

APNIC 26 policy update Shifting landscape

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Overview

- Recap of the Internet policy community
 - RIR and NRO
 - APNIC policy development process
- IP address distribution statistics
 - IPv4 address
 - IPv6 address
- IPv4 address exhaustion status update
- APNIC 26 policy update
 - Policy discussion
 - Next APNIC meetings
- IPv6 current deployment status
- Where do we go from here?

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Recap of the Internet policy community





Regional Internet Registries





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The main aims of the NRO:

- To protect the unallocated number resource pool
- To promote and protect the bottom-up policy development process
- To facilitate the joint coordination of activities e.g., engineering projects
- To act as a focal point for Internet community input into the RIR system



The main function of ASO:

- ASO receives global policies and policy process details from the NRO
- ASO forwards global policies and policy process details to ICANN board

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IPv4 address distribution

As of 30 June 2008 Prepared by Regional Internet Registries AfriNIC, APNIC, ARIN, LACNIC and the RIPE NCC



IPv4 ADDRESS SPACE

What is the status of each of the 256 /8s

STATUS OF 256 /8s IPv4 ADDRESS SPACE



Number Resource Organization





IPv4 ADDRESS SPACE ISSUED (RIRs TO CUSTOMERS)

In terms of /8s, how much total space has each RIR allocated (Jan 1999 – June 2008)

Number Resource Organization



Internet Number Resource Report

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IPv6 address distribution

As of 30 June 2008 Prepared by Regional Internet Registries AfriNIC, APNIC, ARIN, LACNIC and the RIPE NCC



IPv6 Allocations RIRs to LIRs/ISPs

How many allocations have been made by each RIR by year



Internet Number Resource Report



IPv6 ALLOCATIONS RIRs to LIRs/ISPs

(Jan 1999 – June 2008)





LINKS TO RIR STATISTICS

- RIR Stats: www.nro.net/statistics
- Raw Data/Historical RIR Allocations: www.aso.icann.org/stats
 www.iana.org/assignments/ipv4-address-space
 www.iana.org/assignments/as-numbers
 www.iana.org/assignments/ipv6-unicast-address-assignments



IPv4 address exhaustion

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Projection

RIR and IANA consumption /8s



http://www.potaroo.net/tools/ipv4/ as of 31/08/2008

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APNIC 26 policy update

APNIC 26 meeting

- 25th 29th August 2008
 - Christchurch, New Zealand
 - -Hosted by InternetNZ
- Meeting statistics
 - -237 attendees RECORD
 - 57 from NZ and 180 from 32 economies
 - 103 newcomers (43%)
- Remote participation
 - First time to trial remote participation via IP video link
 - -Two locations
 - Hanoi, Vietnam and Manila, Philippines

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Key issues driving current discussion

- IPv4 depletion
 - How to distribute remaining IPv4 fairly
 - How to manage IPv4 after remaining free pool is exhausted
- Security and authentication of IP address stewards
 - Routing security
 - Accurate whois data
- Note:
 - "problem" and "solution" text in the coming slides based on each author's proposed idea
 - does not necessarily reflect the views of the community or the Secretariat

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Policy proposals

- Policy proposals in relation to IPv4 address exhaustion
- Discussion continuing from APNIC25
 - -prop-050: IPv4 address transfers
 - prop-055: Global policy for the allocation of the remaining IPv4 address space
- New proposals
 - -prop-062: Use of final /8
 - prop-063: Reducing timeframe of IPv4 allocations from twelve to six months
 - prop-066: Ensuring efficient use of historical IPv4 resources

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prop-050: IPv4 address transfers

- Problems this proposal aims to address
 - Current APNIC policies limit registration to resources related to mergers and acquisitions of operational networks
 - There will continue to be demand for IPv4 after the exhaustion of the allocated address pool
 - The APNIC resource registry needs to accurately reflect current address distribution information

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prop-050: IPv4 address transfers

