



BGP Commands_ A through B

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address-family ipv4 (BGP)

To enter address family or router scope address family configuration mode to configure a routing session using standard IP Version 4 (IPv4) address prefixes, use the **address-family ipv4** command in router configuration or router scope configuration mode. To exit address family configuration mode and remove the IPv4 address family configuration from the running configuration, use the **no** form of this command.

Syntax Available Under Router Configuration Mode

address-family ipv4 [**mdt** | **tunnel** | {**multicast** | **unicast**} [**vrf vrf-name**] | **vrf vrf-name**]

no address-family ipv4 [**mdt** | **tunnel** | {**multicast** | **unicast**} [**vrf vrf-name**] | **vrf vrf-name**]

Syntax Available Under Router Scope Configuration Mode

address-family ipv4 [**mdt** | **multicast** | **unicast**]

no address-family ipv4 [**mdt** | **multicast** | **unicast**]

Syntax Description

mdt	(Optional) Specifies an IPv4 multicast distribution tree (MDT) address family session.
tunnel	(Optional) Specifies an IPv4 routing session for multipoint tunneling.
multicast	(Optional) Specifies IPv4 multicast address prefixes.
unicast	(Optional) Specifies IPv4 unicast address prefixes. This is the default.
vrf vrf-name	(Optional) Specifies the name of the VPN routing and forwarding (VRF) instance to associate with subsequent IPv4 address family configuration mode commands.

Command Default

IPv4 address prefixes are not enabled.

Command Modes

Router configuration (config-router)

Router scope configuration (config-router-scope)

Command History

Release	Modification
12.0(5)T	This command was introduced. This command replaced the match nlri and set nlri commands.

Release	Modification
12.0(28)S	This command was modified. The tunnel keyword was added.
12.0(29)S	This command was modified. The mdt keyword was added.
12.0(30)S	This command was modified. Support for the Cisco 12000 series Internet router was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SRB	This command was modified. Support for router scope configuration mode was added. The tunnel keyword was deprecated.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
12.2(33)SB	This command was integrated into Cisco IOS Release 12.2(33)SB.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Aggregation Services Routers.
12.4(20)T	This command was modified. The mdt keyword was added. The tunnel keyword was deprecated.
Cisco IOS XE Release 3.6S	This command was modified. VRF-based multicast support was added.
15.2(4)S	This command was implemented on the Cisco 7200 series router.
15.1(2)SNG	This command was implemented on the Cisco ASR 901 Series Aggregation Services Routers.

Usage Guidelines

The **address-family ipv4** command replaces the **match nlri** and **set nlri** commands. The **address-family ipv4** command places the device in address family configuration mode (prompt: config-router-af), from which you can configure routing sessions that use standard IPv4 address prefixes. To leave address family configuration mode and return to router configuration mode, type **exit**.



Note

Routing information for address family IPv4 is advertised by default for each Border Gateway Protocol (BGP) routing session configured with the **neighbor remote-as** command unless you enter the **no bgp default ipv4-unicast** command before configuring the **neighbor remote-as** command.

The **tunnel** keyword is used to enable the tunnel subaddress family identifier (SAFI) under the IPv4 address family identifier. This SAFI is used to advertise the tunnel endpoints and the SAFI-specific attributes (which contain the tunnel type and tunnel capabilities). Redistribution of tunnel endpoints into the BGP IPv4 tunnel SAFI table occurs automatically when the tunnel address family is configured. However, peers need to be activated under the tunnel address family before the sessions can exchange tunnel information.

The **mdt** keyword is used to enable the MDT SAFI under the IPv4 address family identifier. This SAFI is used to advertise tunnel endpoints for inter-AS multicast VPN peering sessions.

If you specify the **address-family ipv4 multicast** command, you will then specify the **network network-number [mask network-mask]** command. The **network** command advertises (injects) the specified network number and mask into the multicast BGP database. This route must exist in the forwarding table installed by an Interior Gateway Protocol (IGP) (that is, by EIGRP, OSPF, RIP, IGRP, static, or IS-IS), but not BGP.

In Cisco IOS Release 12.2(33)SRB and later releases, the ability to use address family configuration under the router scope configuration mode was introduced. The scope hierarchy can be defined for BGP routing sessions and is required to support Multitopology Routing (MTR). To enter the router scope configuration mode, use the **scope** command, which can apply globally or for a specific VRF. When using the scope for a specific VRF, only the **unicast** keyword is available.

