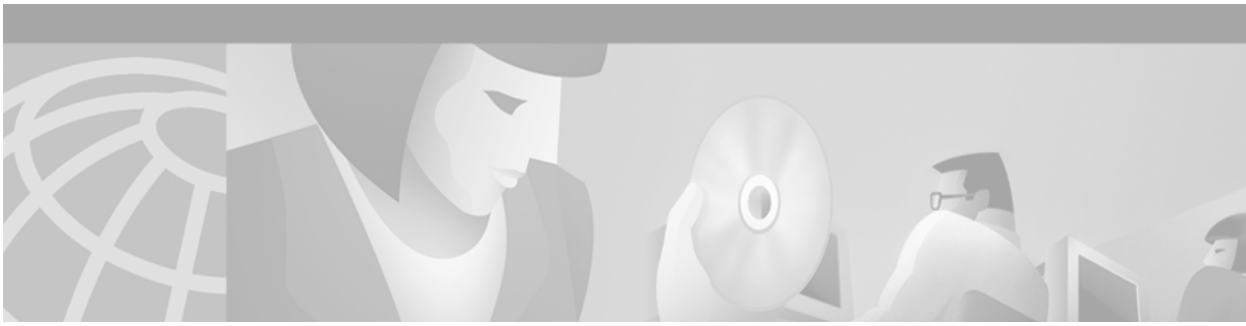

Multiprotocol BGP Extensions for IP Multicast Commands

Use the commands in this chapter to configure and monitor multiprotocol BGP. Multiprotocol BGP is based on RFC 2283, *Multiprotocol Extensions for BGP-4*. For multiprotocol BGP configuration information and examples, refer to the "Configuring Multiprotocol BGP Extensions for IP Multicast" chapter of the *Cisco IOS IP Configuration Guide*. For BGP configuration information and examples, refer to the "Configuring BGP" chapter of the *Cisco IOS IP Configuration Guide*. For BGP command descriptions, refer to the "BGP Commands" chapter of this document.

Commands in this chapter that have been replaced by new or existing commands are no longer documented. Table 48 maps the previous commands to their replacements.

Table 48 Mapping Previous Commands to Replacement Commands

Old Command	Replacement Command
distance mbgp	**distance bgp**
match nlri	**address-family ipv4** **address-family vpnv4**
set nlri	**address-family ipv4** or **address-family vpnv4**
show ip mbgp	**show ip bgp ipv4 multicast**
show ip mbgp summary	**show ip bgp ipv4 multicast summary**

address-family ipv4

To enter address family configuration mode for configuring routing sessions such as BGP that use standard IP Version 4 address prefixes, use the **address-family ipv4** command in router configuration mode. To disable address family configuration mode, use the **no** form of this command.

address-family ipv4 [**multicast** | **unicast** | **vrf** *vrf-name*]

no address-family ipv4 [**multicast** | **unicast** | **vrf** *vrf-name*]

Syntax Description

multicast	(Optional) Specifies IP Version 4 multicast address prefixes.
unicast	(Optional) Specifies IP Version 4 unicast address prefixes.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance to associate with subsequent IP Version 4 address family configuration mode commands.

Defaults

IP Version 4 address prefixes are not enabled. Unicast address prefixes are the default when IP Version 4 address prefixes are configured.

Command Modes

Router configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

The **address-family ipv4** command places the router in address family configuration mode (prompt: `config-router-af`), from which you can configure routing sessions that use standard IP Version 4 address prefixes. To leave address family configuration mode and return to router configuration mode, type **exit**.

Routing information for address family IP Version 4 is advertised by default when you configure a BGP routing session using the **neighbor remote-as** command unless you enter the **no bgp default ipv4-unicast** command.

The **address-family ipv4** command replaces the **match nlri** and **set nlri** commands.

