prop-086
Global Policy for IPv4 Allocations by the IANA Post Exhaustion

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What?

A global policy to allow the IANA to accept and re-allocate IPv4 space, in blocks smaller than /8.

- 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

Why?

Without this policy, any space returned to the IANA will be stranded.

No current mechanism exists for IANA to distribute such space to the RIRs.

*This is a **massive** problem if we expect any IPv4 resource returns.*

How?

- IPv4 space returned to the IANA enters the Reclamation Pool.
- The IANA allocates space in the Reclamation Pool evenly to all **<u>eligible</u>** RIRs.
  - Once per three months.
  - On CIDR boundaries.
  - Maximum one /8 per RIR.
  - Minimum equal to the min. allocation unit of all RIRs.
- Eligible RIRs have need.
  - Unable to assign space to customers.
  - One /10 can be held in reserve for special purposes.
- No Transfer Rights
  - Transfers only allowed under future global (coordinated) policy.

prop-069 and prop-086

- prop-069 had two very distinct provisions:
  - To allow IANA to accept and re-allocate space post-exhaustion and
  - To describe how IPv4 space returned to the RIRs is returned to IANA.
- prop-086 addresses the former provision (allowing IANA to accept and re-allocate IPv4 space).
- prop-086 in no way precludes another proposal to address the latter provision (when and how RIRs return space to the IANA). In fact it likely facilitates it.
- We (the co-authors/contributors) see the need for IANA to be able to accept and distribute any returned IPv4 space and we see that prop-069 appears to be at an impasse (abandoned by the NRO EC).
- **Now is the time to act - we can neither live in the past nor expect the future to take care of itself.**

Why did prop-069 fail?

- 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

Why Mandatory Return Fails

- Any RIR could abandon needs based allocations at any time without a codified agreement

- Unforeseen circumstances could evolve in any region and global policy is too slow to react

- Can not reach consensus in all RIR regions

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
- Leaving to chance is too large a risk
- A redistribution of address space should not result in less stewardship; roadblock

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
- Concerns about the inability of IANA to make allocations
- Concerns that the IANA may act unpredictably
- **Lack of policy is preventing returns**

Returned 20 OCT 10: 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 prop-069
- 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

Status in other RIRs

- AfriNIC: AFPUB-2010-v4-003
  - Under discussion
- ARIN: Draft policy 2010-10
  - Modified text, prompted update in all regions
  - Adopted
- LACNIC: LAC-2010-04
  - Under discussion
- RIPE: Proposal 2010 – 05
  - Under discussion

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

5. Details

5.1 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.

5.2 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 RIRs unless they are being returned by the RIR that they were orignally allocated to. Legacy address holders may return address space directly to the IANA if they so choose.

5.3 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 will be allocated on a CIDR boundary equal to or shorter than the longest minimum allocation unit of all RIRs in order to complete these allocations. The Reclamation Pool will be divided on CIDR boundaries and distributed evenly to all eligible RIRs. Any remainder not evenly divisible by the number of eligible RIRs based on a CIDR boundary equal to or shorter than the longest minimum allocation unit of all RIRs will remain in the Reclamation Pool. Addresses that are left over will be held in the Reclamation Pool until additional IP addresses can be returned to rejoin addresses on CIDR boundaries to the Reclamation Pool or a minimum allocation unit is set to allow allocation from existing inventory.

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

5.5 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 5.4.

5.6 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 prop-069
  http://www.icann.org/en/announcements/announcement-12may09-en.htm
  http://www.ripe.net/ripe/maillists/archives/address-policy-wg/2010/msg00392.html

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Discussion

Thank you.

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