Examples

The following example places the device in address family configuration mode for the IPv4 address family:

```
Device(config)# router bgp 50000
Device(config-router)# address-family ipv4
Device(config-router-af)#
```

The following example places the device in address family configuration mode and specifies only multicast address prefixes for the IPv4 address family:

```
Device(config)# router bgp 50000
Device(config-router)# address-family ipv4 multicast
Device(config-router-af)#
```

The following example places the device in address family configuration mode and specifies unicast address prefixes for the IPv4 address family:

```
Device(config)# router bgp 50000
Device(config-router)# address-family ipv4 unicast
Device(config-router-af)#
```

The following example places the device in address family configuration mode and specifies **cisco** as the name of the VRF instance to associate with subsequent IPv4 address family configuration mode commands:

```
Device(config)# router bgp 50000
Device(config-router)# address-family ipv4 vrf cisco
Device(config-router-af)#
```



Note

Use this form of the command, which specifies a VRF, only to configure routing exchanges between provider edge (PE) and customer edge (CE) devices.

The following example places the device in tunnel address family configuration mode:

```
Device(config)# router bgp 100
Device(config-router)# address-family ipv4 tunnel
Device(config-router-af)#
```

The following example shows how to configure a device to support an IPv4 MDT address-family session:

```
Device(config)# router bgp 45000
Device(config-router)# address-family ipv4 mdt
Device(config-router-af)#
```

The following example shows how to configure the IPv4 address family under router scope configuration mode. In this example, the scope hierarchy is enabled globally. The device enters router scope address family configuration mode, and only multicast address prefixes for the IPv4 address family are specified:

```
Device(config)# router bgp 50000
Device(config-router)# scope global
Device(config-router-scope)# address-family ipv4 multicast
Device(config-router-scope-af)#
```

Related Commands

Command	Description
address-family ipv6	Places the device in address family configuration mode for configuring routing sessions, such as BGP, that use standard IPv6 address prefixes.
address-family vpn4	Places the device in address family configuration mode for configuring routing sessions such as BGP, RIP, or static routing sessions that use standard VPN Version 4 address prefixes.
bgp default ipv4-unicast	Enables the IPv4 unicast address family on all neighbors.
neighbor activate	Enables the exchange of information with a BGP neighboring device.
neighbor remote-as	Adds an entry to the BGP or multiprotocol BGP neighbor table.
scope	Defines the scope for a BGP routing session and enters router scope configuration mode.

aggregate-address

To create an aggregate entry in a Border Gateway Protocol (BGP) database, use the **aggregate-address** command in address family or router configuration mode. To disable this function, use the **no** form of this command.

aggregate-address *address mask* [**as-set**] [**as-confed-set**] [**summary-only**] [**suppress-map** *map-name*] [**advertise-map** *map-name*] [**attribute-map** *map-name*]

no aggregate-address *address mask* [**as-set**] [**as-confed-set**] [**summary-only**] [**suppress-map** *map-name*] [**advertise-map** *map-name*] [**attribute-map** *map-name*]

Syntax Description

<i>address</i>	Aggregate address.
<i>mask</i>	Aggregate mask.
as-set	(Optional) Generates autonomous system set path information.
as-confed-set	(Optional) Generates autonomous confederation set path information.
summary-only	(Optional) Filters all more-specific routes from updates.
suppress-map <i>map-name</i>	(Optional) Specifies the name of the route map used to select the routes to be suppressed.
advertise-map <i>map-name</i>	(Optional) Specifies the name of the route map used to select the routes to create AS_SET origin communities.
attribute-map <i>map-name</i>	(Optional) Specifies the name of the route map used to set the attribute of the aggregate route.

Command Default

The atomic aggregate attribute is set automatically when an aggregate route is created with this command unless the **as-set** keyword is specified.

