

# Chapter 19

## Summary of PIM Configuration Statements

The following sections explain each of the PIM configuration statements. The statements are organized alphabetically.

address

### **address (static RPs)**

**Syntax**      `address address {  
                  version version;  
                  group-ranges {  
                    destination-mask;  
                  }  
                  }`

**Hierarchy Level**    [edit protocols pim static]

**Description**        Configure static RP addresses.

For each static RP address, you can optionally specify the PIM version and the groups for which this address can be the RP. The default PIM version is version 1.

**Options**            *address*—Static RP address.  
                      **Default:** 224.0.0.0/4

The remaining statements are explained separately.

**Usage Guidelines**    See “Configure Static RPs” on page 144.

**Required Privilege Level**    routing—To view this statement in the configuration.  
                                  routing-control—To add this statement to the configuration.

**address (local RPs)**

<b>Syntax</b>	address <i>address</i> ;
<b>Hierarchy Level</b>	[edit protocols pim rp local family]
<b>Description</b>	Configure the local RP address.
<b>Options</b>	<i>address</i> —Local RP address.
<b>Usage Guidelines</b>	See “Configure the Local RP Address” on page 143.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## auto-rp

<b>Syntax</b>	auto-rp (announce   discovery   mapping);
<b>Hierarchy Level</b>	[edit protocols pim rp]
<b>Description</b>	Configure automatic RP announcement and discovery.
<b>Options</b>	announce—Configures the router to listen only for mapping packets and also to advertise itself if it is an RP.  discovery—Configures the router to listen only for mapping packets  mapping—Configures the router to announce, listens for and generates mapping packets, and announces that the router is eligible to be an RP.
<b>Usage Guidelines</b>	See “Configure Auto-RP Announcement and Discovery” on page 146.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## bootstrap-export

<b>Syntax</b>	bootstrap-export [ <i>policy-names</i> ];
<b>Hierarchy Level</b>	[edit protocols pim rp]
<b>Description</b>	Apply one or more export policies to control outgoing PIM bootstrap messages.
<b>Options</b>	<i>policy-names</i> —Name of the import policy.
<b>Usage Guidelines</b>	See “Filter PIM Bootstrap Messages” on page 145.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## bootstrap-import

<b>Syntax</b>	bootstrap-import [ <i>policy-names</i> ];
<b>Hierarchy Level</b>	[edit protocols pim rp]
<b>Description</b>	Apply one or more import policies to control incoming PIM bootstrap messages.
<b>Options</b>	<i>policy-names</i> —Name of the import policy.
<b>Usage Guidelines</b>	See “Filter PIM Bootstrap Messages” on page 145.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## bootstrap-priority

<b>Syntax</b>	bootstrap-priority <i>number</i> ;
<b>Hierarchy Level</b>	[edit protocols pim rp]
<b>Description</b>	Configure whether this router is eligible to be a bootstrap router. In the case of a tie, the router with the highest IP address is elected to be the bootstrap router.
<b>Options</b>	<i>number</i> —Priority for becoming the bootstrap router. A value of 0 means that the router is not eligible to be the bootstrap router. <b>Range:</b> 0 through 255 <b>Default:</b> 0
<b>Usage Guidelines</b>	See “Configure PIM Sparse Mode Properties” on page 141.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## dense-groups

<b>Syntax</b>	dense-groups { <i>addresses</i> ; }
<b>Hierarchy Level</b>	[edit protocols pim interface <i>interface-name</i> ]
<b>Description</b>	Configure which groups are operating in dense mode.
<b>Options</b>	<i>addresses</i> —Operate in dense mode.
<b>Usage Guidelines</b>	See “Configure Sparse-Dense Mode Properties” on page 148.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## disable

<b>Syntax</b>	disable;
<b>Hierarchy Level</b>	[edit protocols pim], [edit protocols pim rp local family]
<b>Description</b>	Explicitly disable PIM.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## family

<b>Syntax</b>	family (inet   inet6) { address <i>address</i> ; disable; group-ranges { <i>destination-mask</i> ; } hold-time <i>seconds</i> ; priority <i>number</i> ; }
<b>Hierarchy Level</b>	[edit protocols pim rp local]
<b>Description</b>	Configure which IP protocol type local RP properties to apply.
<b>Options</b>	inet—Apply IPv4 local RP properties.  inet6—Apply IPv6 local RP properties.  The remaining statements are explained separately.
<b>Usage Guidelines</b>	See “Configure PIM Sparse Mode Properties” on page 141.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## group-ranges

