

# IPv6

## Around the World

Global IPv6 deployment is vital to the continued growth and stability of the Internet.

Today, key organizations, governments, and the private sector are working - often in partnership - to implement IPv6-ready networks, and to ensure all regions and sectors have access to the equipment and education necessary to deploy IPv6.

A supply of global IP addresses larger than the currently available pool of IPv4 addresses is necessary to maintain the sustainable, long-term development of a global and open Internet. Momentum for IPv6 deployment is increasing globally as IPv4 addresses become scarce. Around the world, there are efforts to increase broadband penetration. More smart phones and network-ready devices are entering the market, and the number of Internet users is steadily increasing.

### INTERNET SERVICE PROVIDERS AND MOBILE NETWORK OPERATORS

Many of the world's major ISPs and mobile network operators, including Verizon Wireless (USA), StarHub Cable (Singapore), Chubu Telecommunications (Japan), Kabel Deutschland (Germany), Swisscom (Swiss), T-Mobile USA (USA), Internode (Australia), and Telefonica (Peru) are providing IPv6 commercial services to both business and residential customers.

### CONTENT PROVIDERS

Major Internet content providers such as Google (including YouTube), Facebook, Yahoo, and Netflix also provide their services using the IPv6 protocol, offering access to all Internet users.

### IPv6 FOR EVERYONE

Approximately 90% of end users have computer operating systems capable of working seamlessly over IPv6. This means that many home and small business users are simply waiting for their service providers to offer IPv6 connections. In some cases, they may already be using IPv6.

Meanwhile, the explosive growth of mobile-only Internet access, which sees voice, messaging, and data delivered through IP-based services, will only increase the demand for IP addresses. IPv6 will satisfy this demand, and sustain future business growth. Companies like T-Mobile US (which in 2014 launched an Android phone that defaults to IPv6-only connections) and Apple (which requires IPv6 support for all iOS 9 apps) are examples from an industry that is moving toward full, native IPv6 support.

## IPv6 and the Technical Community

The technical community is responsible for much of the work necessary to make IPv6 access ubiquitous. Organizations such as the Regional Internet Registries (RIRs), the Internet Society (ISOC) and the Internet Corporation for Assigned Names and Numbers (ICANN), as well as many academic networks, are involved in joint initiatives to raise awareness about IPv6 deployment and how everyone can contribute.

- » All 13 root name servers offer services over IPv6 at multiple locations around the world
- » Of 289 country code TLDs (ccTLDs), 264 have deployed IPv6
- » All 753 generic Top Level Domains (gTLDs) have at least one name server reachable over IPv6

## Learn More About IPv6 Adoption Around the World

Growing awareness of the need for IPv6 adoption, driven by the exhaustion of IPv4 address space and enhanced by events like the World IPv6 Day (2011) and World IPv6 Launch (2012), means that the global IPv6 deployment situation is evolving rapidly. There are many online resources that can provide up-to-the-minute information and statistics.

- » The World IPv6 Launch saw Internet companies including Google, Facebook, Yahoo!, Akamai, and Limelight Networks contributing to a global IPv6 roll-out effort. Current data on its progress is available at: [www.worldipv6launch.org/measurements](http://www.worldipv6launch.org/measurements)

The five RIRs provide data, statistics, and analysis on IPv6 adoption via projects including:

- » **IPv6 RIPEness:** A rating system providing a unique indicator of IPv6 readiness of RIPE NCC members by country, sector, and network size: <http://ripeness.ripe.net>

- » **APNIC Labs:** Provides measurements of global IPv6 usage by economy, UN geopolitical region, and ASN: <http://stats.labs.apnic.net/ipv6/>
- » **IPv6-enabled Autonomous Systems:** This interactive tool shows the percentage of networks in a given country or region that announce IPv6 addresses on the public Internet: <http://v6asns.ripe.net>
- » **LACNIC and CAF Study:** The study (titled “IPv6 Deployment for Social and Economic Development in Latin America and the Caribbean”) covers an analysis of the problems caused by IPv4 address exhaustion, advantages of IPv6 and methods for its deployment, the behavior of various players, economic issues and modeling of alternatives, best practices and success stories, among others. <http://portalipv6.lacnic.net/en/caf-lacnic/>

## Distributing IPv6 Around the World

The five RIRs manage the distribution of IP addresses directly to Internet service providers (ISPs) and network operators within their regions. This allocation is based on demonstrated need, according to policies created by the Internet community, following an open and transparent policy development process.

IPv6 allocations are being made all over the world. A significant percentage of ISPs and operators in each RIR service region have already obtained an allocation of IPv6 address space from their RIR (see facing map), with more than 20% of Autonomous Systems currently announcing IPv6 addresses to the public Internet.

Around the world, RIRs are working with their communities, business stakeholders, and governments to develop the human and technical capacity vital to the full adoption of IPv6.

