1 PIM-DM Commands

Command	Function
clear ip pim dense-mode track	Clear statistical information about PIM-DM packets.
ip pim bfd	Enable the PIM-BFD function on an interface.
ip pim dense-mode	Enable the PIM-DM function on an interface.
ip pim dense-mode passive	Enable the PIM-DM passive mode on an interface.
ip pim dense-mode subvlan	Enable the PIM-DM function on a super VLAN interface.
ip pim neighbor-filter	Enable the neighbor filtering function on an interface.
ip pim override-interval	Configure the prune override interval of hello messages.
ip pim propagation-delay	Configure the propagation delay of hello messages.
ip pim query-interval	Configure the hello message sending interval.
ip pim state-refresh disable	Disable the PIM-DM state refresh function on an interface.
ip pim state-refresh origination-interval	Configure the PIM-DM SRM sending interval on an interface.
ip pim mib dense-mode	Switch over the management object of the MIB function from PIM-SM to PIM-DM.
show ip pim dense-mode interface	Display information of a PIM-DM interface.
show ip pim dense-mode mroute	Display PIM-DM routing entry information.
show ip pim dense-mode neighbor	Display PIM-DM neighbor information.
show ip pim dense-mode nexthop	Display PIM-DM next hop information.
show ip pim dense-mode track	Display statistical information about PIM-DM packets.

1.1 clear ip pim dense-mode track

Function

Run the **clear ip pim dense-mode track** command to clear statistical information about PIM-DM packets.

Syntax

clear ip pim dense-mode track

Parameter Description

N/A

Command Modes

Privileged EXEC mode

Default Level

14

Usage Guidelines

This command resets the statistic start time and clears the counter of PIM-DM packets.

Examples

The following example clears statistical information about the PIM-DM packets.

```
Hostname> enable
Hostname# clear ip pim dense-mode track
```

Notifications

N/A

Platform Description

N/A

1.2 ip pim bfd

Function

Run the **ip pim bfd** command to enable the PIM-BFD function on an interface.

Run the **no** form of this command to disable this function.

The PIM-BFD function is disabled on an interface by default.

Syntax

ip pim bfd

no ip pim bfd

Parameter Description

N/A

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

Bidirectional forwarding detection (BFD) is a detection mechanism applying to an entire network and it is used to quickly detect or monitor links or IP route forwarding connectivity in a network.

PIM-DM uses the assertion election mechanism. The assertion winning device functions as a unique forwarder of multicast data in a shared network. If multiple devices in a shared network receive multicast data concurrently, they forward the data to the same devices. These devices mutually transmit assert packets and elect a winning device based on the assert packets. The winning device forwards traffic. When the neighbor interface changes, the change can be quickly detected by BFD correlation and a new round of election can be initiated.

Examples

The following example enables the PIM-BFD function on GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface GigabitEthernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip pim bfd
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

- **ip pim dense-mode**
- **show bfd neighbors** (reliability/BFD)

1.3 ip pim dense-mode

Function

Run the **ip pim dense-mode** command to enable the PIM-DM function on an interface.

Run the **no** form of this command to disable this function on an interface.

Run the **default** form of this command to restore the default configuration.

The PIM-DM function is disabled on an interface by default.

Syntax

ip pim dense-mode

no ip pim dense-mode

default ip pim dense-mode

Parameter Description

N/A

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

The PIM-DM function must be enabled on an interface to process PIM packets of PIM neighbors so that a PIM-DM network can be constructed. PIM-DM can effectively solve multicast data transmission of small networks with densely located hosts. You are advised to enable PIM-DM on all L3 interfaces of the PIM-DM network and configure the same IPv4 multicast routing protocol on interfaces of a device.

Before PIM-DM is enabled, you must enable the multicast routing and forwarding function in global configuration mode. Otherwise, the PIM-DM function does not take effect. When PIM-DM is enabled, IGMP is automatically started on different interfaces.

For tunnel interfaces, only 4Over4, 4Over4 GRE, 4Over6, and 4Over6 GRE support the IPv4 multicast function. The multicast function can be enabled on a tunnel interface that does not support multicast. In this case, no notification is displayed and multicast packets are not sent or received through this interface. A multicast tunnel must be created on an Ethernet interface, and it cannot be nested and does not support multicast data QoS/ACL.

