Technical Configuration Guide
for PP8600 PIM-SM

Abstract

This document provides several configuration examples in reference to PIM-SM/SSM. It should be noted that all configuration examples are based on Passport 8600 software level 3.7.

Table of Contents

1. Overview

PIM Sparse Mode

The Passport 8600 PIM-SM implementation is based on PIM-SMv2 and is compliant to RFC 2362.

PIM-SM is a multicast protocol that uses an existing unicast route table to perform RPF (reverse path forwarding). PIM-SM uses a join mechanism to send multicast traffic only to locations that explicitly request it. When a multicast stream is no longer needed, a prune mechanism is used to remove the forwarding state on receiving links.

In a PIM-SM network, a RP (Rendezvous Point) is used as a root for the multicast shared tree to handle one or several IP multicast groups. The RP should be placed close to the source to keep the initial data path as optimized as possible. All routers in a PIM-SM network learn about the one or more RP's from the BSR (Bootstrap Router). Once a router learns the RP(s) from the BSR, senders will register with the RP and receivers can join a specific multicast group with a *.G join to the RP handling the specified multicast group. This will allow the RP to inform the receiver(s) and intermediate routers to learn the source of the multicast group so that a more direct path or Shortest Path Tree can be built between the sender and receiver(s). Two or more RP's can be used to handle the same multicast group for redundancy where the active RP is based on priority and IP address (higher wins if equal priority).

In the case where the Passport 8600 may have to work in a network with other vendors not supporting a BSR, such as a Cisco network in PIMv1 mode, it can be configured with static RP entries. Or for security purposes in the PIMv2 network, static RP entries can also be used.

The Passport 8600 can also be configured as a PIM-SM Border Router. This will allow the Passport 8600 to operate in both a PIM-SM and DVMRP domain.

PIM-SSM

Source Specific Multicast (SSM) optimizes PIM-SM by simplifying the many-to-many model. Since most multicast applications distribute content to a group in one direction, SSM uses a one-to-many model that only uses a subset of the PIM-SM features. This model is more efficient and puts less of a load on multicast routing devices.

SSM only builds source-based shortest path trees. Where PIM-SM always joins a shared tree first and then switches to the source tree, SSM eliminates the need for starting with a shared tree by immediately joining a source through the shortest path tree. This method enables SSM to avoid using a rendezvous point (RP) and RP-based shared trees, which can be a potential bottleneck.

Belonging to an SSM group means that its members can only receive from a single source. This is ideal for applications like TV channel distribution and other content-distribution businesses. Banking and trade applications can also use SSM because it provides more control over the hosts receiving data and sending data into their networks.

SSM applications use IP addresses reserved by the Internet Assigned Numbers Authority (IANA) in the 232/8 range (232.0.0.0 to 232.255.255.255). SSM recognizes packets in this range and controls the behavior of multicast routing devices and hosts that use these addresses. When a source (S) transmits IP datagrams to an SSM destination address G, a receiver can receive these datagrams by subscribing to the (S,G) channel.

A channel is a source-group (S,G) pair where S is the source sending to the multicast group and G is an SSM group address. SSM defines channels on a per-source basis, which enforces the one-to-many concept of SSM applications. In an SSM channel, each group is associated with one and only one source. However, another SSM channel can associate the same multicast group with a different source, which allows an efficient use of the SSM address range. For example, channel (192.1.3.4, 232.1.2.3) is different from channel (141.251.186.13, 232.1.2.3).

2. PIM Configuration Examples

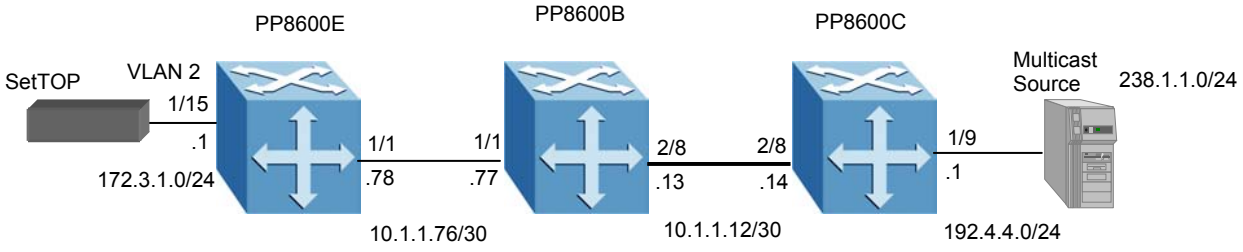
2.1 Base Configuration with backup BSR

In reference to the diagram below, we will configure the following:

- Configure OSPF as the IGP protocol
- Configure PP8600B as the primary BSR and PP8600C and backup BSR. NOTE: The higher preference number determines the BSR so PP8600B will be configured with a higher preference than PP8600C.
- Configure PP8600C as RP for multicast group 238.1.1.0/24
- Configure PP8600E with VLAN 2 to connect to a SetTOP box to receive multicast traffic. VLAN 2 will be configured in PIM-SM *passive mode and also OSPF passive mode.
- Configure PP8600C with VLAN 2 to connect the multicast source. VLAN 2 will be configured in PIM-SM *passive mode.

