



PIM User Guide

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Registered Address	Support	Sales
26, Kingston Terrace, Princeton, New Jersey 08540, United States		
		+91 80 4850 5445
http://www.rtbrick.com	support@rtbrick.com	sales@rtbrick.com

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1. Introduction

Protocol Independent Multicast (PIM) is a multicast routing protocol that runs over an existing unicast infrastructure. RBFS supports PIM source-specific multicast (SSM). PIM-SSM uses a subset of PIM sparse mode and IGMP version 3 (IGMPv3) to permit a client to receive multicast traffic directly from the source.

PIM SSM builds shortest-path trees (SPTs) rooted at the source immediately because in SSM, the router closest to the interested receiver host is informed of the unicast IP address of the source for the multicast traffic. That is, PIM SSM bypasses the RP connection stage through shared distribution trees, as in PIM sparse mode, and goes directly to the source-based distribution tree.

Internet Protocol Television (IPTV) is a service where digital TV signal data is delivered by using Internet protocol (IP). IPTV service networks typically use PIM-SSM as the multicast routing protocol which has the following characteristics:

- Source specific host membership report for a particular multicast group. IGMPv3 allows a host to describe specific sources from which it would like to receive data.
- PIM shortest path forwarding. Source specific host report for a particular multicast group and initiating PIM (S,G) joins directly and immediately as result.
- No shared tree forwarding. In order to achieve global effectiveness of SSM, all networks must agree to restrict data forwarding to source trees for some recognized group range. The address range 232.0.0.0/8 has been allocated by IANA for use by source specific multicast (SSM).

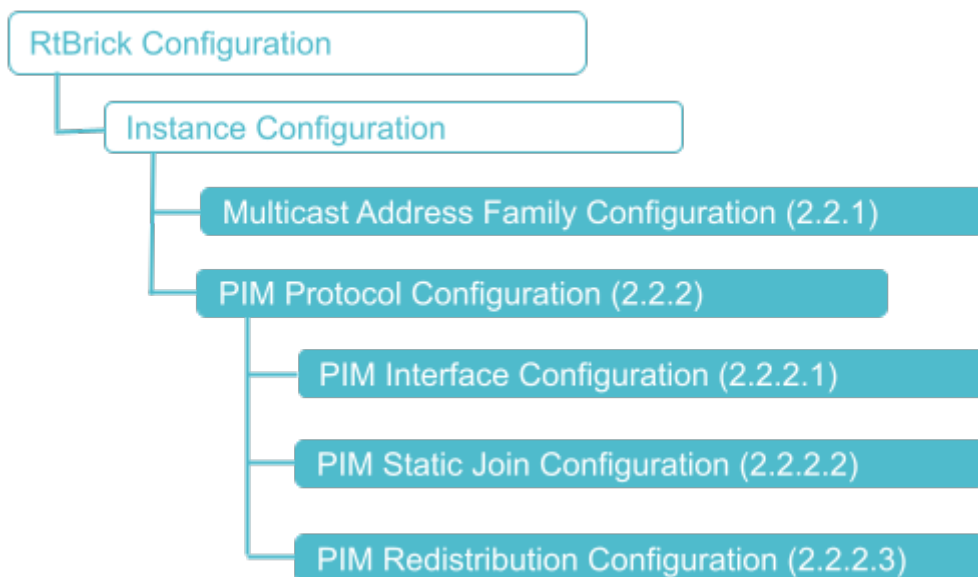
1.1. Supported Platforms

Not all features are necessarily supported on each hardware platform. Refer to the *Platform Guide* for the features and the sub-features that are or are not supported by each platform.

2. Configuring PIM

2.1. Configuration Hierarchy

The diagram illustrates the PIM configuration hierarchy.



2.2. Configuration Syntax and Commands

The following sections describe the interface configuration syntax and commands.