Examples

The following example places the router in address family configuration mode for the IP Version 4 address family:

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

The following example places the router in address family configuration mode and specifies multicast address prefixes for the IP Version 4 address family:

```
Router(config)# router bgp 100
Router(config-router)# address-family ipv4 multicast
Router(config-router-af)#
```

The following example places the router in address family configuration mode and specifies unicast address prefixes for the IP Version 4 address family:

```
Router(config)# router bgp 100
Router(config-router)# address-family ipv4 unicast
Router(config-router-af)#
```

The following example places the router in address family configuration mode and specifies cisco as the name of the VRF instance to associate with subsequent IP Version 4 address family configuration mode commands:

```
Router(config)# router bgp 100
Router(config-router)# address-family ipv4 vrf cisco
Router(config-router-af)#
```

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

Related Commands

Command	Description
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 VPN Version 4 address prefixes.
neighbor activate	Enables the exchange of information with a BGP neighboring router.

address-family vpnv4

To enter address family configuration mode for configuring routing sessions, such as BGP, that use standard Virtual Private Network (VPN) Version 4 address prefixes, use the **address-family vpnv4** command in router configuration mode. To disable address family configuration mode, use the **no** form of this command.

address-family vpnv4 [**unicast**]

no address-family vpnv4 [**unicast**]

Syntax Description

unicast	(Optional) Specifies VPN Version 4 unicast address prefixes.

Defaults

VPN Version 4 address prefixes are not enabled. Unicast address prefixes are the default when VPN Version 4 address prefixes are configured.

Command Modes

Router configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

The **address-family vpnv4** command places the router in address family configuration mode (prompt: `config-router-af`), from which you can configure routing sessions that use VPN Version 4 address prefixes. To leave address family configuration mode and return to router configuration mode, type **exit**.

The **address-family vpnv4** command replaces the **match nlri** and **set nlri** commands.

Examples

The following example places the router in address family configuration mode for the VPN Version 4 address family:

```
Router(config)# router bgp 100
(config-router)# address-family vpnv4
(config-router-af)#
```

The following example places the router in address family configuration mode for the unicast VPN Version 4 address family:

```
Router(config)# router bgp 100
(config-router)# address-family vpnv4 unicast
(config-router-af)#
```

Related Commands

Command	Description
address-family ipv4	Places the router in address family configuration mode for configuring routing sessions such as BGP, RIP, or static routing sessions that use standard IP Version 4 address prefixes.
neighbor activate	Enables the exchange of information with a BGP neighboring router.

distance mbgp

The **distance mbgp** command is replaced by the **distance bgp** command. See the description of the **distance bgp** command in the "BGP Commands" chapter for more information.

ip dvmrp metric

To configure the metric associated with a set of destinations for Distance Vector Multicast Routing Protocol (DVMRP) reports, use the **ip dvmrp metric** command in interface configuration mode. (Note that this command has two different syntax possibilities.) To disable this function, use the **no** form of this command.

ip dvmrp metric *metric* [**route-map** *map-name*] [**mbgp**] [**list** *access-list-number*] [[*protocol process-id*] | **dvmrp**]

no ip dvmrp metric *metric* [**route-map** *map-name*] [**mbgp**] [**list** *access-list-number*] [[*protocol process-id*] | **dvmrp**]

Syntax Description

metric	Metric associated with a set of destinations for DVMRP reports. It can be a value from 0 to 32. A value of 0 means that the route is not advertised. A value of 32 is equivalent to infinity (unreachable).
route-map *map-name*	(Optional) Name of a route map. If you specify this argument, only the destinations that match the route map are reported with the configured metric. Unicast routes are subject to route map conditions before being injected into DVMRP. Route maps cannot be used for DVMRP routes.
mbgp	(Optional) Configures redistribution of only IP Version 4 multicast routes into DVMRP.
list *access-list-number*	(Optional) Number of an access list. If you specify this argument, only the multicast destinations that match the access list are reported with the configured metric. Any destinations not advertised because of split horizon do not use the configured metric.
protocol	(Optional) Name of unicast routing protocol, such as **bgp**, **dvmrp**, **eigrp**, **igrp**, **isis**, **ospf**, **rip**, or **static**. If you specify these values, only routes learned by the specified routing protocol are advertised in DVMRP report messages.
process-id	(Optional) Process ID number of the unicast routing protocol.
dvmrp	(Optional) Allows routes from the DVMRP routing table to be advertised with the configured *metric* value, or filtered.

