BGP per Neighbor SoO Configuration

First Published: November 17, 2006
Last Updated: February 28, 2007

The BGP per Neighbor SoO Configuration feature simplifies the configuration of the site-of-origin (SoO) value. In Cisco IOS Release 12.4(9)T, 12.2(33)SRA, and previous releases, the SoO value is configured using an inbound route map that sets the SoO value during the update process. Per neighbor SoO configuration introduces two new commands that can be used under router configuration mode to set the SoO value.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the "Feature Information for BGP per Neighbor SoO Configuration" section on page 22.

Finding Support Information for Platforms and Cisco IOS and Catalyst OS Software Images

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

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Americas Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Prerequisites for BGP per Neighbor SoO Configuration

This feature assumes that a Border Gateway Protocol (BGP) network is configured and that Cisco Express Forwarding (CEF) is enabled in your network.

Restrictions for BGP per Neighbor SoO Configuration

A BGP neighbor or peer policy template-based SoO configuration takes precedence over the SoO value configured in an inbound route map.

Information About Configuring BGP per Neighbor SoO

Before configuring SoO values for BGP neighbors, you should understand the following concepts:

Site of Origin BGP Community Attribute

The site-of-origin (SoO) extended community is a BGP extended community attribute that is used to identify routes that have originated from a site so that the readvertisement of that prefix back to the source site can be prevented. The SoO extended community uniquely identifies the site from which a router has learned a route. BGP can use the SoO value associated with a route to prevent routing loops.

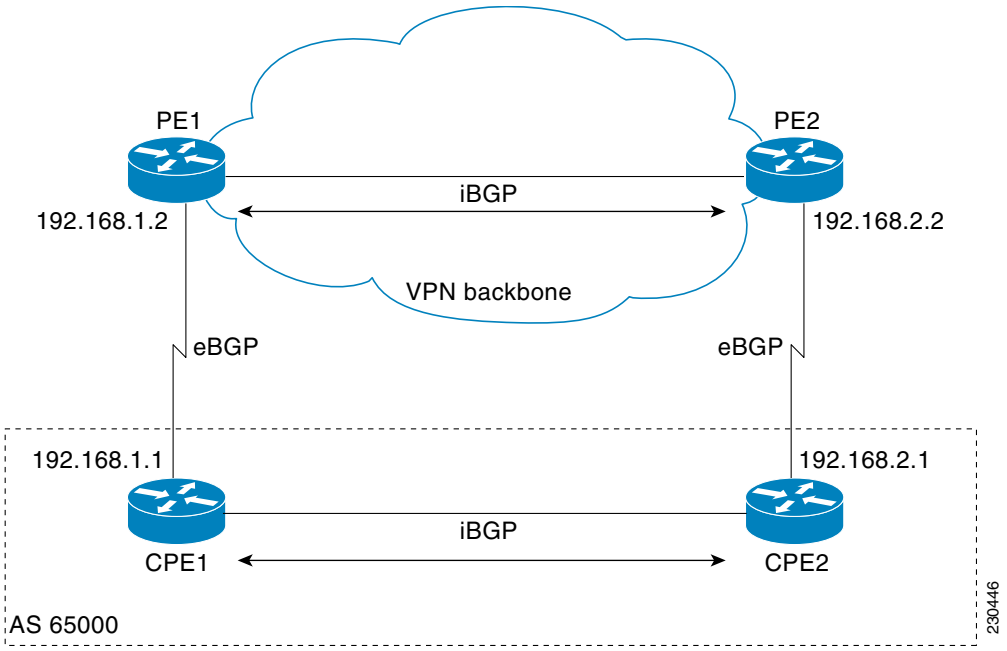
BGP per Neighbor Site of Origin Configuration

There are three ways to configure an SoO value for a BGP neighbor:

- BGP peer policy template—A peer policy template is created, and an SoO value is configured as part of the peer policy. Under address family IPv4 VRF, a neighbor is identified and is configured to inherit the peer policy that contains the SoO value.
- BGP **neighbor** command—Under address family IPv4 VRF, a neighbor is identified, and an SoO value is configured for the neighbor.
- BGP peer group—Under address family IPv4 VRF, a BGP peer group is configured, an SoO value is configured for the peer group, a neighbor is identified, and the neighbor is configured as a member of the peer group.