* It is highly recommended to configure all PIM interfaces for passive mode if there is no PIM router attached to this interface. This also applies to OSPF if there is no OSPF router attached to this interface.

The Passport configuration files are also displayed in Appendix B section 6.1 - **Base Configuration**.



2.1.1 PP8600E Configuration

a) Configure OSPF interface — brouter port

The following commands configure port 1/1 as a brouter port with VLAN ID 2170 and enables OSPF & PIM on this interface:

Passport-8610:5# ***config ethernet 1/1 ip create 10.1.1.78/30 2170***
Passport-8610:5# ***config ethernet 1/1 ip ospf enable***
Passport-8610:5# ***config ethernet 1/1 ip pim enable***

b) Configure VLAN 2

The following commands create port-based VLAN 2 under STG 1 with OSPF and PIM.

Passport-8610:5# ***config vlan 2 create byport 1***
Passport-8610:5# ***config vlan 2 ports add 1/15***
Passport-8610:5# ***config vlan 2 ip create 172.3.1.1/255.255.255.0***
Passport-8610:5# ***config vlan 2 ip pim interface-type passive***
Passport-8610:5# ***config vlan 2 ip pim enable***
Passport-8610:5# ***config vlan 2 ip ospf interface-type passive***
Passport-8610:5# ***config vlan 2 ip ospf enable***

c) Enable OSPF Globally

Passport-8610:5# ***config ip ospf enable***

d) Enable PIM Globally

Passport-8610:5# ***config ip pim enable***

2.1.2 PP8600B Configuration

a) Configure OSPF interface — brouter port 1/1

The following commands configure port 1/1 as a brouter port with VLAN ID 2202 and enables OSPF plus PIM on this interface:

Passport-8610:5# ***config ethernet 1/1 ip create 10.1.1.77/30 2202***
Passport-8610:5# ***config ethernet 1/1 ip ospf enable***
Passport-8610:5# ***config ethernet 1/1 ip pim enable***

b) Configure OSPF interface — brouter port 2/8

The following commands configure port 2/8 as a brouter port with VLAN ID 2199 and enables OSPF plus PIM on this interface:

Passport-8610:5# ***config ethernet 2/8 ip create 10.1.1.13/30 2199***
Passport-8610:5# ***config ethernet 2/8 ip ospf enable***
Passport-8610:5# ***config ethernet 2/8 ip pim enable***

c) Enable OSPF Globally

Passport-8610:5# ***config ip ospf enable***

d) Configure BSR

Passport-8610:6# ***config ip pim candbsr interface 10.1.1.77 enable preference 10***

e) Enable PIM Globally

Passport-8610:5# ***config ip pim enable***

2.1.3 PP8600C Configuration

a) Configure OSPF interface — brouter port 1/9

The following commands configure port 1/9 as a brouter port with VLAN ID 2138 and enables OSPF and PIM with passive interface:

Passport-8610:5# ***config ethernet 1/9 ip create 192.4.4.1/24 2138***
Passport-8610:5# ***config ethernet 1/9 ip ospf interface-type passive***
Passport-8610:5# ***config ethernet 1/9 ip ospf enable***
Passport-8610:5# ***config ethernet 1/9 ip pim interface-type passive***
Passport-8610:5# ***config ethernet 1/9 ip pim enable***

b) Configure OSPF interface — brouter port 2/8

The following commands configure port 2/8 as a brouter port with VLAN ID 2135 and enables OSPF and PIM on this interface:

Passport-8610:5# ***config ethernet 2/8 ip create 10.1.1.14/30 2135***
Passport-8610:5# ***config ethernet 2/8 ip ospf enable***
Passport-8610:5# ***config ethernet 2/8 ip pim enable***

c) Enable OSPF Globally

Passport-8610:5# ***config ip ospf enable***

d) Configure BSR

Passport-8610:6# ***config ip pim candbsr interface 10.1.1.14 enable preference 1***

e) Configure RP with multicast group address 238.1.1.0/24

Passport-8610:5# ***config ip pim candrp add grp 238.1.1.0 mask 255.255.255.0 rp 192.4.4.1***

f) Enable PIM Globally

Passport-8610:5# ***config ip pim enable***

2.2 PIM-SM BSR and RP Configuring Example using Circuitless IP Addresses

In release 4.0, the BSR and RP can be configured using Circuitless IP (CLIP) addresses. In this example, based on the drawing in section 2.1, we will configure PP8600E with the following:

- **CLIP 1: IP address 1.1.1.12/32 with OSPF enabled and used for the OSPF router ID.
- CLIP 2: IP address 1.1.1.13 with OSPF enabled and configured for PIM-SM BSR with a priority of 140
- CLIP 3: IP address 1.1.1.14 with OSPF enabled and configured for PIM-SM RP for group 238.2.2.0/24

** A CLIP address for the OSPF router-id is not necessary and only used as an example illustrating the use of CLIP for OSPF and PIM.