Examples

The following example enables the PIM-DM function on GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface GigabitEthernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip pim dense-mode
```

Notifications

If the multicast routing function is not enabled on a device, the following notification will be displayed:

```
WARNING:  "ip multicast-routing"  is not configured, PIM Dense-mode will not
start-up.
```

If the number of multicast interfaces on a device reaches the upper limit, the following notification will be displayed:

```
Operation failed: PIM-DM VIF limit exceeded
```

If the interface is not added to the global VRF, the following notification will be displayed:

```
PIM-DM allow to configure on vrf 0 only
```

Common Errors

N/A

Platform Description

N/A

Related Commands

- **ip multicast-routing** (IPv4 multicast routing management)

1.4 ip pim dense-mode passive

Function

Run the **ip pim dense-mode passive** command to enable the PIM-DM passive mode on an interface.

Run the **no** form of this command to disable this mode on an interface.

Run the **default** form of this passive command to restore the default configuration.

The PIM-DM passive mode is disabled on an interface by default.

Syntax

ip pim dense-mode passive

no ip pim dense-mode passive

default ip pim dense-mode passive

Parameter Description

N/A

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

Before the PIM-DM passive mode is enabled, enable the multicast routing and forwarding function in global configuration mode. Otherwise, multicast packets cannot be sent even if PIM-DM passive mode is enabled.

When the PIM-DM passive mode is enabled, IGMP is automatically enabled on different interfaces.

After the PIM-DM passive mode is enabled on an interface, the interface does not receive or send PIM packets, but it can forward multicast packets. You are advised to enable the PIM-DM passive mode on an interface of a stub network device connected to hosts. This avoids L2 flooding of the PIM hello messages.

Examples

The following example enables the PIM-DM passive mode on GigabitEthernet 0/1.

```
Hostname> enable
```

```
Hostname# configure terminal
Hostname(config)# interface GigabitEthernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip pim dense-mode passive
```

Notifications

If the multicast routing function is not enabled on a device, the following notification will be displayed:

```
WARNING:  "ip multicast-routing"  is not configured, PIM Dense-mode passive will
not start-up.
```

If the number of multicast interfaces on a device reaches the upper limit, the following notification will be displayed:

```
Operation failed: PIM-DM VIF limit exceeded
```

If the interface is not added to the global VRF, the following notification will be displayed:

```
PIM-DM allow to configure on vrf 0 only
```

Common Errors

If two devices in a network segment forward multicast packets, assertion election cannot proceed. If the **pim dense-mode passive** mode is enabled on the interface, the assertion election mechanism fails. As a result, two identical multicast packets are sent to this network segment.

If the **pim dense-mode passive** mode is enabled on an interface of an intermediate device deployed on an L3 multicast network, the networking fails because the interface does not receive or send PIM packets.

Platform Description

N/A

Related Commands

- **ip multicast-routing** (IPv4 multicast routing management)

1.5 ip pim dense-mode subvlan

Function

Run the **ip pim dense-mode subvlan** command to enable the PIM-DM function on a super VLAN interface.

Run the **no** form of this command to disable this function on a super VLAN interface.

Run the **default** form of this command to restore the default configuration.

The PIM-DM function is disabled on a super VLAN interface by default.

Syntax

ip pim dense-mode subvlan [**all** | *subvlan-id*]

no ip pim dense-mode subvlan

default ip pim dense-mode subvlan

Parameter Description

all: Specifies that PIM-DM packets are sent to all sub VLANs.

subvlan-id: ID of a sub VLAN to which PIM-DM packets are sent. The value range is from 1 to 4094.

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

Generally, a super VLAN contains many sub VLANs. If PIM-DM is enabled on a super VLAN interface, the super VLAN interface duplicates the protocol packets and sends them to all sub VLANs. If the number of sub VLANs is too many, exceeding the processing capability of the device, packets are discarded, resulting in protocol flapping.

In most scenarios, the PIM-DM protocol is disabled by default and not needed on a super VLAN interface. This interface does not send or receive PIM packets. If the PIM-DM protocol is needed on a super VLAN interface in some scenarios, you can run this command to enable the protocol. Note that if all sub VLANs are specified to receive packets, the transmission performance may be reduced, causing neighbor flapping.

Examples

The following example enables the PIM-DM function on the super VLAN interface with VLAN 100 and specifies PIM packets to be sent to sub VLAN 200.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface vlan 100
Hostname(config-if-vlan 100)# ip pim dense-mode subvlan 200
```

