



PIM User Guide

Version 24.1.1, 31 January 2024

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Table of Contents

1. Introduction	3
1.1. Supported Platforms	3
2. Configuring PIM	4
2.1. Configuration Hierarchy	4
2.2. Configuration Syntax and Commands	4
2.2.1. Multicast Address Family Configuration	4
2.2.2. PIM Protocol Configuration	5
2.2.2.1. PIM Interface Configuration	5
2.2.2.2. PIM Static Join Configuration	6
2.2.2.3. PIM Redistribution Configuration	7
2.3. PIM Configuration Example	8
3. Operational Commands	9
3.1. PIM Show Commands	9
3.1.1. PIM Interface	9
3.1.2. PIM Membership	10
3.1.3. PIM Join and Prune	13
3.1.4. PIM Neighbors	16
3.1.5. PIM Reverse Path Forwarding (RPF)	17
3.1.6. PIM Routes	18
3.2. PIM Clear Commands	20
3.2.1. PIM Neighbor	20
3.2.2. PIM Neighbor Instance	20

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).

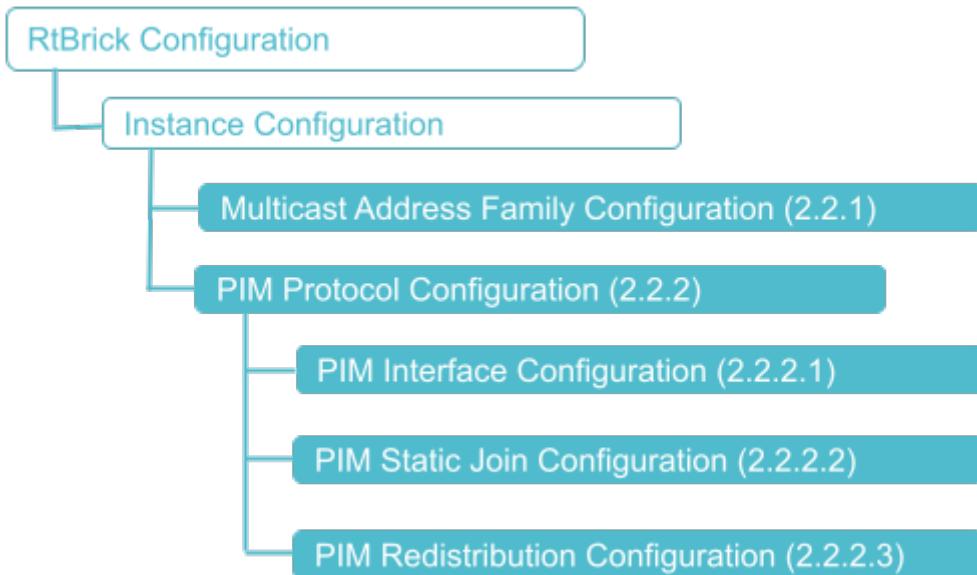
1.1. Supported Platforms

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": "if1-0/0/0/1",
      "hello-interval": 100,
      "dr-priority": 101
    },
    {
      "interface-name": "if1-0/0/1/2"
    },
    {
      "interface-name": "if1-0/0/3/3",
      "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": "if1-0/0/0/1",
            "group-address": "198.51.100.12",
            "source-address": "198.51.100.120"
        }
    ]
}
```

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": "198.51.100.110",  
                    "source-address": "198.18.73.250"  
                },  
                {  
                    "outgoing-interface": "null0",  
                    "group-address": "198.51.100.111",  
                    "source-address": "198.18.73.250"  
                },  
                {  
                    "outgoing-interface": "null0",  
                    "group-address": "198.51.100.112",  
                    "source-address": "198.18.73.250"  
                },  
                {  
                    "outgoing-interface": "null0",  
                    "group-address": "198.51.100.113",  
                    "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
<<<<<< HEAD
if1-1/7/1/1         default      198.51.100.247   Non-DR
198.51.100.42      1896236448
null0              default      n/a             n/a       n/a
n/a
if1-0/0/3/3         vpn1        198.51.100.25    Non-DR      198.51.100.33
2123016228
=====
if1-1/7/1/1         default      198.51.100.247   Non-DR      198.51.100.42
1896236448
null0              default      n/a             n/a       n/a
n/a
if1-0/0/3/3         vpn1        198.51.100.25    Non-DR      198.51.100.33
2123016228
>>>>> 1ecc2f585d37484ebb74f3bcbeafa3675aa8d42ce
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
<<<<<< HEAD
ifl-0/0/3/3          vpn1         198.51.100.25   Non-DR    198.51.100.33
2123016228
=====
ifl-0/0/3/3          vpn1         198.51.100.25   Non-DR    198.51.100.33
2123016228
>>>>> lecc2f585d37484ebb74f3bcbeafa3675aa8d42ce
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 ifl-0/0/3/3
Interface: ifl-0/0/3/3
  Instance          : vpn1
  State            : Non-DR
  Primary address  : 198.51.100.25
  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        : 198.51.100.33
    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
<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
<<<<< HEAD
Source          Group          Interface          Instance
Uptime
=====
Source          Group          Interface          Instance
Uptime
>>>>> 1ecc2f585d37484ebb74f3bcbeafa3675aa8d42ce
198.51.100.42    198.51.100.222   null0           default
00h:38m:05s
198.51.100.42    198.51.100.187   null0           default
00h:38m:05s
198.51.100.42    198.51.100.235   null0           default
00h:38m:05s
```