The configuration of SoO values for BGP neighbors is performed on a provider edge (PE) router, which is the VPN entry point. When SoO is enabled, the PE router forwards prefixes to the customer premises equipment (CPE) only when the SoO tag of the prefix does not match the SoO tag configured for the CPE. For example, in Figure 1, an SoO tag is set as 65000:1 for the customer site that includes routers CPE1 and CPE2 with an autonomous system number of 65000. When CPE1 sends prefixes to PE1, PE1 tags the prefixes with 65000:1, which is the SoO tag for CPE1 and CPE2. When PE1 sends the tagged prefixes to PE2, PE2 performs a match against the SoO tag from CPE2. Any prefixes with the tag value of 65000:1 are not sent to CPE2 because the SoO tag matches the SoO tag of CPE2, and a routing loop is avoided.

Figure 1 Network Diagram for SoO Example



Benefits of BGP per Neighbor Site of Origin

In releases prior to Cisco IOS Release 12.4(11)T and 12.2(33)SRB, the SoO extended community attribute is configured using an inbound route map that sets the SoO value during the update process. The introduction of two new commands under address family IPv4 VRF configuration mode simplifies the SoO value configuration.

How to Configure BGP per Neighbor SoO

To configure an SoO value for a BGP neighbor, you must perform the first task in the following list and one of the next three tasks. The last three tasks are mutually exclusive; you need perform only one of them.

- Enabling CEF and Configuring VRF Instances, page 3
- Configuring a per Neighbor SoO Value Using a BGP Peer Policy Template, page 6
- Configuring a per Neighbor SoO Value Using a BGP neighbor Command, page 9
- Configuring a per Neighbor SoO Value Using a BGP Peer Group, page 11

Enabling CEF and Configuring VRF Instances

Perform this task on both of the PE routers in Figure 1 to configure Virtual Routing and Forwarding (VRF) instances to be used with the per-VRF assignment tasks. In this task, CEF is enabled, and a VRF instance named SOO_VRF is created. To make the VRF functional, a route distinguisher is created, and

the VRF is associated with an interface. When the route distinguisher is created, the routing and forwarding tables are created for the VRF instance named SOO_VRF. After associating the VRF with an interface, the interface is configured with an IP address.

Route Distinguisher

A router distinguisher (RD) creates routing and forwarding tables and specifies the default route distinguisher for a VPN. The RD is added to the beginning of an IPv4 prefix to change it into a globally unique VPN-IPv4 prefix. An RD can be composed in one of two ways: with an autonomous system number and an arbitrary number or with an IP address and an arbitrary number.

You can enter an RD in either of these formats:

- Enter a 16-bit autonomous system number, a colon, and a 32-bit number. For example:

  45000:3
- Enter a 32-bit IP address, a colon, and a 16-bit number. For example:

  192.168.10.15:1

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip cef**
4. **ip vrf** *vrf-name*
5. **rd** *route-distinguisher*
6. **route-target** {**import** | **both**} *route-target-ext-community*
7. **route-target** {**export** | **both**} *route-target-ext-community*
8. **exit**
9. **interface** *type number*
10. **ip vrf forwarding** *vrf-name* [**downstream** *vrf-name2*]
11. **ip address** *ip-address mask* [**secondary**]
12. **end**
13. **show ip vrf** [**brief** | **detail** | **interfaces** | **id**] [*vrf-name*] [*output-modifiers*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 3	**ip cef** **Example:** `Router(config)# ip cef`	Enables CEF on the route processor.
Step 4	**ip vrf** *vrf-name* **Example:** `Router(config)# ip vrf SOO_VRF`	Defines a VRF instance and enters VRF configuration mode.
Step 5	**rd** *route-distinguisher* **Example:** `Router(config-vrf)# rd 1:1`	Creates routing and forwarding tables for a VRF and specifies the default RD for a VPN. • Use the *route-distinguisher* argument to specify the default RD for a VPN. There are two formats you can use to specify an RD: – A 16-bit autonomous system number, a colon, and a 32-bit number, for example: 65000:3 – A 32-bit IP address, a colon, and a 16-bit number, for example: 192.168.1.2:51 • In this example, the RD uses an autonomous system number with the number 1 after the colon.
Step 6	**route-target** {**export** | **both**} *route-target-ext-community* **Example:** `Router(config-vrf)# route-target export 1:1`	Creates a route-target extended community for a VRF. • Use the **export** keyword to export routing information to the target VPN extended community. • Use the **both** keyword to both import routing information from, and export routing information to, the target VPN extended community. • Use the *route-target-ext-community* argument to specify the VPN extended community. **Note** Only the syntax applicable to this step is displayed. For a different use of this syntax, see Step 7.
Step 7	**route-target** {**import** | **both**} *route-target-ext-community* **Example:** `Router(config-vrf)# route-target import 1:1`	Creates a route-target extended community for a VRF. • Use the **import** keyword to import routing information from the target VPN extended community. • Use the **both** keyword to both import routing information from, and export routing information to, the target VPN extended community. • Use the *route-target-ext-community* argument to specify the VPN extended community.
Step 8	**exit** **Example:** `Router(config-vrf)# exit`	Exits VRF configuration mode and returns to global configuration mode.