Notifications

If this command is run on a non-super VLAN interface, the following notification will be displayed:

```
%% this command can apply to supervlan switch virtual interface only.
```

If the specified sub VLAN ID is consistent with the VLAN ID of an SVI, the following notification will be displayed:

```
%% subvlan vid(%d) is equal to SVI vlan id, not support
```

Common Errors

- This command is run on a non-super VLAN interface.
- The sub VLAN specified on a super VLAN interface cannot communicate with neighbors.

Platform Description

N/A

Related Commands

N/A

1.6 ip pim neighbor-filter

Function

Run the **ip pim neighbor-filter** command to enable the neighbor filtering function on an interface.

Run the **no** form of this command to disable this function on the interface.

Run the **default** form of this command to restore the default configuration.

The neighbor filtering function is disabled on an interface by default.

Syntax

ip pim neighbor-filter { *acl-name* | *acl-number* }

no ip pim neighbor-filter { *acl-name* | *acl-number* }

default ip pim neighbor-filter { *acl-name* | *acl-number* }

Parameter Description

acl-name: Name of a standard IP ACL. The value is a case-sensitive string of 1 to 99 characters.

acl- number: No. of a standard IP ACL. The value range is from 1 to 99.

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

If a neighbor is filtered out based on an access filtering list, PIM-DM does not create peer relationship with the neighbor or stops the peer relationship with this neighbor.

Only addresses that meet ACL filtering conditions can be used as PIM neighbors of the current interface. Otherwise, the addresses filtered out cannot be neighbors. Peering refers to exchange of protocol packets between PIM neighbors. If peering with a PIM device is suspended, the neighbor relationship with it cannot be formed so that PIM protocol packets will not be received from the device.

Examples

The following example enables the neighbor filtering function on GigabitEthernet 0/1 and uses ACL 14 as the filtering rule.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface GigabitEthernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip pim neighbor-filter 14
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

[™]

- show ip pim dense-mode interface

1.7 ip pim override-interval

Function

Run the **ip pim override-interval** command to configure the prune override interval of hello messages.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

The default prune override interval of hello messages is **2500** ms.

Syntax

ip pim override-interval *override-interval*

no ip pim override-interval

default ip pim override-interval

Parameter Description

override-interval: Prune override interval of hello messages, in milliseconds. The value range is from 1 to 65535.

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example sets the prune override interval of hello messages to 3000 ms on GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface GigabitEthernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip pim override-interval 3000
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

- ip pim propagation-delay
- show ip pim dense-mode interface

1.8 ip pim propagation-delay

Function

Run the **ip pim propagation-delay** command to configure the propagation delay of hello messages.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

The default propagation delay of hello messages on an interface is **500** ms.

Syntax

ip pim propagation-delay *propagation-delay-time*

no ip pim propagation-delay

default ip pim propagation-delay

Parameter Description

propagation-delay-time: Propagation delay of hello messages, in milliseconds. The value range is from 1 to 32767.

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example sets the propagation delay of hello messages to 600 ms on GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface GigabitEthernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip pim propagation-delay 600
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

- ip pim override-interval
- show ip pim dense-mode interface

1.9 ip pim query-interval

Function

Run the **ip pim query-interval** command to configure the hello message sending interval.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

Hello messages are sent at an interval of **30** seconds by default.

Syntax

ip pim query-interval *query-interval*

no ip pim query-interval

default ip pim query-interval

Parameter Description

query-interval: Hello message sending interval, in seconds. The value range is from 1 to 65535.

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

If the hello message sending interval is configured, the hello message hold time is updated as a product of 3.5 and the hello message sending interval.

Examples

The following example sets the hello message sending interval to 123 seconds on GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface GigabitEthernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip pim query-interval 123
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

- show ip pim dense-mode interface

1.10 ip pim state-refresh disable

Function

Run the **ip pim state-refresh disable** command to disable the PIM-DM state refresh function on an interface.

Run the **no** form of this command to restore the PIM-DM state refresh function on an interface.

Run the **default** form of this command to restore the default configuration.

The PIM-DM SRMs are processed and forwarded by default.