2.2.1. Multicast Address Family Configuration

You can enable the multicast IPv4 address family under the PIM instance using the following command:

Syntax:

set instance <instance> **address-family** <attribute> <value>

Attribute	Description
<instance>	Specifies the name of the network instance
<afi>	Address family identifier (AFI). Supported values: ipv4
<safi>	Subsequent address family identifier (SAFI), that is, multicast.

Example: Multicast Address Family Configuration

```

{
  "rtbrick-config:address-family": [
    {
      "afi": "ipv4",
      "safi": "multicast"
    }
  ]
}

```

2.2.2. PIM Protocol Configuration

Syntax:

set instance <instance> **protocol pim** <attribute> <value>



If no instance is specified, PIM will be enabled on the default instance. RBFS supports only IPV4 address family.

Attribute	Description
<instance>	Specifies the name of the instance
afi <afi>	Address family identifier (AFI). Supported: ipv4
join-prune-interval <join-prune-interval>	PIM join & prune interval. The interval ranges from 10 to 600 seconds. By default, join & prune interval is 60 seconds and hold-down timer is 210 seconds.
sparse-mode interface <...>	Reference to an entry in the global interface list. Refer to section 2.2.1.1 for the PIM interface configuration.
sparse-mode static-join <...>	A static pim join, (*,G) or (S,G). Refer to section 2.2.1.2 for the PIM static join configuration.
sparse-mode redistribute <...>	Redistribution-related configuration. Refer to section 2.2.1.3 for the PIM redistribution configuration.

2.2.2.1. PIM Interface Configuration

Syntax:

set instance <instance> **protocol pim sparse-mode interface** <attribute> <value>

Attribute	Description
<instance>	Specifies the name of the instance
<interface-name>	Reference to an entry in the global interface list
afi <afi>	Address family identifier (AFI). Supported: ipv4

Attribute	Description
dr-priority <dr-priority>	Specifies the designated router (DR) priority value.
hello-interval <hello-interval>	Specifies the hello timer in seconds. The hello timer ranges from 1 to 3600 seconds. Default: 30 seconds.
override-interval <override-interval>	Specifies the override interval in milliseconds. Default: 2000 milliseconds.
propagation-delay <propagation-delay>	Specifies the propagation delay in milliseconds. Default: 500 milliseconds.

Example: PIM Interface Configuration

```
{
  "rtbrick-config:interface": [
    {
      "interface-name": "hostif-0/0/0/1",
      "hello-interval": 100,
      "dr-priority": 101
    },
    {
      "interface-name": "hostif-0/0/1/2"
    },
    {
      "interface-name": "hostif-0/0/3/3",
      "propagation-delay": 103,
      "override-interval": 1000
    }
  ]
}
```

2.2.2.2. PIM Static Join Configuration

Syntax:

set instance <instance> **protocol pim sparse-mode static-join** <attribute> <value>

Attribute	Description
<instance>	Specifies the name of the instance
<interface-name>	Reference to an entry in the global interface list
<outgoing-interface>	Multicast outbound interface name
<group-address>	Multicast group IP address
<source-address>	Multicast source IP address

Example: PIM Static Join Configuration

```
{
  "rtbrick-config:static-join": [
    {
      "outgoing-interface": "hostif-0/0/0/1",
      "group-address": "232.1.1.2",
      "source-address": "192.0.1.2"
    }
  ]
}
```

2.2.2.3. PIM Redistribution Configuration

Syntax:

set instance <instance> **protocol pim sparse-mode redistribute** <attribute> <value>

Command Parameters

<instance>	Specifies the name of the instance.
<afi>	Specifies the address family identifier. Supported value: ipv4.
<safi>	Specifies the subsequent address family identifier. Supported value: multicast.
<source>	Source protocol from which routes are being redistributed such as BGP or static.