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

```
supervisor@rtbrick: op> show pim membership instance default
<<<<< HEAD
Source          Group          Interface          Instance
Uptime
=====
Source          Group          Interface          Instance
Uptime
>>>>> 1ecc2f585d37484ebb74f3bcbeafa3675aa8d42ce
198.51.100.42    198.51.100.222   null0           default
00h:38m:18s
198.51.100.42    198.51.100.187   null0           default
00h:38m:18s
198.51.100.42    198.51.100.235   null0           default
00h:38m:18s
```

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

```

supervisor@rtbrick: op> show pim membership detail
198.51.100.42, 198.51.100.222
  Instance          : default
  Outgoing interface : null0
  Source            : pim
  Subtype           : Join
  Subsource          : Static
  Uptime             : 00h:39m:29s
198.51.100.42, 198.51.100.187
  Instance          : default
  Outgoing interface : null0
  Source            : pim
  Subtype           : Join
  Subsource          : Static
  Uptime             : 00h:39m:29s
198.51.100.42, 198.51.100.235
  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
198.51.100.42, 198.51.100.222
  Instance          : default
  Outgoing interface : null0
  Source            : pim
  Subtype           : Join
  Subsource          : Static
  Uptime             : 00h:39m:39s
198.51.100.42, 198.51.100.187
  Instance          : default
  Outgoing interface : null0
  Source            : pim
  Subtype           : Join
  Subsource          : Static
  Uptime             : 00h:39m:39s
198.51.100.42, 198.51.100.235
  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 198.51.100.222
198.51.100.42
198.51.100.42, 198.51.100.222
  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
198.51.100.42  198.51.100.222  ifl-1/7/1/1    default
198.51.100.42  198.51.100.187  ifl-1/7/1/1    default
198.51.100.42  198.51.100.235  ifl-1/7/1/1    default
198.51.100.11   198.51.100.22   ifl-0/0/3/3    vpn1
198.51.100.11   198.51.100.217  ifl-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
<<<<< HEAD
Source          Group          Upstream Interface  Instance
=====
Source          Group          Upstream Interface  Instance
>>>>> lecc2f585d37484ebb74f3bcbe3675aa8d42ce
198.51.100.11   198.51.100.22    ifl-0/0/3/3      vpn1
198.51.100.11   198.51.100.217   ifl-0/0/3/3      vpn1
198.51.100.33   198.51.100.23    ifl-0/0/3/3      vpn1
198.51.100.40   198.51.100.24    ifl-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
198.51.100.11, 198.51.100.22
  Instance          : vpn1
  Upstream interface : if1-0/0/3/3
  Upstream neighbor  : 198.51.100.11
  Type              : Join
  Uptime            : 00h:01m:11s
198.51.100.11, 198.51.100.217
  Instance          : vpn1
  Upstream interface : if1-0/0/3/3
  Upstream neighbor  : 198.51.100.11
  Type              : Join
  Uptime            : 00h:01m:11s
198.51.100.33, 198.51.100.23
  Instance          : vpn1
  Upstream interface : if1-0/0/3/3
  Upstream neighbor  : 198.51.100.33
  Type              : Join
  Uptime            : 00h:03m:41s
198.51.100.40, 198.51.100.24
  Instance          : vpn1
  Upstream interface : if1-0/0/3/3
  Upstream neighbor  : 198.51.100.40
  Type              : Join
  Uptime            : 00h:03m:41s
198.51.100.66, 198.51.100.196
  Instance          : vpn1
  Upstream interface : if1-0/0/3/3
  Upstream neighbor  : 198.51.100.66
  Type              : Join
  Uptime            : 00h:55m:31s
198.51.100.70, 198.51.100.197
  Instance          : vpn1
  Upstream interface : if1-0/0/3/3
  Upstream neighbor  : 198.51.100.70
  Type              : Join
  Uptime            : 00h:55m:30s
198.51.100.80, 198.51.100.198
  Instance          : vpn1
  Upstream interface : if1-0/0/3/3
  Upstream neighbor  : 198.51.100.80
  Type              : Join
  Uptime            : 00h:55m:30s
198.51.100.38, 198.51.100.199
  Instance          : vpn1
  Upstream interface : if1-0/0/3/3
  Upstream neighbor  : 198.51.100.38
  Type              : Join
  Uptime            : 00h:55m:31s
198.51.100.200, 198.51.100.210
  Instance          : vpn1
  Upstream interface : if1-0/0/3/3
  Upstream neighbor  : 198.51.100.200
  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 198.51.100.210
198.51.100.200
198.51.100.200, 198.51.100.210
  Instance          : vpn1
  Upstream interface : ifl-0/0/3/3
  Upstream neighbor   : 198.51.100.200
  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
<<<<< HEAD
Neighbor      Interface     Instance  Generation ID  Uptime
Expires
198.51.100.42  ifl-1/7/1/1  default   1413290566  00h:55m:34s  1m
35s
198.51.100.11  ifl-0/0/3/3  vpn1      666648646   00h:55m:59s  21s
198.51.100.37  ifl-0/0/3/3  vpn1      1893441310  00h:55m:59s  28s
198.51.100.33  ifl-0/0/3/3  vpn1      1582670973  00h:55m:56s  24s
198.51.100.40  ifl-0/0/3/3  vpn1      2114142516  00h:55m:59s  21s
198.51.100.50  ifl-0/0/3/3  vpn1      620803409   00h:55m:56s  29s
=====
Neighbor      Interface     Instance  Generation ID  Uptime
Expires
198.51.100.42  ifl-1/7/1/1  default   1413290566  00h:55m:34s  1m
35s
198.51.100.11  ifl-0/0/3/3  vpn1      666648646   00h:55m:59s  21s
198.51.100.37  ifl-0/0/3/3  vpn1      1893441310  00h:55m:59s  28s
198.51.100.33  ifl-0/0/3/3  vpn1      1582670973  00h:55m:56s  24s
198.51.100.40  ifl-0/0/3/3  vpn1      2114142516  00h:55m:59s  21s
198.51.100.50  ifl-0/0/3/3  vpn1      620803409   00h:55m:56s  29s
>>>>> 1ecc2f585d37484ebb74f3bcbea3675aa8d42ce
```