Syntax

ip pim state-refresh disable

no ip pim state-refresh disable

default ip pim state-refresh disable

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

When the PIM state refresh function is disabled, SRMs are not processed or forwarded. The SR Cap option is not included in a hello message, and is not processed when the hello message is received.

Disabling the PIM-DM state refresh function may cause the converged PIM-DM MDT to re-converge, which leads to unnecessary bandwidth waste and multicast routing table flapping. Therefore, you are not advised to disable this function in general conditions.

Examples

The following example disables the PIM-DM state refresh function on GigabitEthernet 0/1.

```
Hostname> enable
```

```
Hostname# configure terminal
Hostname(config-if-GigabitEthernet 0/1)# ip pim state-refresh disable
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.11 ip pim state-refresh origination-interval

Function

Run the **ip pim state-refresh origination-interval** command to configure the PIM-DM SRM sending interval on an interface.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

The PIM-DM SRMs are sent at an interval of **60** seconds by default.

Syntax

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

no ip pim state-refresh origination-interval

default ip pim state-refresh origination-interval

Parameter Description

origination-interval: PIM-DM SRM sending interval, in seconds. The value range is from 1 to 100.

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example sets the PIM-DM SRM sending interval to 65 seconds on GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
```

```
Hostname(config)# interface GigabitEthernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip pim state-refresh origination-
interval 65
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.12 ip pim mib dense-mode

Function

Run the **ip pim mib dense-mode** command to switch over the management object of the MIB function from PIM-SM to PIM-DM.

Run the **no** form of this command to switch over the management object of the MIB function from PIM-DM to PIM-SM.

Run the **default** form of this command to restore the default configuration.

PIM-SM is managed by the MIB function by default.

Syntax

ip pim mib dense-mode
no ip pim mib dense-mode

default ip pim mib dense-mode

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example switches over the management object of the MIB function from PIM-SM to PIM-DM.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip pim mib dense-mode
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.13 show ip pim dense-mode interface

Function

Run the **show ip pim dense-mode interface** command to display information of a PIM-DM interface.

Syntax

show ip pim dense-mode interface [*interface-type interface-number*] [**detail**]

Parameter Description

interface-type interface-number: Specified interface type and interface number, used to display information of this PIM-DM interface.

detail: Displays detailed information of an interface.

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays information of a PIM-DM interface.

```
Hostname> enable
Hostname# show ip pim dense-mode interface
Address       Interface           VIF      Ver/    Nbr
                                  Index    Mode    Count
10.10.10.10   FastEthernet 0/45   3        v2/D    1
50.50.50.50   VLAN 4              2        v2/D    1
```

Table 1-1Output Fields of the show ip pim dense-mode interface Command

Field	Description
Address	Primary IP address of a PIM-DM interface
Interface	Name of a PIM-DM interface
VIF Index	VIF ID
Ver/Mode	PIM version and mode
Nbr Count	Number of neighbors on a PIM-DM interface

Notifications

N/A

Platform Description

N/A

1.14 show ip pim dense-mode mroute

Function

Run the **show ip pim dense-mode mroute** command to display PIM-DM routing entry information.

Syntax

show ip pim dense-mode mroute [*group-or-source-address-1* [*group-or-source-address-2*]] [**summary**]

Parameter Description

group-or-source-address-1: Group address or source address.

group-or-source-address-2: Group address or source address. The two addresses must be one group address and one source address.

summary: Displays summary of routing entries.

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays PIM-DM routing entry information.

```
Hostname> enable
Hostname# show ip pim dense-mode mroute
```

```
PIM-DM Multicast Routing Table
(1.1.1.111, 229.1.1.1)
MRT lifetime expires in 205 seconds
RPF Neighbor: 50.50.50.1, Nexthop:50.50.50.1,VLAN 4
Upstream IF: VLAN 4
Upstream State: Pruned, PLT:200
Assert State: NoInfo
Downstream IF List:
FastEthernet 0/45:
Downstream State: NoInfo
Assert State: Loser, AT:170
```

Table 1-1Output Fields of the show ip pim dense-mode mroute Command

Field	Description
RPF Neighbor	RPF neighbor
Nexthop	IP address and interface of the RPF next hop
Upstream IF	Interface connected to an upstream neighbor
Upstream State	State of an upstream neighbor
Assert State	Assert state of an upstream interface
Downstream IF List	List of interfaces connected to downstream neighbors
Downstream State	State of a downstream neighbor
Assert State	Assert state of a downstream interface

Notifications

N/A

Platform Description

N/A

1.15 show ip pim dense-mode neighbor

Function

Run the **show ip pim dense-mode neighbor** command to display PIM-DM neighbor information.

Syntax

show ip pim dense-mode neighbor [*interface-type interface-number*]

Parameter Description

interface-type interface-number: Specified interface type and interface number, used to display PIM-DM neighbor information of this interface.

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays the PIM-DM neighbor information.