Example: PIM Redistribution Configuration

```
{
  "rtbrick-config:redistribute": [
    {
      "afi": "ipv4",
      "safi": "multicast",
      "source": "bgp"
    }
  ]
}
```


2.3. PIM Configuration Example

```
{
  "rtbrick-config:pim": {
    "sparse-mode": {
      "interface": [
        {
          "interface-name": "ifp-0/0/1"
        }
      ],
      "redistribute": [
        {
          "afi": "ipv4",
          "safi": "multicast",
          "source": "bgp"
        }
      ],
      "static-join": [
        {
          "outgoing-interface": "null0",
          "group-address": "232.27.72.10",
          "source-address": "198.18.73.250"
        },
        {
          "outgoing-interface": "null0",
          "group-address": "232.27.72.11",
          "source-address": "198.18.73.250"
        },
        {
          "outgoing-interface": "null0",
          "group-address": "232.27.72.12",
          "source-address": "198.18.73.250"
        },
        {
          "outgoing-interface": "null0",
          "group-address": "232.27.72.13",
          "source-address": "198.18.73.250"
        }
      ]
    }
  }
}
```

3. Operational Commands

3.1. PIM Show Commands

3.1.1. PIM Interface

Syntax:

show pim interface <option>

Option	Description
-	Without any option, the commands displays the information for all interfaces.
<interface_name>	Displays the PIM interface detail for the default instance
instance <instance_name>	Displays interface summary on specific instance

Example 1: Summary of PIM logical interface for all instances.

```

supervisor@rtbrick: op> show pim interface
Interface          Instance          IP Address        State             DR
Generator ID
memif-1/7/1/1     default          30.1.1.1         Non-DR           30.1.1.2
1896236448
null0              default          n/a              n/a              n/a
n/a
hostif-0/0/3/3    vpn1             50.0.0.25        Non-DR           50.0.0.3
2123016228
null0              vpn1             n/a              n/a              n/a
n/a

```

Example 2: Summary of interfaces for the specified instance.

```

supervisor@rtbrick: op> show pim interface instance vpn1
Interface          Instance          IP Address        State             DR
Generator ID
hostif-0/0/3/3    vpn1             50.0.0.25        Non-DR           50.0.0.3
2123016228
null0              vpn1             n/a              n/a              n/a
n/a

```

Example 3: Detailed view of the specified PIM interface.

```

supervisor@rtbrick: op> show pim interface hostif-0/0/3/3
Interface: hostif-0/0/3/3
  Instance           : vpn1
  State              : Non-DR
  Primary address    : 50.0.0.25
  Generation ID      : 2123016228
  Timer values
    Hello interval   : 35s
    Join/Prune interval : 35s
    Hold interval    : 105s
    Override interval : 2000ms
    Prune delay interval : 500ms
  DR election
    DR address       : 50.0.0.3
    DR priority      : 1
    DR election count : 251
  Negotiated
    DR priority used : True
    Lan delay used   : False
    Lan prune interval : 0
    Lan override used : False
    Lan override interval : 0
  Statistics
    Hello
      Received       : 17214
      Sent           : 95
    Membership
      Received       : 0
      Sent           : 759
    Assert
      Received       : 0
      Sent           : 0

```

3.1.2. PIM Membership

Syntax:

show pim membership <option>

Option	Description
-	Without any option, the commands displays PIM membership summary on all instances.
instance <instance_name>	Displays the PIM membership summary information on specific instance.
detail	Detailed information on all BGP peers in all instances in a list view.
instance <instance_name> detail	Displays the PIM membership detailed information on specific instance.
<group_address>	Specifies the multicast multicast group address

Option	Description
<source_address>	Specifies the source from which the multicast traffic is received

Example 1: Summary of the PIM membership on all instances.

```

supervisor@rtbrick: op> show pim membership
Source          Group          Interface
Instance      Uptime
30.1.1.2      232.198.198.198  null0          default
00h:38m:05s
30.1.1.2      234.234.234.234  null0          default
00h:38m:05s
30.1.1.2      235.235.235.235  null0          default
00h:38m:05s