The configuration file is also shown in Appendix B section 6.2 - **PIM-SM Configuration Example using CLIP for BSR and RP**.

2.2.1 PP8600E Configuration

a) Configure OSPF interface — brouter port

The following commands configure port 1/1 as a brouter port with VLAN ID 2170 and enables OSPF & PIM on this interface:

Passport-8610:5# ***config ethernet 1/1 ip create 10.1.1.78/30 2170***
Passport-8610:5# ***config ethernet 1/1 ip ospf enable***
Passport-8610:5# ***config ethernet 1/1 ip pim enable***

b) Configure VLAN 2

The following commands create port-based VLAN 2 under STG 1 with OSPF and PIM.

Passport-8610:5# ***config vlan 2 create byport 1***
Passport-8610:5# ***config vlan 2 ports add 1/15***
Passport-8610:5# ***config vlan 2 ip create 172.3.1.1/255.255.255.0***
Passport-8610:5# ***config vlan 2 ip pim interface-type passive***
Passport-8610:5# ***config vlan 2 ip pim enable***
Passport-8610:5# ***config vlan 2 ip ospf interface-type passive***
Passport-8610:5# ***config vlan 2 ip ospf enable***

c) Configure CLIP addresses

The following commands create three CLIP address. CLIP 1 will be used for the OSPF Router-ID, CLIP 2 will be used for the BSR, and CLIP 3 will be used for the RP:

Passport-8610:5# ***config ip circuitless-ip-int 1 create 1.1.1.12/32***
Passport-8610:5# ***config ip circuitless-ip-int 1 ospf enable***
Passport-8610:5# ***config ip circuitless-ip-int 2 create 1.1.1.13/32***
Passport-8610:5# ***config ip circuitless-ip-int 2 ospf enable***
Passport-8610:5# ***config ip circuitless-ip-int 2 pim enable***
Passport-8610:5# ***config ip circuitless-ip-int 3 create 1.1.1.14/32***
Passport-8610:5# ***config ip circuitless-ip-int 3 ospf enable***
Passport-8610:5# ***config ip circuitless-ip-int 3 pim enable***

d) Enable OSPF Globally

Passport-8610:5# ***config ip ospf router-id 1.1.1.12***
Passport-8610:5# ***config ip ospf enable***

e) Configure BSR

The following command configures CLIP 2 as a BSR:

Passport-8610:5# ***config ip pim candbsr interface 1.1.1.13 enable preference 140***

f) Configure RP with multicast group address 238.2.2.0/24

The following command configures CLIP 3 as a RP with group address 238.2.2.0/24:

Passport-8610:5# ***config ip pim candrp add grp 238.2.2.0 mask 255.255.255.0 rp 1.1.1.14***

g) Enable PIM Globally

Passport-8610:5# ***config ip pim enable***

2.3 Show Commands

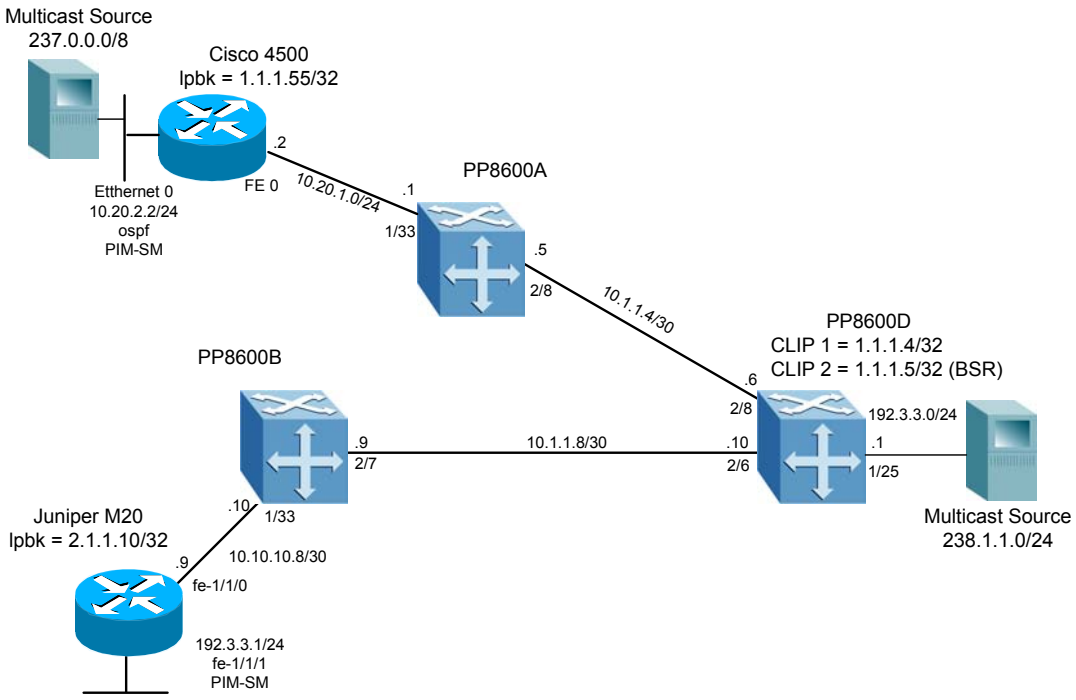
The following commands can be used to verify and troubleshoot PIM operations

