

AFPUB-2010-v4-003

**Global Policy for IPv4 Allocations by the IANA
Post Exhaustion**

AFRINIC 13

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Housekeeping

Definitions

- ICANN (IANA)
- Legacy address space
- RFC 2050
- Needs basis
- ASO AC/NRO NC

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Problem Statement

- IPv4 address allocation as we know it will end
- IPv4 resources that could reach RIR's may not
- IPv4 resources not held and distributed in the RIR system will cost more

Global Policy Proposal

- Provides for the IANA to allocate v4 addresses post depletion open and transparently
- Defines RIR eligibility criteria
- Publishes distribution method (transparent)
- Provides for public reporting (openness)
- Maintain the values of RFC 2050 in present day form
- Removes roadblocks to return from RIR's

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How does it work?

- Creates a “Reclamation Pool”
- If IPv4 addresses longer (smaller) than a /8 are returned to IANA they are placed in Reclamation Pool
- If IPv4 addresses are returned post IANA depletion, they are placed in Reclamation Pool
- Post depletion of the IANA Reserved space, IANA will allocate out of the Reclamation pool
 - Allocate to eligible RIR’s
 - Equal sized allocations to eligible RIR’s
 - Only transferable with a global (coordinated) policy
 - Open and transparent

Why not just adopt 2009-v4-002?

- Ability to transfer IPv4 addresses through other regions with dissimilar standards is a roadblock to global consensus
- Mandatory return is a roadblock to global consensus

Comparing like-proposals

2009-v4-002

- Allow IANA to re-allocate returned addresses
- Available addresses evenly split between RIR's
- Mandatory returns

2010-GEN-003

- Allow IANA to re-allocate returned addresses
- Available addresses evenly split between eligible RIR's
- No mandatory returns
- Inter and Intra RIR transfer policy hook*
- Provides total /10 reservation exception (austerity measures)

* Globally Coordinated Transfer Proposal in ARIN region

Global Feedback

RIR	2009-v4-002	2010-GEN-003	ACTION
AFRINIC	<ul style="list-style-type: none"> •Consensus 	<ul style="list-style-type: none"> •Some support, discussion 	<ul style="list-style-type: none"> •Update required, meeting presentation on 25 NOV 10
APNIC	<ul style="list-style-type: none"> •Consensus 	<ul style="list-style-type: none"> •Needed •Not Needed •Distribution method unfair •CIDR language •Transfer restriction = meddling in local policy 	<ul style="list-style-type: none"> •Updated distribution mechanism to insure fairness •Permit transfers only with global (coordinated) policy
ARIN	<ul style="list-style-type: none"> •Transfer and mandatory return prevents consensus •ARIN AC rewrite must return to may return 	<ul style="list-style-type: none"> •Concern raised about “various registries” space •Consensus •ARIN AC re-write for clarity 	<ul style="list-style-type: none"> •Sent to last-call
LACNIC	<ul style="list-style-type: none"> •Consensus 	<ul style="list-style-type: none"> •Not discussed - already gained consensus for RIPE 2009-01 	<ul style="list-style-type: none"> •Sent back to the list for further discussion •NRO EC abandoned RIPE-2009-01
RIPE	<ul style="list-style-type: none"> •Consensus 	<ul style="list-style-type: none"> •Needs to be discussed •Not Needed •Distribution broken •CIDR language 	<ul style="list-style-type: none"> •Support, consensus may be possible

Why Mandatory Return Fails

- Threat conditions are rapidly evolving
- Any RIR could abandon needs based allocations at any time without an agreement
- Unforeseen circumstances could evolve in any region and global policy is too slow to react
- Leaving to chance is a large risk
- A redistribution of address space should not result in less stewardship; roadblock

Why Transfer of Space Fails

- Needs basis system is fair until broken
- Distributing IPv4 space to any RIR that has significantly dissimilar standards is inequitable
- Any RIR could abandon needs based allocations at any time without a codified agreement
- Can not reach consensus in all RIR regions

Why a Transfer Hook?

- Transfer hooked into proposal
 - Allows RIR communities to develop transfer requirements through local policy
 - Separates the proposal from the politics
- How does it work?
 - RIR communities develop a proposal
 - Global or Globally Coordinated
 - Two sentences or two hundred
 - RIR communities retain the power to decide
- Compromise

Removing Roadblocks

- Extract the hot-button issues
- Pave the way for legacy returns direct to the IANA bypassing an RIR
- RIR's have returned address space previously
- No reason to believe that it won't happen again if roadblocks are removed
- Lack of a policy may prevent future returns
- Concerns about the inability of IANA to make allocations
- Concerns that the IANA may act unpredictably

Returned 20 OCT 11: 45/8

- Interop returned ~/8 equivalent
- ARIN Press Release

“ARIN will accept the returned space and not reissue it for a short period, per existing operational procedure. **After the hold period, ARIN will follow global policy at that time and return it to the global free pool or distribute the space to those organizations in the ARIN region with documented need, as appropriate.**” --John Curran, CEO, ARIN

Summary

- Conceptually the same as 2009-V4-002
- Compromises on the transfer issue and removes mandatory return issues that are unable to reach consensus globally
- Allows two control mechanisms for RIR communities to address allocation size and transferability of address space
- Insures that if there is need and if there are v4 addresses at the IANA that they will be distributed
- Removes roadblocks for returning IPv4 addresses

ARIN AC rewrite to ARIN 2010-10

Original text:

Exhaustion is defined as an inventory of less than the equivalent of a single /8 and the inability to further assign address space to its customers in units equal to or shorter than the longest of **any RIR's** policy defined minimum allocation unit.