	Command or Action	Purpose
Step 9	**interface** *type number* **Example:** `Router(config)# interface Ethernet 1/0`	Configures an interface type and enters interface configuration mode. • In this example, Ethernet interface 1/0 is configured.
Step 10	**ip vrf forwarding** *vrf-name* [**downstream** *vrf-name2*] **Example:** `Router(config-if)# ip vrf forwarding SOO_VRF`	Associates a VRF with an interface or subinterface. • In this example, the VRF named SOO_VRF is associated with Ethernet interface 1/0. **Note** Executing this command on an interface removes the IP address, so the IP address should be reconfigured.
Step 11	**ip address** *ip-address mask* [**secondary**] **Example:** `Router(config-if)# ip address 192.168.1.2 255.255.255.0`	Configures an IP address. • In this example, Ethernet interface 1/0 is configured with an IP address of 192.168.1.2.
Step 12	**end** **Example:** `Router(config-if)# end`	Exits interface configuration mode and returns to privileged EXEC mode.
Step 13	**show ip vrf** [**brief** | **detail** | **interfaces** | **id**] [*vrf-name*] [*output-modifiers*] **Example:** `Router# show ip vrf`	Displays the configured VRFs. • Use this command to verify the configuration of this task.

Examples

The following output of the **show ip vrf** command displays the VRF named SOO_VRF configured in this task.

```
Router# show ip vrf

Name                              Default RD            Interfaces
SOO_VRF                                1:1                  Eth1/0
```

Configuring a per Neighbor SoO Value Using a BGP Peer Policy Template

Perform this task on router PE1 in Figure 1 to configure an SoO value for a BGP neighbor at the router CPE1 in Figure 1 using a peer policy template. In this task, a peer policy template is created, and the SoO value is configured for the peer policy. Under address family IPv4 VRF, a neighbor is identified and is configured to inherit the peer policy that contains the SoO value.

Note If a BGP peer inherits from several peer policy templates that specify different SoO values, the SoO value in the last template applied takes precedence and is applied to the peer. However, direct configuration of the SoO value on the BGP neighbor overrides any inherited template configurations of the SoO value.

BGP Peer Policy Templates

Peer policy templates are used to configure BGP policy commands that are configured for neighbors that belong to specific address families. Peer policy templates are configured once and then applied to many neighbors through the direct application of a peer policy template or through inheritance from peer policy templates. The configuration of peer policy templates simplifies the configuration of BGP policy commands that are applied to all neighbors within an autonomous system.

Peer policy templates support inheritance. A directly applied peer policy template can directly or indirectly inherit configurations from up to seven peer policy templates. So, a total of eight peer policy templates can be applied to a neighbor or neighbor group.

The configuration of peer policy templates simplifies and improves the flexibility of BGP configuration. A specific policy can be configured once and referenced many times. Because a peer policy supports up to eight levels of inheritance, very specific and very complex BGP policies can be created.

For more details about BGP peer policy templates, see the "Configuring a Basic BGP Network" module.