Command	Description
show ip pim info	Show global settings
show ip pim interface	Displays all PIM interfaces
show ip pim bsr	Displays current BSR
show ip pim rp	Displays current RP(s)
show ip pim neighbor	Displays PIM neighbor information
show ip pim static-rp	Displays static RP if configured
show ip pim mroute	Displays all PIM multicast routes
show ip mroute route	Displays all multicast routes with type of multicast protocol used
show ip mroute interface	Displays type of multicast protocol used on each interface configured with a multicast protocol
show ip mroute next-hop	Displays multicast group(s) with source address and state

2.4 PIMv2 Configuration example with Cisco and Juniper – with Redundant BSR

In this configuration example, we will configure the following:

- Enable OSPF as the IGP
- Configure PP8600D as the BSR with priority of 100 using CLIP
- Configure Cisco 4500 as backup BSR with priority of 10
- Configure the Cisco 4500 as a RP for group address 237.0.0.0/8
- Configure PP8600D as RP for group address 238.1.1.0



2.4.1 Cisco Configuration

The following is a Cisco configuration of sparse-mode PIM with RP configured with group address 237.0.0.0/8.

```
version 12.2
!
ip subnet-zero
!
ip multicast-routing
!
interface Loopback0
 ip address 1.1.1.55 255.255.255.255
!
interface Ethernet0
 ip address 10.20.2.2 255.255.255.0
 ip pim sparse-mode
 ip ospf network broadcast
 ip ospf priority 0
 media-type 10BaseT
 no cdp enable
!
!
interface FastEthernet0
 ip address 10.20.1.2 255.255.255.0
 ip pim sparse-mode
 ip ospf priority 0
 full-duplex
!
router ospf 1
 log-adjacency-changes
 passive-interface Ethernet0
 network 1.1.1.55 0.0.0.0 area 0
 network 10.20.0.0 0.0.255.255 area 0
!
ip classless
ip pim bsr-candidate Loopback0 30 10
ip pim rp-candidate Ethernet0 group-list 1
!
access-list 1 permit 237.0.0.0 0.255.255.255
!
end
```

2.4.2 Juniper M20 Configuration

This following is a Juniper configuration of sparse-mode PIM.

```
 interfaces {
fe-1/1/0 {
        speed 100m;
        link-mode full-duplex;
        unit 0 {
            family inet {
                address 10.10.10.9/30;
            }
        }
    }
    fe-1/1/1 {
```

```
        speed 100m;
        link-mode full-duplex;
        unit 0 {
            family inet {
                address 192.3.3.1/24;
            }
        }
        lo0 {
        unit 0 {
            family inet {
                address 2.1.1.10/32;
            }
            family iso {
                address 49.0001.2081.9716.9018.00;
            }
        }
    }
}
   routing-options {
    router-id 2.1.1.10;
}
protocols {
    ospf {
        traffic-engineering;
        area 0.0.0.0 {
            interface lo0.0;
            interface fe-1/1/0.0;
            interface fe-1/1/1.0;
        }
    }
pim {
        traceoptions {
            file boot size 100000;
            flag bootstrap;
        }
        rp {
            local {
            }
        }
        interface fe-1/1/0.0;
        interface lo0.0 {
            mode sparse;
            version 2;
        }
        interface fe-1/1/1.0;
    }
}
```

2.4.3 PP8600A Config

```
#
# PIM CONFIGURATION
#

ip pim enable

#
# PORT CONFIGURATION - PHASE II
#

ethernet 1/33 auto-negotiate disable
ethernet 1/33 speed 100
ethernet 1/33 duplex full
ethernet 1/33 ip create 10.20.1.1/255.255.255.0 2096 mac_offset 6
ethernet 1/33 ip ospf enable
ethernet 1/33 ip pim enable
ethernet 2/8 ip create 10.1.1.5/255.255.255.252 2135 mac_offset 3
ethernet 2/8 ip ospf enable
ethernet 2/8 ip pim enable


#
# OSPF CONFIGURATION
#

ip ospf admin-state enable
ip ospf enable
```

