MULTICAST CONFIGURATION COMMANDS

Multicast Configuration Commands

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CHAPTER 1 BASIC MULTICAST COMMANDS

1.1. Basic Multicast Commands

1.1.1. debug ip mpacket

Syntax

If you want to track the process for the multicast packet, you can use this command “**debug ip mpacket**”, and use the”**no**” forma of the command to close debug information.

debug ip mpacket *access-list group-address* **detail**

no debug ip mpacket

Parameter

Parameter	Description
access-list	Range for tracked multicast packets
group-address	The tracked multicast packet group address
detail	Details for multicast packet processing

Default value

Close debug information output

Command mode

Supervisor mode

Usage guidelines

You can use this command to track the main process for igmp-host end protocol.

Example

The following example shows some situations for multicast packet processing.

You have received the (100.168.20.151,224.1.1.1) packet on e0/1 port, and the packet length is 112 bytes.

You have sent the (192.168.20.99,224.0.0.5) packet on e0/1 port, and the packet length is 64 bytes.

```
router#debug ip mpacket
MINPUT: IP Ethernet0/1 (100.168.20.151,224.1.1.1), len=112
MOUTPUT: IP Ethernet0/1 (192.168.20.99,224.0.0.5), len=64
```

1.1.2. debug ip mroute-cache

Syntax

Use this command “debug ip mrouting” to enable “mroute-cache” tracking function, then you can see the change from the multicast routing cache. In addition, you can use the “no”format of the command to close the tracking.

debug ip mroute-cache *group-address*

no debug ip mroute-cache

Parameter

Parameter	**Description**
group-address	The tracked multicast routing cache group address

Default value

Close all tracking functions.

Command mode

Supervisor mode

Usage Guidelines

You can use this command to see the change of the adding/deleting of multicast routing cache.

Example

The following example shows you some changes on the multicast routing cache, and the creating and timeout of (192.168.20.97,230.0.0.1) cache.

```
router#debug ip mroute-cache
MRC: create (192.168.20.97,230.0.0.1) mroute-cache
MRC: expired (192.168.20.97,230.0.0.1) mroute-cache
```

1.1.3. debug ip multicast

Syntax

You can use this command “**debug ip multicast**” to enable multicast event tracking function, and then see the interaction between the multicast protocol and mrouting. you can use the “**no**”format of the command to close the function.

debug ip multicast [**alert** | **border-router**]

no debug ip multicast [**alert** | **border-router**]

Parameter

Parameter	**Description**
alert	Track the alert interaction among multicast routing components
border-router	Track related events of multicast border router MBR

Default value

Close all tracking functions.

Command mode

Supervisor mode

Usage guidelines

Defining some standard events between multicast routing protocol and mrouting indicates “alert”, for example: creation alert/deletion alert which related (S,G). You can use “debug ip multicast alert” to see these alerts.

’s multicast routing protocol supports MBR, and each multicast routing protocol is a “component”. You can use “debug ip multicast border-router” to see the component’s running information.

Example

In the following example, the alert router is turned on for output:

```
router#debug ip multicast alert
MBR: [(S, G) deletion alert], originated by OLNK, sent to all components
MBR: [(S, G) creation alert], originated by NONE, sent to all components
MBR:    src = 192.168.20.110, grp = 239.0.0.100
MBR:    sent to owner OLNK first
MBR: [(S, G) join alert], originated by NONE, sent to OLNK
MBR:    src = 192.168.20.110, grp = 239.0.0.100
MBR: [(S, G) firstuse alert], originated by NONE, sent to OLNK
MBR:    src = 192.168.20.110, grp = 239.0.0.100
MBR: [(S, G) deletion alert], originated by OLNK, sent to all components
MBR:    src = 192.168.20.110, grp = 239.0.0.100
```

1.1.4. ip multicast-statistic

Syntax

To enable IP multicast packet statistics, run the following command. To return to the default setting, use the no form of this command.

ip multicast-statistic

no ip multicast-statistic

Parameter

Default value

Disabled

Command mode

Global configuration mode

Usage guidelines

The multicast statistics provides with evidence of switching rpt of pim-sm to spt. When configured switching threshold, the command needs to be enabled. Once the command is disabled, the switch will not make statistics of the multicast.

Example

The following example shows how to configure the statistics multicast packet of the switch:

```
switch_config#ip multicast-statistic
```

Related Command

None

1.1.5. ip multicast-routing

Syntax

Use this command “ip multicast-routing” to enable IP multicast packet transferring function, and “no ip multicast-routing” to disable the function.

ip multicast-routing

no ip multicast-routing

Parameter

none

default value

The default is not to transfer multicast packets.

Command mode

global configuration mode

Usage Guidelines

If you disable this function, the router will no longer transfer multicast packets, meanwhile, the multicast routing list and the multicast cache will be empty.

Example

The following example will configure the router to transfer multicast packets:

```
router_config#ip multicast-routing
```

Related command

show ip mroute mfc

1.1.6. ip multicast route-limit

Syntax

Use this command “ip multicast route-limit” to configure the maximum number of multicast routing item, and “no ip multicast route-limit” to un-limit the number.

ip multicast route-limit *size*

no ip multicast route-limit *size*

Parameter

Parameter	Description
size	Maximum number of multicast routing item

Default value

The default multicast routing item number is unlimited.

Command mode

global configuration mode

Usage guidelines

If you have configured this function, the multicast routing item number will be limited.

Example

The following example will configure the maximum number of multicast routing list to 2000:

```
router_config#ip multicast route-limit 2000
```

Related command

show ip mroute mfc

1.1.7. ip multicast boundary

Syntax

Use this command "**ip multicast boundary**" to manage the range for the port allowed processing multicast packets; it is valid for input/output packets on the port. use "**no ip multicast boundary**" to cancel this command.

ip multicast boundary *access-list*

no ip multicast boundary

Parameter

Parameter	Description
access-list	The access-list name used to specify the range for processing multicast packets.

Default

Process all multicast packets.

Command mode

interface configuration mode

Usage Guidelines

If the function is configured, the range for the port allowed processing multicast packets will be limited.

Example

The following example will configure the range for the port e1/0 allowed processing multicast packets to the range limited by the access-list testacl:

```
router_config_e1/0#ip multicast boundary testacl
```

1.1.8. ip multicast helper-map

Syntax

Use this command “ip multicast helper-map” to configure the connection of two broadcast networks with the multicast routing on the multicast network, and “**no ip multicast helper-map**” to cancel this command.

ip multicast boundary helper-map {*group-address*|**broadcast**} {*broadcast-address* |*multicast-address* } *access-list*

no ip multicast boundary helper-map {*group-address*|**broadcast**} {*broadcast-address* | *multicast-address* } *access-list*

Parameter

Parameter	Description
group-address	The multicast packet group address which needed to be converted to the broadcast packet. it is used with the broadcast-address keyword.
broadcast	It can convert the broadcast packet to the multicast packet. it is used with the multicast-address keyword.
broadcast-address	The target address of broadcast packet which is sent after converting. it is used with the group-address keyword.
multicast-address	The target address of multicast packet which is sent after converting. It is used with the broadcast keyword.
access-list	IP extended access-list name. You can use it to specify the port number for packet converting.

Default value

Not perform the conversion between any multicast packets and broadcast packets.

Command mode

interface configuration mode

Usage Guidelines

If two broadcast networks are connected with a multicast network, you can convert the broadcast flow to multicast flow on the first hop router connected with the source broadcast network, and then convert the multicast flow to broadcast flow on the last hop router connected with the target broadcast network. Thus, you can utilize the multicast network’s multicast characteristic between the two broadcast networks which are required to be connected with each other. Furthermore, it can prevent the packets between two broadcast networks from being sent repeatedly, and utilize the “quick forward” characteristic on the multicast network.

Before using “ip multicast helper-map”, you should have configured this command “ip directed-broadcast” on the port.

Example

Configuration on the router is as follow:

if you configure command”ip directed-broadcast” on port e0 of the first hop router, it will be allowed to process the link broadcast packets.

If you have configured “ip multicast helper-map broadcast 230.0.0.1 testacl1”, you can convert the udp broadcast packet, whose port number is 4000(“ip forward-protocol” command specified) and the source address is 192.168.20.97/24 (testacl1 specified), to multicast packet whose target address is 230.0.0.1 (“ip multicast helper-map” command specified).

if you configure command”ip directed-broadcast” on port e1 of the last hop router, it will be allowed to process the link broadcast packets.

If you have configured “ip multicast helper-map broadcast 230.0.0.1 172.10.255.255 testacl2”, you can convert the multicast packet, whose port number is 4000(“ip forward-protocol” command specified), the source address is 192.168.20.97/24 (testacl2 specified) and target address is 230.0.0.1, to broadcast packet whose target address is 170.10.255.255 (“ip multicast helper-map” command specified).

On the first hop router which is connected with the source broadcast network:

```
interface ethernet 0
ip directed-broadcast
ip multicast helper-map broadcast 230.0.0.1 testacl
ip pim dense-mode
!
ip access-list extended testacl  permit udp 192.168.20.97 255.255.255.0 any
ip forward-protocol udp 4000
```

On the last hop router which is connected with the target broadcast network:

```
interface ethernet 1
ip directed-broadcast
ip multicast helper-map 230.0.0.1 172.10.255.255 testacl2
ip pim dense-mode
```

```
!
ip access-list extended testacl2 permit udp 192.168.20.97 255.255.255.0 any
ip forward-protocol udp 4000
```

Related command

ip forward-protocol

ip directed-broadcast

1.1.9. ip multicast ttl-threshold

Syntax

Use this command “ip multicast ttl-threshold” to configure the maximum threshold value of multicast packet ttl on the port, and “no ip multicast ttl-threshold” to restore default.

ip multicast ttl-threshold *ttl-value*

no ip multicast ttl-threshold

Parameter

Parameter	Description
ttl-value	The multicast packet ttl threshold value on the port.

Default

The default ttl threshold value on the port is 1.

Command mode

interface configuration mode

Usage Guidelines

The ttl value of receiving/sending packet should be largerer than the specified threshold value on the port, you can use this command to configure a router to border router.

example

The ttl threshold value configured on port s0 is 200, it means only the multicast packet with ttl value more than 200 is allowed to be received/sent on the port.

```
interface serial 0
ip multicast ttl-threshold 200
```

1.1.10. show ip mflow

Syntax

You can use this command “show ip mflow” to display global flow information processed by system and multicast flow information processed on the port.

show ip mflow [*group-address*|*source-address*]**interface**

Parameter

Parameter	Description
group-address	The displayed multicast flow information group address.
source-address	The displayed multicast flow information source address.
interface	The displayed port multicast flow information.

Default value

none

Command mode

Supervisor mode

Usage Guidelines

Display the processed packet number from the multicast flow, wrong incoming interface packet number, and current flow value.

Example

The following example will display global multicast flow information:

```
router#show ip mflow
IP Multicast Flow
(100.168.20.151,224.1.1.1)
total process: 0 wrong_if_count: 0 curr-flux: 0.00
(192.167.20.131,239.1.1.1)
total process: 0 wrong_if_count: 0 curr-flux: 0.00
```

The following example will display port multicast flow information:

```
router#show ip mflow interface e0/1
IP Multicast Flow
(192.168.20.97,230.0.0.1)
total recv: 21180 total send: 0 curr-in-flux: 0.00 curr-out-flux: 0.00
(100.168.20.151,224.1.1.1)
total recv: 16822400 total send: 0 curr-in-flux: 0.00 curr-out-flux: 0.00
(192.168.20.97,232.0.0.1)
total recv: 240 total send: 0 curr-in-flux: 0.00 curr-out-flux: 0.00
(192.167.20.131,239.1.1.1)
total recv: 103264 total send: 0 curr-in-flux: 0.90 curr-out-flux: 0.00
```

1.1.11. show ip mroute-cache

Syntax

use this command “show ip mroute-cache” to display the information on the multicast routing cache.

show ip mroute-cache [*group-address*]

Parameter

Parameter	Description
group-address	The displayed multicast routing cache group address.

Default

none

Command mode

Supervisor mode

Usage Guidelines

MRC (Multicast Route Cache) is a global multicast routing cache, and every MRC item contains the (S, G)/ (*, G) information, upstream/downstream interface information received from the multicast routing.

Example

The following example will display multicast routing list information:

```
router#show ip mroute-cache
IP Multicast Route Cache
(192.168.20.97, 230.0.0.1)|(192.168.20.97,230.0.0.1)
  Incoming interface: Ethernet0/2, Last used: 00:00:34
  Outgoing interface list:
    Loopback0
(192.168.20.97, 230.0.0.2)|(192.168.20.97,230.0.0.2)
  Incoming interface: Ethernet0/2, Last used: 00:00:12
  Outgoing interface list:
    Loopback1
```

1.1.12. show ip mroute mfc

You can use this command “show ip mroute mfc” to display the multicast forwarding list information, and then activate the multicast function.

Syntax

show ip mroute mfc

Parameter

None

Default

none

Command mode

Supervisor mode

Usage guidelines

MFC (Multicast Forwarding Cache) is a global multicast forwarding list, and the multicast packet is forwarded by it. Every MFC item has (S, G)/ (*, G) information and upstream/downstream interface information.

Example

The following example will display multicast routing list information:

```
router#show ip mroute mfc
IP Multicast Forwarding Cache
(192.168.20.110/32, 239.0.0.100/32)
  Incoming interface: Ethernet0/2, RPF nbr 0.0.0.0, owned by OLNK
  Outgoing interface list:
    Loopback0, owned by OLNK
(192.168.20.110/32, 239.0.0.101/32)
  Incoming interface: Ethernet0/2, RPF nbr 0.0.0.0, owned by OLNK
  Outgoing interface list:
    Loopback0, owned by OLNK
(192.168.20.138/32, 239.1.1.1/32)
  Incoming interface: Ethernet0/2, RPF nbr 0.0.0.0, owned by OLNK
  Outgoing interface list:
  Loopback0, owned by OLNK
```

Related command

show ip mroute olnk

show ip mroute static

CHAPTER 2 IGMP CONFIGURATION COMMANDS

2.1. IGMP Configuration Commands

2.1.1. clear ip igmp group

Syntax

If you want to clear the multicast group member information saved in multicast router that supports IGMP, you can use the command “**clear ip igmp group**”.

clear ip igmp group *type-number group-address*

Parameter

Parameter	Description
type-number	port type and port number.
group-address	Multicast group’s group address to clear information.

