Multicast Service Reflection

Multicast service reflection feature enables the users to translate externally received multicast destination addresses to addresses that conform to the organization's internal addressing policy. With this feature, users need not redistribute routes at the translation boundary into their network infrastructure for the Reverse Path Forwarding (RPF) to work properly. Also, users can receive identical feeds from two ingress points in the network and route them independently.

The multicast service reflection feature is configured on the virtual interface. When a packet is forwarded to a virtual interface (original IP), this feature maps the original IP address to an internal IP address and the traffic is directed to the internal IP address. Therefore, it enables an organization to logically separate the private and public multicast networks.

Multicast Service Reflection Working Architecture

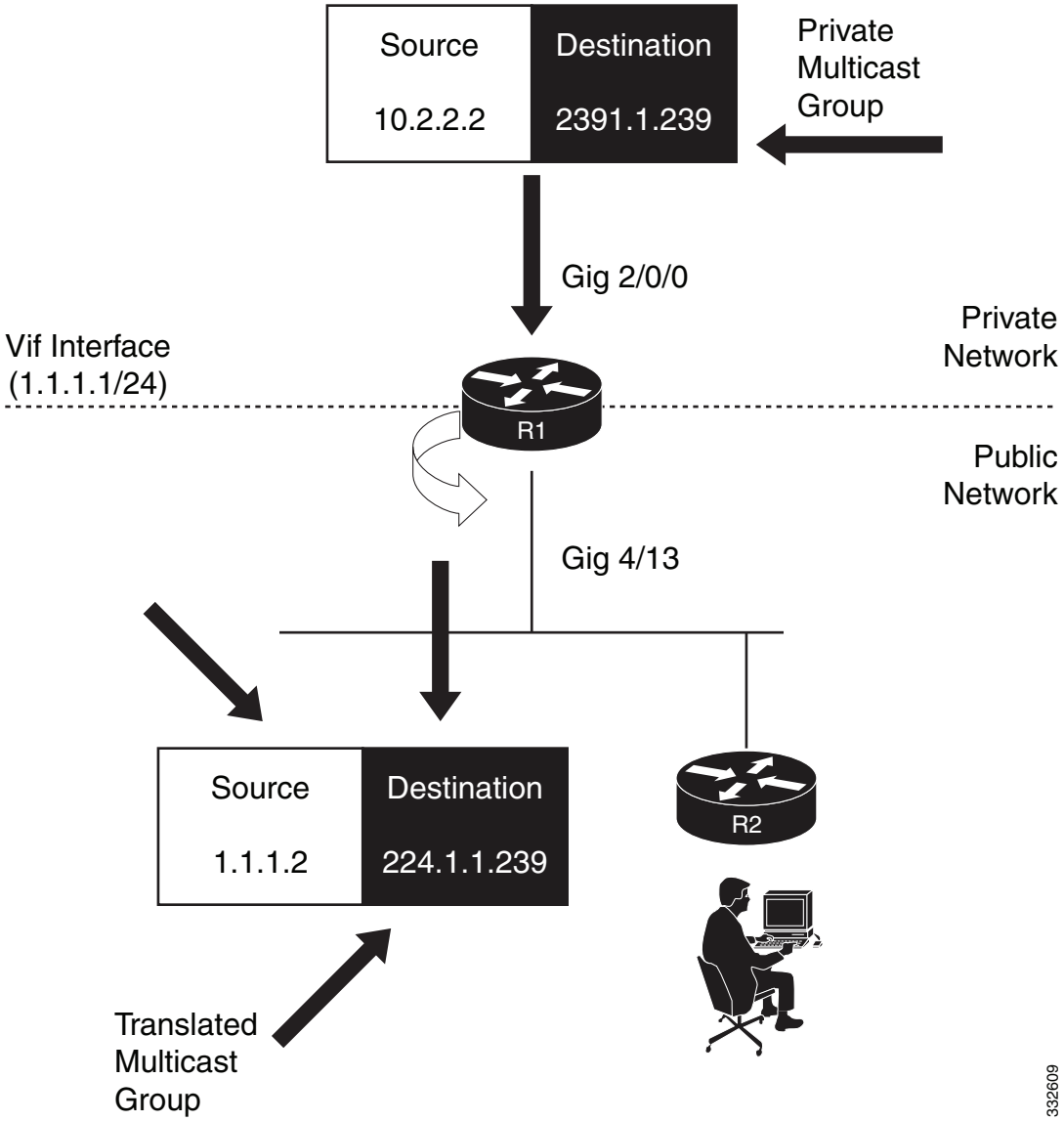
For multicast service reflection, the virtual interface is configured to statically join the group that needs to be translated to build a multicast tree. The virtual interface maintains information about:

- Input interface
- Private-to-public multicast group mappings
- Mask length to define the pool range
- Source of translated packet

When a packet is forwarded to a virtual interface, it is reflected for translation. The source IP address is changed to the IP address of the virtual interface subnet, which prevents RPF failures. Finally, the destination IP address is translated to a new multicast group IP address.

Figure 74-1 shows the multicast service reflection working architecture.

Figure 74-1 Multicast Service Reflection Working Architecture



Restrictions for Multicast Service Reflection

Following restrictions apply for multicast service reflection feature:

- The virtual interface should be installed on the border router.
- Multicast service reflection does not support bidirectional multicast.
- Protocol Independent Multicast (PIM)/IGMP control packets are not translated.

- Multicast service reflection does not support P2P GRE tunnelling.
- Multicast service reflection does not support IPv6 multicasting.
- Only 1000 service reflection translations are supported.
- Multicast service reflection is not supported in the PIM-Dense mode.

Configuring Multicast Service Reflection

Complete these steps to configure multicast service reflection feature.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip multicast-routing** [**distributed**]
4. **interface loopback** *loopback_id*
5. **description** *description*
6. **ip address** *ip_address subnet_mask*
7. **ip pim sparse-mode**
8. **exit**
9. **interface gigabitEthernet** *slot/port*
10. **ip address** *ip_address subnet_mask*
11. **ip pim sparse-mode**
12. **exit**
13. **interface gigabitEthernet** *slot/port*
14. **ip address** *ip_address subnet_mask*
15. **ip pim sparse-mode**
16. **exit**
17. **interface** *vif_id*
18. **ip address** *ip_address subnet_mask*
19. **ip pim sparse-mode**
20. **ip service reflect** *interface_id* **destination** *destination_ip1* to *destination_ip2* **mask-len** *subnet_mask_length* **source** *source_ip*
21. **ip igmp static-group** {* | *group-address* [**source** {*source-address* | **ssm-map**}]}
22. **exit**
23. **ip pim rp-address** *rp_address*
24. **end**

DETAILED STEPS

	Command	Purpose
Step 1	**enable** **Example:** `R1> enable`	Enables the privileged EXEC mode. Enter your password if prompted.
Step 2	**configure terminal** **Example:** `R1# configure terminal`	Enters the global configuration mode.
Step 3	**ip multicast-routing** [**distributed**] **Example:** `R1(config)# ip multicast-routing`	Enables the IP multicast routing.
Step 4	**interface loopback** loopback_if_number **Example:** `R1(config)# interface Loopback0`	Enters the interface configuration mode.
Step 5	**description** description **Example:** `R1(config-if)# description Rendezvous Point for Public Net`	Describes the interface.
Step 6	ip address ip_address subnet_mask **Example:** `R1(config-if)# ip address 22.22.22.22 255.255.255.255`	Assigns the IP address and subnet mask to the interface.
Step 7	**ip pim sparse-mode** **Example:** `R1(config-if)# ip pim sparse-mode`	Enables the PIM sparse mode on the interface.
Step 8	**exit** **Example:** `R1(config-if)# exit`	Exits the interface configuration mode.
Step 9	**interface gigabitethernet** GigabitEthernet_interface_number **Example:** `R1(config)# interface GigabitEthernet2/0/0`	Enters the interface configuration mode.