```

Example 2: Summary of the PIM membership for the specified instance.

```

supervisor@rtbrick: op> show pim membership instance default
Source          Group          Interface
Instance      Uptime
30.1.1.2      232.198.198.198  null0          default
00h:38m:18s
30.1.1.2      234.234.234.234  null0          default
00h:38m:18s
30.1.1.2      235.235.235.235  null0          default
00h:38m:18s

```

Example 3: Detailed view of PIM membership on all instances.

```
supervisor@rtbrick: op> show pim membership detail
30.1.1.2, 232.198.198.198
  Instance           : default
  Outgoing interface : null0
  Source             : pim
  Subtype            : Join
  Subsource          : Static
  Uptime             : 00h:39m:29s
30.1.1.2, 234.234.234.234
  Instance           : default
  Outgoing interface : null0
  Source             : pim
  Subtype            : Join
  Subsource          : Static
  Uptime             : 00h:39m:29s
30.1.1.2, 235.235.235.235
  Instance           : default
  Outgoing interface : null0
  Source             : pim
  Subtype            : Join
  Subsource          : Static
  Uptime             : 00h:39m:29s
```

Example 4: Detailed view of PIM membership for the specified instance.

```
supervisor@rtbrick: op> show pim membership instance default detail
30.1.1.2, 232.198.198.198
  Instance           : default
  Outgoing interface : null0
  Source             : pim
  Subtype            : Join
  Subsource          : Static
  Uptime             : 00h:39m:39s
30.1.1.2, 234.234.234.234
  Instance           : default
  Outgoing interface : null0
  Source             : pim
  Subtype            : Join
  Subsource          : Static
  Uptime             : 00h:39m:39s
30.1.1.2, 235.235.235.235
  Instance           : default
  Outgoing interface : null0
  Source             : pim
  Subtype            : Join
  Subsource          : Static
  Uptime             : 00h:39m:39s
```

Example 5: Detailed view of PIM membership for the specified group-address and source-address in selected instance.

```

supervisor@rtbrick: op> show pim membership instance default 232.198.198.198
30.1.1.2
30.1.1.2, 232.198.198.198
  Instance           : default
  Outgoing interface : null0
  Source             : pim
  Subtype            : Join
  Subsource          : Static
  Uptime             : 00h:39m:50s
supervisor@rtbrick: op>

```

3.1.3. PIM Join and Prune

Syntax:

show pim join-prune <option>

Option	Description
-	Without any option, the commands displays join and prune summary command on all instances.
instance <instance_name>	Displays join and prune summary on a specific instance.
detail	Displays PIM join and prune detailed information on all instances.
instance <instance_name> detail	Displays detailed join and prune information in selected instance.
<group_address>	Displays PIM join and prune detailed information for a specific group on all instance
<source_address>	Specifies the source from which the multicast traffic is received.

Example 1: Summary of the PIM join and prune all instances.

```
supervisor@rtbrick: op> show pim join-prune
```

Source	Group	Upstream	Interface	Instance
30.1.1.2	232.198.198.198	memif-1/7/1/1	default	
30.1.1.2	234.234.234.234	memif-1/7/1/1	default	
30.1.1.2	235.235.235.235	memif-1/7/1/1	default	
50.0.0.1	232.27.72.2	hostif-0/0/3/3	vpn1	
50.0.0.1	232.27.72.5	hostif-0/0/3/3	vpn1	
50.0.0.3	232.27.72.3	hostif-0/0/3/3	vpn1	
50.0.0.4	232.27.72.4	hostif-0/0/3/3	vpn1	
50.0.0.6	225.0.0.6	hostif-0/0/3/3	vpn1	
50.0.0.7	225.0.0.7	hostif-0/0/3/3	vpn1	
50.0.0.8	225.0.0.8	hostif-0/0/3/3	vpn1	
50.0.0.9	225.0.0.9	hostif-0/0/3/3	vpn1	
50.0.0.10	225.0.0.10	hostif-0/0/3/3	vpn1	
50.0.0.125	232.2.2.2	hostif-0/0/3/3	vpn1	
50.0.0.234	233.233.233.223	hostif-0/0/3/3	vpn1	