Default value

None

Command mode

Supervisor mode

Usage guidelines

Using this command, you can clear the multicast group member information saved in router when the saved multicast group information has a problem.

Example

The following example shows you how to clear the information of multicast group 233.33.1.1 on e1/0 port.

```
clear ip igmp group e1/0 233.33.1.1
```

Related command

None

2.1.2. debug ip igmp

Syntax

If you want to track the process for igmp-router end protocol, you can use this command “**debug ip igmp**”, and use the”**no**” forma of the command to close debug information.

debug ip igmp

no debug ip igmp

Parameter

None

Default value

Close debug information output

Command mode

Supervisor mode

Usage guidelines

You can use this command to track the main process for igmp-router end protocol to find the reason for protocol processing failure.

Example

igmp-router function module’s debug information usually use the natural language to make description. Due to its simplicity, we will not list all of the debug information.

2.1.3. debug ip igmp-host

Syntax

If you want to track the process for igmp-host end protocol, you can use this command “**debug ip igmph**”, and use the”**no**” forma of the command to close debug information.

debug ip igmph *group-address*

no debug ip igmph

Parameter

None

Default value

Close debug information output

Command mode

Supervisor mode

Usage guidelines

You can use this command to track the main process for igmp-host end protocol to find the reason for protocol processing failure.

Example

Igmp-host function module’s debug information usually use the natural language to make description. Due to its simplicity, we will not list all of the debug information.

2.1.4. ip igmp helper-address

Syntax

If you want a port to transit IGMP packet, you can use this command to configure the port. One port can configure the command only once time, so the next configured command will overwrite the original command.

ip igmp helper-address *destination-address*

no ip igmp helper-address *destination-address*

Parameter

Parameter	**Description**
destination-address	The destination address of transitting IGMP packet.

Default value

The port will not transit IGMP packet

Command mode

interface configuration mode

Usage guidelines

Use this command “ip igmp helper-address” to transit all received igmp packets.

Example

ip igmp helper-address 192.168.20.10

2.1.5. ip igmp join-group

Syntax

If you want to add a multicast group on the port, you can use this command to perform it.

ip igmp join-group *group-address* [{**include**|**exclude**} *source-address*]

no ip igmp join-group *group-address* [{include|exclude} *source-address*]

Parameter

Parameter	**Description**
group-address	The multicast group required to be added to the port
include	The mode of SSM needed to add a multicast group is “include”.
exclude	The mode of SSM needed to add a multicast group is “exclude”.
source-address	Source filter address whose port is added to multicast group.

Default value

No multicast group will be added to the port.

Command mode

interface configuration mode

Usage guidelines

Use this command “ip igmp join-group” to dynamically add a multicast group to the port.

Example

ip igmp join-group 230.0.0.1

ip igmp join-group 230.0.0.1 exclude 192.168.20.10

2.1.6. ip igmp immediate-leave group-list

Syntax

If you want the router port running IGMP version 2 to run the multicast group function “Exit Now”, you can use this command “**ip igmp immediate-leave group-list**” to perform configuring. In addition, you can use the “**no**”format of the command to forbid the IGMP host to “exit now”.

ip igmp immediate-leave *group-list* *list-name*

no ip igmp immediate-leave *group-list*

Parameter

Parameter	**Description**
list-name	Pre-configured ip standard access-list name

Default value

The IGMP host is not allowed to run “Exit Now” function.

Command mode

global configuration mode/interface configuration mode

Usage guidelines

This command is available only for the port of running IGMP version 2.it can be used when the network connecting with the port has only one IGMP host. Through configuring this command, the host can immediately exit from a multicast group without the process for packet exchanging and delaying from the router. Besides, you can configure this command in “global configuration mode” and “interface configuration mode”, but this command configured in “global configuration mode” will be prior to the command configured in “interface configuration mode”. If you have configured the command in “global configuration mode”, the next command configured in “interface configuration mode “will be ignored. On the other hand, the command configured in “global configurationmode” will overwrite the original command configured in “interface configurationmode”.

Example

Prefer to “Configure multicast routing”.

relevant command

ip access-list

2.1.7. ip igmp last-member-query-interval

Syntax

To change the query interval of last group member I on the current port, use this command “**ip igmp last-member-query-interval”**. You can use the “**no**” format of the command to restore default settings.

ip igmp last-member-query-interval *time*

no ip igmp last-member-query-interval

Parameter

Parameter	**Description**
list-name	The value of last member query interval configured on the port. its unit is millisecond.

Default value

The default of the last group member query interval on the port is 1000ms.

Command mode

interface configuration mode

Usage guidelines

You can use this command “ip igmp last-member-query-interval” to modify the last group member query interval on the port.

Example

The following example will modify the last member query interval on the port to 2 seconds.

```
interface ethernet 0/0
ip igmp last-member-query-interval 2000
```

2.1.8. ip igmp querier-timeout

Syntax

You can use this command “**ip igmp querier-timeout**”to modify other routers for IGMP querier timeout,.use the “**no**” f ormat of this command to restore default.

ip igmp querier-timeout *time*

no ip igmp querier-timeout

Parameter

Parameter	**Description**
time	Other querier timeout. its unit is second.

Default value

125 seconds

Command mode

interface configuration mode

Usage guidelines

You can use this command “ip igmp querier-timeout” to modify other routers for querier timeout. This command is available only for the port which running IGMP version 2.

Example

The following example shows that the querier-timeout specified on interface Ethernet 0/0 is 100 seconds.

interface ethernet 0/0

ip igmp querier-timeout 100

2.1.9. ip igmp query-interval

Syntax

To set the interval for IGMP General Query packet sending on the port, you can use this command “**ip igmp query-interval**”. Use the “**no**”format of this command to restore default.

ip igmp query-interval *time*

no ip igmp query-interval

Parameter

Parameter	Description
time	Interval of sending general query packet. its unit is second.

Default value

60 seconds

Command mode

interface configuration mode

Usage guidelines

you can use this command “**ip igmp query-interval**”to set the interval for IGMP General Query packet sending on the port,

Example

The following example shows that the interval of sending general query packet on Ethernet 0/0 port is specified to 50 seconds.

interface ethernet 0/0

ip igmp query-interval 50

2.1.10. ip igmp query-max-response-time

Syntax

To specify the maximum interval for IGMP host to respond General Query packet, you can use this command "**ip igmp query-max-resposne-time**". Use the "**no**"format of this command to restore default.

ip igmp query-max-response-time *time*

no ip igmp query-max-response-time

Parameter

Parameter	**Description**
time	Value of the maximum response time configured on the port.

Default

10 seconds

Command mode

interface configuration mode

Usage guidelines

you can use this command "**ip igmp query-max-resposne-time**"to specify the maximum interval for IGMP host to respond General Query packet. This command is available only for the port which running IGMP version 2 and 3.

Example

The following example will set the IGMP maximum response time on Ethernet 0/0 port as 15 seconds.

interface ethernet 0/0

ip igmp query-max-response-time 15

2.1.11. ip igmp static-group

Syntax

If you want to configure a static multicast group on the port, you can use this command "**ip igmp static-group**" to perform it. Use the "**no**"format of this command to restore default.

ip igmp static-group { ***** | ***group-address*** } {**include** *source-address* }

no ip igmp static-group { * | *group-address* } {**include** *source-address*}

Parameter

Parameter	**Description**

*	All multicast groups.
group-address	specified multicast group address.
source-address	specified host source address.

Default value

In default, no multicast group is static configured on the port.

Command mode

interface configuration mode

Usage guidelines

Configure the static IGMP multicast group information on the current port.

Notes:

For the same group-address, you can configure several “include source-address” commands for the corresponding static multicast group to have several source-addresses existing. However, for the same group-address, you can’t configure both commands with/without “include source-address”.

Example

Refer to “Configure multicast routing”

2.1.12. ip igmp version

Syntax

To set the IGMP version number running on the port, you can use this command “**ip igmp version**”. use the “**no**”format of the command to restore default.

ip igmp version *version-number*

no ip igmp version

Parameter

Parameter	Description
version-number	The value 1.2 or 3 indicates separately the IGMP version number 1,2 or3.

Default value

If you don’t configure this command, the default version number for IGMP-Router end protocol running on the port is 3.

Command mode

interface configuration mode

Usage guidelines

Use this command “**ip igmp version**”can set the IGMP version number running on the port.

Example

The following example will specify the IGMP version number running on Ethernet 0/0 port as 2.

interface ethernet 0/0

ip igmp version 2

2.1.13. show ip igmp groups

Syntax

You can use the following command to see the multicast group member information that is saved on the current router.

show ip igmp groups {***interface* | *group-address* | *detail***}

Parameter

Parameter	Description
interface	The port where you want to see the multicast group information. If you don’t add this parameter, all multicast groups information on the port will be displayed.
group-address	The multicast group address to see. If you don’t add this parameter, all multicast groups information on the router will be displayed.
detail	The router whether you want to see the multicast group information.

Default value

None

Command mode

Supervisor mode/global configuration mode/interface configuration mode.

Usage guidelines

You can use this command to see the multicast group member information that is saved on the router.

Example

show ip igmp groups e0/0 detail

Running this command will display the following message:

Interface: Ethernet0/0

Group address: 233.33.1.3

```
Uptime: 00:03:46
Group status: Static
Group filter mode: INCLUDE
Last reporter: 0.0.0.0
Group source-list:  (Flags: S-Static,  R-Remote)
  Source address:   Uptime     Timer      Fwd   Flags
  192.168.20.5      00:03:46   stopped    Yes   S
Interface: Ethernet0/0
Group address: 233.33.1.1
Uptime: 00:03:46
Group status: Static
Group filter mode: INCLUDE
Last reporter: 0.0.0.0
Group source-list:  (Flags: S-Static,  R-Remote)
  Source address:   Uptime     Timer      Fwd   Flags
  192.168.20.5      00:03:46   stopped    Yes   S
  192.168.20.3      00:03:46   stopped    Yes   S
  192.168.20.1      00:03:46   stopped    Yes   S
```

show ip igmp groups 233.33.1.1 detail

Running this command will display the following message:

```
Interface: Ethernet0/0
Group address: 233.33.1.1
Uptime: 00:02:42
Group status: Static
Group filter mode: INCLUDE
Last reporter: 0.0.0.0
Group source-list:  (Flags: S-Static,  R-Remote)
  Source address:   Uptime     Timer      Fwd   Flags
  192.168.20.5      00:02:42   stopped    Yes   S
  192.168.20.3      00:02:42   stopped    Yes   S
  192.168.20.1      00:02:42   stopped    Yes   S
```

show ip igmp groups

Running this command will display the following message:

```
Interface        Group address    Uptime    Expires   Last Reporter    Flags
```

```
Ethernet0/0     239.255.255.250  00:01:08  00:02:05  192.168.20.141   R
Ethernet0/0     224.2.127.254    00:01:09  00:02:00  32.1.1.67        R
Ethernet0/0     224.1.1.1        00:01:24  stopped   0.0.0.0          S
Ethernet0/0     233.33.1.5       00:01:24  stopped   0.0.0.0          S
Ethernet0/0     233.33.1.3       00:01:24  stopped   0.0.0.0          S
Ethernet0/0     233.33.1.1       00:01:24  stopped   0.0.0.0          S
Interface       Group address    Uptime    Expires   Last Reporter    Flags
Loopback10      239.255.255.250  00:01:08  00:02:05  192.168.20.141   R
Loopback10      224.2.127.254    00:01:09  00:02:00  32.1.1.67        R
```

2.1.14. show ip igmp interface

Syntax

You can use this command to see information on the current router’s port where IGMP is activated.

show ip igmp interface *interface*

Parameter

Parameter	Description
interface	The specified port to display information. If you don’t add this parameter, all information on ports where IGMP is activated will be displayed.

Default value

None

Command mode

Supervisor mode/global configuration mode/interface configuration mode

Usage guidelines

You can use this command to display information on the port where IGMP is activated.

Example

```
show ip igmp interface e0/0
```

Running this command will display the following information:

```
Ethernet0/0 is up, line protocol is up
  Internet address is 192.168.20.167
  Current IGMP router version is 3
  Router plays role of querier on the interface now
  IGMP is enable on the interface
  IGMP query-interval is 60 seconds
  IGMP max query response time is 10 seconds
  IGMP Last member query response time is 1000 milliseconds
  IGMP querier timeout is 125 seconds
  Multicast routing is enabled on the interface
```

2.1.15. show ip igmp-host

Syntax

You can use this command to see IGMP host information on the port ofcurrent router.

show ip igmph { ***interface*** } **detail**

Parameter

Parameter	Description
interface	The specified port to display information.
detail	Display igmp host detailed information.

Default value

none

Command mode

Supervisor mode/global configuration mode/interface configuration mode

Usage guidelines

You can use this command to display basic IGMP host information on the port.