<b>Syntax</b>	group-ranges { <i>destination-mask</i> ; }
<b>Hierarchy Level</b>	[edit protocols pim rp local family], [edit protocols pim rp static address <i>address</i> ]
<b>Description</b>	Configure the address ranges of the multicast groups for which this router can be an RP.
<b>Default</b>	The router is eligible to be the RP for all groups (224.0.0.0/4).
<b>Options</b>	<i>destination-mask</i> —Addresses or address ranges for which this router can be an RP.
<b>Usage Guidelines</b>	See “Configure the Groups for Which the Router Is the RP” on page 143.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## hello-interval

<b>Syntax</b>	hello-interval <i>seconds</i> ;
<b>Hierarchy Level</b>	[edit protocols pim interface <i>interface-name</i> ], [edit routing-instances <i>routing-instance-name</i> protocols pim interface <i>interface-name</i> ]
<b>Description</b>	How often the router sends PIM hello packets out of an interface.
<b>Options</b>	<i>seconds</i> —Length of time between PIM hello packets. <b>Range:</b> 0 through 255 <b>Default:</b> 30 seconds
<b>Usage Guidelines</b>	See “Modify the Hello Interval” on page 139.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>See Also</b>	hold-time on page 177

## hold-time

<b>Syntax</b>	hold-time <i>seconds</i> ;
<b>Hierarchy Level</b>	[edit protocols pim rp local family]
<b>Description</b>	How long a neighbor should consider the sending router (this router) to be operative (up).
<b>Options</b>	<i>seconds</i> —Hold time. <b>Range:</b> 0 through 255 <b>Default:</b> 0 seconds
<b>Usage Guidelines</b>	See “Configure the Router’s Local RP Properties” on page 142.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## import

<b>Syntax</b>	import [ <i>policy-names</i> ];
<b>Hierarchy Level</b>	[edit protocols pim]
<b>Description</b>	Apply one or more policies to routes being imported into the routing table from PIM. Use the import statement to filter PIM join messages from entering the network.
<b>Options</b>	<i>policy-names</i> —Name of one or more policies.
<b>Usage Guidelines</b>	See “Filter PIM Join Messages” on page 138.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## interface

<b>Syntax</b>	interface [all   <i>interface-name</i> ] { disable; hello-interval <i>seconds</i> ; mode (dense   sparse   sparse-dense); priority <i>number</i> ; version <i>version</i> ; }
<b>Hierarchy Level</b>	[edit protocols pim]
<b>Description</b>	Enable PIM on an interface and configure interface-specific properties.
<b>Options</b>	<i>interface-name</i> —Name of the interface. Specify the full interface name, including the physical and logical address components. To configure all interfaces, you can specify all. For details about specifying interfaces, see the <i>JUNOS Internet Software Configuration Guide: Network Interfaces and Class of Service</i> .  The remaining statements are explained separately.
<b>Usage Guidelines</b>	See “Enable PIM Dense Mode” on page 140.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## local

<b>Syntax</b>	<pre> local {     family (inet   inet6) {         address <i>address</i>;         disable;         group-ranges {             <i>destination-mask</i>;         }         hold-time <i>seconds</i>;         priority <i>number</i>;     } } </pre>
<b>Hierarchy Level</b>	[edit protocols pim rp]
<b>Description</b>	Configure the router's RP properties.
<b>Options</b>	The statements are explained separately.
<b>Usage Guidelines</b>	See "Configure PIM Sparse Mode Properties" on page 141.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## mode

<b>Syntax</b>	mode (dense   sparse   sparse-dense);
<b>Hierarchy Level</b>	[edit protocols pim interface <i>interface-name</i> ]
<b>Description</b>	Configure PIM to operate in sparse, dense, or sparse-dense mode.
<b>Options</b>	<p><i>dense</i>—Operate in dense mode.</p> <p><i>sparse</i>—Operate in sparse mode.</p> <p><i>sparse-dense</i>—Operate in sparse-dense mode.</p> <p><b>Default:</b> dense</p>
<b>Usage Guidelines</b>	See "Configure PIM Dense Mode Properties" on page 140, "Configure PIM Sparse Mode Properties" on page 141, and "Configure Sparse-Dense Mode Properties" on page 148.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## pim

```

Syntax  pim {
    dense-groups {
        addresses;
    }
    disable;
    import [ policy-names ];
    interface interface-name {
        disable;
        hello-interval seconds;
        mode (dense | sparse | sparse-dense);
        priority number;
        version version;
    }
    rib-group group-name;
    rp {
        auto-rp (announce | discovery | mapping);
        bootstrap-import [ policy-names ];
        bootstrap-export [ policy-names ];
        bootstrap-priority number;
        local {
            family (inet | inet6) {
                disable;
                address address;
                group-ranges {
                    destination-mask;
                }
                hold-time seconds;
                priority number;
            }
        }
        static {
            address address {
                version version;
                group-ranges {
                    destination-mask;
                }
        }
        traceoptions {
            file name <replace> <size size> <files number> <no-stamp>
                <(world-readable | no-world-readable)>;
            flag flag <flag-modifier> <disable>;
        }
    }
}