Command Modes

Address family configuration (config-router-af)
Router configuration (config-router)

Command History

Release	Modification
10.0	This command was introduced.
11.1(20)CC	The nlri unicast , nlri multicast , and nlri unicast multicast keywords were added.
12.0(2)S	The nlri unicast , nlri multicast , and nlri unicast multicast keywords were added.
12.0(7)T	The nlri unicast , nlri multicast , and nlri unicast multicast keywords were removed. Address family configuration mode support was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRB	Support for IPv6 was added.
12.2(33)SB	This command was integrated into Cisco IOS Release 12.2(33)SB.
12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.
12.2(33)SRE	The as-confed-set keyword was added.
Cisco IOS XE Release 3.1S	This command was introduced on Cisco ASR 1000 series routers.

Usage Guidelines

You can implement aggregate routing in BGP and Multiprotocol BGP (mBGP) either by redistributing an aggregate route into BGP or mBGP, or by using the conditional aggregate routing feature.

Using the **aggregate-address** command with no keywords will create an aggregate entry in the BGP or mBGP routing table if any more-specific BGP or mBGP routes are available that fall within the specified range. (A longer prefix that matches the aggregate must exist in the Routing Information Base (RIB).) The aggregate route will be advertised as coming from your autonomous system and will have the atomic aggregate attribute set to show that information might be missing. (By default, the atomic aggregate attribute is set unless you specify the **as-set** keyword.)

Using the **as-set** keyword creates an aggregate entry using the same rules that the command follows without this keyword, but the path advertised for this route will be an AS_SET consisting of all elements contained in all paths that are being summarized. Do not use this form of the **aggregate-address** command when aggregating many paths, because this route must be continually withdrawn and updated as autonomous system path reachability information for the summarized routes changes.

Using the **as-confed-set** keyword creates an aggregate entry using the same rules that the command follows without this keyword. This keyword performs the same function as the **as-set** keyword, except that it generates autonomous confed set path information.

Using the **summary-only** keyword not only creates the aggregate route (for example, 192.*.*) but also suppresses advertisements of more-specific routes to all neighbors. If you want to suppress only advertisements to certain neighbors, you may use the **neighbor distribute-list** command, with caution. If a more-specific

route leaks out, all BGP or mBGP routers will prefer that route over the less-specific aggregate you are generating (using longest-match routing).

Using the **suppress-map** keyword creates the aggregate route but suppresses advertisement of specified routes. You can use the **match** clauses of route maps to selectively suppress some more-specific routes of the aggregate and leave others unsuppressed. IP access lists and autonomous system path access lists match clauses are supported.

Using the **advertise-map** keyword selects specific routes that will be used to build different components of the aggregate route, such as AS_SET or community. This form of the **aggregate-address** command is useful when the components of an aggregate are in separate autonomous systems and you want to create an aggregate with AS_SET, and advertise it back to some of the same autonomous systems. You must remember to omit the specific autonomous system numbers from the AS_SET to prevent the aggregate from being dropped by the BGP loop detection mechanism at the receiving router. IP access lists and autonomous system path access lists **match** clauses are supported.

Using the **attribute-map** keyword allows attributes of the aggregate route to be changed. This form of the **aggregate-address** command is useful when one of the routes forming the AS_SET is configured with an attribute such as the community no-export attribute, which would prevent the aggregate route from being exported. An attribute map route map can be created to change the aggregate attributes.

Examples

Examples

In the following example, an aggregate BGP address is created in router configuration mode. The path advertised for this route will be an AS_SET consisting of all elements contained in all paths that are being summarized.

```
Router(config)# router bgp 50000
Router(config-router)# aggregate-address 10.0.0.0 255.0.0.0 as-set
```

Examples

In the following example, an aggregate BGP address is created in address family configuration mode and applied to the multicast database under the IP Version 4 address family. Because the **summary-only** keyword is configured, more-specific routes are filtered from updates.

```
Router(config)# router bgp 50000
Router(config-router)# address-family ipv4 multicast
Router(config-router-af)# aggregate-address 10.0.0.0 255.0.0.0 summary-only
```

Examples

In the following example, a route map called MAP-ONE is created to match on an AS-path access list. The path advertised for this route will be an AS_SET consisting of elements contained in paths that are matched in the route map.

```
Router(config)# ip as-path access-list 1 deny ^1234_
Router(config)# ip as-path access-list 1 permit .*
Router(config)# !
Router(config)# route-map MAP-ONE
Router(config-route-map)# match ip as-path 1
Router(config-route-map)# exit
Router(config)# router bgp 50000
Router(config-router)# address-family ipv4
Router(config-router-af)# aggregate-address 10.0.0.0 255.0.0.0 as-set advertise-map
MAP-ONE
Router(config-router-af)# end
```