Example

```
show ip igmph interface e0/0
```

Running this command will display the following information:

```
IGMP host Mode is IGMP_V3_ROUTER
  IGMP host Query Interval is 23 second
  IGMP host Query Response Interval is 125
  IGMP host Query Robustness Variable is 2
  IGMP host Last Query Interval is 0
  IGMP interface timer is 0
  IGMP host group joined(number of users):
    230.0.0.1(1)
```

CHAPTER 3 PIM-DM CONFIGURATION COMMANDS

3.1. PIM-DM Configuration Commands

3.1.1. clear ip mroute pim-dm

Syntax

Use the following command in supervisor mode to clear the (S,G) routing list items submitted by PIM-DM to mrouting:

clear ip mroute pim-dm {***** | ***group*** [***source***]}

Parameter

Parameter	**Description**
*****	Delete all multicast routing list items submitted by pim-dm.
group	Delete all list items submitted by pim-dm and satisfied in the specified group.
source	(optional) Delete all list items submitted by pim-dm and satisfied in the specified group's *source*.

Default value

None

Command mode

Supervisor mode

Usage guidelines

The command will delete all or part of table lists of local multicast router table,and it is possible to affect the normal multicast packet forwarding. This command can only delete the (S,G) items, whose upstream port is created by PIM-DM multicast routing protocol, and inform mrouting, then mrouting will determine if it should re-establish the corresponding (S,G).

Example

Example1:

Router#clear ip mroute pim-dm *

All (S,G) items, whose middlestream/upstream port is created by PIM-DM, on local MRT will be cleared.

Example2:

Router#clear ip mroute pim-dm 239.1.1.1

All (S,G) items with the group address 239.1.1.1, whose middlestream/upstream port is created by PIM-DM, on local MRT will be cleared.

Example3:

Router#clear ip mroute pim-dm 239.1.1.1 192.168.20.131

All (S,G) items with the address (192.168.20.138, 239.1.1.1), whose middlestream/upstream port is created by PIM-DM, on local MRT will be cleared.

3.1.2. clear ip pim-dm interface

Reset the multicast packet statistic value forwarded through (S,G) on PIM-DM port. You can use the command in supervisor mode:

Syntax

clear ip pim-dm interface {**count** | *type number*{***count***}}

Parameter

Parameter	**Description**
count	(optional) Delete all multicast packet statistic values on PIM-DM port.
type number	(optional) Delete multicast packet statistic values on the specified port.

Default value

none

Command mode

supervisor mode

Usage guidelines

This operation will reset the multicast packet number statistic values forwarded through PIM-DM port in local multicast routing list. This command can only reset the (S,G) items, whose upstream port is created by PIM-DM multicast routing protocol.

Example

Example1:

Router#clear ip pim-dm interface count

It will reset all multicast packet number statistic values forwarded by (S,G) items, whose upstream port is created by PIM-DM, on local MRT.

Example2:

Router#clear ip pim-dm interface Ethernet1/1 count

It will reset all multicast packet number statistic values forwarded by (S,G) items, whose upstream port is Ethernet1/1 and created by PIM-DM, on local MRT.

3.1.3. debug ip pim-dm

Syntax

use this command to track input/output PIM packets and caused events. Set this command to “no” to stop tracking.

debug ip pim-dm [**group**|**alert**]

Parameter

Parameter	**Description**
group	(optional) Track the specified group status.
alert	(optional) Track the alert status received from mrouting.

Default value

none

Command mode

supervisor mode

Usage guidelines

receive Alert from mrouting.

Send alert to other components.

Example

Example 1, the output information is as follows:

Hello packet prompt sent to each port.

Hello packet prompt received from each port.

A new neighbor is found.

Delete neighbor.

Port sending status refresh packet.

Port receiving status refresh packet.

Port is sending Assert packet.

Port is receiving Assert packet.

Port is sending prune packet.

Port is receiving prune packet.

Port is sending graft ack packet.

Port is receiving graft ack packet.

Port is sending graft packet.

Port is receiving graft packet.

Port is sending join/prune packet.

Port is receiving join/prune packet.

When a new (S,G) is created

When deleting (S,G)

```
Router#debug ip pim-dm
2003-3-26 11:45:17 received V2 hello packet on Ethernet2/1 from 192.168.20.133(GenID = 3539)
2003-3-26 11:45:17 Ethernet2/1 create new nbr 192.168.20.133
2003-3-26 11:45:25 send hello packet to 224.0.0.13 on Loopback1
2003-3-26 11:50:29 Ethernet2/1 delete nbr 192.168.20.133
2003-3-26 11:50:51 received V2 hello packet on Ethernet2/1 from 192.168.20.152
2003-3-26 11:50:51 send hello packet to 224.0.0.13 on Ethernet2/1
2003-3-26 12:04:37 PIM-DM:  delete (192.168.20.138, 239.1.1.1) in MRT success
2003-3-26 12:04:37 PIM-DM: clear (192.168.20.138, 239.1.1.1) from MRT successful
2003-3-26 12:04:39 PIM-DM: ignored V2 packet on Ethernet2/1 from 192.168.10.204 (validate source address failed)
2003-3-26 12:04:39 PIM-DM: (192.168.20.138, 239.1.1.1)'s upstream:192.168.20.132 Adding in MRT success
2003-3-26 12:04:39 PIM-DM: (192.168.20.138, 239.1.1.1) Adding in MRT
```

Example 2, output received alert message:

```
Router#debug ip pim-dm alert
2003-3-26 12:09:51 receive alert_rt_change alert from mroute
2003-3-26 12:09:54 receive alert_rt_change alert from mroute
2003-3-26 12:11:08 PIM-DM: send sg_deletion alert
2003-3-26 12:11:19 receive alert_sg_creation alert from mroute
2003-3-26 12:11:20 receive alert_sg_prune alert from mroute
2003-3-26 12:11:56 receive alert_group_report alert from mroute
2003-3-26 12:11:56 receive alert_sg_join alert from mroute
```

Example 3, track the specified group status:

```
Router#deb ip pim-dm 239.1.1.1
Router#2003-3-26 12:35:27 PIM-DM: clear (192.168.20.138, 239.1.1.1) forwd pkt count success
2003-3-26 12:35:37 PIM-DM: delete (192.168.20.138, 239.1.1.1) in MRT success
2003-3-26 12:35:37 PIM-DM: clear (192.168.20.138, 239.1.1.1) from MRT successful
```

```
2003-3-26 12:35:37 PIM-DM: (192.168.20.138, 239.1.1.1)'s upstream:
192.168.20.132 Adding in MRT success

2003-3-26 12:35:37 PIM-DM: (192.168.20.138, 239.1.1.1)'s downstream: 1.1.1.1
create success

2003-3-26 12:35:37 PIM-DM: (192.168.20.138, 239.1.1.1)'s downstream:
192.167.20.132 create success

2003-3-262:35:42 PIM-DM: (192.168.20.138, 239.1.1.1) Adding in MRT
```

3.1.4. ip pim-dm

Syntax

This command is used to run PIM-DM on the port. set this command to “no” to disable PIM-DM on the port.

ip pim-dm

no ip pim-dm

Parameter

None

Default

None

Command mode

interface configuration mode

Usage guidelines

1. If the “ip multicast-routing” is not configured before configuring this command, it will display the following warning: WARNING: "ip multicast-routing" is not configured, IP Multicast packets will not be forwarded
2. Once this function is disabled, PIMDM will no longer run on the port.but it will not affect other PIM-DM configurations. After rerun PIM-DM on the port, all PIM-DM configurations are still valid.
3. Enabling this function means it is available for forwarding multicast packet on the port, however, you have to enable the global multicast packet forwarding function first.

Example

```
Router_config#ip multicast-routing

Router_config#interface Ethernet1/1

Router_config_e1/1#ip pim-dm
```

Related command

ip multicast-routing

show ip pim-dm interface

3.1.5. ip pim-dm dr-priority

Syntax

Set a router as the priority to specified router (DR). You can set this command to "no" to restore default DR priority on the port.

ip pim-dm dr-prioirty *priority*

no pim-dm dr-prioirty

Parameter

Parameter	Description
priority	Port DR priority. The larger the value is, the higher the priority is. Its range is from 0 to 4294967294, and the default is 1.

Default value

default DR priority on PIM port is 1.

Command mode

interface configuration mode

Usage guidelines

1. If all PIM neighbors support DR Priority on the port, select the one with the highest priority as DR. If all have the same priority, just select the one with the highest port IP value as DR.
2. If router didn't advertise its priority in Hello packet and there are several routers have the same situation, just select the router with the highest port IP value as DR.

3.1.5. ip pim-dm hello-interval

Syntax

This command is used to configure the interval of regularly sent PIM-Hello packets on the port. You can set this command to "no" to restore default interval.

ip pim-dm hello-interval *interval*

***no* ip pim-dm hello-interval**

Parameter

Parameter	Description
interval	The interval of regularly sent PIM-Hello packets. Its range is from 0 to 65535, and the default is 30 seconds.

Default value

30 seconds

Command mode

interface configuration mode

Usage guidelines

Regularly sending Hello packets can check if the neighbor exists. Generally, if Hello packets is not received after the 3.5 times hello-interval timeout configured by neighbor, the neighbor will be considered disappeared.

For IGMP v1, you can select the specified router (DR) through PIM-DM Hello packet.

Example

```
Router_config#interface Ethernet1/1
Router_config_e1/1#ip pim-dm hello-interval 30
```

Related command

ip igmp query-interval

3.1.6. ip pim-dm state-refresh origination-interval

Syntax

The command allows the router to generate original PIM-DM state refresh packet and configure the state refresh interval. To cancel the generation for original PIM-DM state refresh packet, set this command to “no”.

ip pim state-refresh origination-interval [*interval*]

no ip pim state-refresh origination-interval

Parameter

Parameter	**Description**
interval	For the first port router connected with the source directly, it is the interval of regularly sending state refresh packet. For the following router, it is interval of allowed receiving and processing state refresh packet for the port. This parameter is configured optionally, and its range is from 4 to 100 seconds. The default is 60 seconds.

Default value

This parameter is configured optionally.

The default is 60 seconds.

Command mode

interface configuration mode

Usage guidelines

Configure this command on the first router's, neighboring directly on the multicast source, incoming port. By default, it will generate original state refresh packet. During configuring this command on the following router's port, you can use *interval* to limit the process for received state refresh packet interval. By default, all routers where is running PIM-DM can process and forward state refresh packet.

Example

Router_config_e1/1#ip pim-dm state-refresh origination-interval 80

Related command

ip pim-dm state-refresh disable

3.1.7. ip pim-dm neighor-filter

Syntax

This command is used to prevent some routers from participating PIM-DM operation. Set this command to "no" to cancel the limit.

ip pim-dm neighor-filter *acess-list-name*

no ip pim-dm neighor-filter *acess-list-name*

Parameter

Parameter	**Description**
access-list-name	Standard access-list, whose definition is to deny PIM packets from the specified source.

Default

No filter function.

Command mode

interface configuration mode

Usage guidelines

You can use multiple filter lists. The router denied by anyone of the lists can't be a neighbor of local PIM-DM.

Example

```
router_config_e1/1#ip pim-dm neighbor-filter nbr_filter
router_config#ip access-list standard nbr_filter
router_config_std_nacl#deny 192.167.20.132 255.255.255.255
router_config_std_nacl#permit 192.168.20.0 255.255.255.0
```

Related command

access-list

3.1.8. ip pim-dm state-refresh disable

Syntax

It will not allow running router process for PIM-DM multicast protocol or forward PIM-DM state refresh control message. You can set this command to “no” to restore the forwarding function.

ip pim-dm state-refresh disable

no ip pim-dm state-refresh disable

Parameter

none

Default value

By default, it is allowed to run forwarding PIM dense mode state refresh control message.

Command mode

Supervisor mode

Usage guidelines

After configuring this command to forbid processing and forwarding PIM-DM state refresh control message, the Hello message in PIM-DM will no longer contain state refresh control options and receive/send state refresh control packet.

Example

The following command forbids forwarding state refresh control message to downstream neighbors of PIM dense mode.

ip pim-dm state-refresh disable

Related command

ip pim-dm state-refresh origination-interval

3.1.9. show ip mroute pim-dm

Syntax

To display PIM-DM multicast routing list information, run the following command.

show ip mroute pim-dm *group-address* ***source***

Parameter

Parameter	Description
group-address	(optional)group address
source	(optional)source address

Default value

none

Command mode

All modes except the user mode.

Usage guidelines

It can display all (S,G) or specified (S,G) only in local MRT.

Example

Example1: Display all (S,G) in local MRT.

```
Router#show ip mroute pim-dm
PIM-DM Multicast Routing Table
Timers: Uptime/Expires
State: Interface state
RPF nbr: RPF neighbor address
(192.168.20.151, 224.1.1.1),    00:00:03 /00:03:27
 Incoming interface:
  Ethernet2/1   Forwarding      0.0.0.0
 Outgoing interface list:
  Loopback1     NoInfo  00:00:07 /00:00:00
(192.168.20.138, 239.1.1.1),    00:00:03 /00:03:27
 Incoming interface:
  Ethernet2/1   Forwarding      0.0.0.0
 Outgoing interface list:
  Loopback1     NoInfo  00:00:07 /00:00:00
  Ethernet1/1   NoInfo  00:02:43 /00:00:00
```

Example 2: Display the specified (S,G) in local MRT.

```
Router#show ip mroute pim-dm 224.1.1.1
PIM-DM Multicast Routing Table
Timers: Uptime/Expires
State: Interface state
RPF nbr: RPF neighbor address
(192.168.20.151, 224.1.1.1),    00:00:01 /00:03:29
Incoming interface:
Ethernet2/1   Forwarding      0.0.0.0
Outgoing interface list:
Loopback1     NoInfo  00:03:50 /00:00:00
```

Example3: Display the specified (S,G) in local MRT.

```
Router#show ip mroute pim-dm 224.1.1.1 192.168.20.131
PIM-DM Multicast Routing Table
```

3.1.10. show ip pim-dm neighbor

Syntax

To display the PIM-DM neighbor and the selected DR, run the following command:

show ip pim-dm neighbor [***interface-type*** *interface-number*]

Parameter

Parameter	Description
interface-type *interface-number*	Type and ID of the interface, such as Ethernet1/1 and serial 11/0

Default value

None

Command mode

All modes except the user mode

Usage guidelines

This command is used to check on which LAN routers PIM-DM or PIM-SM is configured.

