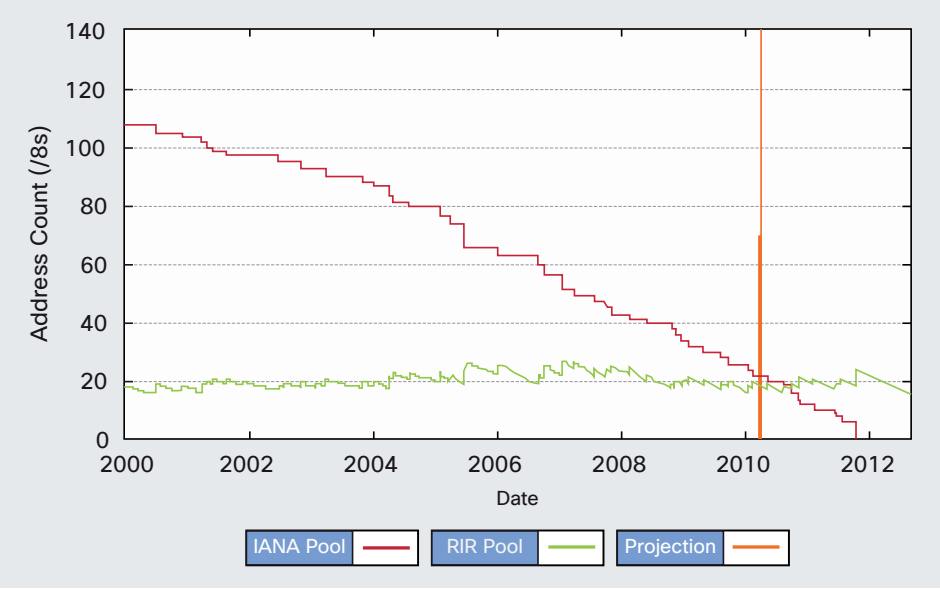
Cisco Catalyst 4500 Series Switches IPv6

Why Should I Care About IPv6?

The growth of the Internet has surpassed the IPv4 standard's ability to support the number of users and functions. Figure 1 displays the trend of remaining/8 address blocks in IANA and RIR address pools. Features such as Network Address Translation (NAT) help customers overcome address space limitations, but they also make bidirectional communication for primary triple play applications such as voice and video more challenging.

Figure 1. Trend of IPv4 Address Depletion (source: http://www.potarro.net)



IPv6 has a vastly larger address space than IPv4, from the use of a 128-bit address. The large address blocks allow hierarchical address assignment, therefore enhancing routing efficiency and aggregation.

For businesses, there are many factors to accelerate IPv6 adoption:

- **Exhaustion of IPv4 address space:** IPv4 addresses cannot be obtained for new services or business expansion.
- **Growing support for IPv6 applications:** Operating systems such as Microsoft Vista and Server 2008 have IPv6 on by default and preferred. It is essential to gain visibility and control over IPv6 applications in the network.
- **National IT strategy:** Government mandate, next-generation Internet project in China and Japan, and so on.
- **Infrastructure evolution:** Next-generation network architecture requirement such as smart grid, DOCSIS 3.0, quad play, mobile service providers, networked sensors, and so on.

The transition of applications and networks from IPv4 to IPv6 will probably take several years. This transition will require the network infrastructure to be ready to support both IPv4 and IPv6 concurrently.

"IPv6-Ready" Cisco Catalyst 4500 Series Switches

The Cisco® Catalyst® 4500 Series Switches support a broad range of IPv6 functionalities and deliver robust, resilient communication. The switching platform supports both IPv4 and IPv6 concurrently (dual stack). Supervisor Engines 7-E, 7L-E, 6-E and 6L-E as well as the Cisco Catalyst 4500X standalone series forward IPv6 traffic in hardware. This platform has become leading platform to enable IPv6 adoption in enterprise campus, data center, and service provider broadband access. Supervisor Engine 7-E and 7L-E offers more than doubled system capacity compared to previous generations.