Related Commands

Command	Description
address-family ipv4 (BGP)	Places the router in address family configuration mode for configuring routing sessions such as BGP, RIP, or static routing sessions that use standard IPv4 address prefixes.
ip as-path access-list	Defines a BGP autonomous system path access list.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or extended access list, and performs policy routing on packets.
neighbor distribute-list	Distributes BGP neighbor information in an access list.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.

auto-summary (BGP)

To configure automatic summarization of subnet routes into network-level routes, use the **auto-summary** command in address family or router configuration mode. To disable automatic summarization and send subprefix routing information across classful network boundaries, use the **no** form of this command.

auto-summary

no auto-summary

Syntax Description This command has no arguments or keywords.

Command Default Automatic summarization is disabled by default (the software sends subprefix routing information across classful network boundaries).

Command Modes Address family configuration (config-router-af)
Router configuration (config-router)

Command History	Release	Modification
	10.0	This command was introduced.
	12.0(7)T	Address family configuration mode support was added.
	12.2(8)T	The command default behavior was changed to disabled.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
	15.0M, 12.2SRE	This command was modified. When an interface addressed with an address falling within the summarized range is shut down, that route no longer appears in the BGP routing table.

Usage Guidelines BGP automatically summarizes routes to classful network boundaries when this command is enabled. Route summarization is used to reduce the amount of routing information in routing tables. Automatic summarization applies to connected, static, and redistributed routes.



Note

The MPLS VPN Per VRF Label feature does not support auto-summary.

By default, automatic summarization is disabled and BGP accepts subnets redistributed from an Interior Gateway Protocol (IGP). To block subnets and create summary subprefixes to the classful network boundary when crossing classful network boundaries, use the **auto-summary** command.

To advertise and carry subnet routes in BGP when automatic summarization is enabled, use an explicit **network** command to advertise the subnet. The **auto-summary** command does not apply to routes injected into BGP via the **network** command or through iBGP or eBGP.

Why auto-summary for BGP Is Disabled By Default

When **auto-summary** is enabled, routes injected into BGP via redistribution are summarized on a classful boundary. Remember that a 32-bit IP address consists of a network address and a host address. The subnet mask determines the number of bits used for the network address and the number of bits used for the host address. The IP address classes have a natural or standard subnet mask, as shown in the table below.

Table 1: IP Address Classes

Class	Address Range	Standard Mask
A	1.0.0.0 to 126.0.0.0	255.0.0.0 or /8
B	128.1.0.0 to 191.254.0.0	255.255.0.0 or /16
C	192.0.1.0 to 223.255.254.0	255.255.255.0 or /24

Reserved addresses include 128.0.0.0, 191.255.0.0, 192.0.0.0, and 223.255.255.0.

When using the standard subnet mask, Class A addresses have one octet for the network, Class B addresses have two octets for the network, and Class C addresses have three octets for the network.

Consider the Class B address 156.26.32.1 with a 24-bit subnet mask, for example. The 24-bit subnet mask selects three octets, 156.26.32, for the network. The last octet is the host address. If the network 156.26.32.1/24 is learned via an IGP and is then redistributed into BGP, if **auto-summary** were enabled, the network would be automatically summarized to the natural mask for a Class B network. The network that BGP would advertise is 156.26.0.0/16. BGP would be advertising that it can reach the entire Class B address space from 156.26.0.0 to 156.26.255.255. If the only network that can be reached via the BGP router is 156.26.32.0/24, BGP would be advertising 254 networks that cannot be reached via this router. This is why the **auto-summary (BGP)** command is disabled by default.

