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| **PIM – Protocol Independent Multicast** |

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| VyOS supports PIM-SM as well as IGMP v2 and v3 |

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| PIM must be configured in every interface of every participating router. Every router |

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| must also have the location of the Rendevouz Point manually configured. Then, |

unidirectional shared trees rooted at the Rendevouz Point will automatically be built for

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| multicast distribution. |

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| Traffic from multicast sources will go to the Rendezvous Point, and receivers will pull it |

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| from a shared tree using IGMP. |

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| Multicast receivers will talk IGMP to their local router, so, besides having PIM configured |

in every router, IGMP must also be configured in any router where there could be a

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| multicast receiver locally connected. |

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| VyOS supports both IGMP version 2 and version 3 (which allows source-specific |

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| multicast). |

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| **PIM-SM - PIM Sparse Mode** |

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| **set protocols pim ecmp** |

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| If PIM has the a choice of ECMP nexthops for a particular RPF, PIM will cause S,G flows |

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| to be spread out amongst the nexthops. If this command is not specified then the first |

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| nexthop found will be used. |

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| **set protocols pim ecmp rebalance** |

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| If PIM is using ECMP and an interface goes down, cause PIM to rebalance all S,G flows |

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| across the remaining nexthops. If this command is not configured PIM only modifies |

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| those S,G flows that were using the interface that went down. |

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| **set protocols pim join-prune-interval <n>** |

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| Modify the join/prune interval that PIM uses to the new value. Time is specified in |

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| seconds. |

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| The default time is 60 seconds. |

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| If you enter a value smaller than 60 seconds be aware that this can and will affect |

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| convergence at scale. |

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| **set protocols pim keep-alive-timer <n>** |

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| Modify the time out value for a S,G flow from 1-65535 seconds. If choosing a value |

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| below 31 seconds be aware that some hardware platforms cannot see data flowing in |

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| better than 30 second chunks. |

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| **set protocols pim packets <n>** |

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| When processing packets from a neighbor process the number of packets incoming at |

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| one time before moving on to the next task. |

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| The default value is 3 packets. |

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| This command is only useful at scale when you can possibly have a large number of PIM |

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| control packets flowing. |

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| **set protocols pim register-accept-list <prefix-list>** |

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| When PIM receives a register packet the source of the packet will be compared to the |

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| prefix-list specified, and if a permit is received normal processing continues. If a deny is |

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| returned for the source address of the register packet a register stop message is sent to |

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| the source. |

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| **set protocols pim register-suppress-time <n>** |

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| Modify the time that pim will register suppress a FHR will send register notifications to |

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| the kernel. |

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| **set protocols pim rp <address> group <group>** |

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| In order to use PIM, it is necessary to configure a RP for join messages to be sent to. |

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| Currently the only methodology to do this is via static rendezvous point commands. |

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| All routers in the PIM network must agree on these values. |

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| The first ip address is the RP’s address and the second value is the matching prefix of |

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| group ranges covered. |

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| **set protocols pim rp keep-alive-timer <n>** |

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| Modify the time out value for a S,G flow from 1-65535 seconds at RP. The normal |

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| keepalive period for the KAT(S,G) defaults to 210 seconds. However, at the RP, the |

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| keepalive period must be at least the Register\_Suppression\_Time, or the RP may time |

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| out the (S,G) state before the next Null-Register arrives. Thus, the KAT(S,G) is set to |

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| max(Keepalive\_Period, RP\_Keepalive\_Period) when a Register-Stop is sent. |

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| If choosing a value below 31 seconds be aware that some hardware platforms cannot |

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| see data flowing in better than 30 second chunks. |

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| See **RFC 7761#section-4.1** for details. |

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| **set protocols pim no-v6-secondary** |

When sending PIM hello packets tell PIM to not send any v6 secondary addresses on the

interface. This information is used to allow PIM to use v6 nexthops in it’s decision

for RPF lookup if this option is not set (default).