Example 2: Summary of the PIM join and prune summary for the specified instance.

```
supervisor@rtbrick: op> show pim join-prune instance vpn1
```

Source	Group	Upstream	Interface	Instance
50.0.0.1	232.27.72.2	hostif-0/0/3/3	vpn1	
50.0.0.1	232.27.72.5	hostif-0/0/3/3	vpn1	
50.0.0.3	232.27.72.3	hostif-0/0/3/3	vpn1	
50.0.0.4	232.27.72.4	hostif-0/0/3/3	vpn1	
50.0.0.6	225.0.0.6	hostif-0/0/3/3	vpn1	
50.0.0.7	225.0.0.7	hostif-0/0/3/3	vpn1	
50.0.0.8	225.0.0.8	hostif-0/0/3/3	vpn1	
50.0.0.9	225.0.0.9	hostif-0/0/3/3	vpn1	
50.0.0.10	225.0.0.10	hostif-0/0/3/3	vpn1	
50.0.0.125	232.2.2.2	hostif-0/0/3/3	vpn1	
50.0.0.234	233.233.233.223	hostif-0/0/3/3	vpn1	

Example 3: Detailed view of the PIM join and prune for the specified instance.

```
supervisor@rtbrick: op> show pim join-prune instance vpn1 detail
50.0.0.1, 232.27.72.2
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.1
  Type               : Join
  Uptime             : 00h:01m:11s
50.0.0.1, 232.27.72.5
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.1
  Type               : Join
  Uptime             : 00h:01m:11s
50.0.0.3, 232.27.72.3
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.3
  Type               : Join
  Uptime             : 00h:03m:41s
50.0.0.4, 232.27.72.4
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.4
  Type               : Join
  Uptime             : 00h:03m:41s
50.0.0.6, 225.0.0.6
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.6
  Type               : Join
  Uptime             : 00h:55m:31s
50.0.0.7, 225.0.0.7
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.7
  Type               : Join
  Uptime             : 00h:55m:30s
50.0.0.8, 225.0.0.8
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.8
  Type               : Join
  Uptime             : 00h:55m:30s
50.0.0.9, 225.0.0.9
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.9
  Type               : Join
  Uptime             : 00h:55m:31s
50.0.0.10, 225.0.0.10
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.10
  Type               : Join
  Uptime             : 00h:55m:31s
```


Example 4: Detailed view of the PIM join and prune for the specified instance, source, and group.

```

supervisor@rtbrick: op> show pim join-prune instance vpn1 225.0.0.10
50.0.0.10
50.0.0.10, 225.0.0.10
  Instance           : vpn1
  Upstream interface : hostif-0/0/3/3
  Upstream neighbor  : 50.0.0.10
  Type               : Join
  Uptime             : 00h:55m:50s
    
```

3.1.4. PIM Neighbors

Syntax:

show pim neighbor <option>

Option	Description
-	Without any option, the commands displays the PIM neighbor summary on all instances.
instance <instance_name>	Displays the PIM neighbor summary information on specific instance
instance <instance_name> <neighbor_address>	Displays detailed information for specific PIM neighbor in selected instance.

Example 1: Summary of PIM neighbor on all instances.

```

supervisor@rtbrick: op> show pim neighbor
Neighbor           Interface           Instance           Generation ID  Uptime
Expires
30.1.1.2           memif-1/7/1/1      default            1413290566
00h:55m:34s      1m 35s
50.0.0.1           hostif-0/0/3/3     vpn1                666648646    00h:55m:59s
21s
50.0.0.2           hostif-0/0/3/3     vpn1                1893441310   00h:55m:59s
28s
50.0.0.3           hostif-0/0/3/3     vpn1                1582670973   00h:55m:56s
24s
50.0.0.4           hostif-0/0/3/3     vpn1                2114142516   00h:55m:59s
21s
50.0.0.5           hostif-0/0/3/3     vpn1                620803409    00h:55m:56s
29s
50.0.0.6           hostif-0/0/3/3     vpn1                21872824     00h:56m:00s
28s
50.0.0.7           hostif-0/0/3/3     vpn1                1938032162   00h:55m:58s
22s
50.0.0.8           hostif-0/0/3/3     vpn1                1317312430   00h:55m:58s
22s
    
```