```

**Hierarchy Level** [edit protocols]

**Description** Enable PIM on the router.

**Default** PIM is disabled on the router.

**Options** The statements are explained separately.

**Usage Guidelines** See “PIM Configuration Guidelines” on page 135.

**Required Privilege Level** routing—To view this statement in the configuration.  
routing-control—To add this statement to the configuration.

## priority

**priority (PIM interfaces)**

<b>Syntax</b>	priority <i>number</i> ;
<b>Hierarchy Level</b>	[edit protocols pim interface <i>interface-name</i> ]
<b>Description</b>	Configure the router's likelihood to be elected as the designated router.
<b>Options</b>	<i>number</i> —Router's priority for becoming the designated router. A higher value corresponds to a higher priority. <b>Range:</b> 1 through a 32-bit number <b>Default:</b> 1 (The router has the least likelihood of becoming the designated router.)
<b>Usage Guidelines</b>	See "Configure the Designated Router Priority" on page 138.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

**priority (PIM RPs)**

<b>Syntax</b>	priority <i>number</i> ;
<b>Hierarchy Level</b>	[edit protocols pim rp local family]
<b>Description</b>	This router's priority for becoming a rendezvous point (RP). The bootstrap router uses this field when selecting the list of candidate RPs to send in the bootstrap message.
<b>Options</b>	<i>number</i> —Router's priority for becoming an RP. <b>Range:</b> 0 through 255 <b>Default:</b> 0 (The bootstrap router can override the group range being advertised by the candidate RP.)
<b>Usage Guidelines</b>	See "Configure the Router's Local RP Properties" on page 142.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## rib-group

<b>Syntax</b>	rib-group <i>group-name</i> ;
<b>Hierarchy Level</b>	[edit protocols pim]
<b>Description</b>	Associate a routing table group with PIM.
<b>Options</b>	<i>group-name</i> —Name of the routing table group. The name must be one that you defined with the rib-group statement at the [edit routing-options] hierarchy level.
<b>Usage Guidelines</b>	See "Enable PIM Dense Mode" on page 140.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## rp

```

Syntax  rp {
    auto-rp (announce | discovery | mapping);
    bootstrap-export [ policy-names ];
    bootstrap-import [ policy-names ];
    bootstrap-priority number;
    local {
        family (inet | inet6) {
            disable;
            address address;
            group-ranges {
                destination-mask;
            }
            hold-time seconds;
            priority number;
        }
    }
    static {
        address address {
            version version;
            group-ranges {
                destination-mask;
            }
        }
    }
}

```

**Hierarchy Level** [edit protocols pim]

**Description** Configure the router as an actual or potential RP. A router can be an RP for more than one group.

**Default** If you do not include the rp statement, the router can never become the RP.

**Options** The statements are explained separately.

**Usage Guidelines** See “Configure PIM Sparse Mode Properties” on page 141.

**Required Privilege Level** routing—To view this statement in the configuration.  
routing-control—To add this statement to the configuration.

## static

<b>Syntax</b>	<pre>static {     address <i>address</i> {         version <i>version</i>;         group-ranges {             <i>destination-mask</i>;         }     } }</pre>
<b>Hierarchy Level</b>	[edit protocols pim rp]
<b>Description</b>	<p>Configure static RP addresses. The default static RP address is 224.0.0.0/4. To configure other addresses, include one or more address statements.</p> <p>For each static RP address, you can optionally specify the PIM version and the groups for which this address can be the RP. The default PIM version is version 1.</p>
<b>Options</b>	The statements are explained separately.
<b>Usage Guidelines</b>	See “Configure Static RPs” on page 144.
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

