

Cisco Support for OSPFv3 Address Families

The Cisco® OSPFv3 Address Families feature helps allow Open Shortest Path First Version 3 (OSPFv3) IPv6 networks to support both IPv6 and IPv4 nodes. This feature, available for select Cisco integrated services routers, helps enable:

- Interoperability between IPv4 and IPv6 networks
- Interoperability between IPv4 nodes in different sub-nets, using IPv6 link-local addresses for peering

What Problems Need to be Solved?

- OSPFv3 is expected to be widely deployed, especially in government environments where IPv6 support has been mandated. As OSPF-based networks evolve, organizations need to ensure that IPv4 and IPv6 resources can coexist. However, OSPFv3 was defined to support only the IPv6 unicast address family. Migrating real-world networks to OSPFv3 requires a solution that supports both IPv6 and IPv4 traffic.
- Many organizations are extending their networks to support highly mobile users. Mobile networks based on IPv4 can only support peering between nodes on the same subnet, which can be a significant limitation in complex mobile operations. While IPv6-based OSPFv3 eliminates a number of addressing and peering restrictions, it does not support IPv4 nodes as originally defined. Users need a solution that utilizes the benefits of OSPFv3 link-local addressing for existing IPv4 nodes.
- Organizations require standards-based solutions to ensure interoperability in multi-agency environments. Any OSPF interoperability solution must be both standards-based and easily implemented.

How It Works

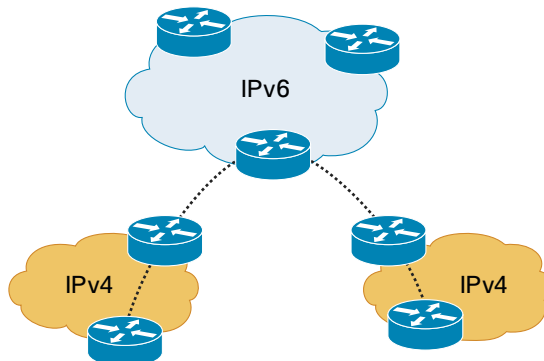
The Cisco OSPFv3 Address Families feature is a field-deployable implementation of the capabilities described in draft-ietf-ospf-af-alt-07, which was co-authored by Cisco. The feature is available on a limited basis to select customers.

The Address Families feature maps an address family to a separate OSPFv3 instance, using the Instance ID field in the packet header. Each OSPFv3 instance maintains its own adjacencies, link state database, and shortest path computation.

The feature adds a new Instance ID for IPv4 unicast, in addition to the IPv6 unicast support originally defined in OSPFv3. With this feature enabled, the same router can support both IPv4 and IPv6 routing.

Address Families-enabled routers establish peers based on IPv6 link-local addresses, but can advertise IPv4 routes. This capability allows IPv4 routers in different subnets to peer with each other through the IPv6 network (see Figure 1).

Figure 1 Peering Between IPv4 Routers in Different Subnets



What are the Benefits of OSPFv3 Address Families?

- **Enhanced mobility:** The OSPFv3 Address Families feature enables IPv4 nodes on separate subnets to peer using IPv6 link-local addresses. The added flexibility enables organizations to support a more diverse group of mobile users under a wider range of conditions.
- **Reduced complexity:** Helps enable IPv4 and IPv6 address families to be supported on a single network infrastructure. This feature reduces or eliminates the need to maintain parallel networks, and protects your organization's IPv4 technology investment.
- **Ease of migration:** Facilitates robust interoperability within mixed IPv4 and IPv6 network environments for organizations in transition. The feature is easily configured, and requires only minimal changes to existing OSPFv3 implementations. Address Family-capable routers can be deployed without disturbing networks with non-capable routers.

Why Cisco?

Support for OSPFv3 Address Families is an important element of the Cisco Mobile Ready Net, a comprehensive solution for extending the benefits of IP networking to users beyond the reach of traditional networks. Mobile Ready Net uses Cisco's innovative Radio Aware Routing technology, plus a wide range of platforms and services, to enable communications at any time from anywhere.

As the global leader in mission-critical IP networking, Cisco is uniquely positioned to deliver reliable and efficient converged voice, video, and data solutions to fixed and mobile users worldwide. Cisco solutions are backed by award-winning technical support and advanced services.