Defaults

No metric is preconfigured. Only directly connected subnets and networks are advertised to neighboring DVMRP routers.

Command Modes

Interface configuration

Command History

Release	Modification
10.2	This command was introduced.
11.1	The **route-map** keyword was added.
11.1(20)CC	This **mbgp** keyword was added.
12.0(7)T	This **mbgp** keyword was added.

Usage Guidelines

When Protocol Independent Multicast (PIM) is configured on an interface and DVMRP neighbors are discovered, the Cisco IOS software sends DVMRP report messages for directly connected networks. The **ip dvmrp metric** command enables DVMRP report messages for multicast destinations that match the access list. Usually, the metric for these routes is 1. Under certain circumstances, you might want to tailor the metric used for various unicast routes. This command lets you configure the metric associated with a set of destinations for report messages sent out this interface.

You can use the *access-list-number* argument in conjunction with the *protocol* and *process-id* arguments to selectively list the destinations learned from a given routing protocol.

To display DVMRP activity, use the **debug ip dvmrp** command.

Examples

The following example connects a PIM cloud to a DVMRP cloud. Access list 1 permits the sending of DVMRP reports to the DVMRP routers advertising all sources in the 172.16.35.0 network with a metric of 1. Access list 2 permits all other destinations, but the metric of 0 means that no DVMRP reports are sent for these destinations.

```
access-list 1 permit 172.16.35.0 0.0.0.255
access-list 1 deny 0.0.0.0 255.255.255.255
access-list 2 permit 0.0.0.0 255.255.255.255
interface tunnel 0
 ip dvmrp metric 1 list 1
 ip dvmrp metric 0 list 2
```

The following example redistributes IP Version 4 multicast routes into DVMRP neighbors with a metric of 1:

```
interface tunnel 0
 ip dvmrp metric 1 mbgp
```

Related Commands

Command	Description
debug ip dvmrp	Displays information on DVMRP packets received and sent.
ip dvmrp accept-filter	Configures an acceptance filter for incoming DVMRP reports.

ip multicast cache-headers

To allocate a circular buffer to store IP Version 4 multicast packet headers that the router receives, use the **ip multicast cache-headers** global configuration command. To disable the buffer, use the **no** form of this command.

ip multicast cache-headers [**rtp**]

no ip multicast cache-headers

Syntax Description

rtp	(Optional) Caches Real-Time Transport Protocol (RTP) headers.

Defaults

This command is disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
11.1	This command was introduced.
11.1(20)CC	The **rtp** keyword was added.
12.0(7)T	The **rtp** keyword was added.

Usage Guidelines

You can store IP Version 4 multicast packet headers in a cache and then display them to determine the following information:

- Who is sending IP multicast packets to which groups
- Interpacket delay
- Duplicate IP multicast packets (if any)
- Multicast forwarding loops in your network (if any)
- Scope of the group
- User Datagram Protocol (UDP) port numbers
- Packet length

Note This feature allocates a circular buffer of approximately 32 KB. Do not configure this feature if the router is low on memory.

Use the **show ip mpacket** command to display the buffer.