## traceoptions

<b>Syntax</b>	<pre>traceoptions {     file <i>name</i> &lt;replace&gt; &lt;size <i>size</i>&gt; &lt;files <i>number</i>&gt; &lt;no-stamp&gt;         &lt;(world-readable   no-world-readable)&gt;;     flag <i>flag</i> &lt;<i>flag-modifier</i>&gt; &lt;disable&gt;; }</pre>
<b>Hierarchy Level</b>	[edit protocols pim]
<b>Description</b>	<p>Configure PIM tracing options.</p> <p>To specify more than one tracing operation, include multiple flag statements.</p>
<b>Default</b>	The default PIM trace options are those inherited from the routing protocol’s traceoptions statement included at the [edit routing-options] hierarchy level.
<b>Options</b>	<p>disable—(Optional) Disable the tracing operation. You can use this option to disable a single operation when you have defined a broad group of tracing operations, such as all.</p> <p>file <i>name</i>—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory /var/log. We recommend that you place tracing output in the pim-log file.</p>

files *number*—(Optional) Maximum number of trace files. When a trace file named *trace-file* reaches its maximum size, it is renamed *trace-file.0*, then *trace-file.1*, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum number of files, you also must specify a maximum file size with the *size* option.

**Range:** 2 through 1000 files

**Default:** 2 files

flag *flag*—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements.

#### PIM Tracing Flags

assert—Assert messages

bootstrap—Bootstrap messages

cache—Packets in the PIM-SM routing cache

graft—Graft and graft acknowledgment messages

hello—Hello packets

join—Join messages

packets—All PIM packets

prune—Prune messages

register—Register and register stop messages

rp—Candidate RP advertisements

#### Global Tracing Flags

all—All tracing operations

general—A combination of the normal and route trace operations

normal—All normal operations

**Default:** If you do not specify this option, only unusual or abnormal operations are traced.

policy—Policy operations and actions

route—Routing table changes

state—State transitions

task—Interface transactions and processing

timer—Timer usage

*flag-modifier*—(Optional) Modifier for the tracing flag. You can specify one or more of these modifiers:

detail—Detailed trace information

receive—Packets being received

send—Packets being transmitted

no-stamp—(Optional) Do not place timestamp information at the beginning of each line in the trace file.

**Default:** If you omit this option, timestamp information is placed at the beginning of each line of the tracing output.

no-world-readable—(Optional) Disallow any user to read the log file.

replace—(Optional) Replace an existing trace file if there is one.

**Default:** If you do not include this option, tracing output is appended to an existing trace file.

size *size*—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named *trace-file* reaches this size, it is renamed *trace-file.0*. When *trace-file* again reaches its maximum size, *trace-file.0* is renamed *trace-file.1* and *trace-file* is renamed *trace-file.0*. This renaming scheme continues until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum file size, you must also specify a maximum number of trace files with the files option.

**Syntax:** *xk* to specify KB, *xm* to specify MB, or *xg* to specify GB

**Range:** 10 KB through the maximum file size supported on your system

**Default:** 1 MB

world-readable—(Optional) Allow any user to read the log file.

**Usage Guidelines** See “Trace IGMP Protocol Traffic” on page 41, “Trace DVMRP Protocol Traffic” on page 99, “Configure PIM Trace Options” on page 139, and “Trace MSDP Protocol Traffic” on page 198.

**Required Privilege Level** routing and trace—To view this statement in the configuration.  
routing-control and trace-control—To add this statement to the configuration.

## version

<b>Statement</b>	<code>version <i>version</i>;</code>
<b>Hierarchy Level</b>	[edit protocols pim interface <i>interface-name</i> ], [edit protocols pim rp static address <i>address</i> ]
<b>Description</b>	Specify the version of PIM.
<b>Options</b>	<i>version</i> —PIM version number. <b>Range:</b> 1 or 2 <b>Default:</b> PIM Version 2
<b>Usage Guidelines</b>	See “Modify the Hello Interval” on page 139.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

## vpn-group-address

<b>Syntax</b>	<code>vpn-group-address <i>address</i>;</code>
<b>Hierarchy Level</b>	[edit routing-instances <i>instance-name</i> protocols pim]
<b>Description</b>	Specify a group address on which to encapsulate multicast traffic from a VPN instance.
<b>Options</b>	<i>address</i> —IP address whose high-order four bits are 1110, giving an address range from 224.0.0.0 through 239.255.255.255, or simply 224.0.0.0/4. For more information about addresses, see “Multicast Addresses” on page 27.
<b>Usage Guidelines</b>	See “Configure Multicast for Layer 3 VPNs” on page 148.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.