Examples

In the following example, automatic summarization is enabled for IPv4 address family prefixes:

```
Router(config)# router bgp 50000
Router(config-router)# address-family ipv4 unicast
Router(config-router-af)# auto-summary
Router(config-router-af)# network 7.7.7.7 255.255.255.255
```

In the example, there are different subnets, such as 7.7.7.6 and 7.7.7.7 on Loopback interface 6 and Loopback interface 7, respectively. Both **auto-summary** and a **network** command are configured.

```
Router# show ip interface brief
Interface      IP-Address      OK? Method Status      Protocol
Ethernet0/0    100.0.1.7       YES NVRAM    up          up
Ethernet0/1    unassigned      YES NVRAM    administratively down down
```

```

Ethernet0/2      unassigned      YES NVRAM  administratively down down
Ethernet0/3      unassigned      YES NVRAM  administratively down down
Ethernet1/0      108.7.9.7       YES NVRAM  up          up
Ethernet1/1      unassigned      YES NVRAM  administratively down down
Ethernet1/2      unassigned      YES NVRAM  administratively down down
Ethernet1/3      unassigned      YES NVRAM  administratively down down
Loopback6       7.7.7.6         YES NVRAM  up          up
Loopback7       7.7.7.7         YES NVRAM  up          up

```

Note that in the output below, because of the **auto-summary** command, the BGP routing table displays the summarized route 7.0.0.0 instead of 7.7.7.6. The 7.7.7.7/32 network is displayed because it was configured with the **network** command, which is not affected by the **auto-summary** command.

```

Router# show ip bgp
BGP table version is 10, local router ID is 7.7.7.7
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, x best-external
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network        Next Hop           Metric LocPrf Weight Path
*> 6.6.6.6/32     100.0.1.6           0             0 6 i
*> 7.0.0.0        0.0.0.0             0             32768 ?  <-- summarization
*> 7.7.7.7/32     0.0.0.0             0             32768 i  <-- network command
r>i9.9.9.9/32     108.7.9.9           0            100      0 i
*> 100.0.0.0      0.0.0.0             0             32768 ?
r> 100.0.1.0/24   100.0.1.6           0             0 6 ?
*> 108.0.0.0      0.0.0.0             0             32768 ?
r>i108.7.9.0/24   108.7.9.9           0            100      0 ?
*>i200.0.1.0      108.7.9.9

```

Related Commands

Command	Description
address-family ipv4 (BGP)	Places the router in address family configuration mode for configuring routing sessions such as BGP, RIP, or static routing sessions that use standard IPv4 address prefixes.
address-family vpnv4	Places the router in address family configuration mode for configuring routing sessions such as BGP, RIP, or static routing sessions that use standard VPNv4 address prefixes.
network (BGP and multiprotocol BGP)	Specifies the networks to be advertised by BGP and multiprotocol BGP.

bgp default ipv4-unicast

To set the IP version 4 (IPv4) unicast address family as default for BGP peering session establishment, use the **bgp default ipv4-unicast** command in router configuration mode. To disable default IPv4 unicast address family for peering session establishment, use the **no** form of this command.

bgp default ipv4-unicast

no bgp default ipv4-unicast

Syntax Description This command has no arguments or keywords.

Command Default IPv4 address family routing information is advertised by default for each BGP routing session configured with the **neighbor remote-as** command, unless you first configure the **no bgp default ipv4-unicast** command before configuring the **neighbor remote-as** command.

Command Modes Router configuration (config-router)

Command History	Release	Modification
	12.0(5)T	This command was introduced.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
	Cisco IOS XE Release 3.7S	This command was integrated into Cisco IOS XE Release 3.7S.
	15.2(2)SNG	This command was implemented on the Cisco ASR 901 Series Aggregation Services Routers.

Usage Guidelines The **bgp default ipv4-unicast** command is used to enable the automatic exchange of IPv4 address family prefixes. The **neighbor activate** address family configuration command must be entered in each IPv4 address family session before prefix exchange will occur.

Examples In the following example, the automatic exchange of IP version 4 unicast address family routing information is disabled:

```
Device(config)# router bgp 50000
Device(config-router)# no bgp default ipv4-unicast
```

Related Commands

Command	Description
neighbor activate	Enables the exchange of information with a neighboring router.

bgp fast-external-fallover

To configure a Border Gateway Protocol (BGP) routing process to immediately reset external BGP peering sessions if the link used to reach these peers goes down, use the **bgp fast-external-fallover** command in router configuration mode. To disable BGP fast external fallover, use the **no** form of this command.

bgp fast-external-fallover

no bgp fast-external-fallover

Syntax Description This command has no arguments or keywords.

Command Default BGP fast external fallover is enabled by default in Cisco IOS software.