2.4.4 PP8600D Configuration

```
#
# PIM CONFIGURATION
#

ip pim enable

#
# PORT CONFIGURATION - PHASE II
#

ethernet 1/25 ip create 192.3.3.1/255.255.255.0 2088 mac_offset 10
ethernet 1/25 ip ospf enable
ethernet 1/25 ip pim interface-type passive
ethernet 1/25 ip pim enable
ethernet 2/6 ip create 10.1.1.10/255.255.255.252 2134 mac_offset 1
ethernet 2/6 ip ospf enable
ethernet 2/6 ip pim enable
ethernet 2/8 ip create 10.1.1.6/255.255.255.252 2135 mac_offset 2
ethernet 2/8 ip ospf enable
ethernet 2/8 ip pim enable
ethernet 2/8 ip pim cbsrpreference 100

#
```

```
# CIRCUITLESS IP INTERFACE CONFIGURATION
#

ip circuitless-ip-int  1 create 1.1.1.4/255.255.255.255
ip circuitless-ip-int  1 ospf enable
ip circuitless-ip-int  2 create 1.1.1.5/255.255.255.255
ip circuitless-ip-int  2 ospf enable
ip circuitless-ip-int  2 pim enable

#
# PIM RP CONFIGURATION
#

ip pim candrp add grp 238.1.1.0 mask 255.255.255.0 rp 192.3.3.1

#
# PIM CIRCUITLESS IP CANDBSR CONFIGURATION
#

ip pim interface 1.1.1.4 cbsrpreference -1
ip pim interface 1.1.1.5 cbsrpreference 100

#
# OSPF CONFIGURATION
#

ip ospf admin-state enable
ip ospf router-id 1.1.1.4
ip ospf enable
```

2.4.5 PP8600B Configuration

```
#
# PIM CONFIGURATION
#

ip pim enable

#
# PORT CONFIGURATION - PHASE II
#

ethernet 1/33 auto-negotiate disable
ethernet 1/33 speed 100
ethernet 1/33 ip create 10.10.10.10/255.255.255.252 2201 mac_offset 6
ethernet 1/33 ip ospf enable
ethernet 1/33 ip pim enable
ethernet 2/7 ip create 10.1.1.9/255.255.255.252 2198 mac_offset 1
ethernet 2/7 ip ospf enable
ethernet 2/7 ip pim enable


#
# OSPF CONFIGURATION
#

ip ospf admin-state enable
```

ip ospf enable

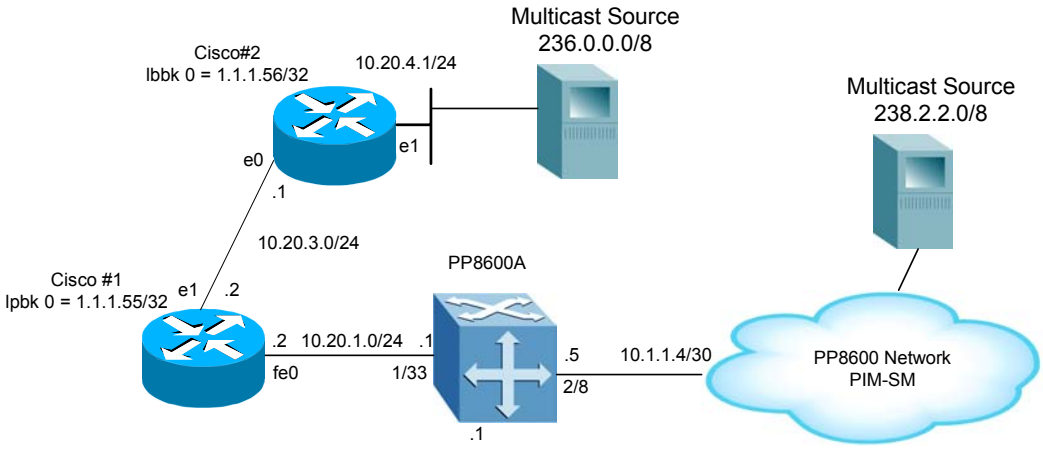
2.5 PIM Configuration example with Cisco using PIMv1 and Auto-RP

The Passport 8600 can be connected to a Cisco proprietary PIMv1 network using Auto-RP. This application will work will the following caveats:

- The IP interface between the Passport 8600 and Cisco router must be configured using PIMv2. All other IP interfaces on the Cisco router can be configured as PIMv1 with or without Auto-RP.
- The Cisco router connected to the Passport 8600 should be configured as the BSR. This will allow the Cisco router to advertise any RP discovered via Auto-RP to be advertised to the Passport 8600.
- A multicast source on a Cisco PIMv1 router can use an RP configured on the Passport 8600.
- A multicast source on a Passport 8600 switch cannot use an RP configured on a Cisco router. As long as the source is connected to a Cisco router where AutoRP is used, the multicast receivers can be on a Cisco router or Passport 8600 switch.