Prerequisites

This task assumes that the task described in the "Enabling CEF and Configuring VRF Instances" section on page 3 has been performed.

Restrictions

A BGP peer cannot inherit from a peer policy or session template and be configured as a peer group member at the same. BGP templates and BGP peer groups are mutually exclusive.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *autonomous-system-number*
4. **template peer-policy** *policy-template-name*
5. **soo** *extended-community-value*
6. **exit-peer-policy**
7. **address-family ipv4** [**unicast** | **multicast** | **vrf** *vrf-name*]
8. **neighbor** *ip-address* **remote-as** *autonomous-system-number*
9. **neighbor** *ip-address* **activate**
10. **neighbor** *ip-address* **inherit peer-policy** *policy-template-name*
11. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**router bgp** *autonomous-system-number* **Example:** `Router(config)# router bgp 50000`	Enters router configuration mode for the specified routing process.
Step 4	**template peer-policy** *policy-template-name* **Example:** `Router(config-router)# template peer-policy SOO_POLICY`	Creates a peer policy template and enters policy-template configuration mode.
Step 5	**soo** *extended-community-value* **Example:** `Router(config-router-ptmp)# soo 65000:1`	Sets the SoO value for a BGP peer policy template. • Use the *extended-community-value* argument to specify the VPN extended community value. The value takes one of the following formats: – A 16-bit autonomous system number, a colon, and a 32-bit number, for example: 45000:3 – A 32-bit IP address, a colon, and a 16-bit number, for example: 192.168.10.2:51 • In this example, the SoO value is set at 65000:1.
Step 6	**exit-peer-policy** **Example:** `Router(config-router-pmtp)# exit-peer-policy`	Exits policy-template configuration mode and returns to router configuration mode.
Step 7	**address-family ipv4** [**unicast** | **multicast** | **vrf** *vrf-name*] **Example:** `Router(config-router)# address-family ipv4 vrf SOO_VRF`	Specifies the IPv4 address family and enters address family configuration mode. • Use the **unicast** keyword to specify the IPv4 unicast address family. By default, the router is placed in configuration mode for the IPv4 unicast address family if the **unicast** keyword is not specified with the **address-family ipv4** command. • Use the **multicast** keyword to specify IPv4 multicast address prefixes. • Use the **vrf** keyword and *vrf-name* argument to specify the name of the VRF instance to associate with subsequent IPv4 address family configuration mode commands.

	Command or Action	Purpose
Step 8	**neighbor** *ip-address* **remote-as** *autonomous-system-number* **Example:** `Router(config-router-af)# neighbor 192.168.1.1 remote-as 65000`	Adds the IP address of the neighbor in the specified autonomous system to the IPv4 multiprotocol BGP neighbor table of the local router.
Step 9	**neighbor** *ip-address* **activate** **Example:** `Router(config-router-af)# neighbor 192.168.1.1 activate`	Enables the neighbor to exchange prefixes for the IPv4 VRF address family with the local router.
Step 10	**neighbor** *ip-address* **inherit peer-policy** *policy-template-name* **Example:** `Router(config-router-af)# neighbor 192.168.1.1 inherit peer-policy SOO_POLICY`	Sends a peer policy template to a neighbor so that the neighbor can inherit the configuration. • In this example, the router is configured to send the peer policy template named SOO_POLICY to the 192.168.1.1 neighbor to inherit. If another peer policy template is indirectly inherited from SOO_POLICY, the indirectly inherited configuration will also be applied. Up to seven additional peer policy templates can be indirectly inherited from SOO_POLICY.
Step 11	**end** **Example:** `Router(config-router-af)# end`	Exits address family configuration mode and returns to privileged EXEC mode.

Configuring a per Neighbor SoO Value Using a BGP neighbor Command

Perform this task on router PE2 in Figure 1 to configure an SoO value for the BGP neighbor at router CPE2 in Figure 1 using a **neighbor** command. Under address family IPv4 VRF, a neighbor is identified, and an SoO value is configured for the neighbor.

Note Direct configuration of the SoO value on a BGP neighbor overrides any inherited peer policy template configurations of the SoO value.