Example

Example 1:

```
Router#show ip pim-dm neighbor
      PIM-DM Neighbor Table
Neighbor        Interface        Uptime/Expires       Ver   DR Prior/Mode
Address
192.167.20.132    Ethernet1/1       03:13:34 / 00:00:00    v2     4/D      (DR)
1.1.1.1          Loopback1         03:52:30 / 00:00:00    v2     1/D      (DR)
192.168.20.132    Ethernet2/1       19:35:56 / 00:00:00    v2     1/D
192.168.20.152    Ethernet2/1       00:00:04 / 00:01:41    v2     1/D
192.168.20.204    Ethernet2/1       00:00:36 / 00:01:44    v2     20/D     (DR)
```

Example 2:

```
Router# show ip pim-dm neighbor Ethernet2/1
PIM-DM Neighbor Table
Neighbor        Interface        Uptime/Expires       Ver   DR Prior/Mode
```

```
Address
192.168.20.132    Ethernet2/1     19:39:22 / 00:00:00    v2    1/D
192.168.20.152    Ethernet2/1     00:00:30 / 00:01:15    v2    1/D
192.168.20.204    Ethernet2/1     00:00:04 / 00:02:16    v2    20/D    (DR)
```

Related command

ip pim-dm

ip pim-dm dr-priority

ip pim-dm hello-interval

ip pim version

ip pim-dm neighor-filter

show ip pim-dm interface

3.1.11. show ip pim-dm interface

Syntax

To display the state of the PIM-DM interface, run the following command:

show ip pim-dm interface [***interface-type*** *interface-number*] [***count***][***detail***]

Parameter

Parameter	Description
interface-type *interface-number*	Type and ID of the interface, such as Ethernet1/1 and serial 11/0

Default value

None

Command mode

All modes except the user mode

Usage guidelines

Only the state of the PIM-DM interface can be displayed after this command is run. If the PIM-DM interface is not designated, the information about all PIM-DM interfaces' state will be displayed.

Example

Example 1:

```
Router#show ip pim interface
address          Interface        Ver/  Nbr    Hello  DR     DR
                                  Mode  Count  intvl  Prior
192.167.20.132   Ethernet1/1      v2/D  0      30     4      192.167.20.132
```

```
1.1.1.1          Loopback1        v2/D  0      30     1      1.1.1.1
192.168.20.132    Ethernet2/1       v2/D  2      30     1      192.168.20.204
```

Example 2:

```
Router#show ip pim interface Ethernet2/1
address           Interface         Ver/  Nbr    Hello  DR     DR
                                  Mode  Count  intvl  Prior
192.168.20.132    Ethernet2/1       v2/D  2      30     1      192.168.20.204
```

Related command

ip pim-dm

ip pim-dm dr-priority

ip pim-dm hello-interval

ip pim version

ip pim-dm neighor-filter

show ip pim-dm neighbor

3.1.12. show ip rpf pim-dm

Syntax

To display how the multicast route conducts the Reverse Path Forwarding (RPF), run the following command:

show ip rpf pim-dm *source-address*

Parameter

Parameter	Description
source-address	Displays the RFP information of the designated source address.

Default value

None

Command mode

All modes except the user mode

Usage guidelines

The PIM-DM protocol can obtain the RPF information from multiple types of routing tables. This command tells you where the RPF information is obtained.

Example

```
Router#show ip rpf pim 4.1.1.1
RPF information for (4.1.1.1)
RPF interface: Ethernet2/1
```

RPF neighbor: 192.168.20.80

RPF route/mask: 192.168.20.0/24

RPF type: unicast

Metric preference: 120

Metric: 1

Related command

None

CHAPTER 4 PIM-SM CONFIGURATION COMMANDS

4.1. PIM-SM Configuration Commands

4.1.1. ip pim-sm

Syntax

ip pim-sm

no ip pim-sm

Parameter

None

Default value

Disable PIM-SM

Command mode

Interface configuration mode

Usage guidelines

To enable PIM-SM function on an interface.You will enable PIM-SM when you configure the routers first in the router interface .you can cancle PIM-SM configure in the last interface to stop PIM-SM running.

Related command

None

4.1.2. ip pim-sm admin-scope

Syntax

To configure the multicast administrator scope, run **ip pim-sm admin-scope *gaddr gmask***. The designated multicast address ranges between 239.0.0.0 and 239.255.255.255. This command is configured only on the edge routers which interlace other SZs.

ip pim-sm admin-scope *gaddr gmask*

no ip pim-sm admin-scope

Parameter

Name	English prompt	Description
admin-scope	admin-scope – pim-sm administrator scope	Only the C-BSRs and the ZBRs need to be configured to know about the existence of the scope zones. Other routers,

		including the C-RPs, learn of their existence from Bootstrap messages.
gaddr	A.B.C.D – private group address prefix	239.0.0.0 to 239.255.255.255
gmask	gmask – sz group mask	

Default value

The global domain is 224.0.0.0/4 by default.

Command mode

Port configuration mode

Usage guidelines

This command is configured on the boundary of the PIM-SM administrator scope and used to check the BSM information which is received from the outside of the administrator scope. If the SZ scope of the received BSM information is smaller than or equal to the locally configured administrator scope, the received BSM information will be discarded. Otherwise, the received BSM information will enter the local administrator scope. When the BSM information is forwarded locally, the same principle is followed. At present, Huawei only supports the global domain and the private domain, but does not support the covering of the group address. RP in SZ1 will not notify the global SZ of the C-RP-ADV information. But the global BSM information can get in.

Example

The following example shows how to configure the boundary scope on routerA to **pim-sm sz1(239.1.1.1/24)**.

```
RouterA_config_f0/0#ip pim-sm admin-scope 239.1.1.1 255.255.255.0
RouterB_config_ps# c-bsr interface lo1
RouterB_config_ps# c-bsr admin-scope 239.1.1.1 255.255.255.0
```

Related command

ip pim-sm bsr-border

c-bsr intf_type intf_name

4.1.3. ip pim-sm asrt-hold

Syntax

To configure the holdtime for the **assert** state on the port corresponding to PIM-SM, run the following command.

ip pim-sm asrt-hold *intvl*

no ip pim-sm asrt-hold *[*intvl*]*

Parameter

Name	English prompt	Description
pim-sm	pim-sm - Enable PIM sparse mode operatioin	
asrt-hold	***asrt-hold*** – assert status hold timer	
intvl	<7-65535> - time value (second)	The default value is 180 seconds.

Default value

180 seconds

Command mode

Port configuration mode

Usage guidelines

Example

The following example shows how to configure the timeout time in **assert** state on port f0/0 to 200 seconds.

```
Router_config_f0/0#ip pim-sm holdtimer assert 200
```

4.1.4. ip pim-sm bsr-border

Syntax

ip pim-sm bsr-border

no ip pim-sm bsr-border

Parameter

None

Default value

Non-BSR boundary.

Command mode

Global configuration mode

Usage guidelines

This command can set interface to BSR boundary.in this interface didn’t send/receive BSM message ;use “no”command to recovery default.

This command change difineition BSR boundary to make BSM message can not effect each other in different PIM-SM domain.

Related command

None

4.1.5. ip pim-sm dr-pri

Syntax

ip pim-sm dr-pri *pri-value*

no ip pim-sm dr-pri *pri-value*

Parameter

Name	**English prompt**
dr-pri	dr-pri - pim-sm interface DR priority
Pri-value	<0-4294967294> - DR priority, preference given to larger value

Default value

DR priority is 1 by default in global mode.

Command mode

Interface configuration mode

Usage guidelines

To change interface DR priority ,use “no”command to recovery default value.

The highest priority routers will be DR.if the priority is same,then the highest address is DR.

Related command

None

4.1.6. ip pim-sm hello-intvl

Syntax

ip pim-sm hello-intvl *seconds*

no pim-sm hello-intvl *[seconds]*

Parameter

Name	**English prompt**
hello-intvl	hello-intvl - pim-sm hello advertisement interval
seconds	<1-65535> - periodic pim hello message are sent(unit:s)

Default value

The interval of sending Hello messages is 30s.

Command mode

Interface configuration mode

Usage guidelines

To configure hello message sending interval ,use “no”command to renew default value.

To change the hold-time of neighbor router, hold-time is 3.5 times of hello message sending interval.

Related command

None

4.1.7. ip pim-sm holdtime

Syntax

To configure the interval of the hello timer on the PIM-SM port, run the following first command. The value of the interval ranges between 4 and 65535.

ip pim-sm holdtime *seconds*

no pim-sm holdtime [*seconds*]

Parameter

Name	**English prompt**	**Notes**
Holdtime	holdtime – keep alive time to neighbor	
seconds	<4-65535> - keep alive time value	

Default value

105 seconds

Command mode

Interface configuration mode

Usage guidelines

This command is first run in port configuration mode and then in global configuration mode, or the default value is chosen. If the value of the holdtime is smaller than that of Hello interval, the configured value is then invalid. The value of the holdtime is **hello-intvl***3.5.

Example

The following example sets the holdtime value to 100 for interface pimsm configuration:

```
Router_config#interface f0/0
Router_config_f0/0#ip address 10.0.1.2 255.255.255.0
Router_config_f0/0#ip pim-sm holdtime 100
```

Related command

ip pim-sm hold-intvl

intvl-time hello *hlo-intvl*

4.1.8. ip pim-sm horizon-split

Syntax

To configure the horizon split strategy of the BSM packets on a port, run the following first command.

ip pim-sm horizon-split

no ip pim-sm horizon-split

Parameter

Name	English prompt	Notes
horizon-split	Horizon-split – permit interface horizon split	

Default value

The horizontal split is disabled by default.

Command mode

Interface configuration mode

Usage guidelines

After this command takes effect, you can set the corresponding label bit of the PIM-SM port. The BSM packets that are received from a port will not be transmitted from the port.

Example

The following example sets the DR priority value to 200 for the interface f0/0:

```
Router_config#interface f0/0
Router_config_f0/0#ip address 10.0.1.2 255.255.255.0
Router_config_f0/0#ip pim-sm horizon-split
```

Related command

bsm policy

4.1.9. ip pim-sm jp-hold

Syntax

To configure the holdtime for the **join-prune** state on the port corresponding to PIM-SM, run the following first command.

ip pim-sm jp-hold *intvl*

no ip pim-sm jp-hold *[intvl]*

Parameter

Name	English prompt	Notes
pim-sm	pim-sm - Enable PIM sparse mode operation	
jp-hold	Join-prune –join-prune status hold timer	
intvl	<1-65535> - time value (second)	The default value is 210 seconds.

Default value

210 seconds

Command mode

Port configuration mode

Usage guidelines

Example

The following example shows how to configure the timeout time in **join** state on port f0/0 to 200 seconds.

```
Router_config_f0/0#ip pim-sm jp-hold 200
```

4.1.10. ip pim-sm jp-intvl

Syntax

To set the interval of transmitting the **join** or **prune** packets periodically, run the following first command. The interval, whose unit is second, ranges between 1 and 65535.

ip pim-sm jp-intvl [*seconds*]

***no* ip pim-sm jp-intvl**

Parameter

Name	English prompt	Notes
pim-sm	pim-sm - Enable PIM sparse mode operatioin	
jp-hold	jp-intvl – regular Join/Prune message interval (unit:s)	
Seconds	<1-65535> - time value (second)	The default value is 60 seconds.

Default value

60 seconds

Command mode

Port configuration mode

Usage guidelines

*At each configuration the PIM-SM database must be entirely searched for the **(s, g)** pairs or the **(*, g)** pairs; if the configured port is an upstream one, the interval of the **jp** timer of the corresponding **(s, g)** or **(*, g)** pair should be reset. The interval in port configuration mode is prior to the **join/prune** interval in global mode.* If the **Join** packets from the downstream neighbor have not been received in three JP timeout periods, the downstream that corresponds to the multicast item will be shifted to the **prune** state. The default holdtime is 3 minutes. If this value is changed randomly, CPU shock and service-forwarding shock may be caused.

Example

The following example changes the PIM join message interval to 90 seconds:

```
Router_config_f0/0# ip pim-sm jp-intvl 90
```

Related command

ip pim-sm jp-hold

4.1.11. ip pim-sm lan-delay

Syntax

To designate the prune delay time of the PIM-SM port, run the following first command.

ip pim-sm lan-delay *delay-intvl*

no pim-sm lan-delay

Parameter

Name	English prompt	Notes
lan-delay	lan-delay - pim-sm prune delay	
delay-intvl	<1-32767> - prune delay time out interval(unit:ms)	The default value is 500 milliseconds.

Default value

500ms

Command mode

Interface configuration mode

Usage guidelines

*If the local port is the downstream port, the finally calculated prune delay time is based on all maximum values reported by downstream neighbors. In this case, the override timer of transmitting the **join** packets towards the upstream neighbors will be affected.* If the **prune_delay** option is not supported by all downstream neighbors, the default value will be used as the overtime interval of the **prune pending** timer. If the interval of the **prune delay** timer is locally set, it will be reported to upstream neighbors through the HELLO packets.

Example

The following example sets the prune delay value to 200 ms for the pim-sm interface f0/0:

```
Router_config#interface f0/0
Router_config_f0/0#ip address 10.0.1.2 255.255.255.0
Router_config_f0/0#ip pim-sm lan-delay 20
```

Related command

ip pim-sm override

4.1.12. ip pim-sm nbma-mode

Syntax

If the following first command is configured on all NBMA interfaces, the central node will forward all information that is transmitted from the sub-nodes and the other sub-nodes can obtain the corresponding information.

ip pim-sm nbma-mode

no ip pim-sm nbma-mode

Parameter

Name	English prompt	Notes
nbma-mode	nbma-mode - Use Non-Broadcast Multi-Access (NBMA) mode on interface	Currently our products do not support this function.