50.0.0.9 27s	hostif-0/0/3/3	vpn1	135050151	00h:55m:59s
50.0.0.10 21s	hostif-0/0/3/3	vpn1	1992665194	00h:55m:59s
50.0.0.11 28s	hostif-0/0/3/3	vpn1	223322718	00h:55m:57s
50.0.0.12 21s	hostif-0/0/3/3	vpn1	1604225905	00h:55m:59s
50.0.0.13 29s	hostif-0/0/3/3	vpn1	2016644219	00h:55m:56s
50.0.0.14 21s	hostif-0/0/3/3	vpn1	1702825153	00h:55m:59s
50.0.0.15 22s	hostif-0/0/3/3	vpn1	946957262	00h:55m:58s
50.0.0.16 22s	hostif-0/0/3/3	vpn1	629661990	00h:55m:58s
50.0.0.17 27s	hostif-0/0/3/3	vpn1	28854718	00h:55m:59s
50.0.0.18 28s	hostif-0/0/3/3	vpn1	569003403	00h:55m:59s
50.0.0.19 22s	hostif-0/0/3/3	vpn1	1005143597	00h:55m:58s
50.0.0.20 28s	hostif-0/0/3/3	vpn1	1947663757	00h:55m:57s
50.0.0.21 29s	hostif-0/0/3/3	vpn1	935980530	00h:55m:59s
50.0.0.22 28s	hostif-0/0/3/3	vpn1	1077227716	00h:55m:57s
50.0.0.23 28s	hostif-0/0/3/3	vpn1	1883998663	00h:55m:56s
50.0.0.24 28s	hostif-0/0/3/3	vpn1	1080685537	00h:55m:59s
50.0.0.26 25s	hostif-0/0/3/3	vpn1	552779013	00h:55m:58s
50.0.0.27 28s	hostif-0/0/3/3	vpn1	1263214263	00h:55m:58s
50.0.0.28 28s	hostif-0/0/3/3	vpn1	2048997893	00h:56m:00s
50.0.0.29 29s	hostif-0/0/3/3	vpn1	946709615	00h:55m:56s
50.0.0.30 28s	hostif-0/0/3/3	vpn1	118339568	00h:56m:00s
50.0.0.31 28s	hostif-0/0/3/3	vpn1	1455498510	00h:56m:00s
50.0.0.32 22s	hostif-0/0/3/3	vpn1	624592867	00h:55m:58s
50.0.0.33 29s	hostif-0/0/3/3	vpn1	852784085	00h:55m:56s
50.0.0.34 21s	hostif-0/0/3/3	vpn1	1723470230	00h:55m:59s

Example 2: Summary of PIM neighbor for the specified instance.

```

supervisor@rtbrick: op> show pim neighbor instance default
Neighbor          Interface          Instance          Generation ID  Uptime
Expires
30.1.1.2          memif-1/7/1/1    default          1413290566
00h:55m:41s      1m 28s
    
```

Example 3: Detailed view of PIM neighbor for the specified instance.

```

supervisor@rtbrick: op> show pim neighbor instance default 30.1.1.2
Neighbor: 30.1.1.2
  Interface          : memif-1/7/1/1
  Instance           : default
  Hold down interval : 105s
  Expires            : 105s
  Generation ID      : 1413290566
  DR priority        : 1
  Uptime              : 00h:55m:47s
  Last transition time : Tue Nov 24 06:47:08 GMT +0000 2020
  Holddown received  : 1
    
```

3.1.5. PIM Reverse Path Forwarding (RPF)

Syntax:

show pim rpf <option>

Option	Description
-	Without any option, the commands displays the PIM rpf summary information on all instance.
instance <instance_name>	Displays the PIM rpf summary information on specific instance.
instance <instance> <source_address>	Displays the PIM rpf detailed information for specific source-address in selected instance.