Prerequisites

This task assumes that the task described in the "Enabling CEF and Configuring VRF Instances" section on page 3 has been performed with appropriate changes to interfaces and IP addresses.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *autonomous-system-number*
4. **address-family ipv4** [**unicast** | **multicast** | **vrf** *vrf-name*]

5. **neighbor** {*ip-address* | *peer-group-name*} **remote-as** *autonomous-system-number*
6. **neighbor** *ip-address* **activate**
7. **neighbor** {*ip-address* | *peer-group-name*} **soo** *extended-community-value*
8. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**router bgp** *autonomous-system-number* **Example:** `Router(config)# router bgp 50000`	Enters router configuration mode for the specified routing process.
Step 4	**address-family ipv4** [**unicast** | **multicast** | **vrf** *vrf-name*] **Example:** `Router(config-router)# address-family ipv4 vrf SOO_VRF`	Specifies the IPv4 address family and enters address family configuration mode. • Use the **unicast** keyword to specify the IPv4 unicast address family. By default, the router is placed in configuration mode for the IPv4 unicast address family if the **unicast** keyword is not specified with the **address-family ipv4** command. • Use the **multicast** keyword to specify IPv4 multicast address prefixes. • Use the **vrf** keyword and *vrf-name* argument to specify the name of the VRF instance to associate with subsequent IPv4 address family configuration mode commands.
Step 5	**neighbor** {*ip-address* | *peer-group-name*} **remote-as** *autonomous-system-number* **Example:** `Router(config-router-af)# neighbor 192.168.2.1 remote-as 65000`	Adds the IP address of the neighbor in the specified autonomous system to the IPv4 multiprotocol BGP neighbor table of the local router.

	Command or Action	Purpose
Step 6	**neighbor** *ip-address* **activate** **Example:** `Router(config-router-af)# neighbor 192.168.2.1 activate`	Enables the neighbor to exchange prefixes for the IPv4 VRF address family with the local router. • In this example, the external BGP peer at 192.168.2.1 is activated. **Note** If a peer group has been configured in Step 5, do not use this step because BGP peer groups are activated when any parameter is configured. For example, a BGP peer group is activated when an SoO value is configured using the **neighbor soo** command in Step 7.
Step 7	**neighbor** {*ip-address* | *peer-group-name*} **soo** *extended-community-value* **Example:** `Router(config-router-af)# neighbor 192.168.2.1 soo 65000:1`	Sets the site-of-origin (SoO) value for a BGP neighbor or peer group. • In this example, the neighbor at 192.168.2.1 is configured with an SoO value of 65000:1.
Step 8	**end** **Example:** `Router(config-router-af)# end`	Exits address family configuration mode and returns to privileged EXEC mode.

Configuring a per Neighbor SoO Value Using a BGP Peer Group

Perform this task on router PE1 in Figure 1 to configure an SoO value for the BGP neighbor at router CPE1 in Figure 1 using a **neighbor** command with a BGP peer group. Under address family IPv4 VRF, a BGP peer group is created and an SoO value is configured using a BGP **neighbor** command, and a neighbor is then identified and added as a peer group member. A BGP peer group member inherits the configuration associated with a peer group, which in this example, includes the SoO value.

Note Direct configuration of the SoO value on a BGP neighbor overrides any inherited peer group configurations of the SoO value.

Prerequisites

This task assumes that the task described in the "Enabling CEF and Configuring VRF Instances" section on page 3 has been performed.

Restrictions

A BGP peer cannot inherit from a peer policy or session template and be configured as a peer group member at the same. BGP templates and BGP peer groups are mutually exclusive.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *autonomous-system-number*
4. **address-family ipv4** [**unicast** | **multicast** | **vrf** *vrf-name*]
5. **neighbor** *peer-group-name* **peer-group**
6. **neighbor** {*ip-address* | *peer-group-name*} **soo** *extended-community-value*
7. **neighbor** *ip-address* **remote-as** *autonomous-system-number*
8. **neighbor** *ip-address* **activate**
9. **neighbor** *ip-address* **peer-group** *peer-group-name*
10. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**router bgp** *autonomous-system-number* **Example:** `Router(config)# router bgp 50000`	Enters router configuration mode for the specified routing process.
Step 4	**address-family ipv4** [**unicast** | **multicast** | **vrf** *vrf-name*] **Example:** `Router(config-router)# address-family ipv4 vrf SOO_VRF`	Specifies the IPv4 address family and enters address family configuration mode. • Use the **unicast** keyword to specify the IPv4 unicast address family. By default, the router is placed in configuration mode for the IPv4 unicast address family if the **unicast** keyword is not specified with the **address-family ipv4** command. • Use the **multicast** keyword to specify IPv4 multicast address prefixes. • Use the **vrf** keyword and *vrf-name* argument to specify the name of the VRF instance to associate with subsequent IPv4 address family configuration mode commands.