Default value

Disable

Command mode

Interface configuration mode

Usage guidelines

Traditional NBMA networks (frame relay, ATM and SMDS) adopt the point-to-multipoint mode; when a sub-node need be pruned, it will report this information directly to the central node and other sub-nodes, however, can not receive this information. In this case, other sub-nodes cannot respond and the interface of the central node will be incorrectly pruned.

If the following first command is configured on all NBMA interfaces, the central node will forward all information that is transmitted from the sub-nodes and the other sub-nodes can obtain the corresponding information.

This command cannot be used in multicast LANs, such as Ethernet or FDDI.

Example

The following example configures an interface to be in NBMA mode:

```
Router_config#interface s1/0
Router_config_s1/0#ip address 10.0.1.2 255.255.255.0
Router_config_s1/0#ip pim-sm nbma-mode
```

Related command

4.1.13. ip pim-sm nbr-filter

Syntax

To stop a device from being added to PIM, run the following first command; to cancel this function, run the following second command.

ip pim-sm nbr-filter *acl-name*

no ip pim-sm nbr-filter

Parameter

Name	English prompt	Notes
nbr-filter	nbr-filter - PIM peering filter	
acl-name	WORD – ip stand access list name	

Default value

Disable

Command mode

Interface configuration mode

Usage guidelines

If this command is configured, the neighbors need be filtered when Hello packets are received and then a new neighbor can be created. If it is in **deny** state, the corresponding new neighbor need not be created. Multiple neighbor access lists can be configured (New CISCO bin only allows to configure a neighbor access list; old bin allows to configure multiple neighbor access lists). Once a neighbor is filtered, the neighbor is then denied.

Example

The following example shows how to configure stub multicast routing on router A and how router B uses access list 1 to filter all PIM information from router A.

Router A Configuration

```
Router_config# ip multicast-routing
Router_config#interface f0/0
Router_config_f0/0#ip address 10.0.0.1 255.255.255.0
Router_config#interface f0/1
Router_config_f0/1# ip igmp-helper 10.0.0.2
```

Router B Configuration

```
Router_config# ip multicast-routing
Router_config#interface f0/0
Router_config_f0/0#ip address 10.0.0.2 255.255.255.0
Router_config_f0/0# ip pim-sm nbr-filter 1
Router_config#ip access-list standard 1
Router_config_std_nacl# deny 10.0.0.1
Router_config_std_nacl# permit any
```

Related command

ip pim-sm jp-intvl

4.1.14. ip pim-sm nbr-track

Syntax

To forbid the limitation of the JOIN packets globally and enable neighbor tracking, run the following first command:

ip pim-sm nbr-track

no ip pim-sm nbr-track

Parameter

Name	English prompt	Notes
nbr-track	nbr-track - pim-sm interface neighbor tracking	

Default value

If the global congfigration mode is not configured, neighbor tracking is forbidden.

Command mode

Interface configuration mode

Usage guidelines

This command is used to forbid the limitation function of the **join** packets and enable neighbor tracking.

Example

The following example sets the DR priority value to 200 for the interface f0/0:

```
Router_config#interface f0/0
Router_config_f0/0#ip address 10.0.1.2 255.255.255.0
Router_config_f0/0#ip pim-sm nbr-track
```

Related command

None

4.1.15. ip pim-sm override

Syntax

To designate the prune deny time of the PIM-SM port, run the following first command.

ip pim-sm override *override-intvl*

no ip pim-sm override

Parameter

Name	English prompt	Notes
override	override - pim-sm override timer	
override-intvl	<1-65535> - override time out interval(unit:100ms)	

Default value

2.5s

Command mode

Interface configuration mode

Usage guidelines

The finally calculated prune deny time is based on the maximum value among all the values reported by all neighbors. If some neighbor does not support prune deny, the default value is selected. If OT is enabled, the value can be random. If the interval of the **prune deny** timer is locally set, it will be reported to upstream neighbors through the HELLO packets.

Example

The following example sets the override value to 2000 ms for pim-sm interface f0/0 configuration:

```
Router_config#interface f0/0
```

```
Router_config_f0/0#ip address 10.0.1.2 255.255.255.0
Router_config_f0/0#ip pim-sm override 200
```

Related command

ip pim-sm lan-delay

4.1.16. router pim-sm

Syntax

To enter the global PIM-SM view, under which there is common attributes, run the following first command:

router pim-sm

no router pim-sm

Parameter

None

Default value

The system will not generate the PIM-SM view by default.

Command mode

Global configuration mode

Usage guidelines

If the **router pim-sm** command is configured globally or the PIM-SM related configuration is first configured on the port, the global PIM-SM view will be created. If there is some PIM-SM related configuration on the port, the global view cannot be deleted.

Example

The following command shows how to create the global PIM-SM view:

```
Router_config#router pim-sm
Router_config_ps#
```

Related command

ip pim-sm

4.1.17. hello-option

Syntax

To configure in the global PIM-SM view, the global DR priority, the prune delay time, the transmission interval of HELLO packets, the prune deny time, neighbor tracking and neighbor timeout time, run the following command:

hello-option { dr-pri *pri-value* | lan-delay *delay-intvl* |

override *override-intvl* | nbr-track | holdtime *hold-intvl* }

no hello-option [dr-pri | lan-delay | override | nbr-track | holdtime]

Parameter

Name	Prompt	Notes
dr-pri	dr-pri - pim-sm global DR priority	
pri-value	<0-4294967294> - DR priority, preference given to larger value	If this command is not configured, the default DR priority of this process is 1.
lan-delay	lan-delay - pim-sm prune delay time	Configures the prune delay time.
override	Override – override for rcvd prune	Configures the prune deny.
delay-intvl	**<0-32767>** – value for prune delay	The default prune delay time is 500ms.
override-intvl	**<0-65535>** – value for override delay	The default prune deny time is 2500ms.
nbr-track	**nbr-track – neighbor track enable**	If this command is configured, the JOIN packets will not be limited.
holdtime	**holdtime – neighbor keep alive timer**	
hold-intvl	**<4-65535>** – value for neighbor timeout	In normal case, its value is 3.5 times larger than the Hello interval on a port. The default neighbor holdtime is 105 seconds.

Default value

See the table above.

Command mode

Global PIM-SM view

Usage guidelines

If there is no corresponding configuration items on a port, the globally configured attributes will be used as the corresponding attributes on the port. The change of the global DR priority may affect the new DR selection.

The rules of DR selection are shown below:

1. The highest DR priority on a port will be selected as the DR of the network segment to which this port belongs; if there are many same DR values, the relatively large IP address among the main IP address on the local port and the main IP address of the neighbor will be selected as DR.

2. If there are neighbors on a port or the DR priority is not supported on a port, the relatively large mainaddress will serve as DR.

Example

The following example sets the DR priority value to 200 for global pimsm configuration:

```
Router_config#Router pim-sm
Router_config_ps#dr-priority 200
```

4.1.18. accept bsm-adv

Syntax

You can run **accept bsm-adv** in global mode to set the filtration list. The filtration list settings is especially for filtrating specific BSM source addresses and receive the designated BSM source address. To cancel the filtration, you can run **no accept bsm-adv [*list*** *std-acl***]**.

accept bsm-adv *list* *std-acl*

no accept bsm-adv [*list* *std-acl***]**

Parameter

Name	Prompt	Notes
accept	Accept – configure accept policy	
bsm-adv	bsm-adv - BSM packet source address accept filter	
list	list - IP access-list for bsm source-list	
std-acl	WORD -- stand access list name	It is used to limit the range of the BSM source address.

Default value

This filtration is disabled by default.

Command mode

pim-sm global view

Usage guidelines

Only one filtration command can be set.

Example

The following example shows that the BSM notifications only from network segment 192.2.2.0/30 can be received.

```
Router_config#router pim-sm
Router_config_ps#accept bsm-adv list adv-src
Router_config_ps#exit
Router_config#ip access-list stand adv-src
Router_config_std_nacl#permit 192.2.2.0 255.255.255.252
```

4.1.19. accept crp-adv

Syntax

To set the filtration list specially for filtrating the address range of specific groups, limiting to receive the C-RP-ADV packets from specific candidate rp unicast, and specifying the group address’ range in the received packets through ACL. To cancel the filtration, you can run **no accept crp-adv *.*.*.*** *[std-acl]*.

accept crp-adv *.*.*.* *[std-acl]*

no accept crp-adv *.*.*.* *[std-acl]*

Parameter

Name	Prompt	Notes
accept	Accept – configure accept policy	
c-rp-adv	crp-adv – C-RP-ADV accept filter c	
A.B.C.D	A.B.C.D – IP address of candidate RP for group	
std-acl	WORD – ip stand access-list name for group	

Default value

Disable (not filtrating C-RP-ADV from c-rp)

Command mode

pim-sm global view

Usage guidelines

After this command is set, BSR only processes C-RP-ADV from RP. Additionally, the range of the group address must be allowed by the standard ACL.

Example

The following example states that the router will accept c-rp messages RP address is 100.1.1.1 for the multicast group 224.2.2.2:

```
Router_config#router pim-sm
Router_config_ps#accept crp-adv 100.1.1.1 grp-acl
Router_config#ip access-list stand grp-acl
Router_config_std_nacl#permit 224.2.2.2 255.255.255.255
```

4.1.20. accept rp-addr

Syntax

Run **accept-rp** in global configuration mode to set the filtration list to filter the specific group address range, deciding whether the join/prune of (*, G) is acceptable and responding to the registration information of specific destination group addresses. To cancel this setting above, run the “no” form of this command.

accept rp-addr *A.B.C.D [std-acl]*

no accept rp-addr *A.B.C.D***[***std-acl***]**

Parameter

Name	Prompt	Notes
accept	Accept – configure accept policy Accept – Configure the policy of packet reception.	
rp-addr	rp-addr - RP address accept filter rp-addr – Configure the acceptable RP address filter.	
A.B.C.D	A.B.C.D – IP address of RP for group A.B.C.D – Designate the RP address of a multicast group.	
std-acl	WORD – ip stand access-list name for group WORD – Stands for the standard access list that is used for multicast group filtration.	If omitting it, the router will process all the PIM-SM message to any group which is mapped to the RP.

Default value

Disable (All Join, Prune or Register packets will be processed)

Command mode

pim-sm global view

Usage guidelines

After this command is set, the router processes only those Join packets which are mapped to the designated RP. Another point deserving attention is that the range of the group address must be allowed by the standard access list. The aggregation point of the corresponding group must be the calculated RP, and when the aggregation point matches up with the RP can the access filtration list be applied. If the group address is denied, RP will reject the Join and Register packets; after the Register packets are received, RP will return a Register Stop packet to the registration packet generator.

This command can be set many times if the **rp-addr** parameters in this command are different. If the RP that the group address is mapped to is not in the configured range, the RP will be denied directly.

Example

The following example states that the router will accept join or prune messages destined for the RP at address 100.1.1.1 for the multicast group 224.2.2.2:

```
Router_config#router pim-sm

Router_config_ps#accept rp 100.1.1.1 no-ssm-range

Router_config#ip access-list extended no-ssm-range

Router_config_std_nacl#permit 224.2.2.2

%PIM-6-INVALID_RP_JOIN: Received (*, 238.1.1.1) Join from 192.17.20.173 for
invalid RP 1.1.1.1

Router#show ip mroute

(*, 238.1.1.1), 00:02:52/00:00:07, RP 1.1.1.1, flags: S

  Incoming interface: Null, RPF nbr 0.0.0.0

  Outgoing interface list:

  FastEthernet0/0, Forward/Sparse, 00:02:52/00:00:07
```

It can be seen that the previous address, *.238.1.1.1, ages after the filtration is set.

4.1.21. accept register

Syntax

When the Register range list is set on C-RP, the selection is RP and the PIM-SM Register packet is received, the filtration list should be used to filter the Register packets. In this case, you should run **accept-register**, and if you want to cancel the filtration, run the “no” form of this command.

accept register *{**list ext-acl** **|** **route-map map-name**}*

no **accept register [*list*** *ext-acl* **|** ***route-map*** *map-name***]**

Parameter

Name	Prompt	Notes
accept	Accept – configure accept policy Accept – Configure the policy of packet reception.	
register	register - Registers accept filter Register – Stands for the filter of receiving the Register message.	
list	list – access list list – stands for the access list.	
route-map	Route-map – route map Route-map – stands for the route map list.	
ext-acl	WORD – IP extend access list name WORD – stands for the name of the extensible IP access control list.	
map-name	WORD – route map name WORD – stands for the name of the route map list.	

Default value

The access list filtration or the route-map filtration will not be conducted to the Register packets.

Command mode

pim-sm global view

Usage guidelines

This command is used to prevent those unauthenticated data source from sending the Register packets to RP. If an unauthenticated data source sends a Register packet to RP, RP will return a Register Stop packet at once. This command takes effect only on the machine that runs as RP.

Example

The following example shows how to restrict the RP from allowing sources in the Source Specific Multicast (SSM) range of addresses to register with the RP.

```
Router_config#router pim-sm
Router_config_ps#accept register list no-ssm-range
Router_config#ip access-list extended no-ssm-range
```

```
Router_config_std_nacl#deny ip any 232.0.0.0 0.255.255.255
Router_config_std_nacl#permit ip any any
```

Related command

reg-src

4.1.22. anycast-rp

Syntax

Through configuring **anycast-rp** and the corresponding neighbor address, you can specify the corresponding peer neighbor to share the load of RP. To cancel this setting above, run the "no" form of this command.

anycast-rp *A.B.C.D* **nbr *.*.*.***

no* anycast-rp** *A.B.C.D* **nbr *.*.*.