Examples

The following example allocates a buffer to store IP Version 4 multicast packet headers:

```
ip multicast cache-headers
```

Related Commands

Command	Description
show ip mpacket	Displays the contents of the circular cache-header buffer.

match nlri

The **match nlri** command is replaced by the **address-family ipv4** and **address-family vpnv4** commands. See the description of the **address-family ipv4** or **address-family vpnv4** command for more information.

redistribute dvmrp

To configure redistribution of Distance Vector Multicast Routing Protocol (DVMRP) routes into multiprotocol BGP, use the **redistribute dvmrp** command in address family or router configuration mode. To stop such redistribution, use the **no** form of this command.

redistribute dvmrp [**route-map** *map-name*]

no redistribute dvmrp [**route-map** *map-name*]

Syntax Description

route-map *map-name*	(Optional) Name of the route map that contains various BGP attribute settings.

Defaults

DVMRP routes are not redistributed into multiprotocol BGP.

Command Modes

Address family configuration

Router configuration

Command History

Release	Modification
11.1(20)CC	This command was introduced.
12.0(7)T	Address family configuration mode was added.

Usage Guidelines

Use this command if you have a subset of DVMRP routes in an autonomous system that you want to take the multiprotocol BGP path. Define a route map to further specify which DVMRP routes get redistributed.

Examples

The following router configuration mode example redistributes DVMRP routes to BGP peers that match access list 1:

```
router bgp 109
 redistribute dvmrp route-map dvmrp-into-mbgp
route-map dvmrp-into-mbgp
 match ip address 1
```

The following address family configuration mode example redistributes DVMRP routes to multiprotocol BGP peers that match access list 1:

```
router bgp 109
address-family ipv4 multicast
 redistribute dvmrp route-map dvmrp-into-mbgp

route-map dvmrp-into-mbgp
 match ip address 1
```

set nlri

The **set nlri** command is replaced by the **address-family ipv4** and **address-family vpnv4** commands. See the description of the **address-family ipv4** or **address-family vpnv4** command for more information.

show ip mbgp

The **show ip mgbp** command is replaced by the **show ip bgp ipv4 multicast** command. See the description of the **show ip bgp ipv4 multicast** command for more information.

show ip bgp ipv4 multicast

To display IP Version 4 multicast database-related information, use the **show ip bgp ipv4 multicast** command in EXEC mode.

show ip bgp ipv4 multicast [*command*]

Syntax Description

command	(Optional) Any multiprotocol BGP command supported by the **show ip bgp ipv4 multicast** command.

Command Modes

EXEC

Command History

Release	Modification
12.0(7)T	This command was introduced.

Usage Guidelines

Use this command in conjunction with the **show ip rpf** command to determine if IP multicast routing is using multiprotocol BGP routes.

To determine which multiprotocol BGP commands are supported by the **show ip bgp ipv4 multicast** command, enter the following command while in EXEC mode:

```
Router# show ip bgp ipv4 multicast ?
```

The **show ip bgp ipv4 multicast** command replaces the **show ip mbgp** command.

Examples

The following is sample output from the **show ip bgp ipv4 multicast** command:

```
Router# show ip bgp ipv4 multicast

MBGP table version is 6, local router ID is 192.168.200.66
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network          Next Hop            Metric LocPrf Weight Path
*> 10.0.20.16/28     0.0.0.0                  0      0 32768 i
*> 10.0.35.16/28     0.0.0.0                  0      0 32768 i
*> 10.0.36.0/28      0.0.0.0                  0      0 32768 i
*> 10.0.48.16/28     0.0.0.0                  0      0 32768 i
*> 10.2.0.0/16       0.0.0.0                  0      0 32768 i
*> 10.2.1.0/24       0.0.0.0                  0      0 32768 i
*> 10.2.2.0/24       0.0.0.0                  0      0 32768 i
*> 10.2.3.0/24       0.0.0.0                  0      0 32768 i
*> 10.2.7.0/24       0.0.0.0                  0      0 32768 i
*> 10.2.8.0/24       0.0.0.0                  0      0 32768 i
*> 10.2.10.0/24      0.0.0.0                  0      0 32768 i
*> 10.2.11.0/24      0.0.0.0                  0      0 32768 i
*> 10.2.12.0/24      0.0.0.0                  0      0 32768 i
*> 10.2.13.0/24      0.0.0.0                  0      0 32768 i
```

Table 49 describes the significant fields shown in the display.