Example 1: Summary of PIM rpf on all instances.

```

supervisor@rtbrick: op> show pim rpf
Multicast Source Instance RPF Interface Neighbor
30.1.1.2 default memif-1/7/1/1 30.1.1.2
50.0.0.1 vpn1 hostif-0/0/3/3 50.0.0.1
50.0.0.3 vpn1 hostif-0/0/3/3 50.0.0.3
50.0.0.4 vpn1 hostif-0/0/3/3 50.0.0.4
50.0.0.6 vpn1 hostif-0/0/3/3 50.0.0.6
50.0.0.7 vpn1 hostif-0/0/3/3 50.0.0.7
50.0.0.8 vpn1 hostif-0/0/3/3 50.0.0.8
50.0.0.9 vpn1 hostif-0/0/3/3 50.0.0.9
50.0.0.10 vpn1 hostif-0/0/3/3 50.0.0.10
50.0.0.125 vpn1 hostif-0/0/3/3 50.0.0.125
50.0.0.234 vpn1 hostif-0/0/3/3 50.0.0.234
192.168.200.64 vpn1 n/a n/a

```

Example 2: Summary of PIM rpf for the specified instance.

```

supervisor@rtbrick: op> show pim rpf instance vpn1
Multicast Source Instance RPF Interface Neighbor
50.0.0.1 vpn1 hostif-0/0/3/3 50.0.0.1
50.0.0.3 vpn1 hostif-0/0/3/3 50.0.0.3
50.0.0.4 vpn1 hostif-0/0/3/3 50.0.0.4
50.0.0.6 vpn1 hostif-0/0/3/3 50.0.0.6
50.0.0.7 vpn1 hostif-0/0/3/3 50.0.0.7
50.0.0.8 vpn1 hostif-0/0/3/3 50.0.0.8
50.0.0.9 vpn1 hostif-0/0/3/3 50.0.0.9
50.0.0.10 vpn1 hostif-0/0/3/3 50.0.0.10
50.0.0.125 vpn1 hostif-0/0/3/3 50.0.0.125
50.0.0.234 vpn1 hostif-0/0/3/3 50.0.0.234
192.168.200.64 vpn1 n/a n/a

```

Example 3: Detailed view of PIM rpf for the specified source-address in selected instance.

```

supervisor@rtbrick: op> show pim rpf instance vpn1 50.0.0.1
Multicast source : 50.0.0.1
Instance : vpn1
AFI : ipv4
SAFI : unicast
RPF interface : hostif-0/0/3/3
Peer : 50.0.0.1
Covering prefix : n/a
MAC address : 00:12:01:00:00:01

```

3.1.6. PIM Routes

Syntax:

show pim mroute <option>

Option	Description
-	Without any option, the commands displays the PIM routes summary information on all instance.
detail	Displays the PIM routes detail for all instances.
instance <instance_name>	Displays the PIM routes summary on specific instance
instance <instance_name> detail	Displays the PIM routes detailed information on specific instances.

Example 1: Summary of PIM routes for all instances.

```

supervisor@rtbrick: op> show pim mroute
Instance: default, AFI: ipv4, SAFI: multicast
  Source          Group          Route Source  Preference  Nexthop
OIF
  30.1.1.2        232.198.198.198 pim          240         n/a
null0
  30.1.1.2        234.234.234.234 pim          240         n/a
null0
  30.1.1.2        235.235.235.235 pim          240         n/a
null0
    
```

