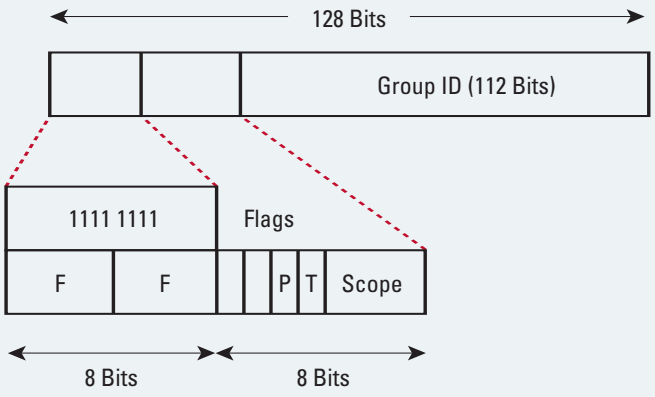
IPv6 MULTICAST
AT–A–GLANCE

IPv6 multicast shares common features and protocols with IPv4 multicast, but also provides changes and improvements.

Service	IPv4 Solution	IPv6 Solution
Addressing Range	32-bit, class D	128-bit (112-bit group)
Routing	Protocol independent, all IGPs and MBGP	Protocol independent, all IGPs and MBGP with v6mcast SAFI
Forwarding	PIM-DM, PIM-SM, PIM-SSM, PIM-bidir	PIM-SM, PIM-SSM, PIM-bidir
Group Management	IGMPv1, v2, v3	MLDv1, v2
Domain Control	Boundary, border	Scope identifier
Interdomain Solutions	MSDP across independent PIM domains	Single RP within globally shared domains

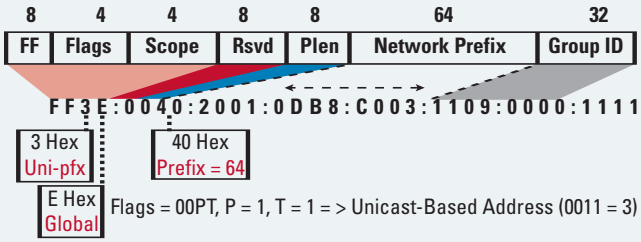
Basic IPv6 multicast addresses (RFC 3513) are composed of an 8-bit address, 4-bit flag, 4-bit scope, and 112-bit group ID field.

Figure 1



When an IPv6 global prefix is assigned, a routable IPv6 multicast prefix becomes available. RFC 3306 provides for IPv6 unicast-based multicast addresses. The example below shows how the RFC 3306 address is built. Modifying the flags field makes two new fields available: Plen (prefix length) and the network prefix (the globally assigned IPv6 unicast prefix).

Figure 2



Group management:

- MLD is equivalent to IGMP in IPv4
- MLD messages are transported over ICMPv6
- MLD uses link local source addresses
- MLD packets use "router alert" option in IPv6 header (hop-by-hop option) (RFC 2711)

Version number change:

- MLDv1 (RFC 2710) like IGMPv2 (RFC 2236)
- MLDv2 (RFC 3810) like IGMPv3 (RFC 3376)

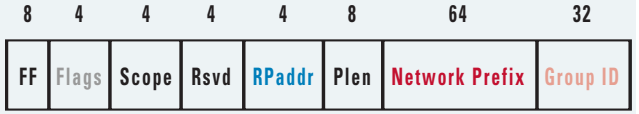
IPv6 multicast interdomain options are the same as they were with IPv4:

- PIM source-specific multicast (SSM)
- Static-RP (PIM-SM; PIM-DM is dead)
- PIM boot strap router (PIM-BSR)
- PIM Bidir

One new interdomain option with IPv6 is embedded RP:

- Relies on a subset of RFC 3306 multicast group addresses
- Group address carries the RP address for the group

Figure 3



New address format defined:
Flags
0RPT (0111 = 7)
R = 1, P = 1, T = 1 = > RP Embedded
Example Group:
FF7E:0140:2001:0DB8:C003:111D:0000:1112
Embedded RP:
2001:0DB8:C003:111D::1

RP redundancy is currently not the same. The only method available for RP redundancy today is PIM-BSR. Efforts are under way within Cisco Systems® and the IETF to build a redundant RP mechanism similar to anycast RP with IPv4.

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