	Command	Purpose
Step 10	**ip address** ip_address subnet_mask **Example:** R1(config-if)# ip address 2.1.1.1 255.255.0.0	Assigns the IP address and subnet mask to the interface.
Step 11	**ip pim sparse-mode** **Example:** R1(config-if)# ip pim sparse-mode	Enables the PIM sparse mode on the interface.
Step 12	**exit** **Example:** R1(config-if)# exit	Exits the interface configuration mode.
Step 13	**interface gigabitethernet** GigabitEthernet_interface_number **Example:** R1(config)# interface GigabitEthernet4/13	Enters the interface configuration mode.
Step 14	**ip address** ip_address subnet_mask **Example:** R1(config-if)# ip address 23.1.1.2 255.255.0.0	Assigns the IP address and subnet mask to the interface.
Step 15	**ip pim sparse-mode** **Example:** R1(config-if)# ip pim sparse-mode	Enables the PIM sparse mode on the interface.
Step 16	**exit** **Example:** R1(config-if)# end	Exits the interface configuration mode.
Step 17	**interface** interface_name **Example:** R1(config)# interface Vif1	Enters the interface configuration mode.
Step 18	**ip address** ip_address subnet_mask **Example:** R1(config-if)# ip address 1.1.1.1 255.255.0.0	Assigns the IP address and subnet mask to the interface.

	Command	Purpose
Step 19	**ip pim sparse-mode** **Example:** `R1(config-if)# ip pim sparse-mode`	Enables the PIM sparse mode on the interface.
Step 20	**ip service reflect** input-interface **destination** destination-address **to** new-destination-address **mask-len** number **source** new-source-address **Example:** `R1(config-if)# ip service reflect GigabitEthernet2/0/0 destination 239.1.1.100 to 225.1.1.100 mask-len 32 source 1.1.1.2`	Matches and rewrites the multicast packets routed onto the virtual interface. • The matched and rewritten packets are sent back into multicast packet routing (or unicast routing if the destination is unicast), where they are handled like any other packets arriving from an interface.
Step 21	**ip igmp static-group {* |** group-address **[source {**source-address **| ssm-map}]}** **Example:** `R1(config-if)# ip igmp static-group 239.1.1.100`	Configures the router to be a statically connected member of the specified group on the interface, and forwards traffic destined for the multicast group onto the interface. **Note** This step is only applicable for multicast-to-multicast and multicast-to-unicast scenarios.
Step 22	**exit** **Example:** `R1(config-if)# end`	Exits the interface configuration mode.
Step 23	**ip pim rp-address** rp-address **Example:** `R1(config)# ip pim rp-address 22.22.22.22`	Configures the address of a PIM RP for a particular group.
Step 24	**end** **Example:** `R1(config-controller)# end`	Ends the configuration session.

Configuration Example

This example describes how to configure multicast service reflection.

```
R11>enable
R11#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R11(config)#ip multicast-routing
R11(config)#interface Loopback0
R11(config-if)#description Rendezvous Point for Public Net
```

```
R11(config-if)#ip address 22.22.22.22 255.255.255.255
R11(config-if)#ip pim sparse-mode
R11(config-if)#exit

R11(config)#interface GigabitEthernet2/0/0

R11(config-if)#ip address 2.1.1.1 255.255.0.0

R11(config-if)#ip pim sparse-mode
R11(config-if)#exit

R11(config)#interface GigabitEthernet4/13
R11(config-if)#ip address 23.1.1.2 255.255.0.0
R11(config-if)#ip pim sparse-mode
R11(config-if)#exit

R11(config)#interface Vif1
R11(config-if)#ip address 1.1.1.1 255.255.0.0
R11(config-if)#ip pim sparse-mode
R1(config-if)#ip service reflect GigabitEthernet2/0/0 destination 239.1.1.100 to
225.1.1.100 mask-len 32 source 1.1.1.2
R1(config-if)#ip igmp static-group 239.1.1.100
R1(config-if)#exit
R1(config)#ip pim rp-address 22.22.22.22
R1(config)#exit
```

For more information on configuring multicast service reflection, see Configuring Multicast Service Reflection.