



Background briefing on IPv4 to IPv6 transition

This document is a concise summary of the main issues of the transition to IPv6 addressing, as identified by the Internet Society (ISOC) in consultation with members of the Internet Engineering Task Force (IETF) and Regional Internet Registry (RIR) communities in October 2007.

Background

The pool of remaining unallocated IPv4 addresses held by the Internet Assigned Names and Numbers Authority (IANA) will be depleted within the next few years. Estimates vary, but it is generally expected that the unallocated pool will be depleted before demand ends for new IPv4 address assignments.

This does not mean that the Internet will stop functioning or growing, given that:

- at any give time, there are portions of allocated IPv4 address space that are not being actively used (routed) and that these might be reclaimed to support the continued growth of Internet activities in the medium term; and
- the transition to IPv6 is underway and IPv6 addresses are available and being allocated today.

When IANA no longer has unallocated IPv4 address space to assign, the global Internet will continue to function for users world wide. It is expected that:

- mechanisms for obtaining IPv4 address space will have to change; and
- IPv6 addresses will continue to come from entirely new address allocations made from IANA's IPv6 address pool.

Current activities

IANA and the RIRs are committed to ensuring IP address allocation is carried out in an orderly, fair, and open fashion, for the benefit of the global Internet and all its users. They have well-developed forums for open discussion and management of their allocation policies. This allows global effect while still ensuring responsiveness to regional needs.

There are on-going discussions of policies to find the best approach for handling the final allocations from the unallocated IPv4 address space (if changes are needed) to ensure the appropriate handling of IPv4 address allocations in the absence of a free pool. For example, any IP address trading process must be supported by appropriate policies and mechanisms to ensure that IPv4 address space consistently, openly, and fairly meets the needs of existing and future consumers and suppliers as much as possible.

IPv6 address allocations are available today, under agreed procedures. As always, the RIR discussion forums are available for continued refinement of those allocation procedures.

Discussions are ongoing and open to participation. It is expected that these policies will be in place and operational well in advance of the depletion of the unallocated IPv4 address pool.

The IETF continues to discuss and refine specifications for an IPv6 Internet and the transition mechanisms needed to get there.

Looking forward

While the operation of the Internet is not threatened by the depletion of the pool of unallocated IPv4 addresses, it remains the case that the best path forward for an unfragmented, open Internet is to adopt IPv6 as the primary addressing mechanism.

Vendor support for IPv6, as well as adoption of IPv6 by service providers and users, should be encouraged and facilitated. As the IPv6 deployed base grows, it will be important to collect emerging engineering, operational, and allocation requirements and provide them as input to the existing open standards and community policy development organisations.

The Internet Society is continuing to work with all stakeholders and interested parties to ensure collaborative promotion and facilitation of the global transition to IPv6.

For more information on IPv6 issues, see:

http://www.isoc.org/educpillar/resources/ipv6_faq.shtml

For further discussion of regional issues, see:

AfriNIC – African Regional Internet Registry

AfriNIC-8: 24 May - 8 June 2008

<http://www.afrinic.org>

APNIC – Asia Pacific Network Information Centre

APNIC-25: 25-29 February 2008

<http://www.apnic.net>

ARIN – American Registry for Internet Numbers

ARIN XXI: 6-9 April 2008

<http://www.arin.net>

LACNIC – Latin American and Caribbean Internet Address Registry

<http://www.lacnic.net>

RIPE – Réseaux IP Européens

RIPE56: May 2008

<http://www.ripe.net>

For ongoing engineering discussions, see

IETF – Internet Engineering Task Force

IETF 70: 2-9 December 2007

<http://www.ietf.org>

About ISOC

The Internet Society (www.isoc.org) is a not-for-profit organisation founded in 1992 to provide leadership in Internet related standards, education, and policy. With offices in Washington, DC, and Geneva, Switzerland, it is dedicated to ensuring the open development, evolution, and use of the Internet for the benefit of people throughout the world.