In this configuration, we will configure the following:

- Configure Cisco #1 interface fe0 with PIMv2 and e1 with PIMv1
- Configure Cisco #1 as the BSR with priority of 170
- Configure Cisco #1 as a RP for group address 237.0.0.0/8
- Configure Cisco #2 interface e0 and e1 with PIMv1. Cisco #2 is using an older IOS software that only supports PIMv1 (ISO 11.2)
- Configure Cisco #2 as a RP for group 236.0.0.0/8 using Auto-RP



2.5.1 Cisco #1 Configuration

```
!
version 12.2
!
ip subnet-zero
ip cef
!
ip multicast-routing
!
!
interface Loopback0
 ip address 1.1.1.55 255.255.255.255
 ip ospf priority 0
!
!
interface Ethernet1
 ip address 10.20.3.2 255.255.255.0
 ip pim version 1
 ip pim sparse-dense-mode
 ip ospf priority 0
 media-type 10BaseT
!
interface FastEthernet0
 ip address 10.20.1.2 255.255.255.0
 ip pim sparse-mode
 ip ospf priority 0
 full-duplex
!
router ospf 1
 log-adjacency-changes
 passive-interface Ethernet0
 network 1.1.1.55 0.0.0.0 area 0
 network 10.20.0.0 0.0.255.255 area 0
!
ip classless
ip ospf name-lookup
ip pim bsr-candidate Loopback0 30 170
ip pim rp-candidate Ethernet0 group-list 1
ip pim send-rp-announce Ethernet1 scope 16 group-list 3
ip pim send-rp-discovery scope 16
!
access-list 1 permit 237.0.0.0 0.255.255.255
access-list 3 permit 237.0.0.0 0.255.255.255
access-list 3 permit 238.2.2.0 0.0.0.255
```

2.5.2 Cisco #2 Configuration

```
!
version 11.2
!
ip subnet-zero
ip multicast-routing
!
interface Loopback0
 ip address 1.1.1.56 255.255.255.255
 ip ospf priority 0
!
interface Ethernet0
 ip address 10.20.3.1 255.255.255.0
 ip pim sparse-mode
 media-type 10BaseT
!
interface Ethernet1
 ip address 10.20.4.1 255.255.255.0
```

```
 ip pim sparse-mode
 ip ospf priority 0
 media-type 10BaseT
!
router ospf 1
 network 1.1.1.56 0.0.0.0 area 0
 network 10.20.0.0 0.0.255.255 area 0
!
ip classless
ip pim send-rp-announce Ethernet0 scope 16 group-list 1
ip pim send-rp-discovery scope 16
access-list 1 permit 236.0.0.0 0.255.255.255
```

2.5.3 PP8600A Configuration

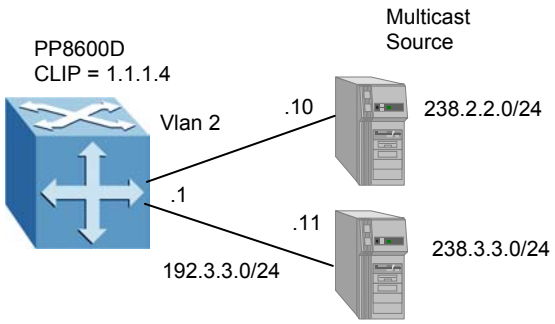
```
#
# PIM CONFIGURATION
#

ip pim enable

#
# PORT CONFIGURATION - PHASE II
#

ethernet 1/33 auto-negotiate disable
ethernet 1/33 speed 100
ethernet 1/33 duplex full
ethernet 1/33 ip create 10.20.1.1/255.255.255.0 2096 mac_offset 6
ethernet 1/33 ip ospf enable
ethernet 1/33 ip pim enable
ethernet 2/8 ip create 10.1.1.5/255.255.255.252 2135 mac_offset 3
ethernet 2/8 ip ospf enable
ethernet 2/8 ip pim enable


#
# PIM CIRCUITLESS IP CANDBSR CONFIGURATION
#

ip pim interface 1.1.1.1 cbsrpreference -1

#
# OSPF CONFIGURATION
#

ip ospf admin-state enable
ip ospf enable
```

2.6 Configuration Example using IGMP Access Control

IGMP access control can be used to selectivity accept or discard multicast traffic on an interface level. It can be applied to either VLAN or Brouter ports and can be applied dynamically even if the multicast traffic is flowing. The following access control types are supported:

- deny-tx
- deny-rx
- deny-both
- allow-only-tx
- allow-only-rx
- allow-both

In this configuration example, we will configure PP8600D to deny transmission of multicast group address 238.2.2.0/24.



2.6.1 PP8600-B Configuration

In this configuration step, we will configure brouter port 1/25 with an Access Control to deny-tx for Multicast group address of 236.2.2.0/24.

a) Add Prefix List

The following command creates a Prefix list named “one”.

Passport-8610:5# ***config ip prefix-list “one” add-prefix 238.2.2.0/24***

b) Add IGMP Access Control to IP Interface of VLAN 2

The following command adds the Prefix list created above to port 1/25 with an Access Control action of deny-tx.