```
Hostname> enable
Hostname# show ip pim dense-mode neighbor
Neighbor-Address   Interface           Uptime/Expires      Ver
10.10.10.1         FastEthernet 0/45   00:19:29/00:01:21   v2
50.50.50.1         VLAN 4              00:22:09/00:01:39   v2
```

Table 1-1 Output Fields of the show ip pim dense-mode neighbor Command

Field	Description
Neighbor-Address	Neighbor address
Interface	Interface connected to neighbors
Uptime/Expires	Entry timeout period/aging time
Ver	PIM version

Notifications

N/A

Platform Description

N/A

1.16 show ip pim dense-mode nexthop

Function

Run the **show ip pim dense-mode nexthop** command to display PIM-DM next hop information.

Syntax

show ip pim dense-mode nexthop

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays the PIM-DM next hop information.

```
Hostname> enable
Hostname# show ip pim dense-mode nexthop
Destination   Nexthop   Nexthop      Nexthop     Metric   Pref
              Num       Addr         Interface
1.1.1.111     1         50.50.50.1   VLAN 4      0        1
```

Table 1-1Output Fields of the show ip pim dense-mode nexthop Command

Field	Description
Destination	Address of a multicast source
Nexthop Num	Number of next hops
Nexthop Addr	Next hop address
Nexthop Interface	Interface connected to a next hop
Metric	Metric of a route
Pref	Route priority

Notifications

N/A

Platform Description

N/A

1.17 show ip pim dense-mode track

Function

Run the **show ip pim dense-mode track** command to display statistical information about PIM-DM packets.

Syntax

show ip pim dense-mode track

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

When the system is started, the statistic start time is set. Each time the **ip pim dense-mode track** command is run, the statistic start time is reset and the PIM packet counter is cleared.

Examples

The following example displays statistical information about PIM-DM packets.

```
Hostname> enable
Hostname# show ip pim dense-mode track
                  PIM packet counters
Elapsed time since counters cleared: 00:04:03
                 Received   sent
Valid PIMDM packets:  1          8
Hello:                1          8
Join/Prune:           0          0
Graft:                0          0
Graft-Ack:            0          0
Assert:               0          0
State-Refresh:        0          0
PIM-SM-Register:      0          0
PIM-SM-Register-Stop: 0          0
PIM-SM-BSM:           0          0
PIM-SM-RP-ADV:      0          0
Unknown Type:         0
Errors:
Malformed packets:    0
Bad checksums:        0
Unknown PIM version:  0
Send errors:          0
```

Table 1-1Output Fields of the show ip pim dense-mode nexthop Command

Field	Description
Elapsed time since counters cleared	Duration since the statistic start time till now

Field	Description
Received	Number of received PIM packets
sent	Number of sent PIM packets
Valid PIMDM packets	Valid PIM-DM packets
Hello	Statistical value of hello messages
Join/Prune	Statistical value of join-prune packets
Graft	Statistical value of graft packets
Graft-Ack	Statistical value of graft acknowledgment packets
Assert	Statistical value of assert packets
State-Refresh	Statistical value of SRMs
PIM-SM-Register	Statistical value of register messages
PIM-SM-Register-Stop	Statistical value of register-stop packets
PIM-SM-BSM	Statistical value of BSMs
PIM-SM-RP-ADV	Statistical value of C-RP advertisement packets
Unknown Type	Unknown PIM packets
Errors	Error packets
Malformed packets	Number of malformed packets
Bad checksums	Number of packets with incorrect checksums
Unknown PIM version	Number of PIM packets with unknown version
Send errors	Number of sent error packets

Notifications

N/A

Platform Description

N/A