### AFRICA

- » African IPv6 Task Force ([www.af6tf.net](http://www.af6tf.net)) created to encourage IPv6 deployment and serve as a regional consolidated platform for the exchange of knowledge and best practices
- » From January 2015 to August 2016, AFRINIC has trained 780 people from 20 different countries in Africa

### ASIA PACIFIC

- » APNIC provides face-to-face and web-based technical training in IPv6 deployment as well as detailed technical assistance
- » APNIC technical experts also collaborate with the ITU's regional office to organize joint workshops that provide capacity development in IPv6
- » Many governments and inter-governmental organizations support IPv6 deployment, including the Asia Pacific Economic Cooperation Telecommunications and Information Working Group (APEC TEL) and the Association of South East Asian Nations (ASEAN)

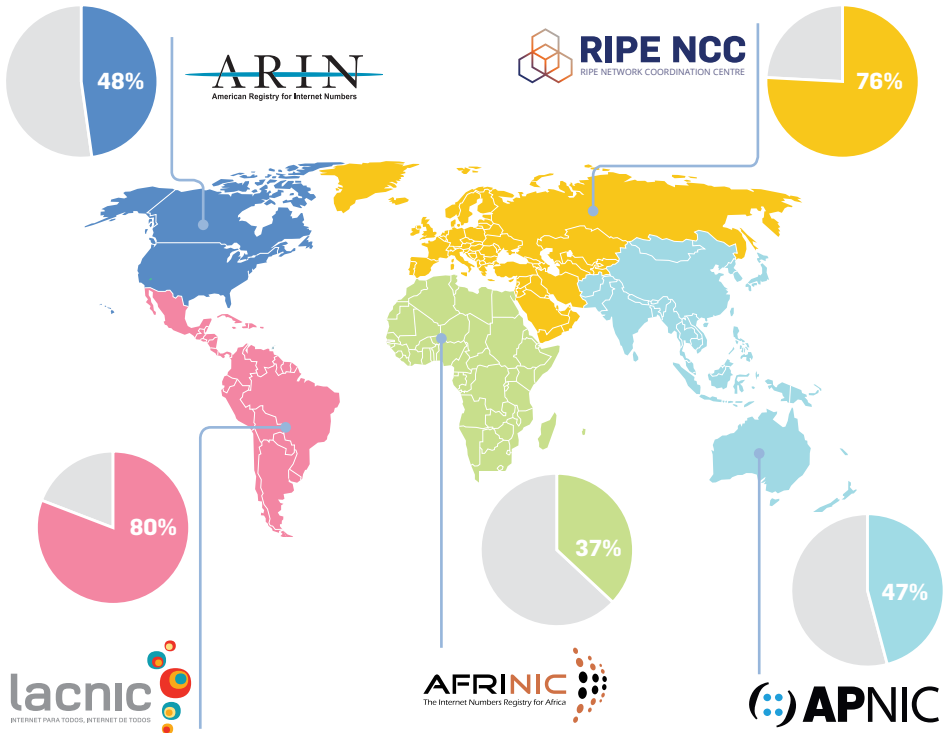
### CANADA AND THE UNITED STATES

- » IPv6 Training courses are available throughout the region, offered by technical consultants and organizations such as the Internet Society (Deploy360)
- » ARIN has refocused its IPv6 efforts to reach beyond the technical community to enterprises in many industries through the Get6 campaign. Public speaking and exhibiting about the need for organizations to get their public-facing services IPv6-enabled continues
- » A community-managed listing of companies offering IPv6 services (Web hosting, DNS, Training, and Consulting) was launched on ARIN's IPv6 Wiki; it includes over 65 providers from across the region as of October 2016
- » CIRA (CA) was a catalyst to grow a coast-to-coast network of IXPs, creating an IPv6 backbone for Canada, and to enable small and medium local ISPs to offer IPv6 services
- » The .CA Canada State of the Internet project developed a performance tool to measure the adoption of DNSSEC and IPv6 in Canada and raise awareness of the importance of IPv6

### EUROPE, CENTRAL ASIA, AND THE MIDDLE EAST

- » Strong support from the European Commission via initiatives like Gen6 and the IPv6 Observatory
- » RIPE NCC offers basic and advanced IPv6 training courses to members throughout the region and via the online RIPE NCC Academy
- » A technical "train the trainer" program launched in Russia and the CIS in 2016
- » National "IPv6 Week" events in Lebanon and Israel tapped into interest in local communities
- » IPv6 Roadshows, cooperative efforts between governments and the technical community, have trained nearly 1000 network staff in the Middle East and CIS
- » National task forces continue to foster progress in countries including Saudi Arabia and the UAE

## % OF MEMBERSHIP WITH IPV6 ADDRESSES (NOVEMBER 2016)



- » **LATIN AMERICA AND THE CARIBBEAN**
- » Many Caribbean ISPs have deployed IPv6 in their core and aggregation networks. IXPs have been deployed with IPv6 infrastructure and peering, like GREX, the Grenada IXP and AMS-IX Caribbean
  - » Research on the transition to IPv6 in Latin America and the Caribbean (LACNIC and Development Bank of Latin American). Find out the results: <http://portalipv6.lacnic.net/wp-content/caf-lacnic/CAF-LACNIC-IPv6-Deployment-Social-Economic-Development-in-LAC.pdf>
  - » CaribNOG, the local operators forum, provides IPv6 training with support from LACNIC and ARIN, along with the Caribbean

- » Telecommunications Union, CANTO, and CITEL
- » IPv6 tours held throughout the region, training hundreds of people
- » LACNIC staged an IPv6 awareness tour in more than seven countries
- » National IPv6 task forces promote IPv6 in the LACNIC region
- » IPv6 training courses held at Campus LACNIC (<http://campus.lacnic.net/>), LACNIC on the move meetings, and other events
- » LACNIC holds the IPv6 Latin American Forum each year, where ISPs, companies, academia, and the technical community meet to promote IPv6 on regional scales
- » LACNIC promotes the new Dr. IPv6 initiative. This new project consists of answering the community's questions on IPv6 implementation via podcast: <http://portalipv6.lacnic.net/dripv6es/>