Step 15	**end** **Example:** Device(config-router-af)# end	Exits address family configuration mode, and enters privileged EXEC mode.
Step 16	**show ip bgp vpnv4 all neighbors** {*ip-address* | *ipv6-address*} **policy** **Example:** Device# show ip bgp vpnv4 all neighbors 192.168.3.3 policy	(Optional) Displays the locally configured policies of the neighbor. • The output includes the phrase "allow-policy" if the **neighbor allow-policy** command was configured for that neighbor.
Step 17	**show ip bgp vpnv4 all update-group** *update-group* **Example:** Device# show ip bgp vpnv4 all update-group 2	(Optional) Displays the information for the update group. • The output includes the phrase "Allow-policy" if the **neighbor allow-policy** command was configured for neighbors in the update group.
Step 18	**show ip bgp vpnv4 all neighbors** {*ip-address* | *ipv6-address*} **Example:** Device# show ip bgp vpnv4 all neighbors 192.168.3.3	(Optional) Displays information about the neighbor. • The output includes the remote AS and local AS, which will indicate the same AS number when the Support for iBGP Local-AS feature is configured.

Configuration Examples for iBGP Local-AS

Example: Configuring iBGP Local-AS

The example configures a route reflector (RR) in AS 4000 to treat BGP sessions with the peer group rr-client-2 in AS 2500 as iBGP sessions. That is, iBGP attributes (LOCAL_PREF, ORIGINATOR_ID, and CLUSTER_LIST) will not be dropped from routes in advertisements to and from the neighbors belonging to the peer group; the attributes will be passed unmodified. AS 2500 will not be prepended to the AS_PATH attribute in routes to or from the peer group.

Additionally, the **neighbor allow-policy** command configures that the network administrator can configure iBGP policies on the RR. That is, an outbound route map can be configured to change attributes that are sent to the downstream peers. In this example, the command is applied to VPNv4 and VPNv6 address families.

```
router bgp 4000
 neighbor rr-client-2 peer-group
 neighbor 192.168.1.1 peer-group rr-client-2
 neighbor 192.168.4.1 peer-group rr-client-2
 neighbor rr-client-2 remote-as 2500
 neighbor rr-client-2 local-as 2500
 neighbor rr-client-2 route-reflector-client
 address-family vpnv4
  neighbor rr-client-2 allow-policy
!
 address-family vpnv6
  neighbor rr-client-2 allow-policy
```

Additional References for Support for iBGP Local-AS

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
BGP commands	Cisco IOS IP Routing: BGP Command Reference
Migration of autonomous systems	"BGP Support for Dual AS Configuration for Network AS Migrations" module in the *IP Routing: BGP Configuration Guide, Cisco IOS XE Release 3S*

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—Support for iBGP Local-AS

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—Support for iBGP Local-AS

Feature Name	Releases	Feature Information
BGP—Support for iBGP Local-AS		Prior to the BGP—Support for Local-AS feature, the **neighbor local-as** command was used on a route reflector to customize AS_PATH attributes for routes received from an eBGP neighbor. The **neighbor local-as** command can now be used to enable the sending of the iBGP attributes (LOCAL_PREF, ORIGINATOR_ID, CLUSTER_ID, and CLUSTER_LIST) over an iBGP local-AS session. This functionality is useful when merging two autonomous systems, when it is advantageous to keep the iBGP attributes in routes. Prior to the BGP—Support for iBGP Local-AS feature, the RR should not have been configured to change iBGP attributes. With the introduction of this feature, the RR can be configured to change iBGP attributes, providing more flexibility. The following command was introduced: • **neighbor allow-policy** The following commands were modified: • **neighbor local-as** • **show ip bgp vpnv4**