Table 1. Cisco Catalyst 4500 Series Switches Family Scalability and Performance

	Supervisor 6L-E	Supervisor 6-E	Supervisor 7-E	Supervisor 7L-E	Catalyst 4500X
Switching Capacity	280 Gbps	320 Gbps	848 Gbps	520 Gbps	800 Gbps
Unicast IPv6 Routes	32k	128k	128k	64k	128k
Multicast IPv6 Routes	16k	16k	16k	16k	16k

Cisco Catalyst 4500 Series Switches in Your IPv6 Network

The Cisco Catalyst 4500 Series Switches are leading wiring closet platforms and collapsed access and aggregation platforms in campus. It is also a high-performance Layer 2 and Layer 3 switching platform for service provider broadband access and aggregation. The Cisco Catalyst Series Switches are ideal for a rack-optimized data center environment. Its rich IPv6 feature set includes the following:

Specific for L2 access, broadband access, or data center deployment:

- **Secure access:** First hop security mechanisms such as Port ACLs (PACLs) and Router Advertisements Guard protect the perimeter of the network.
- **Optimized video delivery:** MLD snooping enables efficient IPv6 multicast delivery.

Specific for L3 access, aggregation, or backbone deployment:

- **Routing:** Rich routing protocol support offers great parity with IPv4. OSPF, EIGRP, BGP, IS-IS, and PIM are supported for IPv6, enabling smooth IPv6 and IPv4 unicast and multicast packet delivery. NSF/SSO for OSPFv3 and OSPFv3 fast convergence are supported too.
- **Redundancy:** First hop redundancy for IPv6 traffic can be provided through HSRP and GLBP, with global address support by HSRP.
- **Addressing services:** IPv6 addresses can be provided through DHCPv6 Server and Relay Agent.
- **Secure network infrastructure:** Security mechanisms such as ACL, extended ACL, and unicast reverse path forwarding (uRPF), help secure the network.

For both L2 and L3 deployment:

- **Application visibility and control:** The unique Flexible NetFlow support on Supervisor Engine 7-E and 7LE allows monitoring of IPv6 traffic in a flexible, user-defined way. IP SLA analyzes IPv6 service levels and provides indication to performance metric. QoS based on IPv6 packet information provide differentiated services to applications.
- **Manageability:** SYSLOG, SNMP, Telnet, SSH, NTP, TACACS+ and Radius are supported over IPv6 to enhance manageability. IPv4 and IPv6 interface stats are reported separately, allowing easy troubleshooting and monitoring.

With a rich feature set and high-performance hardware forwarding, Cisco Catalyst 4500 Series Switches are ideal platforms to address the IPv6 needs in enterprise and service provider networks.

IPv6 Licensing Parity with IPv4

Starting from Cisco IOS® Software Release 12.2(52)SG, customers need no additional software license to get IPv6 functionality on the Cisco Catalyst 4500 Series Switches. IPv6 software licensing on Cisco Catalyst 4500 switches will follow the same model as IPv4.

IPv6 Ready Logo

The Cisco Catalyst 4500 Series Switches obtained the IPv6 Ready Logo phase 2. The IPv6 Ready Logo defines the test specifications for IPv6 conformance and interoperability.

Cisco IPv6 Services

Enable your borderless network to scale beyond IPv4 address limitations while protecting existing network, server, and application investments. As your network expands beyond traditional boundaries and adds devices, applications, and users, Cisco IPv6 Services help you to develop a transition roadmap and maintain network readiness and stability during transition. For more information about Cisco Services, visit http://www.cisco.com/go/services.

Why Cisco?

As a leader in switching and routing solutions, Cisco offers important advantages to customers deploying IPv6:

- **A service-rich solution:** The Cisco solution helps customers build a broad portfolio of IPv6 feature and services.
- **Investment protection:** The Cisco switching portfolio provides industry-leading IPv6 forwarding performance in hardware, future proofing bandwidth demands, and application requirement while continuing to bring software feature richness.
- **Architectural flexibility:** In the enterprise market, Cisco solution can be implemented using Ethernet, optical, and IPv4/IPv6 technologies.
- **Enterprise and service provider market leadership:** Cisco has an extensive product portfolio to deliver end-to-end solutions to its customers.
- **Standards leadership:** For more than a decade, Cisco has led the protocol standardization in the Internet IETF working group (IPv6).

For More Information

- Cisco Catalyst 4500 Series Switches: http://www.cisco.com/go/catalyst4500

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