Command Modes Router configuration (config-router)

Command History	Release	Modification
	10.0	This command was introduced.
	12.0(7)T	Address family configuration mode support was added.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines The **bgp fast-external-fallover** command is used to disable or enable fast external fallover for BGP peering sessions with directly connected external peers. The session is immediately reset if link goes down. Only directly connected peering sessions are supported.

If BGP fast external fallover is disabled, the BGP routing process will wait until the default hold timer expires (3 keepalives) to reset the peering session. BGP fast external fallover can also be configured on a per-interface basis using the **ip bgp fast-external-fallover** interface configuration command.

Examples In the following example, the BGP fast external fallover feature is disabled. If the link through which this session is carried flaps, the connection will not be reset.

```
Router(config)# router bgp 50000
```

```
Router(config-router)# no bgp fast-external-fallover
```

Related Commands

Command	Description
address-family ipv4 (BGP)	Places the router in address family configuration mode for configuring routing sessions such as BGP, RIP, or static routing sessions that use standard IPv4 address prefixes.
ip bgp fast-external-fallover	Configures per-interface BGP fast external fallover.

bgp graceful-restart

To enable the Border Gateway Protocol (BGP) graceful restart capability globally for all BGP neighbors, use the **bgp graceful-restart** command in address family or in router configuration mode. To disable the BGP graceful restart capability globally for all BGP neighbors, use the **no** form of this command.

bgp graceful-restart [**restart-time** *seconds*| **stalepath-time** *seconds*] [**all**]

no bgp graceful-restart

Syntax Description

restart-time <i>seconds</i>	(Optional) Sets the maximum time period that the local router will wait for a graceful-restart-capable neighbor to return to normal operation after a restart event occurs. The default value for this argument is 120 seconds. The configurable range of values is from 1 to 3600 seconds.
stalepath-time <i>seconds</i>	(Optional) Sets the maximum time period that the local router will hold stale paths for a restarting peer. All stale paths are deleted after this timer expires. The default value for this argument is 360 seconds. The configurable range of values is from 1 to 3600 seconds
all	(Optional) Enables BGP graceful restart capability for all address family modes.

Command Default

The following default values are used when this command is entered without any keywords or arguments:

restart-time : 120 seconds **stalepath-time**: 360 seconds



Note

Changing the restart and stalepath timer values is not required to enable the BGP graceful restart capability. The default values are optimal for most network deployments, and these values should be adjusted only by an experienced network operator.

Command Modes

Address-family configuration (config-router-af)

Router configuration (config-router)

Command History

Release	Modification
12.0(22)S	This command was introduced.

Release	Modification
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(28)SB	Support for this command was added into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	Support for IPv6 was added. The optional all keyword was added.
12.2(33)SRE	This command was modified. It was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was modified. It was integrated into Cisco IOS Release 12.2(33)XNE .

Usage Guidelines

The **bgp graceful-restart** command is used to enable or disable the graceful restart capability globally for all BGP neighbors in a BGP network. The graceful restart capability is negotiated between nonstop forwarding (NSF)-capable and NSF-aware peers in OPEN messages during session establishment. If the graceful restart capability is enabled after a BGP session has been established, the session will need to be restarted with a soft or hard reset.

The graceful restart capability is supported by NSF-capable and NSF-aware routers. A router that is NSF-capable can perform a stateful switchover (SSO) operation (graceful restart) and can assist restarting peers by holding routing table information during the SSO operation. A router that is NSF-aware functions like a router that is NSF-capable but cannot perform an SSO operation.

The BGP graceful restart capability is enabled by default when a supporting version of Cisco IOS software is installed. The default timer values for this feature are optimal for most network deployments. We recommend that they are adjusted only by experienced network operators. When adjusting the timer values, the restart timer should not be set to a value greater than the hold time that is carried in the OPEN message. If consecutive restart operations occur, routes (from a restarting router) that were previously marked as stale will be deleted.



Note

Changing the restart and stalepath timer values is not required to enable the BGP graceful restart capability. The default values are optimal for most network deployments, and these values should be adjusted only by an experienced network operator.