Passport-8610:5# ***config vlan 2 ip igmp access-control 2 create 192.3.3.0 255.255.255.0 deny-tx***

2.7 Configuring example using PIM-SSM with Static Channel Table

The Passport 8600 supports a mix of PIM-SSM and PIM-SM with support for the following:

- Support of a mix of PIM-SSM and PIM-SM enabled switches if needed
- Extensions to PIM-SM with full PIM-SSM support
- IGMPv3 support for PIM-SSM in dynamic and static modes
- IGMPv2 extensions to support PIM-SSM
- Flexible implementation with the ability of having configurable SSM range for day one support of existing applications

In this configuration example, we will show how to configure the Passport 8600 to add static multicast entries to support IGMPv2 devices. This will allow support for IGMPv2 devices when the Passport 8600 is configured for PIM-SSM to support a mix of IGMPv2 and IGMPv3 devices.

2.7.1 PP8600 Configuration

Configuring PIM-SSM is very easy to set up since there is no need to configure RP or BSR unless of course you wish to support both PIM-SM and PIM-SSM. To enable PIM-SSM, enter the following commands:

a) Enable PIM-SSM Globally

The following command enables PIM-SSM globally. The default setting is PIM-SM.

- Passport-8610:5# ***config ip pim mode ssm***

b) Enable IGMPv3 on interface

The following command configures an interface for IGMPv3

- Passport-8610:5# ***config ip igmp interface <ipaddr> version 3***

c) Enable either Dynamic or Static PIM-SSM

In PIM-SSM mode, the Passport 8600 can be configured to learn the multicast source dynamically via an IGMP Report. Or Dynamic Learning can be disabled then configure a static SSM table that maps the SSM groups to their sources.

- Passport-8610:5# ***config ip igmp ssm dynamic-learning <enable|disable>***

By default, the SSM group range is 232.0.0.0/8. Multicast groups can be added by using the following command:

- Passport-8610:5# ***config ip igmp ssm ssm-grp-range group <value> mask <value>***

d) Add Static Groups if Passport 8600 is configured for Static PIM-SSM

- Passport-8610:5# ***config ip igmp ssm ssm-channel create group <value> source <value>***
- Passport-8610:5# ***config ip igmp ssm ssm-channel enable <group value>***

or

- Passport-8610:5# ***config ip igmp ssm ssm-channel enable all***

e) View SSM configuration

Use the following commands to view the PIM-SSM configuration

- Passport-8610:5# ***show ip igmp ssm ssm-global***
- Passport-8610:5# ***show ip igmp ssm ssm-channel***

3. Software Baseline:

The Passport 8600 software load for this document is based on release 3.7.

4. Reference Documentation:

Document Title	Publication Number	Description
Release Notes for the Passport 8000 Series Switch Software Release 3.7	317177-A	Release Notes
Configuring IP Multicast Routing Operations	314719-C	Technical Publication

5. Appendix A

Translating Cisco to Nortel Networks Equivalents

This appendix shows you how to translate Cisco commands and functions into their Nortel Networks equivalents.

Configuration Command Equivalents:

Table A-1 lists the Passport 8600 equivalents for Cisco router configuration commands. In this table, Bold text indicates variables that the user supplies. The items in the list following the table describe the functions that the corresponding numbered row configures.

Table A-1 **Interpreting the Cisco to Passport 8600 Translation Table**

Item	Cisco	Passport 8600
1	ip multicast-routing ! interface Ethernet0 ip address 10.20.2.2 255.255.255.0 ip pim sparse-mode	ethernet 1/1 ip create 10.20.2.2/24 2170 ethernet 1/1 ip pim enable
2	ip pim rp-candidate Ethernet0 group-list 1 ! access-list 1 permit 237.0.0.0 0.255.255.255	ip pim candrp add grp 237.0.0.0 mask 255.0.0.0 rp 10.20.20.2
3	ip pim bsr-candidate ethernet 0 24 10	***Config file:*** ethernet 1/1 ip pim cbsrpreference 10 ***cli:*** config ip pim candbsr interface 10.20.2.2 enable preference 10
4	access-list 1 permit 237.0.0.0 0.0.255.255.255 ip pim rp-address 10.1.1.2 1	ip pim static-rp enable ip pim static-rp add grp 237.0.0.0 mask 255.0.0.0 rp 10.1.1.2
5	show ip mroute	show ip mroute route
6	show ip pim rp mapping	show ip pim rp
7	show ip pim bsr	show ip pim bsr
8	show ip pim interface	show ip pim interface

The numbers in the following list correspond to the item numbers in Table A-1. Each numbered item in this list describes the function of the commands in the corresponding row of that table.