ARIN Rewrite:

An RIR is considered at exhaustion when the inventory is less than the equivalent of a single /8 and is unable to further assign address space to its customers in units equal to or shorter than the longest of **that RIR's** policy defined minimum allocation unit.

Procedural Bits

- Issues that may need further clarification
 - Longer / Shorter prefix language
 - Various Registries
 - Any RIR minimum vs. a particular RIR minimum
- Policy language may differ between regions
- Clarification edits by NRO allowed by MoU[1]
 - Are accommodated in global PDP
 - Allows for NRO to convene RIR staff to review and edit
 - Must be in context and same intent
 - Simple, efficient and easy
 - Gives all regions a voice in clarity discussions
- Latest version NOT on AFRINIC.NET

1. Reclamation Pool

Upon adoption of this IPv4 address policy by the ICANN Board of Directors, the IANA shall establish a Reclamation Pool to be utilized post RIR IPv4 exhaustion as defined in Section 4. The reclamation pool will initially contain any fragments that may be left over in IANA inventory. As soon as the first RIR exhausts its inventory of IP address space, this Reclamation Pool will be declared active. When the Reclamation Pool is declared active, the Global Policy for the Allocation of the Remaining IPv4 Address Space[3] and Policy for Allocation of IPv4 Blocks to Regional Internet Registries[4] will be formally deprecated.

2. Returning Address Space to the IANA

The IANA will accept into the Reclamation Pool all eligible IPv4 address space that are offered for return. Eligible address space includes addresses that are not designated as "special use" by an IETF RFC or addresses allocated to RIR's unless they are being returned by the RIR that they were originally allocated to. Legacy address holders may return address space directly to the IANA if they so choose.

3. Address Allocations from the Reclamation Pool by the IANA

Allocations from the Reclamation Pool may begin once the pool is declared active. Addresses in the Reclamation Pool must be allocated on a CIDR boundary. Allocations from the Reclamation Pool are subject to a minimum allocation unit equal to the minimum allocation unit of all RIRs and a maximum allocation unit of one /8. The Reclamation Pool will be divided on CIDR boundaries and distributed evenly to all eligible RIRs once each quarter. Any remainder not evenly divisible by the number of eligible RIRs will remain in the Reclamation Pool until such time sufficient address returns allow another round of allocations.

4. RIR Eligibility for Receiving Allocations from the Reclamation Pool

Upon the exhaustion of an RIR's free space pool and after receiving their final /8 from the IANA[3], an RIR will become eligible to request address space from the IANA Reclamation Pool when it publicly announces via its respective global announcements email list and by posting a notice on its website that it has exhausted its supply of IPv4 address space. Exhaustion is defined as an inventory of less than the equivalent of a single /8 and the inability to further assign address space to its customers in units equal to or shorter than the longest of any RIR's policy defined minimum allocation unit. Up to one /10 or equivalent of IPv4 address space specifically reserved for any special purpose by an RIR will not be counted against that RIR when determining eligibility unless that space was received from the IANA reclamation pool. Any RIR that is formed after the ICANN Board of Directors has ratified this policy is not eligible to utilize this policy to obtain IPv4 address space from the IANA.

5. Reporting Requirements

The IANA shall publish on at least a weekly basis a report that is publicly available which at a minimum details all address space that has been received and that has been allocated. The IANA shall publish a Returned Address Space Report which indicates what resources were returned, by whom and when. The IANA shall publish an Allocations Report on at least a weekly basis which at a minimum indicates what IPv4 address space has been allocated, which RIR received the allocation and when. The IANA shall publish a public notice confirming RIR eligibility subsequent to Section 4.

6. No Transfer Rights

Address space assigned from the Reclamation Pool may be transferred if there is either an ICANN Board ratified global policy or globally coordinated RIR policy specifically written to deal with transfers whether inter-RIR or from one entity to another. Transfers must meet the requirements of such a policy. In the absence of such a policy, no transfers of any kind related to address space allocated or assigned from the reclamation pool is allowed.

8. References

- [1] IANA, Global Policy for the Allocation of the Remaining IPv4 Address Space
<http://www.icann.org/en/general/allocation-remaining-ipv4-space.htm>
- [2] ICANN Address Supporting Organization (ASO) MoU
<http://aso.icann.org/documents/memorandum-of-understanding/index.html>
- [3] Global Policy for the Allocation of the Remaining IPv4 Address Space
<http://www.icann.org/en/general/allocation-remaining-ipv4-space.htm>
- [4] Policy for Allocation of IPv4 Blocks to Regional Internet Registries
<http://aso.icann.org/wp-content/uploads/2009/09/aso-001-2.pdf>
- [5] ICANN announcement abandoning RIPE 2009-1
<http://www.icann.org/en/announcements/announcement-12may09-en.htm>
<http://www.ripe.net/ripe/maillists/archives/address-policy-wg/2010/msg00392.html>

Discussion