



The Internet Makes Information Readily Available. IPv6 Will Change the Way We Share It.

What Is IPv6?

IPv6 is an advancement of IPv4, the network layer protocol widely adopted in 1981 that gave rise to the public Internet as we know it today. But the world has changed in the last 30 years. Our population has skyrocketed, our lives have become more dependent on instantaneous access to resources, and the gadgets we use have proliferated and intertwined themselves into our daily—even hourly—routines. As people become increasingly connected to information, electronic devices, and one another, we must ensure that the underlying backbone can support this expansion.

IPv6 extends us that flexibility, exponentially increasing the quantity of unique IP addresses available to networked devices—from 2^{32} in IPv4 to 2^{128} in IPv6—and providing us the foundation to radically change the way we communicate.

Initiatives by U.S. Government and Other Governments Propel IPv6 Adoption

Years before the Internet Assigned Numbers Authority (IANA) ran out of IPv4 addresses, the U.S. government was at the forefront, pushing the adoption of IPv6. In 2005, the U.S. Office of Management and Budget (OMB) started this effort by directing all federal agencies to begin planning the migration process to IPv6. In 2009, a Federal Acquisition Regulation (FAR) was updated that mandated as of June 2010, all IT departments had to purchase IPv6-capable devices. In 2010, the Federal IPv6 Milestones memo was released, which directed all federal agencies to update their public-facing web servers to be capable of handling IPv6 traffic by September 2012.

These initiatives follow developments worldwide. In Asia, the evolution shows strong progress. Japan, for example, has successfully deployed IPv6 in most service provider networks, using tax incentives to initiate adoption of this technology. Meanwhile, Europe is also integrating IPv6 into its IT strategy. The European Commission has sponsored several IPv6-focused programs, including 6NET, a project designed to show the importance of the new protocol in the future of the Internet, and most recently has released the Regional Internet Registry Europe (RIPE) 501 document describing its IPv6 migration goals. Also, several European countries have national task forces dedicated to generating IPv6 recommendations for their governments.

The collective effect of these efforts is tremendous. Worldwide strides to adopt and develop IPv6 are bringing about welcome changes. IPv6 removes the need for Network Address Translation (NAT), a time-consuming, problematic technology that offers a workaround solution to the addressing shortcomings of IPv4. Furthermore, IPv6 promises advances in communications technologies, making them easier to use and bringing more robust, collaborative capabilities to the marketplace. Essentially, IPv6 can overcome the limitations of IPv4 and reclaim the original intent of the global, end-to-end Internet model.

Survey the Benefits

An IPv6-ready architecture enables the following:

- **Innovative capabilities to the desktop:** Microsoft's Windows Vista and Apple's Mac OS X v10.3 (and later versions) support IPv6 and enable it by default. Increasingly, vendor applications prefer IPv6 over IPv4, even if they have to tunnel it.
- **Powerful IP applications:** IPv6 transcends inefficient, server-based applications and enables sophisticated, peer-to-peer communication tools that improve interagency collaboration.
- **Next-generation multicast:** Cisco IPv6 Multicast technologies optimize media-streaming applications, allowing timely and easy distribution of video feeds and quality-rich information to millions of citizens worldwide, simultaneously. In contrast, IPv4 cannot support newer multicast technologies because of addressing constraints.
- **Mobility support and wireless access:** The nearly infinite capacity of IPv6 for addresses lends connectivity to myriad electronic devices—not merely mobile phones and laptops, but also in-vehicle computers, televisions, and cameras.
- **Security:** IPv6 is inherently less vulnerable to scanning attacks than IPv4, and it possesses native capabilities for packet integrity. Additionally, it integrates security through information encryption and source authentication.
- **Equipment that is ready to use:** IPv6 auto-configures new equipment to communicate with the network when it is detected, meaning devices are ready to use, right when needed.

What Are the Next Steps?

Cisco offers a wide range of IPv6 implementation capabilities to address short-term requirements while also supporting a more gradual, long-term approach incorporating best practices and knowledge derived from previous customer deployments. To design a migration roadmap best suited to your specific needs while mitigating transition, cost, security, and training concerns, Cisco provides assessment services that use a collection-and-reporting tool. The following items help us determine the most beneficial IPv6 deployment route for you:

- **Report:** A customized, color-coded survey that identifies the IPv6 capability status of your network
- **Scorecard:** A confidential, high-level evaluation of the IPv6 capability of devices on the network; also color-coded
- **IPv6 capability assessment:** A thorough analysis that compares your agency's network devices against the IPv6 business rules

After compiling the report, Cisco creates a customized scorecard, assessment, and audit based on your IPv6 readiness, and then works with you to establish a migratory path aligned with your strategic business objectives.

Make Your Move

For detailed technical guides about how to plan or deploy IPv6 in your agency's network, refer to the Cisco "Deploying IPv6 in Campus Networks" and "Deploying IPv6 in Branch Networks" white papers, found here: www.cisco.com/web/strategy/government/usfed_ipv6.html.

To find out more about IPv6 or the Cisco network readiness assessment, call your local Cisco representative today or visit www.cisco.com/go/ipv6.



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