Examples

In the following example, the BGP graceful restart capability is enabled:

```
Router# configure terminal
Router(config)# router bgp 65000
Router(config-router)# bgp graceful-restart
```

In the following example, the restart timer is set to 130 seconds:

```
Router# configure terminal
Router(config)# router bgp 65000
Router(config-router)# bgp graceful-restart restart-time 130
```

In the following example, the stalepath timer is set to 350 seconds:

```
Router# configure terminal
Router(config)# router bgp 65000
Router(config-router)# bgp graceful-restart stalepath-time 350
```

Related Commands

Command	Description
show ip bgp	Displays entries in the BGP routing table.
show ip bgp neighbors	Displays information about the TCP and BGP connections to neighbors.

bgp log-neighbor-changes

To enable logging of BGP neighbor resets, use the **bgp log-neighbor-changes** command in router configuration mode. To disable the logging of changes in BGP neighbor adjacencies, use the **no** form of this command.

bgp log-neighbor-changes

no bgp log-neighbor-changes

Syntax Description This command has no arguments or keywords.

Command Default Logging of BGP neighbor resets is not enabled.

Command Modes Router configuration (config-router)

Command History	Release	Modification
	11.1CC	This command was introduced.
	12.0	This command was integrated into Cisco IOS release 12.0.
	12.0(7)T	Address family configuration mode support was added.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2(33)SRB	Support for IPv6 was added.
	12.2(33)SB	This command was integrated into Cisco IOS Release 12.2(33)SB.
	12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.
	Cisco IOS XE Release 3.7S	This command was integrated into Cisco IOS XE Release 3.7S.
	15.1(2)SNG	This command was implemented on the Cisco ASR 901 Series Aggregation Services Routers.

Usage Guidelines The **bgp log-neighbor-changes** command enables logging of BGP neighbor status changes (up or down) and resets for troubleshooting network connectivity problems and measuring network stability. Unexpected neighbor resets might indicate high error rates or high packet loss in the network and should be investigated.

Using the **bgp log-neighbor-changes** command to enable status change message logging does not cause a substantial performance impact, unlike, for example, enabling per BGP update debugging. If the UNIX syslog facility is enabled, messages are sent to the UNIX host running the syslog daemon so that the messages can be stored and archived. If the UNIX syslog facility is not enabled, the status change messages are retained in

the internal buffer of the router, and are not stored to disk. You can set the size of this buffer, which is dependent upon the available RAM, using the **logging buffered** command.

The neighbor status change messages are not tracked if the **bgp log-neighbor-changes** command is not enabled, except for the reset reason, which is always available as output of the **show ip bgp neighbors** and **show bgp ipv6 neighbors** commands.

The **eigrp log-neighbor-changes** command enables logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor adjacencies, but messages for BGP neighbors are logged only if they are specifically enabled with the **bgp log-neighbor-changes** command.

Use the **show logging** command to display the log for the BGP neighbor changes.

Examples

The following example logs neighbor changes for BGP in router configuration mode:

```
Device(config)# bgp router 40000
Device(config-router)# bgp log-neighbor-changes
```

Related Commands

Command	Description
address-family ipv4 (BGP)	Places the router in address family configuration mode for configuring routing sessions such as BGP, RIP, or static routing sessions that use standard IPv4 address prefixes.
eigrp log-neighbor-changes	Enables the logging of neighbor adjacency changes to monitor the stability of the routing system and to help detect problems.
logging buffered	Logs messages to an internal buffer.
show ip bgp ipv4	Displays information about the TCP and BGP connections to neighbors.
show ip bgp neighbors	Displays information about BGP neighbors.
show logging	Displays the state of logging (syslog).

bgp router-id

To configure a fixed router ID for the local Border Gateway Protocol (BGP) routing process, use the **bgp router-id** command in router or address family configuration mode. To remove the fixed router ID from the running configuration file and restore the default router ID selection, use the **no** form of this command.

Router Configuration

bgp router-id {*ip-address*| **vrf auto-assign**}

no bgp router-id [**vrf auto-assign**]

Address Family Configuration

bgp router-id {*ip-address*| **auto-assign**}

no bgp router-id

Syntax Description

<i>ip-address</i>	Router identifier in the form of an IP address.
vrf	Configures a router identifier for a Virtual Routing and Forwarding (VRF) instance.
auto-assign	Automatically assigns a router identifier for each VRF.