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| **set protocols pim spt-switchover infinity-and-beyond [prefix-list <list>]** |

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| On the last hop router if it is desired to not switch over to the SPT tree configure this |

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| command. |

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| Optional parameter prefix-list can be use to control which groups to switch or not |

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| switch. If a group is PERMIT as per the prefix-list, then the SPT switchover does not |

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| happen for it and if it is DENY, then the SPT switchover happens. |

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| **set protocols pim ssm prefix-list <list>** |

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| Specify a range of group addresses via a prefix-list that forces PIM to never |

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| do SSM over. |

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| **Interface specific commands** |

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| **set protocols pim interface <interface> bfd [profile <name>]** |

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| Automatically create BFD session for each RIP peer discovered in this interface. When |

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| the BFD session monitor signalize that the link is down the RIP peer is removed and all |

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| the learned routes associated with that peer are removed. |

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| If optional profile parameter is used, select a BFD profile for the BFD sessions created |

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| via this interface. |

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| **set protocols pim interface <interface> dr-priority <n>** |

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| Set the DR Priority for the interface. This command is useful to allow the user to |

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| influence what node becomes the DR for a LAN segment. |

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| **set protocols pim interface <interface> hello <n>** |

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| Set the PIM hello and hold interval for a interface. |

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| **set protocols pim interface <interface> no-bsm** |

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| Tell PIM that we would not like to use this interface to process bootstrap messages. |

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| **set protocols pim interface <interface> no-unicast-bsm** |

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| Tell PIM that we would not like to use this interface to process unicast bootstrap |

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| messages. |

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| **set protocols pim interface <interface> passive** |

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| Disable sending and receiving PIM control packets on the interface. |
| **set protocols pim interface <interface> source-address <ip-address>** |

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| If you have multiple addresses configured on a particular interface and would like PIM to |

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| use a specific source address associated with that interface. |

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| **IGMP - Internet Group Management** |

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| **Protocol)** |

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| **set protocols pim igmp watermark-warning <n>** |

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| Configure watermark warning generation for an IGMP group limit. Generates warning |

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| once the configured group limit is reached while adding new groups. |

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| **Interface specific commands** |

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| **set protocols pim interface <interface> igmp join <multicast-address> source-address <IP-address>** |

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| Use this command to allow the selected interface to join a multicast group defining the |

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| multicast address you want to join and the source IP address too. |

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| **set protocols pim interface <interface> igmp query-interval <seconds>** |

Use this command to configure in the selected interface the IGMP host query interval (1-

1800) in seconds that PIM will use.

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| **set protocols pim interface <interface> igmp query-max-response-time <n>** |

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| Use this command to configure in the selected interface the IGMP query response |

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| timeout value (10-250) in deciseconds. If a report is not returned in the specified time, it |

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| will be assumed the (S,G) or (\*,G) state **RFC 7761#section-4.1** has timed out. |

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| **set protocols pim interface <interface> igmp version <version-number>** |

Use this command to define in the selected interface whether you choose IGMP version

2 or 3.

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| The default value is 3. |

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| **Example** |

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| In the following example we can see a basic multicast setup: |

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**Router 1**

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| set interfaces ethernet eth2 address '172.16.0.2/24'  set interfaces ethernet eth1 address '100.64.0.1/24'  set protocols ospf area 0 network '172.16.0.0/24'  set protocols ospf area 0 network '100.64.0.0/24'  set protocols igmp interface eth1  set protocols pim interface eth1  set protocols pim interface eth2  set protocols pim rp address 172.16.255.1 group '224.0.0.0/4' |

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| **Router 3** |

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| set interfaces dummy dum0 address '172.16.255.1/24'  set interfaces ethernet eth0 address '172.16.0.1/24'  set interfaces ethernet eth1 address '172.16.1.1/24'  set protocols ospf area 0 network '172.16.0.0/24'  set protocols ospf area 0 network '172.16.255.0/24'  set protocols ospf area 0 network '172.16.1.0/24'  set protocols pim interface dum0  set protocols pim interface eth0  set protocols pim interface eth1  set protocols pim rp address 172.16.255.1 group '224.0.0.0/4' |

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| **Router 2** |

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| set interfaces ethernet eth1 address '10.0.0.1/24'  set interfaces ethernet eth2 address '172.16.1.2/24'  set protocols ospf area 0 network '10.0.0.0/24'  set protocols ospf area 0 network '172.16.1.0/24'  set protocols pim interface eth1  set protocols pim interface eth2  set protocols pim rp address 172.16.255.1 group '224.0.0.0/4' |

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