Parameter

Name	Prompt	Notes
anycast-rp	anycast-rp –anycast rp for pim-sm	
A.B.C.D	*A.B.C.D – anycast rp address*	
nbr	nbr – anycast rp neighbor	
.*.*.	*A.B.C.D – anycast rp neighbor address*	

Default value

This command takes no effect by default.

Command mode

pim-sm global view

Usage guidelines

PIM-SM only regulates the standards of the single RP, but a big data flow can cause single RP overload easily. In this case, this command will be used to solve the overload of RP in the PIM-SM domain.

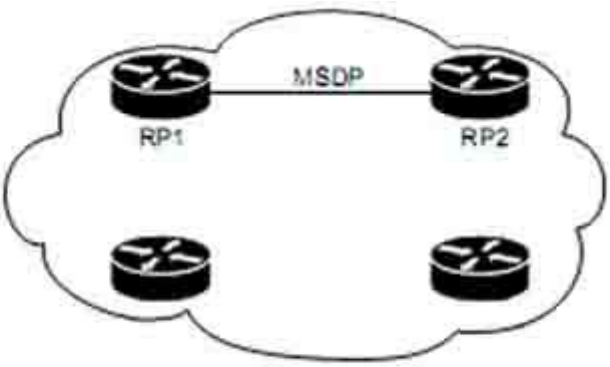
Note:

1. You'd better configure this command on the equipment with good connectivity in the PIM domain in the backbone network. That is, this command is not suitable to be set on the mute terminal router that connects other PIM equipments in the PIM domain through dial-up.
2. If the inside-domain MSDP is not used, the machine that specifies **anycast rp** must at the same time specify the address of a neighbor with the same RP address so as to facilitate the processing of the register.

3. The command, **anycast-rp A.B.C.D nbr**, is used on those devices that have no MSDP settings and provide an address as the static RP. All peer neighbors need be specified. The neighbors are reachable to one another.
4. If MSDP is set, the device, if it has provided the static RP address, need not specify **anycast rp nbr**.

Example

1. The following example shows how to set the **anycast-rp** address when MSDP is used.



```
RP1:
Interface loopback 0
ip address 10.0.0.1 255.255.255.255
ip pim-sm
Interface loopback 1
ip address 10.1.1.1 255.255.255.255
l
ip msdp peer 10.1.1.2 connect-source loopback 1
ip msdp originator-id loopback 1
RP2:
Interface loopback 0
ip address 10.0.0.1 255.255.255.255
ip pim-sm
Interface loopback 1
ip address 10.1.1.2 255.255.255.255
l
ip msdp peer 10.1.1.1 connect-source loopback 1
ip msdp originator-id loopback 1
Designate the static RP address on other devices, for example, do it on router
Ra:
Ra:
router pim-sm
static-rp 10.0.0.1
```

2. The following example shows how to make settings when the MSDP is not used.

```
RP1:
Interface loopback 0
ip address 10.0.0.1 255.255.255.255
ip pim-sm
Interface loopback 1
ip address 10.1.1.1 255.255.255.255
router pim-sm
anycast-rp 10.0.0.1 nbr 10.1.1.1
anycast-rp 10.0.0.1 nbr 10.1.1.2
static-rp 10.0.0.1
RP2:
Interface loopback 0
ip address 10.0.0.1 255.255.255.255
ip pim-sm
Interface loopback 1
ip address 10.1.1.2 255.255.255.255
router pim-sm
anycast-rp 10.0.0.1 nbr 10.1.1.1
anycast-rp 10.0.0.1 nbr 10.1.1.2
static-rp 10.0.0.1
```

Designate the static RP address on other devices, for example, do it on router Ra:

```
Ra:
router pim-sm
static-rp 10.0.0.1
```

Related command

4.1.23. reg-rate-limit

Syntax

As to (s, g), if you want to set the regeneration rate limit of the PIM-SM registration packets per second, you should use the **reg-rate-limit** command; to cancel this settings, you can run **no reg-rate-limit [*rate*]**.

reg-rate-limit *rate*

no reg-rate-limit [*rate*]

Parameter

Name	Prompt	Notes

reg-rate-limit	reg-rate-limit - Rate limit for PIM data registers	
rate	*<1-65535> Packets per second*	

Default value

The regeneration rate of the registration packets of any (s,g) can be limited to one packet per second.

Command mode

pim-sm global view

Usage guidelines

This command can be used to limit the regeneration rate of registration packets of (s.g) on the DR router. After this command is enabled, the load of the DR router will be limited. At the initial establishment of multicast path, the sudden eruption of large traffic of the multicast source may lead to packet loss due to the rate limit and the multicast receiver cannot receive all the multicast packets.

Example

The following example shows how to do the corresponding settings to let each (s.g) generate two registration packets per second.

```
Router_config#router pim-sm
Router_config_ps#reg-rate-limit 2
```

4.1.24. reg-src

Syntax

To specify an IP address of a port to run as the source address for DR to transmit the PIM-SM registration packets, replacing the default port's address that connects the data source, run **reg-src**. If you use the **reg-src** command, the specified port must be active. To cancel this settings, you can run **no reg-src [***intf-type intf-number***]**.

reg-src *intf-type intf-number*

no reg-src [*intf-type intf-number***]**

Parameter

Name	Prompt	Notes
reg-src	reg-src - Source address for PIM Register	
intf-type *intf-number*	Type of the designated port and its name	If a port has no main IP address or has no ID, the settings will take no effect.

		The L3 protocol of a designated port must be up.

Default value

By default, the port that connects DR and the data source will be used as the source address of the Register packet to conduct packet encapsulation.

Command mode

pim-sm global view

Usage guidelines

When the default source address of the Register packet is not the only routable destination address for RP to return the Register Stop packet, you should use this command to set a new source address for the Register packet. For example, in cases that the source address of the Register packet will be filtered on RP by ACL or the source address is not the only IP address, the Register Stop packet returned by RP may not reach the corresponding DR correctly and then the PIM-SM registration finally may fail.

If the source address of the Register packet is not specified or the specified source address takes no effect, DR will choose the port, which connects the data source, as the source address of the Register packet. Therefore, it is recommended to set for the PIM-SM domain a unique routable address on the loopback port as the source address of the Register packet.

Example

The following example shows how to designate the address of the loopback3 port of DR as the source address of the Register packet.

```
Router_config#router pim-sm
Router_config_ps#reg-src loopback 3
```

4.1.25. spt-threshold

Syntax

To set the traffic threshold for a flow to switch over to the shortest path tree, run **spt-threshold** in PIM-SM configuration mode. To resume the default settings, run **no spt-threshold**.

spt-threshold *{**infinity**/kbps} [stand-acl]*

no **spt-threshold**

Parameter

Name	Prompt	Notes
spt-threshold	spt-threshold - Source-tree switching threshold	

infinity	Infinity - Never switch to source-tree	
kbps	<0-4294967> Traffic rate in kilobits per second	
stand-acl	*stand-acl – ip standard access list name for group*	

Default value

There is no traffic limit for switchover. When the downstream receiver tries to join the data source, the data source will switch over to the SPT forwarding when it receives the data.

Command mode

pim-sm global view

Usage guidelines

If the forwarding rate of a multicast source reaches or exceeds the designated threshold, the leaf node will send a (s,g) Join packet to the multicast source for constructing the source tree—the shortest path tree.

If the threshold is set to **infinity**, all multicast sources for the designated group take the sharing tree for packet forwarding. The group access list designates which groups use the configured threshold for SPT switchover. If the message flow from the data source is less than the designated threshold, the PIM-SM router of the leaf node will be switched back to the sharing tree after a period of time and then send the Prune message to the source tree.

Example

The following example sets a threshold of 4 kbps, above which traffic to a group from a source will cause the router to router to the shortest path tree to that source:

```
Router_config#router pim-sm
Router_config_ps# spt-threshold 4
```

Related command

None

4.1.26. ssm

Syntax

To set the range of a specific multicast group, run **ssm {default | range** *std-acl***}**. To cancel the designated SSM range, run **no ssm**.

ssm {default | range *std-acl***}**

no **ssm**

Parameter

Name	Prompt	Notes
ssm	ssm - Configure Source Specific Multicast	
Default	default - Use 232/8 group range for SSM	
Range	range - ACL for group range to be used for SSM	
std-acl	WORD - *ip standard access list name*	

Default value

disable

Command mode

pim-sm global view

Usage guidelines

When PIM-SM is enabled, the default or configured range of the multicast group address can be used. If the multicast group is in the designated SSM range, the locally corresponding (*,g) must be canceled. This requires the same strategic SSM shall be set in the whole PIM-SM.

Note:

1. The same SSM strategy shall be set in the whole PIM-SM, otherwise the configured SSM will take no effect on preventing (*,g) Join for IGMPv3 can also specify the addition of (s,g) Join. Additionally, the (*,g) collision may be caused.
2. PIM-SM cannot be used together with other protocols. The configuration of SSM prevents the transmission of (*,g) Join and (*,*,rp) Join, and the PMBR device cannot send specific (s,g) Join to the upstream devices.
3. After SSM is set, MSDP cannot generate or receive SAs belonging to the designated range of the multicast group address. Our solution is that MSDP notification will be omitted if the group in the (S,G) items of PIM-SM is in the designated SSM group range.
4. If the group range covers BIDIR group range, the previous configuration will be kept, and display error message to the later(not support now).

Example

The following example shows how to configure SSM service for the IP address range defined by access list 4:

```
Router_config#router pim-sm
Router_config_ps# ssm range grp_range
Router_config#ip access-list stand grp_range
Router_config_std_nacl# permit 224.2.151.141
```

Related command

None

4.1.27. c-bsr intf_type intf_name

Syntax

To set a router to be a candidate BSR router, run the first of the following two commands; to cancel this settings, run the second one of the following two commands.

c-bsr *intf_type intf_name* [*hash-length* [*priority*]]

no **c-bsr** *[intf_type][intf_name][hash-length][priority]*

Parameter

Default value

Dynamic BSR selection is disabled.

Command mode

pim-sm global view

Usage guidelines

After this command is set, the designated address of a port will be used as the BSR address and it will send BSM (bootstrap messages) to all PIM-SM neighbors on the local machine. Each neighbor will compare the previously received BSM with the currently received BSM, and if the BSR address in the current BSM is larger than or equal to that in the previously received BSM, the locally stored BSM will be updated and the current BSM will be forwarded; otherwise, the current BSM will be dropped directly. Before the candidate BSR receives the BSM with higher priority, it always regards itself as the BSM router in the corresponding management domain.

Note:

1. You'd better configure this command on the equipment with good connectivity in the PIM domain in the backbone network. That is, this command is not suitable to be set on the mute terminal router that connects other PIM equipments in the PIM domain through dial-up.
2. On accepting C-RP-Adv, BSR only accepts those contents that satisfy the SZ range; if the content exceeds the SZ range, it will be omitted.
3. You can specify only one port of a device as the BSR address; if multiple commands are set, the previously configured candidate BSRs will be replaced.
4. The condition for this command to be effective is that the IP address of the designated port is in PIM-SM state and the protocol is up.

Example

The following example configures the IP address of the router on Ethernet interface 0 to be a candidate BSR with priority of 10:

```
Router_config# router pim-sm
Router_config_ps# c-bsr f0/0 10 100
```

Related command

c-bsr admin-scope {global |*gaddr gmask***} [*hash-length* [*priority*]]**

4.1.28. c-bsr admin-scope

Syntax

To set a candidate BSR in the administration domain, run the first one of the following two commands.

c-bsr admin-scope {global |*gaddr gmask***} [*hash-length* [*priority*]]**

no ***c*-bsr *admin-scope***

Parameter

Name	Prompt	Notes
c-bsr	c-bsr –Candidate bootstrap router (candidate BSR)	
admin-scope	admin-scope – pim-sm administrator scope	
global	global – global range	224.0.0.0/255.0.0.0
gaddr	gaddr – sz group address	239.0.0.0 to 239.255.255.255
gmask	gmask – sz group mask	
hash-length	<0-32> - Hash Mask length for RP selection	
Priority	<0-255> - Priority value for candidate bootstrap router	

Default value

The global domain is 224.0.0.0/4 by default.

Command mode

pim-sm global view

Usage guidelines

This command is used to set the candidate BSR in the administration domain. This command corresponds to the **admin-scope** command in the domain boundary and is used to specify the range of the administration domain.

Note:

1. If the command, c-bsr intf type intf name, is not configured, this command takes no effect.
2. It is recommended to set this command in the administration range (239.0.0.0--239.255.255.255).

Example

The following example shows that C-BSR only takes effect in the administration domain 239.1.1.0/24:

```
Router_config# router pim-sm
Router_config_ps#c-bsr f0/0 10 250
Router_config_ps#c-bsr admoni-scope 239.1.1.1 255.255.255.0
```

Related command

c-bsr intf_type intf_name [hash-length [priority]]

4.1.29. bsm-policy

Syntax

To set the BSM reception policy, run the first one of the following two commands in PIM-SM configuration mode. To resume the default settings, run the other command.

bsm-policy { unicast *{rcvd* | *send}*| *forward-all* | *backward}*

no **bsm-policy { unicast {***rcvd* | *send***}** | *forward-all* **}**

Parameter

Name	Prompt	Notes
bsm	bsm –bsm packet received	
policy	Policy – the policy for BSM receive and forward	
unicast	unicast –unicast bsm packet	The default value allows the reception of the unicast BSM packets. The backward compatibility supports the transmission of unicast BSM.
rvd	*rcvd*-permit receive bsm message	

forward-all	***forward-all – forward all bsm packet***	The horizontal division port will not forward all BSM packets, including unicast or no-forward-bit reset packets.
backward	***backward -*** backwards compatibility support send unicast BSM.	

Default value

There is no BSM reception or transmission policy.

Command mode

pim-sm global view

Usage guidelines

Refer to the description of this command.