Command Default

The following behavior determines local router ID selection when this command is not enabled:

- If a loopback interface is configured, the router ID is set to the IP address of the loopback interface. If multiple loopback interfaces are configured, the router ID is set to the IP address of the loopback interface with the highest IP address.
- If no loopback interface is configured, the router ID is set to the highest IP address on a physical interface.

Command Modes

Address family configuration (config-router-af)

Router configuration (config-router)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	The vrf and auto-assign keywords were added, and this command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command, including the vrf and auto-assign keywords, was integrated into Cisco IOS Release 12.2(31)SB2.

Release	Modification
12.2(33)SXH	This command, including the vrf and auto-assign keywords, was integrated into Cisco IOS Release 12.2(33)SXH.
12.4(20)T	The vrf and auto-assign keywords were added.

Usage Guidelines

The **bgp router-id** command is used to configure a fixed router ID for the local BGP routing process. The router ID is entered in IP address format. Any valid IP address can be used, even an address that is not locally configured on the router. If you use an IP address from a local interface, we recommend that you use the address of a loopback interface rather than the address of a physical interface. (A loopback interface is more effective than a fixed interface as an identifier because there is no physical link to go down.) Peering sessions are automatically reset when the router ID is changed.

In Cisco IOS Release 12.2(33)SRA, 12.2(31)SB2, 12.2(33)SXH, 12.4(20)T, and later releases, the Per-VRF Assignment of BGP Router ID feature introduced VRF-to-VRF peering in BGP on the same router. BGP is designed to refuse a session with itself because of the router ID check. The per-VRF assignment feature allows a separate router ID per VRF. The router ID can be manually configured for each VRF or automatically assigned either for each VRF or globally under address family configuration mode.

Examples

The following example shows how to configure the local router with a fixed BGP router ID of 192.168.254.254:

```
router bgp 50000
  bgp router-id 192.168.254.254
```

The following example shows how to configure a BGP router ID for the VRF named VRF1. This configuration is done under address family IPv4 VRF configuration mode.

```
router bgp 45000
  address-family ipv4 vrf VRF1
    bgp router-id 10.1.1.99
```

The following example shows how to configure an automatically assigned VRF BGP router ID for all VRFs. This configuration is done under BGP router configuration mode.

```
router bgp 45000
  bgp router-id vrf auto-assign
```

The following example shows how to configure an automatically assigned VRF BGP router ID for a single VRF. This configuration is done under address family IPv4 VRF configuration mode.

```
router bgp 45000
  address-family ipv4 vrf VRF2
    bgp router-id auto-assign
```

Related Commands

Command	Description
show ip bgp	Displays entries in the BGP routing table.
show ip bgp vpnv4	Displays VPNv4 address information from the BGP routing table.

bgp soft-reconfig-backup

To configure a Border Gateway Protocol (BGP) speaker to perform inbound soft reconfiguration for peers that do not support the route refresh capability, use the **bgp soft-reconfig-backup** command in address-family or router configuration mode. To disable this function, use the **no** form of this command.

bgp soft-reconfig-backup

no bgp soft-reconfig-backup

Syntax Description

This command has no arguments or keywords.

Command Default

Inbound soft reconfiguration for peers that do not support the route refresh capability is not performed.

Command Modes

Address-family configuration (config-router-af)

Router configuration (config-router)

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

The **bgp soft-reconfig-backup** 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.

Use the **show ip bgp neighbors** command to determine if a peer supports the route refresh capability. If supported, the following will be displayed in the output:

```
Route refresh: advertised and received(new)
```

Use the **show ip bgp** command to determine if the BGP speaker is storing inbound updates for peer that does not support the route refresh capability. If updates are stored, the following will be displayed in the output:

```
(received-only)
```

Examples

The following example, starting in Global configuration mode, configures the router perform inbound soft reconfiguration only if the peer does not support the route refresh capability:

```
Router(config)# router bgp 50000
Router(config-router)# bgp soft-reconfig-backup

Router(config-router)# neighbor 10.1.1.1 remote-as 40000

Router(config-router)# neighbor 192.168.1.1 remote-as 60000
```

Related Commands

Command	Description
show ip bgp	Displays entries in the Border Gateway Protocol (BGP) routing table.
show ip bgp neighbors	Displays information about the TCP and Border Gateway Protocol (BGP) connections to neighbors.

 **bgp soft-reconfig-backup**