	Command or Action	Purpose
Step 5	**neighbor** *peer-group-name* **peer-group** **Example:** `Router(config-router-af)# neighbor SOO_group peer-group`	Creates a BGP peer group.
Step 6	**neighbor** {*ip-address* | *peer-group-name*} **soo** *extended-community-value* **Example:** `Router(config-router-af)# neighbor SOO_group soo 65000:1`	Sets the site-of-origin (SoO) value for a BGP neighbor or peer group. • In this example, the BGP peer group, SOO_group, is configured with an SoO value of 65000:1.
Step 7	**neighbor** *ip-address* **remote-as** *autonomous-system-number* **Example:** `Router(config-router-af)# neighbor 192.168.1.1 remote-as 65000`	Adds the IP address of the neighbor in the specified autonomous system to the IPv4 multiprotocol BGP neighbor table of the local router.
Step 8	**neighbor** *ip-address* **activate** **Example:** `Router(config-router-af)# neighbor 192.168.1.1 activate`	Enables the neighbor to exchange prefixes for the IPv4 VRF address family with the local router.
Step 9	**neighbor** *ip-address* **peer-group** *peer-group-name* **Example:** `Router(config-router-af)# neighbor 192.168.1.1 peer-group SOO_group`	Assigns the IP address of a BGP neighbor to a peer group.
Step 10	**end** **Example:** `Router(config-router-af)# end`	Exits address family configuration mode and returns to privileged EXEC mode.

Configuration Examples for BGP per Neighbor SoO Configuration

This section contains the following configuration examples:

Configuring a per Neighbor SoO Value Using a BGP Peer Policy Template: Example

The following example shows how to create a peer policy template and configure an SoO value as part of the peer policy. After enabling CEF and configuring a VRF instance named SOO_VRF, a peer policy template is created and an SoO value is configured as part of the peer policy. Under address family IPv4 VRF, a neighbor is identified and configured to inherit the peer policy that contains the SoO value.

```
ip cef
ip vrf SOO_VRF
 rd 1:1
 route-target export 1:1
 route-target import 1:1
 exit
interface Ethernet 1/0
 ip vrf forwarding SOO_VRF
 ip address 192.168.1.2 255.255.255.0
 exit
router bgp 50000
 template peer-policy SOO_POLICY
 soo 65000:1
 exit-peer-policy
 address-family ipv4 vrf SOO_VRF
 neighbor 192.168.1.1 remote-as 65000
 neighbor 192.168.1.1 activate
 neighbor 192.168.1.1 inherit peer-policy SOO_POLICY
 end
```

Configuring a per Neighbor SoO Value Using a BGP neighbor Command: Example

The following example shows how to configure an SoO value for a BGP neighbor. After enabling CEF and configuring a VRF instance named SOO_VRF, a neighbor is identified under address family IPv4 VRF and an SoO value is configured for the neighbor.

```
ip cef
ip vrf SOO_VRF
 rd 1:1
 route-target export 1:1
 route-target import 1:1
 exit
interface Ethernet 1/0
 ip vrf forwarding SOO_VRF
 ip address 192.168.2.2 255.255.255.0
 exit
router bgp 50000
 address-family ipv4 vrf SOO_VRF
 neighbor 192.168.2.1 remote-as 65000
 neighbor 192.168.2.1 activate
 neighbor 192.168.2.1 soo 65000:1
 end
```

