Managing IPv6 in Service Provider Networks with BIG-IP Devices

BIG-IP® IPv6 Gateway Module™ enables service providers to deliver applications across and manage both an IPv4 and IPv6 infrastructure simultaneously. The BIG-IP IPv6 Gateway Module can help lower costs of managing both networks and can help expedite the full migration from IPv4 to IPv6 for both internal services as well as external users. F5 products and solutions enable service providers to build a strong foundation that maximizes the use of resources and increases service management, while remaining agile enough to support both existing and future network architectures and new user devices.

Managing IPv6

For many years, enterprise IT and service providers alike have been planning for the depletion of IPv4 address space by slowly migrating to IPv6. This migration has taken a dual-phased approach: first migrating the networking infrastructure (in the core and access networks) and then migrating services and users so they can begin taking advantage of the new IPv6 address infrastructure. Although this migration has been planned for many years, IPv4 depletion is happening at a much faster pace than originally expected.

Migrating from IPv4 to IPv6 is not a trivial process, especially for large service providers who manage millions of IP-based connections on a daily basis. Managing the migration and maintaining bifurcated IPv4 and IPv6 networks between users and services can become a daunting challenge. As the Internet begins moving away from IPv4, service providers face the unique challenge of maintaining connectivity between IPv4 and IPv6 addresses from millions of users, as well as managing their own IPv6 infrastructure migration.

BIG-IP controllers reside in the perfect part of the infrastructure to manage IPv4 to IPv6 migration. BIG-IP controllers act as a full proxy and termination point for both ingress and egress application connections, providing unique access to external users, internal services, and all parts of the IP connectivity stack. BIG-IP controllers provide the same level of Service Delivery Networking (SDN) services for IPv4 and IPv6—including application availability, bi-directional address translation, authentication and security services, DNS services for IPv6 and management of AAAA records—and support NAT64 to work as an extension or replacement for existing large-scale NAT solutions. IPv4 to IPv6 management is crucial for multi-topology networks and devices both in the core network as well as at the edge.

F5 provides a suite of product solutions for IPv6 management and migration. VIPRION®—F5’s chassis-based controller—handles millions of transactions/second, and provides isolated traffic management and segmentation and service provider-grade fault tolerance. BIG-IP Local Traffic Manager™ (LTM) and Global Traffic Manager™ (GTM) software modules provide IPv4 and IPv6 service delivery and support for translation and NAT64. BIG-IP WAN Optimization Module™ (WOM) and Edge Gateway™ modules can be deployed at the edge to optimize and secure user connections between devices and data centers.

### Key features
- **IPv6 Gateway**—Provides native support and seamless migration between IPv4 and IPv6 networks
- **BIG-IP LTM Traffic Management**—Offers single-point management of integrated IPv4 and IPv6 networks
- **VIPRION and Dedicated Hardware**—Scales to support 64 million concurrent sessions
- **IPv6 Routing**—Supports multiple routing protocols such as RIPng, OSPFv3, and IS-ISv6
- **Service Provider-Grade Hardware**—Provides stability and availability to handle millions of user devices

### Key benefits
- **Seamless Management and Migration**—Enables management and migration from IPv4 to IPv6 without wholesale application and network upgrades
- **Extensive IPv6 Feature Support**—Supports IPv6 features such as AAAA, DNAME, A6, DNS64, and NAT64
- **Across Enhanced Service**—Translates traffic for consumption by IPv4 or IPv6 endpoints, enabling service of a breadth of devices and topologies
- **Massive Subscriber Scalability**—Scales to handle millions of subscribers from multiple network device types
- **Service Provider Grade Support**—Worldwide professional services and support for carrier needs
Solution

BIG-IP IPv6 Gateway Module allows service provider and enterprise customers to manage IPv4 and IPv6 networks by providing:

- A full proxy architecture to terminate bi-directional IPv4 and IPv6 traffic concurrently for internal core networking services, the access network, and external user-based devices and networks
- Service optimization over IPv6 networks using core BIG-IP tools such as TCP Express™ and OneConnect™
- A flexible architecture that can be used for simple network translation services up to full service delivery management between IPv4 and IPv6 networks
- The BIG-IP IPv6 Gateway Module that can be used in conjunction with other BIG-IP modules, such as the WAN Optimization Module™ to provide advanced service delivery functionality throughout your network
- Support for specific content and application profiles over IPv6 such as SIP and RTSP
- Dynamic support for multiple translation services between services that rely on IPv6 for functionality, such as AAAA DNS records and DNS64 translation between IPv4 and IPv6 record requests
- Support for IPv6 routing protocols RIPng, OSPFv3, BGP4+, and IS-ISv6
- Service provider-grade hardware, custom designed to handle the high traffic load needs of service provider customers and user devices, and to meet specific needs such as NEBS certification and uptime SLAs

Learn more

For more information about BIG-IP IPv6 solutions, please see the following resources or use the search function on F5.com.

Product pages
- BIG-IP IPv6 Gateway
- BIG-IP Feature Modules

Datasheet
- VIPRION

White papers
- IPv6 101: Introduction
- Controlling Your Migration to IPv6

Podcast
- IPv6—Bridging the Gap to Tomorrow

BIG-IP IPv6 Gateway Module performing IP translation at service-provider speeds.