Messages for key decision makers
www.apnic.net/ipv6

Why IPv6?

Internet Protocol (IP) addresses uniquely identify devices on the Internet. Currently, almost all devices connected to networks use the IP version 4 (IPv4) address system. IPv4 has more than 4 billion possible address combinations, but these are being used up quickly. **APNIC reached its last block of IPv4 addresses in April 2011.**

Internet Protocol version 6 (IPv6) was developed to ensure the continued growth and innovation of the Internet. IPv6 offers an extremely large (2^{128}) address space, as each address is 128 bits long, rather than 32 bits.

Key business drivers for IPv6

IPv6 enables the sustainable growth of the Internet. This in itself is a major motivation to deploy IPv6, but it also provides the possibility for new services and business opportunities on large-scale IP installations e.g. smartphones, smart grid initiatives, and cloud computing. These have all driven an increase in demand for IP addresses.

IPv6 challenges

There are some challenges associated with IPv6 deployment. A device connected via IPv4 cannot communicate directly with a device connected via IPv6. This poses a compatibility challenge; until all networks and devices are IPv6 capable, we need to run both protocols simultaneously.

Government

Many governments in the Asia Pacific are currently focused on achieving high penetration of next generation broadband and mobile networks. These infrastructures will help achieve more inclusive societies and give national economies a competitive edge.

The steady growth of broadband and mobile networks, leading to universal network access, requires an adequate supply of IP addresses. Broadband and mobile network deployment planning checklists must include IPv6 readiness at the service provider level. Governments also need to make sure their e-services support IPv6 for equal accessibility across their population.

Service providers

Service providers play a key role in IPv6 deployment. Networks are growing rapidly with higher subscription rates, and service providers need to think about sustaining future growth without relying on IPv4. The most effective way to manage the shortage of IPv4 addresses is to allow networks to support both IPv4 and IPv6 simultaneously.

Providers should consider how to extend the life of their IPv4 address pools while enabling customers to connect via IPv6. There may be risks associated with delaying IPv6 deployment, so it is advised that decision makers take IPv6 into consideration when planning for the short, mid, and long term to enable IPv6 access via Customer Premise Equipment (CPE).

Mobile networks

The mobile market is growing rapidly, and mobile devices can access networks via wireless or mobile networks. One mobile handset, such as a smartphone or a tablet, may easily require at least two IP addresses.

The increase of mobile handset usage has created a huge demand for IP addresses, which will significantly increase the costs and scalability issues associated with mobile network services. IPv6 provides a long term, scalable solution with lower maintenance than IPv4 deployed in Network Address Translation (NAT) environments.

Content providers, data centre providers, hosting providers, cloud service providers

This group of Internet stakeholders needs to focus on how to enable IPv6 access to their content, and the implications of IPv6 deployment for their Internet connectivity, web servers, load balancers, and firewalls. It's also necessary to consider other modifications as required including backbone databases, setting an IPv6 log file, and geolocation database.

Businesses with an online presence should prepare for an increase of customers accessing their content from mobile devices. Some of these new end users on both fixed and mobile networks may be assigned with only IPv6 addresses. It is necessary to maintain the online experience so there is no difference between IPv4 and IPv6 from the end user perspective.

Enterprise networks

Enterprises need to focus on their IT infrastructure, in terms of enabling IPv6 in their WiFi, Ethernet LAN and WAN. They also need to enable Dual Stack for devices such as laptops, printers, PCs, and file servers. Another aspect to consider is how to replicate IPv6 addressing infrastructure with IPv6 address management, firewalls, and security.