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
198.51.100.42     ifl-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 198.51.100.42
Neighbor: 198.51.100.42
Interface          : ifl-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
198.51.100.42    default      ifl-1/7/1/1      198.51.100.42
198.51.100.11    vpn1        ifl-0/0/3/3      198.51.100.11
198.51.100.33    vpn1        ifl-0/0/3/3      198.51.100.33
198.51.100.40    vpn1        ifl-0/0/3/3      198.51.100.40
198.51.100.66    vpn1        ifl-0/0/3/3      198.51.100.66
198.51.100.107   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
198.51.100.11 vpn1 if1-0/0/3/3 198.51.100.11
198.51.100.33 vpn1 if1-0/0/3/3 198.51.100.33
198.51.100.40 vpn1 if1-0/0/3/3 198.51.100.40
198.51.100.66 vpn1 if1-0/0/3/3 198.51.100.66
198.51.100.70 vpn1 if1-0/0/3/3 198.51.100.70
198.51.100.107 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 198.51.100.11
Multicast source : 198.51.100.11
  Instance      : vpn1
  AFI          : ipv4
  SAFI         : unicast
  RPF interface : if1-0/0/3/3
  Peer          : 198.51.100.11
  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 instances.
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
  198.51.100.42    198.51.100.222  pim        240       n/a
null0
  198.51.100.42    198.51.100.187  pim        240       n/a
null0
  198.51.100.42    198.51.100.235  pim        240       n/a
null0
```

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

```
supervisor@rtbrick: op> show pim mroute detail
198.51.100.42, 198.51.100.222
  Source      : pim          Preference      : 240
  Sub source   : Static       Subtype        : Join
  RPF neighbor : 198.51.100.42  RPF interface  : ifl-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

198.51.100.42, 198.51.100.187
  Source      : pim          Preference      : 240
  Sub source   : Static       Subtype        : Join
  RPF neighbor : 198.51.100.42  RPF interface  : ifl-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

198.51.100.42, 198.51.100.235
  Source      : pim          Preference      : 240
  Sub source   : Static       Subtype        : Join
  RPF neighbor : 198.51.100.42  RPF interface  : ifl-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
  198.51.100.96  198.51.100.222  pim    240      n/a
  null0
  198.51.100.96  198.51.100.187  pim    240      n/a
  null0
  198.51.100.96  198.51.100.235  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
198.51.100.96, 198.51.100.222
  Source      : pim          Preference      : 240
  Sub source  : Static       Subtype        : Join
  RPF neighbor: 198.51.100.96 RPF interface  : ifl-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

198.51.100.96, 198.51.100.187
  Source      : pim          Preference      : 240
  Sub source  : Static       Subtype        : Join
  RPF neighbor: 198.51.100.96 RPF interface  : ifl-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

198.51.100.96, 198.51.100.235
  Source      : pim          Preference      : 240
  Sub source  : Static       Subtype        : Join
  RPF neighbor: 198.51.100.96 RPF interface  : ifl-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

```

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 ifl-0/0/0  
Instance clear triggered
```