1. Enables PIM-SM with an IP address of 10.20.2.2/24 on an Ethernet interface.
2. This command enables a RP with a group address of 237.0.0.0/8 assuming we are using the configuration used from Item 1.
3. Enables router as a BSR with a priority of 10. In the case of Cisco, you also need to define the hash-mask-length, which in this example is 24.
4. This command creates a static-rp entry with a group address of 237.0.0.0/8 and RP of 10.1.1.2.
5. This command displays the multicast route table.
6. This command displays the PIM-SM RP address
7. This command displays the PIM-SM BSR address
8. This command displays the PIM interface configuration

6. Appendix B

The following are actual configuration files for each of the examples above:

6.1 Base Configuration – From Example 2.1

PP8600E

```
#
# PIM CONFIGURATION
#

ip pim enable

#
# VLAN CONFIGURATION
#

vlan 2 create byport 1
vlan 2 ports remove 1/1-1/14,1/16-1/40,1/42-1/48,7/1-7/8 member portmember
vlan 2 ports add 1/15 member portmember
vlan 2 ip create 172.3.1.1/255.255.255.0 mac_offset 1
vlan 2 ip pim interface-type passive
vlan 2 ip pim enable
vlan 2 ip ospf interface-type passive
vlan 2 ip ospf enable

#
# PORT CONFIGURATION - PHASE II
#

ethernet 1/1 ip create 10.1.1.78/255.255.255.252 2170 mac_offset 0
ethernet 1/1 ip ospf enable
ethernet 1/1 ip pim enable


#
# OSPF CONFIGURATION
#

ip ospf admin-state enable
ip ospf enable
```

PP8600B

```
#
# PIM CONFIGURATION

#

ip pim enable

#
# PORT CONFIGURATION - PHASE II
#

ethernet 1/1 ip create 10.1.1.77/255.255.255.252 2202 mac_offset 7
ethernet 1/1 ip ospf enable
ethernet 1/1 ip pim enable
ethernet 1/1 ip pim cbsrpreference 10
ethernet 2/8 ip create 10.1.1.13/255.255.255.252 2199 mac_offset 2
ethernet 2/8 ip ospf enable
ethernet 2/8 ip pim enable


#
# OSPF CONFIGURATION
#

ip ospf admin-state enable
ip ospf enable
```

PP8600C

```
#
# PIM CONFIGURATION
```

```
#

ip pim enable

#
# PORT CONFIGURATION - PHASE II
#


ethernet 1/9 ip create 192.4.4.1/255.255.255.0 2138 mac_offset 7
ethernet 1/9 ip ospf interface-type passive
ethernet 1/9 ip ospf enable
ethernet 1/9 ip pim interface-type passive
ethernet 1/9 ip pim enable
ethernet 2/8 ip create 10.1.1.14/255.255.255.252 2135 mac_offset 2
ethernet 2/8 ip ospf enable
ethernet 2/8 ip pim cbsrpreference 1
ethernet 2/8 ip pim enable


#
# PIM RP CONFIGURATION
#

ip pim candrp add grp 238.1.1.0 mask 255.255.255.0 rp 192.4.4.1

#
# OSPF CONFIGURATION
#

ip ospf admin-state enable
ip ospf enable
```

6.2 PIM-SM Configuration Example using CLIP for BSR and RP

From Example found in section 2.2:

PP8600E

```
#
# PIM CONFIGURATION
#

ip pim enable

#
# VLAN CONFIGURATION
#

vlan 1 ports remove 1/15,1/41 member portmember
vlan 2 create byport 1
vlan 2 ports remove 1/1-1/14,1/16-1/40,1/42-1/48,7/1-7/8 member portmember
vlan 2 ports add 1/15,1/41 member portmember
vlan 2 ip create 172.3.1.1/255.255.255.0 mac_offset 1
vlan 2 ip pim interface-type passive
vlan 2 ip pim enable
vlan 2 ip ospf enable

#
# PORT CONFIGURATION - PHASE II
#

ethernet 1/1 ip create 10.1.1.78/255.255.255.252 2170 mac_offset 0
ethernet 1/1 ip ospf enable
ethernet 1/1 ip pim enable

#
# CIRCUITLESS IP INTERFACE CONFIGURATION
#

ip circuitless-ip-int  1 create 1.1.1.12/255.255.255.255
ip circuitless-ip-int  1 ospf enable
ip circuitless-ip-int  2 create 1.1.1.13/255.255.255.255
ip circuitless-ip-int  2 ospf enable
ip circuitless-ip-int  2 pim enable
```

```
ip circuitless-ip-int  3 create 1.1.1.14/255.255.255.255
ip circuitless-ip-int  3 ospf enable
ip circuitless-ip-int  3 pim enable

#
# PIM RP CONFIGURATION
#

ip pim candrp add grp 238.2.2.0 mask 255.255.255.0 rp 1.1.1.14

#
# PIM CIRCUITLESS IP CANDBSR CONFIGURATION
#

ip pim interface 1.1.1.12 cbsrpreference -1
ip pim interface 1.1.1.13 cbsrpreference 140
ip pim interface 1.1.1.14 cbsrpreference –1

#
# OSPF CONFIGURATION
#

ip ospf admin-state enable
ip ospf router-id 1.1.1.12
ip ospf enable
```

Contact Us:

For product support and sales information, visit the Nortel Networks website at:

http://www.nortelnetworks.com

In North America, dial toll-free 1-800-4Nortel, outside North America dial 987-288-3700.