

IPv4 MULTICAST

Layer 2 Addressing

239.142.57.6

11101111 10001110 00111001 00000110

01-00-5E-0E-39-06

00000001 00000000 01011110 00001110 00111001 00000110

Terminology

Reverse Path Forwarding (RPF)

Verifies that multicast traffic travels in the reverse direction of unicast traffic, away from the tree root

Cisco Group Management Protocol (CGMP)

A proprietary protocol used by switches to obtain multicast membership information for end hosts (deprecated)

Internet Group Management Protocol (IGMP)

Hosts send IGMP requests to local routers to join multicast groups

IGMP Configuration

IGMP Support Router(config-if)# ip igmp [version <#>]

IGMP Snooping Switch(config)# ip igmp snooping

Protocol Independent Multicast (PIM)

Dense Mode

The initial tree encompasses all multicast routers; after a period of time, routers without IGMP members prune back branches

Sparse Mode

The tree is grown from a central rendezvous point out to the multicast source and recipients

Sparse-Dense Mode

Allows a PIM-enabled interface to function in either sparse or dense mode per group

PIMv1

Provides automatic RP discovery with Auto-RP (Cisco proprietary)

PIMv2

Automatic RP discovery is accomplished by the bootstrap router (BSR) method (standard)

PIM Configuration

```
ip multicast-routing
!
interface FastEthernet0/0
 ip pim {sparse-mode | dense-mode | sparse-dense-mode}
 ip pim version {1 | 2}
```

RP Configuration

Manual ip pim rp-address <IP>

Auto-RP Mapping Agent ip pim send-rp-discovery scope <TTL>

Auto-RP Candidate ip pim send-rp-announce <interface>

BSR Candidate ip pim bsr-candidate <interface>

BSR RP Candidate ip pim rp-candidate <interface>

Group Ranges

224.0.0.0/24 Local network control

224.0.1.0/24 Internetwork control

232.0.0.0/8 Source-specific

233.0.0.0/8 GLOP (RFC 3180)

239.0.0.0/8 Admin-scoped

Common Groups

224.0.0.1 All hosts

224.0.0.2 All routers

224.0.1.39 Cisco RP Announce

224.0.1.40 Cisco RP Discovery

Distribution Trees

Shared

A common set of links which carry all multicast traffic; statically configured

Source-Rooted

Provides the shortest paths from the source to receivers

IGMP

IGMPv1

Original IGMP specification

IGMPv2

Adds support for dynamic leave requests and querier election to original IGMP

IGMPv3

Adds multicast source filtering to v2

IGMP Snooping

A switch passively inspects IGMP requests to determine which hosts should receive multicast traffic

IGMP Troubleshooting

show ip igmp

show ip igmp group

show ip igmp interface

show ip igmp snooping

ip igmp join-group

PIM Troubleshooting

show ip mroute

show ip pim interface

show ip pim neighbor

show ip pim rp [mapping]

show ip rpf <IP>