Example

The following example configures the local router can receive bsm unicasted from neighbor:

```
Router_config# router pim-sm
Router_config_ps# bsm-policy unicast rcvd
```

Related command

None

4.1.30. static-rp

Syntax

To set the static RP of PIM-SM, run the first one of the following two commands; to resume the default settings, run the other command.

static-rp ***rp-addr*** **[*std-acl*] [override][bidir]**

no **static-rp** *rp-addr*

Parameter

Name	Prompt	Notes
static	static - configure static rp-address for pim-sm	
rp-addr	A.B.C.D – pim-sm rp-address (Rendezvous Point)	

std-acl	WORD – IP stand access list	
override	override –If conflict,the static rp prevails over the dynamic RP	When static RP goes against dynamic RP, if the parameter is not designated, the dynamic RP will be chosen first, and if no dynamic RP exists or dynamic RP takes no effect can static RP take effect.
bidir	bidir - Group range treated in bidirectional shared-tree mode	It is not supported currently.

Default value

disable

Command mode

pim-sm global view

Usage guidelines

The designated IP address of static RP must be legal unicast address and cannot be the loopback address (127.0.0.0/8). If ACL is designated, the configured static RP will serve the matched multicast group; if ACL is not designated, the configured static RP will serve all multicast groups (224.0.0.0/4). When static RP goes against dynamic RP, the former will be first chosen.

In PIM-SM or BIDIR mode, each group will be provided with an RP. All routers in the same administration domain must follow the identical rule to set RP for the group. RP can be obtained through two mechanisms: static configuration of the RP address or the BSR mechanism’s dynamic learning of RP address. The **static rp-address** command can be used to set an RP to be the aggregation point of multiple groups. The ACL configured by static RP defines the RP application range. If the standard ACL is not set, the designated static RP will be applied to all groups. One PIM router can use multiple RPs, but it can use the only RP for a specific group.

If multiple **static rp-address** commands are set, the matchup rules of group-to-rp are listed below:

1. If a group matches up with multiple static RP rules, suitable RPs can be chosen according to the longest matchup principle specified by the standard ACL. As to the static configuration without designated ACL, it can be applied to all groups, but the entries in the ACL must be first set.
2. If a group and multiple ACLs accord to the longest matchup principle, the IP addresses of RPs must be compared and those RPs with big IP addresses come prior in choice.

3. If the static RP configuration is adopted, the reachability test will not be conducted to the designated RP. If an RP is selected, the RP with a comparatively low RP will not be chosen even though the route of the selected RP does not exist locally.
4. Each command can be used to specify a static RP address. If the designated static RP address or ACL rule is same during configuration, the new configuration will replace the previous configurations.

In case static RP and dynamic RP are used together, the rules of group-to-rp are listed below:

1. When the override is not specified, the RPs, dynamically learned through the BSR mechanism, come prior to static RPs.
2. If dynamic RP is used, the **c-rp intf_type intf_name** command must be set.

Note:

1. The same RP cannot be used simultaneously on BIDIR and PIM-SM.
2. The statically configured RP only supports global SZ or provides support even if global SZ has not yet created.

Example

The following example shows how to designate 198.92.37.33 to be the static RP address.

```
Router_config#router pim-sm
Router_config_ps#static-rp 198.92.37.33
```

Related command

c-rp intf_type intf_name

4.1.31. c-rp intf_type intf_name

Syntax

To set a port to be C-RP and to send the unicast notification periodically to a designated BSR router in the PIM-SM domain, run the first one of the following two commands. To resume the default settings, run the other command.

c-rp *intf-type intf-name* **[group-list** *std-acl***] [bidir][intvl *seconds*][pri *pri-value*]**

no **c-rp** *intf-type intf-name*

Parameter

Name	Prompt	Notes
c-rp	c-rp - To be a PIMv2 RP candidate	
intf-type intf-name	Designating the interface type and the interface’s name	PIM-SM must be enabled on C-RP.

group-list	group-list – ip access list for group-list	It is the prefix of the group address.
std-acl	WORD – ip stand access list	
bidir	bidir - Group range treated in bidirectional shared-tree mode	It is not supported currently.
intvl	Interval - RP candidate advertisement interval	
Seconds	<1-32767> - number of seconds	
pri	pri – RP priority	
pri-value	<0-255> - RP priority value	The smaller the value is, the higher the priority is. The default value is 192.

Default value

Dynamic RP selection is disabled.

Command mode

pim-sm global view

Usage guidelines

This command is used to notify all BSRs on C-RP. The range of the group address is listed in a form of the standard ACL.

Note:

1. PIM-SM must be enabled on the port that serves as C-RP.
2. You'd better set C-RP on the main PIM-SM domain to avoid static configuration on similar routers or the on-demand dialup stub routers.
3. If C-RP is not specified with a multicast group range, C-RP will serve all multicast groups.
4. If you want to set a router to be C-RP for multiple group ranges, you need to represent multiple group ranges with multiple rules when configuring STD-AC1 that group-list corresponds to.
5. One port can only be set to one C-RP and the following configuration will replace the previous configuration, including the replacement of STD-AC1.
6. You can set C-RP for multiple ports on the same PIM-SM router.
7. Multiple C-RPs can use the same standard ACL.
8. If this command is run many times on a same interface, the previous configuration will be replaced.

9. If multiple SZs are known on C-RP, unicast C-RP-Adv will be sent to the BSR of each SZ. It is noted that the established group range cannot exceed the group range of the destination SZ.
10. If C-RP itself is the ZBR of an SZ, the Admin Scope Bit in the C-RP-Adv packet must be reset; otherwise, this bit will not be reset. At present, it is used for BSR to record logs but possible to be used for protocol expansion.

Example

The following example shows how to designate lo172 and lo173 to be C-RP ports, the former limiting to provide RP to the group of prefix 239.1/16.

```
Router_config#router pim-sm
Router_config_ps# c-rp loopback172 group-list grp-range
Router_config# ip access-list standard grp-range
Router_config_std_nacl# permit 239.1.0.0 255.255.0.0
Router_config_ps# c-rp loopback173
```

Related command

None

4.1.32. intvl-time

Syntax

To enable the periodical transmission of join/prune packets and set the interval of periodically transmitting the Hello, BSM or C-RP-Adv packets, run the first of the following two commands:

intvl-time { join-prune *jp-intvl* | *hello hlo-intvl* | *c-bsr cbsr-intvl* |*crp-adv crp-intvl*| *spt-check [spt-intvl]}*

no intvl-time {join-prune [*jp-intvl]* | *hello* [*hlo-intvl]* |*c-bsr[cbsr-intvl]*| *crp-adv* [*crp-intvl]* | *spt-check [spt-intvl]}*

Parameter

Name	Prompt	Notes
join-prune	**join-prune -** pim-sm regular join/prune packet periodic	
jp-intvl	<1-65535> - value for JP timer	The default interval of transmitting Join/Prune packets is 60 seconds.
Hello	hello – pim-sm hello advertisement interval	Sets the interval of transmitting the Hello packets.

hlo-intvl	<1-65535> - value for JP timer	The default interval of transmitting Hello packets is 30 seconds.
c-bsr	c-bsr –Candidate bootstrap router (candidate BSR)	
cbsr-intvl	<1-65535> - value for c-bsr timer	The default interval of self selecting packets is 60 seconds.
crp-adv	crp-adv – pim-sm C-RP-ADV interval	Sets the interval of transmitting the C-RP-Adv packets.
crp-intvl	<1-65535> - value for CRP timer	The default interval of transmitting Report packets is 60 seconds.
spt-check	Spt-check – spt switch timer	
spt-intvl	<1-65535> - value for spt switch query timer	

Default value

See the above-mentioned table.

Command mode

pim-sm global view

Usage guidelines

If the holdtime of Join-prune packet is not set and the **Join** packets from the downstream neighbor have not been received in three JP timeout periods, the downstream that corresponds to the multicast entry will be shifted to the **prune** state. The default holdtime is 3 minutes. The interval in port configuration mode is prior to the **join/prune** interval in global mode.

Example

The following example sets the join/prune advertisement interval value to 30 for global pimsm configuration:

```
Router_config#Router pim-sm
Router_config_ps#timer join-prune 30
```

Related command

holdtime

4.1.33. holdtime

Syntax

To set the interval of the timeout timer of PIM-SM, run the first one of the following two commands. To resume the default settings, run the other command.

holdtime {join-prune *jp-hold* | assert *asrt-hold* | c-bsr *cbsr-**hold*** **| crp-adv *crp-hold* | sz *sz-hold*}**

no **holdtime** {**join-prune** [*jp-hold*] | **assert** [*asrt-hold*] | **c-bsr** [*cbsr-hold*] | **crp-adv** [*crp-hold*] | **sz** [*sz-hold*]}

Parameter

Name	Prompt	Notes
holdtime	holdtime – hold timer for keep the status	
join-prune	Join-prune –join-prune status hold timer	
jp-hold	<1-65535> - time value (second)	The default value is 210 seconds.
assert	assert – assert status hold timer	
asrt-hold	<7-65535> - time value (second)	The default value is 180 seconds.
c-bsr	c-bsr –Candidate bootstrap router (candidate BSR)	
cbsr-hold	<1-65535> - time value (second)	By default, it is as follows: holdtime timeout time= holdtime's interval*2+10 By default, the holdtime's interval is 60 seconds and the holdtime's timeout time is therefore 130 seconds.
c-rp	c-bsr –Candidate bootstrap router (candidate BSR)	
crp-hold	<1-65535> - time value (second)	The default value is 150 seconds.

		Because non-BSR updates its timeout time through the BSR's holdtime packets, the timeout time of C-RP must not be less than the interval of holdtime packet transmission. It is best when the former is 2.5 intervals or beyond.
sz	sz –scope zone timer	
sz-hold	<10-4294967295> - time value (second)	The default value is 1300 seconds.

Default value

See the above-mentioned table.

Command mode

pim-sm global view

Usage guidelines

If the holdtime is set on a port, first comes the configuration of this port and then the global configuration; finally, if neither configuration is done, the default configuration will be chosen.

Note:

- When configuring the holdtime of C-RP, you should set the timeout time of C-RP to 2.5 holdtime transmission intervals or beyond to prevent the C-RP loss in the BSR holdtime packet.
- The timeout time of SZ must be longer than the BSR timeout time and you'd better set it to be 10 BSR timeout times.

Example

The following example shows how to set the holdtime of C-RP to 150 seconds, among which C-RP and C-BSR are not set on Ra.

```
Ra_config# router pim-sm
Ra_config_ps# holdtime c-rp 200
```

Related command

intvl-time

4.1.34. log

Syntax

To enable the log switch to record DR's change, neighbor's up or down, address conflict and abnormal packets, run the first one of the following two commands:

log { nbr-change | ipaddr-conflict | pkt-conflict }

no **log *{ nbr-change* | *ipaddr-conflict* | pkt-*conflict }***

Parameter

Name	Prompt	Notes
Log	log - To log conflict	
nbr-change	nbr-change – neighbor up/donw or DR changes	
ipaddr-conflict	ipaddr-conflict –secondary ip address is conflict with the another neighbor	
pkt-conflict	pkt-conflict – pim-sm mroute items conflict in the pimsm pkt	

Default value

The log function is disabled.

Command mode

pim-sm global view

Usage guidelines

If there is the log server, the corresponding logs will be recorded to the log server.

Example

The following example configures the router to log the conflict when the exist secondary ip address is also contained in hello packet when receivd from another neighbor.

```
Router_config_ps# log nbr-change
```

Related command

None

4.1.35. clear ip pim-sm rp-mapping

Syntax

To clear pim-sm RP mapping table information, run the following command.

clear ip pim-sm rp-mapping [A.B.C.D]

Parameter

Parameter	Description	Notes
pim-sm	pim-sm -- PIM sparse mode	

	pim-sm -- PIM multicast routing protocol in sparse mode	
rp-mapping	rp-mapping -- Clear RP-mapping table by BSR rp-mapping -- Clear RP mapping table	
A.B.C.D	A.B.C.D -- RP address A.B.C.D -- aggregation address (rp)	

Default value

None

Command mode

Management mode

Usage guidelines

The command is used to clear rp mapping table.

Example

4.1.36. clear ip mroute pim-sm

Syntax

To clear ip multicast route pim-sm, run the following command.

clear ip mroute pim-sm*

clear ip mroute pim-sm gaddr [saddr]

Parameter

Parameter	Description	Notes
pim-sm	pim-sm -- PIM sparse mode pim-sm -- multicast routing protocol of PIM sparse mode	
*	* -- Delete all PIM-SM multicast routes * -- Delete all PIM-SM multicast routes	
gaddr	A.B.C.D -- Delete the related Group multicast route A.B.C.D -- Delete the related Group multicast route	
saddr	A.B.C.D -- Delete the related Source multicast route A.B.C.D -- Delete the related Group multicast route	

Default value

None

Command mode

Management mode

Usage guidelines

The command is used to clear ip multicast route pim-sm.

Example

4.1.37. show running-configure

Syntax

To display the global PIM-SM information and the main configuration information about a port, run the following command:

show running-configure

Parameter

None

Default value

None

Command mode

EXEC

Usage guidelines

According to the output information, you can check the configuration information about the current PIM-SM.

Example

4.1.38. show ip pim-sm bsr-router

Syntax

show ip pim-sm bsr

Parameter

None

Default

None

Command mode

Management mode

Usage guidelines

Display PIM-SM router BSR message.