Configuring a per Neighbor SoO Value Using a BGP Peer Group: Example

The following example shows how to configure an SoO value for a BGP peer group. After enabling CEF and configuring a VRF instance named SOO_VRF, a BGP peer group is configured under address family IPv4 VRF, an SoO value is configured for the peer group, a neighbor is identified, and the neighbor is configured as a member of the peer group.

```
ip cef
ip vrf SOO_VRF
 rd 1:1
 route-target export 1:1
 route-target import 1:1
 exit
interface Ethernet 1/0
 ip vrf forwarding SOO_VRF
 ip address 192.168.1.2 255.255.255.0
 exit
router bgp 50000
 address-family ipv4 vrf SOO_VRF
 neighbor SOO_GROUP peer-group
 neighbor SOO_GROUP soo 65000:65
 neighbor 192.168.1.1 remote-as 65000
 neighbor 192.168.1.1 activate
 neighbor 192.168.1.1 peer-group SOO_GROUP
 end
```

Where to Go Next

- To read an overview of BGP, proceed to the "Cisco BGP Overview" chapter of the *Cisco IOS IP Routing Protocols Configuration Guide*, Release 12.4.
- To perform basic BGP feature tasks, proceed to the "Configuring a Basic BGP Network" chapter of the *Cisco IOS BGP Configuration Guide*, Release 12.4T.
- To perform advanced BGP feature tasks, proceed to the "Configuring Advanced BGP Features" chapter of the *Cisco IOS BGP Configuration Guide*, Release 12.4T.
- To configure BGP neighbor session options, proceed to the "Configuring BGP Neighbor Session Options" chapter of the *Cisco IOS BGP Configuration Guide*, Release 12.4T.
- To perform internal BGP tasks, proceed to the "Configuring Internal BGP Features" chapter of the *Cisco IOS IP Routing Protocols Configuration Guide*, Release 12.4.

Additional References

The following sections provide references related to the BGP support for per neighbor SoO configuration feature.

Related Documents

Related Topic	Document Title
BGP commands: complete command syntax, command mode, defaults, command history, usage guidelines, and examples	• *Cisco IOS IP Routing Protocols Command Reference*,

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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register on Cisco.com.	http://www.cisco.com/techsupport

Command Reference

This section documents only commands that are new or modified.

- **neighbor soo**
- **soo**

neighbor soo

To set the site-of-origin (SoO) value for a Border Gateway Protocol (BGP) neighbor or peer group, use the **neighbor soo** command in address family IPv4 VRF configuration mode. To remove the SoO value for a BGP neighbor or peer group, use the **no** form of this command.

neighbor {*ip-address* | *peer-group-name*} **soo** *extended-community-value*

no neighbor {*ip-address* | *peer-group-name*} **soo**

Syntax Description

ip-address	IP address of a neighboring router.
peer-group-name	Name of a BGP peer group.
extended-community-value	Specifies the VPN extended community value. The value takes one of the following formats: • A 16-bit autonomous system number, a colon, and a 32-bit number, for example: 45000:3 • A 32-bit IP address, a colon, and a 16-bit number, for example: 192.168.10.2:51

Command Default

No SoO value is set for a BGP neighbor or peer group.

Command Modes

Address family IPv4 VRF configuration

Command History

Release	Modification
12.4(11)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.

Usage Guidelines

Use this command to set the SoO value for a BGP neighbor. The SoO value is set under address family IPv4 VRF configuration mode either directly for a neighbor or for a BGP peer group.

The SoO extended community is a BGP extended community attribute that is used to identify routes that have originated from a site so that the readvertisement of that prefix back to the source site can be prevented. The SoO extended community uniquely identifies the site from which a router has learned a route. BGP can use the SoO value associated with a route to prevent routing loops.

In releases prior to Cisco IOS Release 12.4(11)T and 12.2(33)SRB, the SoO extended community attribute is configured using an inbound route map that sets the SoO value during the update process. The introduction of the **neighbor soo** and **soo** commands simplifies the SoO value configuration.

Note A BGP neighbor or peer policy template-based SoO configuration takes precedence over an SoO value configured in an inbound route map.