- Solutions proposed by the author
 - Remove APNIC policy restrictions on registrations of IPv4 transfers between current APNIC account holders
 - Address block transferred:
 - Must be /24 or larger
 - Must be in APNIC administered range
 - Are subject to all current APNIC policies from the time of transfer
 - Source of transfer ineligible to receive IPv4 address blocks from APNIC for 24 months after transfer

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prop-050: IPv4 address transfers

- APNIC 26 outcome
 - This proposal to be returned to the author and mailing list for further discussion

prop-050: IPv4 address transfers

- Discussion during APNIC 26
 - Would like to support this policy
 - Transfer of IPv4 addresses is already happening
 - Accuracy of registration is at stake
 - Understood importance of this proposal but not supporting at this point yet
 - Are we opening a Pandora's box too early?
 - Exhaustion is still 2-3 years in the future
 - Projection is a projection
 - Exhaustion could happen much earlier
 - Impact of allowing IPv4 address transfer is not studied carefully yet
 - Do we have sufficient time to conduct such feasibility study?

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prop-055: Global policy for the allocation of the remaining IPv4 address space

- Problems this proposal aims to address
 - Issues each RIR region will face during the exhaustion period vary by region as the level of development of IPv4 and IPv6 are widely different
 - As a result, applying a globally co-ordinated policy may adequately address issues in one region while it may not work for other regions.

prop-055: Global policy for the allocation of the remaining IPv4 address space

- Solutions proposed by the author
 IANA reserves one /8 for each RIR now
- Later, when IANA receives a request for IPv4 address space that cannot be fulfilled use remaining IANA IPv4 free pool:
 - IANA will allocate each RIR a single /8 from the reserved block
- Any remaining /8s in the IANA free pool will then be allocated to the RIR that makes the last request to IANA

prop-055: Global policy for the allocation of the remaining IPv4 address space

- APNIC 26 outcome
 - Pending approval at each remaining stage of the policy proposal process

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prop-062: Use of final /8

- Problems this proposal aims to address
 - How should APNIC use the final /8 if prop-55 (Global policy for the allocation of the remaining IPv4 address space) is implemented?
 - How can new networks connect to a dual IPv4/IPv6 Internet after the free pool exhaustion
 - What happens if a new disruptive technology needs IPv4?

prop-062: Use of final /8

- Solutions proposed by the author
 - Reserve the final /8 in the APNIC region for three things
 - Each new LIR can receive a single minimum allocation
 - Each existing LIR can receive a single minimum allocation
 - Reserve a /16 for potential future technologies that may need IPv4 addresses

prop-062: Use of final /8

APNIC 26 outcome

- Pending approval at each remaining stage of the policy proposal process
 - The size of allocations under this proposal should be tied to APNIC's minimum allocation size
 - This proposal is not dependent on the successful adoption of prop-055 (Global policy for the allocation of the remaining IPv4 address space)

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prop-063: Reducing timeframe of IPv4 allocation from 12 to 6 months

- Problems this proposal aims to address
 - With the imminent depletion of the free pool, it's possible that networks receiving an allocation to meet their needs for the next 12 months may mean that other networks don't have a chance to get any allocation before the free pool is exhausted
- Solutions proposed by the author
 - Make allocations based on a 6 month needs basis, reducing it from 12 months

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prop-063: Reducing timeframe of IPv4 allocations from twelve to six months

- APNIC 26 outcome
 - This proposal to be returned to the Policy SIG mailing list for further discussion

prop-063: Reducing timeframe of IPv4 allocation from 12 to 6 months

- Discussion at APNIC 26
 - Generally support this proposal but not sure exact positive impact that this proposal can provide
 - As LIRs/ISPs may need to apply IPv4 addresses more often, it will increase their administrative work load
 - Support this proposal as it is a reasonable compromise
 - The fragmentation of ISPs and the global routing table will increase as a result of this proposal
 - Don't we need to have consistency with other regions?
 - ISPs in the APNIC region may be disadvantaged by this proposal

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prop-066: Ensuring efficient use of historical IPv4 resources

- Problems this proposal aims to address
 - While the remaining free pool is gradually being depleted, a lot of historical IPv4 addresses are still unused.
 - When LIRs request more space from APNIC, they do not have to demonstrate that their historical address space is being used.
 - LIRs can currently justify resources from the APNIC free pool while still not utilising their historical resources.
- Solutions proposed by the author
 - Include historical resources when calculating an LIR's usage rate.