Example 2: Detailed view of PIM routes for all instances.

```

supervisor@rtbrick: op> show pim mroute detail
30.1.1.2, 232.198.198.198
  Source          : pim          Preference      : 240
  Sub source      : Static        Subtype         : Join
  RPF neighbor   : 30.1.1.2      RPF interface  : memif-1/7/1/1
  Nexthop        : n/a          Egress interface : null0
  Nexthop type   : Multicast Fanout NextHop action  : None
  Destination    : default-ipv4-multicast
  Resolved in    : default-ipv4-multicast
30.1.1.2, 234.234.234.234
  Source          : pim          Preference      : 240
  Sub source      : Static        Subtype         : Join
  RPF neighbor   : 30.1.1.2      RPF interface  : memif-1/7/1/1
  Nexthop        : n/a          Egress interface : null0
  Nexthop type   : Multicast Fanout NextHop action  : None
  Destination    : default-ipv4-multicast
  Resolved in    : default-ipv4-multicast
30.1.1.2, 235.235.235.235
  Source          : pim          Preference      : 240
  Sub source      : Static        Subtype         : Join
  RPF neighbor   : 30.1.1.2      RPF interface  : memif-1/7/1/1
  Nexthop        : n/a          Egress interface : null0
  Nexthop type   : Multicast Fanout NextHop action  : None
  Destination    : default-ipv4-multicast
  Resolved in    : default-ipv4-multicast
    
```

Example 3: Summary of PIM routes for the specific instance.

```

supervisor@rtbrick: op> show pim mroute instance default
Instance: default, AFI: ipv4, SAFI: multicast
  Source          Group          Route Source  Preference  Nexthop
OIF
  30.1.1.2        232.198.198.198 pim          240         n/a
null0
  30.1.1.2        234.234.234.234 pim          240         n/a
null0
  30.1.1.2        235.235.235.235 pim          240         n/a
null0

```

Example 4: Detailed view of PIM routes for the specified instances.

```

supervisor@rtbrick: op> show pim mroute instance default detail
30.1.1.2, 232.198.198.198
  Source          : pim          Preference      : 240
  Sub source      : Static        Subtype         : Join
  RPF neighbor    : 30.1.1.2      RPF interface   : memif-1/7/1/1
  Nexthop        : n/a          Egress interface : null0
  Nexthop type    : Multicast Fanout NextHop action   : None
  Destination     : default-ipv4-multicast
  Resolved in     : default-ipv4-multicast
30.1.1.2, 234.234.234.234
  Source          : pim          Preference      : 240
  Sub source      : Static        Subtype         : Join
  RPF neighbor    : 30.1.1.2      RPF interface   : memif-1/7/1/1
  Nexthop        : n/a          Egress interface : null0
  Nexthop type    : Multicast Fanout NextHop action   : None
  Destination     : default-ipv4-multicast
  Resolved in     : default-ipv4-multicast
30.1.1.2, 235.235.235.235
  Source          : pim          Preference      : 240
  Sub source      : Static        Subtype         : Join
  RPF neighbor    : 30.1.1.2      RPF interface   : memif-1/7/1/1
  Nexthop        : n/a          Egress interface : null0
  Nexthop type    : Multicast Fanout NextHop action   : None
  Destination     : default-ipv4-multicast
  Resolved in     : default-ipv4-multicast
supervisor@rtbrick: op>

```

3.2. PIM Clear Commands

Clear commands allow to reset operational states.

3.2.1. PIM Neighbor

Syntax:

clear pim neighbor

Option	Description
neighbor	Clears all neighbors.

Example: The example below shows how to clear pim neighbor.

```
supervisor@rtbrick: op> clear pim neighbor
All instance clear triggered
```

3.2.2. PIM Neighbor Instance

Syntax:

clear pim neighbor instance <option> ...

Option	Description
neighbor instance <instance_name>	Clears all neighbors on the specified instance.
neighbor instance <instance_name> interface <interface- name>	Clears all neighbors on the specified interface.

Example 1: The example below shows how to clear neighbors of the specified instance

```
supervisor@rtbrick: op> clear pim neighbor instance ip2vrf
Instance clear triggered
```

Example 2: The example below shows how to clear neighbors of the specified interface

```
supervisor@rtbrick: op> clear pim neighbor instance ip2vrf interface hostif-
0/0/0
Instance clear triggered
```