Examples

The following example shows how to configure an SoO value for a BGP neighbor. Under address family IPv4 VRF, a neighbor is identified and an SoO value is configured for the neighbor.

```
router bgp 45000
 address-family ipv4 vrf VRF_SOO
 neighbor 192.168.1.2 remote-as 40000
 neighbor 192.168.1.2 activate
 neighbor 192.168.1.2 soo 45000:40
 end
```

The following example shows how to configure an SoO value for a BGP peer group. Under address family IPv4 VRF, a BGP peer group is configured, an SoO value is configured for the peer group, a neighbor is identified, and the neighbor is configured as a member of the peer group.

```
router bgp 45000
 address-family ipv4 vrf VRF_SOO
 neighbor SOO_GROUP peer-group
 neighbor SOO_GROUP soo 45000:65
 neighbor 192.168.1.2 remote-as 40000
 neighbor 192.168.1.2 activate
 neighbor 192.168.1.2 peer-group SOO_GROUP
 end
```

Related Commands

Command	Description
address-family ipv4 (BGP)	Enters address family configuration mode to configure a routing session using standard IP Version 4 address prefixes.
soo	Sets the SoO value for a BGP peer policy template.

soo

To set the site-of-origin (SoO) value for a Border Gateway Protocol (BGP) peer policy template, use the **soo** command in policy-template configuration mode. To remove the SoO value, use the **no** form of this command.

soo *extended-community-value*

no soo

Syntax Description

extended-community-value	Specifies the VPN extended community value. The value takes one of the following formats: • A 16-bit autonomous system number, a colon, and a 32-bit number, for example: 45000:3 • A 32-bit IP address, a colon, and a 16-bit number, for example: 192.168.10.2:51

Command Default

No SoO value is set for a BGP peer policy template.

Command Modes

Policy-template configuration

Command History

Release	Modification
12.4(11)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.

Usage Guidelines

Use this command to set the SoO value for a BGP peer policy template that a BGP neighbor can inherit. The SoO value is set for a peer policy template, and a BGP neighbor is identified under address family IPv4 VRF configuration mode to inherit the peer policy that contains the SoO value.

The SoO extended community is a BGP extended community attribute that is used to identify routes that have originated from a site so that the readvertisement of that prefix back to the source site can be prevented. The SoO extended community uniquely identifies the site from which a router has learned a route. BGP can use the SoO value associated with a route to prevent routing loops.

In releases prior to Cisco IOS Release 12.4(11)T and 12.2(33)SRB, the SoO extended community attribute is configured using an inbound route map that sets the SoO value during the update process. The introduction of the **neighbor soo** and **soo** commands simplifies the SoO value configuration.

Note If a BGP peer inherits from several peer policy templates that specify different SoO values, the SoO value in the last template applied takes precedence and is applied to the peer. However, direct configuration of the SoO value on the BGP neighbor overrides any inherited template configurations of the SoO value.

Examples

The following example shows how to create a peer policy template and configure an SoO value as part of the peer policy. Under address family IPv4 VRF, a neighbor is identified and configured to inherit the peer policy that contains the SoO value.

```
router bgp 45000
 template peer-policy SOO_POLICY
 soo 45000:3
 exit-peer-policy
 address-family ipv4 vrf SOO_VRF
 neighbor 192.168.3.2 remote-as 50000
 neighbor 192.168.3.2 activate
 neighbor 192.168.3.2 inherit peer-policy SOO_POLICY
 end
```

Related Commands

Command	Description
address-family ipv4 (BGP)	Enters address family configuration mode to configure a routing session using standard IP Version 4 address prefixes.
neighbor soo	Sets the SoO value for a BGP neighbor or peer group.
template peer-policy	Creates a peer policy template and enters policy-template configuration mode.

Feature Information for BGP per Neighbor SoO Configuration

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 1 Feature Information for BGP per Neighbor SoO Configuration

Feature Name	Releases	Feature Information
BGP per Neighbor SoO Configuration	12.4(11)T 12.2(33)SRB	The BGP per neighbor SOO configuration feature simplifies the configuration of the site-of-origin (SoO) parameter. In Cisco IOS Release 12.4(9)T, 12.2(33)SRA, and previous releases, the SoO parameter is configured using an inbound route map that sets the SoO value during the update process. The per neighbor SoO configuration introduces two new commands that can be used under router configuration mode to set the SoO value. The following commands were introduced by this feature: **neighbor soo**, **soo**.