Reserch and investigation of feasible solution for IPv4/v6 dual stack in Taiwan

Abstract

Internet has been playing as an indispensable part in human life. In addition to the traditional use of landline phone systems, with the rapid growth of 4G mobile systems, the number of people using mobile phones to access various services over the Internet has grown rapidly in recent years. It introduces many different kinds of new application services, because mobile phones are a must-have device in today's world.

Due to Taiwan's strong information technology and communications industry chain, we have produced many Internet related products. In order to adapt to the needs of the global market, all products must support Internet connectivity as a benchmark. Under the trend of the network industry revolution, Taiwan's future industry innovation and development need to combine with Internet applications to successfully create new industries and increase revenues.

IP (short for Internet Protocol) specifies the technical format of packets and the addressing scheme for devices to communicate over a network. There are currently two version of IP : IPv4 and a new version called IPv6. IPv6 is and evolutionary upgrade to the Internet Protocol due to the exhaustion of IPv4 addresses. In fact, IPv6 is more advanced and has better features compared to IPv4. There are some differences between IPv4 and IPv6, so IPv6 will coexist with the older IPv4 for a while. The IP address space is managed globally by the IANA(Internet Assigned Number Authority), and by five regional Internet registries (RIR) responsible in their designated territories for assignment to end users and local Internet registries, such as Internet service providers(ISP). In accord with ICANN policies, IANA proceeded to allocate one of those five /8 to each RIR, exhausting the IANA pool, at a ceremony and press conference on 3 February 2011. APNIC was the first regional Internet Registry to run out of freely allocated IPv4 addresses, on 15 April 2011. As the IPv4 runs out from RIRs, new ISPs can no longer apply IPv4 addresses. ISPs may implement IPv4 network address translation (NAT) within their networks and assign private IPv4 addresses to customers as a short-tem solution. As long-term consideration, deployment of IPv6 is the standards-based solution to the IPv4 address shortage. The goal of this project is to try to push IPv6 upgrades to build a complete IPv6 connectivity environment, including the infrastructure and facilities used by end

users. And this is also in line with the needs of the Digital National Development Policy and next-generation Internet applications' requirements (such as smart cities, smart homes and car networking). Have a complete adaptive network environment and win opportunities for the future network industry.

Internet connectivity involves users' devices, connection services, backbone networks, and web applications. NCC has jurisdiction over IASP (Internet Access Service Provider) connection services and backbone networks throughout the connection system. In order to let NCC fully understand Taiwan's IPv6 readiness and be able to adopt an effective strategy to improve it, it must consider IPv6 readiness of all parties in the entire Internet connection system. In this project, we will investigate the IPv6 readiness of the IASP connection service and the backbone network, and study the IPv6 support rate in user equipment and web application services.

To enable IPv6 network connection is an important element of the infrastructure for the current digital era. The project will investigate the entire network solution provider to identify key issues that need to be addressed. It tries to analyze the problems encountered by solution providers, and propose possible solutions to those identified key issues. As the reference for the NCC's follow-up policy, ensure the development of national digital communications infrastructure is moving in the right direction. Let solution' providers work together to build up IPv6 network connectivity service for end users. Ensure that our network infrastructure is as advanced as the global industrialized countries.