Table 49 show ip bgp ipv4 multicast Field Descriptions

Field	Description
MBGP table version	Internal version number of the table. This number is incremented whenever the table changes.
local router ID	IP address of the router.
Status codes	Status of the table entry. The status is displayed at the beginning of each line in the table. It can be one of the following values: s—The table entry is suppressed. d—The table entry is dampened. h—The table entry is historical. *—The table entry is valid. >—The table entry is the best entry to use for that network. i—The table entry was learned via an internal BGP (iBGP) session.
Origin codes	Origin of the entry. The origin code is placed at the end of each line in the table. It can be one of the following values: i—Entry originated from an Interior Gateway Protocol (IGP) and was advertised with a **network** router configuration or address family configuration command. e—Entry originated from an Exterior Gateway Protocol (EGP). ?—Origin of the path is not clear. Usually, this is a router that is redistributed into BGP from an IGP.
Network	IP address of a network entity.
Next Hop	IP address of the next system that is used when forwarding a packet to the destination network. An entry of 0.0.0.0 indicates that the router has some non-BGP routes to this network.
Metric	If shown, the value of the interautonomous system metric.
LocPrf	Local preference value as set with the **set local-preference** route-map configuration command. The default value is 100.
Weight	Weight of the route as set via autonomous system filters.
Path	Autonomous system paths to the destination network. There can be one entry in this field for each autonomous system in the path.

Related Commands

Command	Description
show ip rpf	Displays how IP multicast routing does RPF.

show ip mbgp summary

The **show ip mbgp summary** command is replaced by the **show ip bgp ipv4 multicast summary** command. See the description of the **show ip bgp ipv4 multicast summary** command for more information.

show ip bgp ipv4 multicast summary

To display a summary of IP Version 4 multicast database-related information, use the **show ip bgp ipv4 multicast summary** command in EXEC mode.

show ip bgp ipv4 multicast summary

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
12.0(7)T	This command was introduced.

Usage Guidelines

The **show ip bgp ipv4 multicast summary** command replaces the **show ip mbgp summary** command.

Examples

The following is sample output from the **show ip bgp ipv4 multicast summary** command:

```
Router# show ip bgp ipv4 multicast summary

BGP router identifier 10.0.33.34, local AS number 34
BGP table version is 5, main routing table version 1
4 network entries and 6 paths using 604 bytes of memory
5 BGP path attribute entries using 260 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
2 BGP community entries using 48 bytes of memory
2 BGP route-map cache entries using 32 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP activity 8/28 prefixes, 12/0 paths, scan interval 15 secs

Neighbor        V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
10.0.33.35      4    35     624     624        5    0    0 10:13:46        3
```

Table 50 describes the significant fields shown in the display.

Table 50 show ip bgp ipv4 multicast summary Field Descriptions

Field	Description
Neighbor	IP address of configured neighbor in the multicast routing table.
V	Version of multiprotocol BGP used.
AS	Autonomous system to which the neighbor belongs.
MsgRcvd	Number of messages received from the neighbor.
MsgSent	Number of messages sent to the neighbor.
TblVer	Number of the table version, which is incremented each time the table changes.
InQ	Number of messages received in the input queue.

Table 50 show ip bgp ipv4 multicast summary Field Descriptions (continued)

Field	Description
OutQ	Number of messages ready to go in the output queue.
Up/Down	Days and hours that the neighbor has been up or down (no information in the State column means the connection is up).
State/PfxRcd	State of the neighbor/number of routes received. If no state is indicated, the state is up.

Related Commands

Command	Description
show ip rpf	Displays how IP multicast routing does RPF.