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prop-066: Ensuring efficient use of historical IPv4 resources

- APNIC 26 outcome
 - Pending approval at each remaining stage of the policy proposal process

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prop-066: Ensuring efficient use of historical IPv4 resources

- Discussion at APNIC 26
 - "Historical address space" in this proposal historical address space indicates registered in the APNIC whois database
 - Can ISPs make customer assignments out of these historical block? Aren't they registered as "assignment" addresses?
 - In APNIC whois database:
 - The authority to assert policy over historical address space is unclear – gray area
 - The address prefix shorter than /22 is registered as an allocation
 - The address prefix longer than /22 is registered as an assignment
 - The historical maintenance guide (APNIC) says suballocation can be made under historical address blocks

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How to participate policy discussion

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How to participate policy discussion

- Participate future APNIC meetings – APNIC 27
 - Held in conjunction with APRICOT 2009
 - Manila, Philippines
 - 18 27 February 2009

- APNIC 28

- Beijing, China
- 24 28 August 2009

– APNIC 29

- Held in conjunction with APRICOT 2010
- Kuala Lumpur, Malaysia
- 24 Feb 5 Mar 2010
- Remote participation tools will be available

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IPv6 current deployment status

Acknowledgement: Following slides from Geoff Huston, APNIC Chief Scientist Thanks!

Statistic data

- How much of the Internet today is capable running IPv6?
 - -Geoff Huston's data
 - BGP routing table
 - IPv6 routing on a per AS basis
 - Web server access

The IPv4 routing table size

Asia Pacific Network Information Centre

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The IPv6 routing table size

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BGP IPv6 : IPv4

48

IPv4 AS count

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IPv6 AS count

AS count IPv6 : IPv4

Web server stats

2007

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2008

2008

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www.apnic.net

www.ripe.net

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APNIC 26 traffic statistics

- "IPv6 hour" experiment was conducted on 27/08/2008
- If content is available via IPv6 networks, users access IPv6 networks unconsciously?

Centre

Where do we go from here?

Acknowledgement: Following slides from Geoff Huston, APNIC Chief Scientist Thanks!

Aspects of Transition

- IPv6 is not a simple replacement for IPv4
 - -Networks, service systems and users
 - Will need to access both IPv4 and IPv6 simultaneously across the entire period of the transition
- The transition will take longer than the time remaining for the continued operation of the current IPv4 address distribution framework

 Industry demand for IPv4 addresses will continue beyond the projected date of IPv4 address pool exhaustion

Potential responses to the transition to IPv6

- IPv6 deployment is currently at a low level when compared to the extent of the IPv4 network
- There is a concern:
 - that the longer this investment in transition to IPv6 is deferred,
 - the greater the risk of negative outcomes and cost escalation as a result of IPv4 address exhaustion
- While these risks may suggest:
 - the need for a regulatory initiative, such action would go against the deregulation that has driven the Internet's success and innovation and could stifle future Internet growth

The Challenge

- Industry, regulators and public policy makers need to develop a coherent strategy to sustain the transitional framework between IPv4 and IPv6
- This strategy needs to acknowledge the continuing contribution of the institutions and frameworks that have sustained the Internet through its short but phenomenal history as a deregulated industry
- This strategy should position the various stakeholders and actors in mutually supportive roles while preserving the innovative, vital characteristics of the Internet

Thank You