2009-3: Allocation of IPv4 Blocks to Regional Internet Registries

2009-3: The Problem Statement

- Once the IANA IPv4 free pool is exhausted, there is no written policy for:
  - IANA to distribute any reclaimed address space, or for
  - RIRs to return address space to the IANA.

2009-3: The Proposal (1 of 2)

This document describes the policy governing the allocation of IPv4 address space from the IANA to the Regional Internet Registries (RIRs). This document does not stipulate performance requirements in the provision of services by IANA to an RIR in accordance with this policy. Such requirements should be specified by appropriate agreements among the RIRs and ICANN.

This policy is to be implemented in two phases.

A. Phase I: Recovery of IPv4 Address Space

Upon ratification of this policy by the ICANN Board of Directors the IANA shall establish a mechanism to receive IPv4 address space which is returned to it by the RIRs, and hold that address space in a 'recovered IPv4 pool'.

Each RIR through their respective chosen policies and strategies may recover IPv4 address space which is under their administration. At quarterly intervals, each RIR shall return to the IANA any **legacy** address space recovered, **and may return to the IANA any non-legacy address space recovered**, in aggregated blocks of /24 or larger, for inclusion in the recovered IPv4 pool.

During Phase I, no allocations will be made from the recovered IPv4 pool. **Return of recovered address space (as described above) will continue throughout Phase II.**

B. Phase II: Allocation of Recovered IPv4 address space by the IANA

Upon ratification of this policy by the ICANN Board of Directors and a declaration by the IANA that its existing free pool of unallocated IPv4 address space is depleted; Global Addressing Policy ASO-001-2 (adopted by ICANN Board 8 April 2005) is rescinded. IANA will then commence to allocate the IPv4 address space from the recovered IPv4 pool.

1. The following definitions apply to this policy:

a. Recovered Address Space. Recovered address space is that address space that is returned to an RIR as a result of any activity that seeks to reclaim unused address space or is voluntarily returned to the RIR or is reclaimed by the RIR as a result of legal action or abuse determination. Recovered address space does not include that address space that is reclaimed because of non-payment of contractual fees whose reclamation date is less than 1 year at the time of the report.

b. IPv4 Address Holdings. IPv4 address holdings are all unallocated IPv4 address space held by an RIR to include recovered address space not yet returned less that address space that is committed in accordance with the RIR's reservation policy and practices.

c. Aggregated address blocks. Aggregated address blocks are contiguous prefixes that can be aggregated on natural bit boundaries. 10.0.0.0/24 and 10.0.1.0/24 are two contiguous prefixes that can be combined to form an aggregated address block. 10.0.0.0/24 and 10.0.1.0/25 are two contiguous prefixes that cannot be combined on a natural bit boundary to form an aggregated block.

d. Legacy address space. IPv4 address space allocated or assigned prior to the creation of the RIR.

2009-3: The Proposal (2 of 2)

2. Allocation of IPv4 Address Space

a. For the purposes of this policy, an 'IPv4 allocation period' is defined as a 6-month period following 1 March or 1 September in each year.

b. At the beginning of each IPv4 allocation period, the IANA will determine the 'IPv4 allocation unit' for that period, as 1/10 of its IPv4 address pool, rounded down to the next CIDR (power-of-2) boundary. The minimum 'IPv4 allocation unit' size will be a /24.

c. In each allocation period, each RIR may issue one IPv4 request to the IANA. Providing that the RIR satisfies the allocation criteria described in paragraph B.2, the IANA will allocate a single allocation unit, composed of the smallest possible number of blocks available in its IPv4 address pool.

3. IPv4 Address Space Allocation Criteria

A RIR is eligible to receive additional IPv4 address space from the IANA when the total of its IPv4 address holdings is less than 50% of the current IPv4 allocation unit, and providing that it has not already received an IPv4 allocation from the IANA during the current IPv4 allocation period.

4. Initial Allocation of IPv4 Address Space

Each new RIR shall, at the moment of recognition, be allocated one (1) allocation unit by the IANA. If an allocation unit is not available, then the IANA will issue this block as soon as one is available. This allocation will be made regardless of the newly formed RIR's projected utilization figures and shall be independent of the IPv4 address space that may have been transferred to the new RIR by the already existing RIRs as part of the formal transition process.

5. Reporting

a. All returned space is to be recorded in an IANA-published log of IPv4 address space transactions, with each log entry detailing the returned address block, the date of the return, and the returning RIR.

b. All allocated space is also to be recorded in this IANA-published log of IPv4 address space transactions, with each log entry detailing the address blocks, the date of the allocation and the recipient RIR.

c. The IANA will maintain a public registry of the current disposition of all IPv4 address space, detailing all reservations and current allocations and current IANA-held address space that is unallocated.

d. The IANA may make public announcements of IPv4 address block transactions that occur under this policy. The IANA will make appropriate modifications to the "Internet Protocol V4 Address Space" page of the IANA website and may make announcements to its own appropriate announcement lists. The IANA announcements will be limited to which address ranges, the time of allocation and to which Registry they have been allocated.

2009-3: Rationale

- This policy provides a mechanism for the RIRs to retro allocate the recovered IPv4 address space to the IANA and provides the IANA the policy by which it can allocate it back to the RIRs on a needs basis.
- This policy creates a new global pool of IPv4 address space that can be allocated where it is needed on a global basis without a transfer of address space between the RIRs.

2009-3: Concerns with Original Text

- This proposal creates a disincentive for any RIR to make a substantial effort to reclaim address space.
- Some IPv4 holders may be unwilling to return those resources if most of the returned addresses will be reallocated to other regions.
- This proposal would fragment reverse DNS delegations to the RIRs.

2009-3: AC Changes

- It appeared to the AC that most of the concerns with the proposal are around the mandatory nature of returning reclaimed space.
- In an attempt to address some of the concerns, we modified the original text to make the return of non-legacy space to IANA optional (changes in **bold** above).
- The concerns above still apply to legacy space.

2009-3: Possible paths forward

- Revert to authors' original proposed text (make all returns mandatory).
- Adopt current draft policy (compromise text, with legacy returns mandatory).
- Make returns of only large blocks mandatory.
- Make returns completely optional.
- Abandon the proposal entirely.

2009-2: Depleted IPv4 reserves

Questions/Comments?