Example

R142#show ip pim-sm bsr-router PIMv2 BSR information:

```
I am BSR!
Address of BSR: 192.166.100.142
BSR Priority: 201 Hash Mask Length: 30 Uptime: 00:10:56
Next BSM will be sent in 00:00:04
Candidate-RP: 192.166.100.142(Loopback0)
Interval of Advertisements: 60 seconds
Next Advertisement will be sent in 00:00:04
```

Related command

None

4.1.39. show ip pim-sm sz-info

Syntax

To show pim-sm sz information, including the range of sz, bsm packet number in sz, szt overtime, and the remaining time of BSM is forwarded from iif interface.

show ip pim-sm sz-info

Parameter

Parameter	Description	Notes
pim-sm	pim-sm -- PIM Sparse mode pim-sm -- PIM Sparse mode	
sz-info	sz-info -- display PIM-SM sz information sz-info -- display PIM-SM sz information	

Default value

None

Command mode

Other modes except the user mode

Usage guidelines

The command is used to show pim-sm sz information.

Example

Output examples of the command **show ip pim-sm sz-info**:

```
switch#show ip pim-sm sz-info
PIMv2 administor scope information:
sz range: 224.0.0.0/4
  group range numbers:1
  BSM pkt numbers:0, in current forward queue
  szt not create,for we are c-bsr or BST not expire for no-cbsr
switch #
```

Definitions of domains above:

Parameter	Description
sz range	sz range
group range numbers	group range numbers in sz

4.1.40. show ip pim-sm interface

Syntax

show ip pim-sm interface [**type** *number*]

Parameter

Parameter	Description
type	Port type
number	Port number

Default

None

Command mode

Management mode

Usage guidelines

Display PIM-SM router port imformation.

Example

```
R142#show ip pim-sm interface
Address        Interface   Ver/   Nbr   Query   DR     DR                         Mode   Cou
nt Intvl   Prior
192.168.21.142  Serial2/0   v2/S    1     30      1      192.168.21.144
192.168.100.142 Ethernet1/1 v2/S    1     30     100     192.168.100.142
192.166.100.142 Loopback0   v2/S    0     30      1      192.166.100.142
```

Related command

None

4.1.41. show ip pim-sm neighbor

Syntax

show ip pim-sm neighbor [type *number***]**

Parameter

Parameter	Description
type	Port type
number	Port number

Default

None

Command mode

Management mode

Usage guidelines

Display PIM-SM router neighbor information.

Example

```
R142#show ip pim-sm neighbor
PIM Neighbor Table
Neighbor          Interface     Uptime/Expires       Ver     DR
Address                                             Prio
192.168.21.144     Serial2/0     00:03:53/00:01:22     v2     1
192.168.100.143    Ethernet1/1   00:03:34/00:01:41     v2     1
```

Related command

None

4.1.42. show ip pim-sm rp

Syntax

show ip pim-sm rp [mapping|metric]

Parameter

Parameter	Description
mapping	Displays RP—GROUP mapping relation.
metric	Displays each RP simple-cast route metric.

Default value

None

Command mode

Management

Usage guidelines

Display PIM-SM router RP mapping information.

Example

```
R144#show ip pim-sm rp
GROUP: 225.1.1.10, RP: 9.1.1.1, Version2 Uptime: 1d01h07m, Expires in 00:02:16
```

Related command

None

4.1.43. show ip pim-sm rp-hash

Syntax

show ip pim-sm rp-hash [*group-address*]

Parameter

Parameter	Description
group-address	Group address.

Default value

None

Command mode

Management mode

Usage guidelines

Display specify multicast address hash accout value.

Example

```
R142#show ip pim-sm rp-hash 225.1.1.10
 RP: 192.166.100.142
 Info Source: 192.166.100.142, via BSR
 Uptime: 00:00:08, Expires: 00:02:22
```

Related command

None

4.1.44. show ip pim-sm anycast-rp

Syntax

To show the current information of anycast-rp, run the following command.

show ip pim-sm anycast-rp

Parameter

Parameter	Description	Notes
pim-sm	pim-sm -- PIM Sparse mode pim-sm -- PIM Sparse mode	
anycast-rp	anycast-rp -- display register packet rcv and send for anycast-rp anycast-rp -- display register packet rcv and send for anycast-rp	

Default value

None

Command mode

Other modes except the user mode

Usage guidelines

The command is used to show the status of local anycast-rp receiving and sending register packet.

Example

Output examples of the command **show ip pim-sm anycast-rp** for group 239.1.1.1:

```
switch# show ip pim-sm anycast-rp
anycast-rp 2.2.2.2 nbr 192.168.18.1 status: REG_SEND
```

Definitions of domains above:

Parameter	Description
anycast-rp	2.2.2.2 is the address of anycast-rp
nbr	192.168.18.1 is the neighbor address
status: REG_SEND	Forward register packet to the neighbor.

4.1.45. show ip pim-sm protocol

Syntax

To show the important information related to pim-sm protocol, run the following command.

show ip pim-sm protocol

Parameter

Parameter	Description	Notes

pim-sm	pim-sm -- PIM Sparse mode pim-sm -- PIM Sparse mode	
protocol	protocol -- protocol independent multicast protocol sparse mode protocol -- protocol independent multicast protocol sparse mode	

Default value

None

Command mode

Other modes except the user mode

Usage guidelines

The command shows information about the current status, port number, neighbor number and received packet number and interval of BSM configuration of pim-sm protocol.

Example

Output examples of the command **show ip pim-sm protocol**:

```
switch# show ip pim-sm protocol
PIM-SM is active
pim-sm interface number:3
pim-sm neighbor number:1
pim-sm receive pkt num:133; bad pkt num:0
PIM-SM current glb jp_intvl: 60(s)
PIM-SM current glb hello intvl: 30(s)
PIM-SM current glb BSM update timer intvl: 60(s)
PIM-SM current glb crp_intvl: 60(s)
PIM-SM current glb spt_intvl: 2(s)
PIM-SM BSM hold timeout: 130(s)
```

4.1.46. show ip mroute pim-sm

Syntax

show ip mroute pim-sm [*group-address*|*source-address*] [**type** *number*] [**summary**|**count**] [**active** *kbps*]

Parameter

Parameter	Description

group-address	Group address.
source-address	source-address
type	Port type
number	Port number
summary	Display table PIM-SM entry
count	Display (S,G) stat information
active	Activity sending data speed

Default value

None

Command mode

Management mode

Usage guidelines

Display PIM-SM multicast route information.

Example

```
R142#show ip mroute pim-sm
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir group, s - SSM group,
I - IGMP report, R - RP-bit set, F - Register flag, T - SPT-bit set,
J - Join Needed, P - Pruned,
Timers: Uptime/Expires
(*, 225.1.1.10), 00:15:14/00:02:37, RP 9.1.1.1, flags: SRJ
Incoming interface: Ethernet1/1, RPF nbr 192.168.100.143
Outgoing interface list:
Serial2/0, Forward/Sparse, 00:13:23/00:02:37
(192.166.1.253, 225.1.1.10), 00:15:14/00:02:46, flags: STJ
Incoming interface: Ethernet1/1, RPF nbr 192.168.100.143
Outgoing interface list:
Serial2/0, Forward/Sparse, 00:15:14/00:02:46
(192.168.20.141, 225.1.1.10), 00:15:14/00:02:46, flags: STJ
Incoming interface: Ethernet1/1, RPF nbr 192.168.100.143
```

```
Outgoing interface list:
Serial2/0, Forward/Sparse, 00:15:14/00:02:46
```

Related command

None

4.1.47. show ip rpf pim-sm

Syntax

show ip rpf pim-sm {*source-address*} **metric**

Parameter

Parameter	Description
source-address	Source address.
metric	Simple-cast route Metric

Default

None

Command mode

Management mode

Usage guidelines

Display specify source address converse forwarding information.

Example

```
R142#show ip rpf pim-sm 192.166.1.143
RPF information for 192.166.1.143
 RPF interface: Ethernet1/1
 RPF neighbor: 192.168.100.143
 RPF route/mask: 192.166.1.0/24
 RPF type: unicast (rip)
 RPF recursion count: 0
 Doing distance-preferred lookups across tables
```

Related command

None

4.1.48. debug ip pim-sm alert

To display the alert information from mrouting or IP, run the first one of the following two commands.

debug ip pim-sm alert

no debug ip pim-sm alert

Parameter

None

Default value

None

Command mode

EXEC

Usage guidelines

VTY will be exported if the alart information from mrouting or aged (s,g).

Example

The following example shows that the route event of RIP is monitored.

```
router# debug ip rip database
RIP-DB: Adding summary route 192.1.1.0/24 <metric 0> to RIP database
```

The fields in the previous example are explained in the following table:

Domain	Description
summary	Route type which is added to the routing table
192.1.1.0/24	Route which is added to the routing table
<metric 0>	Value of the route’s metric

4.1.49. debug ip pim-sm assert

To monitor the Assert event of PIM-SM, run the first one of the following two commands:

Syntax

debug ip pim-sm assert [packet | state- machine | A.B.C.D **]**

no debug ip pim-sm assert [packet | state- machine | A.B.C.D **]**

Parameter

Name	Prompt	Notes
state-machine	Show state machine activity debug information	
packet	Trace information about packet	

A.B.C.D	Group address for stm and packet output	

Default value

None

Command mode

EXEC

Usage guidelines

According to the output information, you can check the current assert event of PIM-SM.

Result

- Show (S,G) Assert State-machine Actions
- Show (*,G) Assert Message State Machine actions
- Show activity after timer timerout
- Show packet activity

4.1.50. debug ip pim-sm bsr

Syntax

To monitor the BSM event of PIM-SM, the C-RP-ADV event or the BSR state machine, run the first one of the following two commands:

debug ip pim-sm assert [packet | state- machine**]**

no debug ip pim-sm assert [packet | state- machine**]**

Parameter

Name	Prompt	Notes
state- machine	Show state machine activity debug information	
packet	Trace information about packet	

Default value

None

Command mode

EXEC

Usage guidelines

According to the output information, you can check the BSM event of PIM-SM, the C-RP-ADV event or the BSR state machine.

Example

4.1.51. debug ip pim-sm rp

Syntax

To monitor the related events and packets about PIM-SM-RP-SET change, run the first one of the following two commands:

debug ip pim-sm rp

no debug ip pim-sm rp

Parameter

None

Default value

None

Command mode

EXEC

Usage guidelines

This command is used to export the reception and transmission of C-RP-ADV and the RP-SET change. As to the change of static RP, no debugging information will be exported at present.

Example

4.1.52. debug ip pim-sm entry

Syntax

To export the creation and update of (*,*,rp), (*,g), (s,g,rpt) and (s,g,spt) and their simultaneous change of them at the time of RP change, run the first one of the following two commands.

debug ip pim-sm entry

no debug ip pim-sm entry

Parameter

None

Default value

None

Command mode

EXEC

Usage guidelines

According to the output information, you can browse the information about PIMSM creation and update of multicast routing entries.

Example

4.1.53. debug ip pim-sm event

Syntax

To export all events that PIMSM main task receives, run the first one of the following two commands.

debug ip pim-sm event

no debug ip pim-sm event

Parameter

None

Default value

None

Command mode

EXEC

Usage guidelines

According to the output information, you can browse all events of current PIMSM.

Example

4.1.54. debug ip pim-sm hello

Syntax

To display the Hello packet received or transmitted by PIM-SM for debugging the neighbor’s information, run the first one of the following two commands.

debug ip pim-sm hello

no debug ip pim-sm hello

Parameter

Name	Prompt	Notes
pim-sm	Show state machine activity debug information	
hello	Show information about packet sending and receiving	

Default value

None

Command mode

EXEC

Usage guidelines

According to the output information, you can browse the Hello packets, including those received or transmitted by PIM-SM, to know what's going on the local machine or the neighbors.

Results

- The ports, source addresses and genid of the currently received or transmitted Hello packets can be displayed.

Example

4.1.55. debug ip pim-sm jp

Syntax

To trace the Join/Prune event of (*,g) or (s,g), run the first one of the following two commands.

debug ip pim-sm jp [packet | state- machine | A.B.C.D **]**

no debug ip pim-sm jp [packet | state- machine | A.B.C.D **]**

Parameter

Name	Prompt	Notes
state-machine	Show state machine activity debug information	
packet	Trace information about packet	
A.B.C.D	Group address for stm and packet output	

Default value

None

Command mode

EXEC

Usage guidelines

Example

4.1.56. debug ip pim-sm nbr

Syntax

To trace the related events of a neighbor, such as the addition of neighbor, aging deletion or DR selection, run the first one of the following two commands.

debug ip pim-sm nbr

no debug ip pim-sm nbr

Parameter

None

Default value

None

Command mode

EXEC

Usage guidelines

According to the output information of this command, you can browse neighbor change, neighbor refreshment, GENID change and DR selection.

Example

4.1.57. debug ip pim-sm packet

Syntax

To trace the protocol control packets received or transmitted by PIM-SM, run the following command.

debug ip pim-sm packet

Parameter

None

Default value

None

Command mode

EXEC

Usage guidelines

After this command is run, the PIM-SM packet's type will be displayed.

Example

4.1.58. debug ip pim-sm register

Syntax

To display the registration packet and register state event of PIM-SM, run the first one of the following two commands.

debug ip pim-sm register [packet | state- machine | A.B.C.D **]**

no debug ip pim-sm register [packet | state- machine | A.B.C.D **]**

Parameter

Name	Prompt	Notes

state-machine	Show state machine activity debug information	
packet	Trace information about packet	
A.B.C.D	Group address for stm and packet output	

Default value

None

Command mode

EXEC

Usage guidelines

According to the output information, you can check the register event of PIM-SM.

Example

4.1.59. debug ip pim-sm timer

Syntax

To display the change of all PIM-SM timers, including creation, deletion, stop and timeout, run the first one of the following two commands.

debug ip pim-sm timer

no debug ip pim-sm timer

Parameter

None

Default value

None

Command mode

EXEC

Usage guidelines

The PIM-SM timers include the Hello timer, the neighbor timeout timer, the Join/Prune timer, the override timer, the prune pending timer, the keepalive timer, the assert timer, the register timer, the register limit timer, the BSM timer, and so on.

Example