IPv6 ROUTING AT–A–GLANCE

IPv6 uses the same types of routing protocols as IPv4, but with some slight modifications to account for specific requirements of IPv6.

IPv6 ROUTING TYPES

- Static
- RIPng (RFC 2080)
- IS-IS for IPv6
- OSPFv3 (RFC 2740)
- MP-BGP (RFC 2545/2858)
- EIGRP for IPv6

STATIC ROUTING

Static routing with IPv6 is used and configured in the same way as with IPv4. There is an IPv6-specific requirement per RFC 2461: "A router must be able to determine the link-local address of each of its neighboring routers in order to ensure that the target address of a redirect message identifies the neighbor router by its link-local address." This basically states that it is not recommended to use a global unicast address as a next-hop address with routing.

RIPng

Same as IPv4:

- Distance-vector, 15-hop radius, split-horizon, poison reverse, and so on
- Based on RIPv2

Updated features for IPv6:

- Uses IPv6 for transport
- IPv6 prefix, next-hop IPv6 address
- Uses the multicast group FF02::9 for RIP updates
- Updates are sent on UDP port 521

IS-IS FOR IPv6

- Originally designed as an intradomain routing protocol for Connectionless Network Service (CLNS) traffic, an OSI routing protocol

Major operation remains unchanged:

- Level 2 (backbone) device route between Level 1 areas
- Each IS device still sends out LSP packets
- Cisco IOS® Software support for multitopology ISIS (MT-ISIS)
- Neighborship process is unchanged
- IPv6 support gets added based on "draft-ietf-isis-ipv6-xx.txt, routing IPv6 with IS-IS"

OSPFv3

- Based on OSPFv2, with enhancements
- Distributes IPv6 prefixes
- Runs directly over IPv6
- Ships in the night with OSPFv2

Adds IPv6-specific attributes:

- 128-bit addresses
- Link-local address
- Multiple addresses and instances per interface
- Authentication (now uses IPsec)
- OSPFv3 runs over a link, rather than a subnet

MP-BGP

- To make BGP-4 available for other network layer protocols, RFC 2858 (obsoletes RFC 2283) defines multiprotocol extensions for BGP-4
- Enables BGP-4 to carry information of other protocols, e.g., MPLS, IPv6

EIGRP FOR IPv6

- Same EIGRP used with IPv4
- Best of distance vector and link state (advanced distance vector)
- Multiprotocol EIGRP has a protocol-dependent module for IPv4, IPX, AppleTalk, and now IPv6
- Easy to configure and fast convergence

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