IPv6 Draft Policy Discussions:

2010-7: Simplified IPv6 policy
2010-8: Rework of IPv6 assignment criteria
2010-4: Rework of IPv6 allocation criteria

2010-7: Simplified IPv6 policy

- Comprehensive rewrite and simplification of our entire IPv6 policy structure

2010-8: Rework of IPv6 assignment criteria

- Changes IPv6 end-user assignment criteria to eliminate dependencies on IPv4 assignment criteria, and removes all host counts

2010-4: Rework of IPv6 allocation criteria

- Changes IPv6 ISP allocation criteria to relax requirements to qualify for an initial allocation

2010-7: Simplified IPv6 policy

2010-7: The Problem Statement

- Current IPv6 policy is long and complicated.
- Many parts of current IPv6 policy are out-of-date and don't incorporate recent experience. Many other sections have been bolted on over time.
- IPv6 is plentiful, but IPv6 assignments are restricted to protect the DFZ.

2010-7: History and Acknowledgements

- Policy Proposal 103: *Change IPv6 Allocation Process* was proposed by Bill Herrin in November 2009.
- The ARIN AC observed support from significant sections of the community for major revisions to IPv6 policy, but the AC could not support Proposal 103 as written, and abandoned it.
- 2010-7 incorporates many ideas from Policy Proposal 103, and from many contributors on PPML and elsewhere.

2010-7: What does it do?

Simplifies IPv6 policy in a number of ways:

- Deletes historical and duplicate sections
- Removes the HD-ratio
- Unifies criteria for allocations and assignments
- Creates size classes for allocating IPv6 blocks, and simplifies criteria for determining allocation size.
- Reduces IPv6 policy from 11 pages to 4 (from 3,660 to 1,010 words).

2010-7: Why classful?

A size-class-based allocation system:

- Allows all LIRs and multihomed orgs to get allocations or assignments from ARIN.
- Protects the DFZ by allowing for safe filtering of traffic-engineering (TE) more-specifics.
- Expands availability of non-routed blocks for internal infrastructure.
  - Since routable blocks are easy to get, availability of non-routable blocks needn't be restricted.

2010-7: Simplified IPv6 policy

Questions/Comments?

2010-7: Simplified IPv6 policy

Appendices

2010-7: The Proposal (1 of 5)

Delete 6.1 Introduction - This is all historical.

Leave 6.3 as is (renumber to **6.1**) - These still accurately reflect the Goals we want our policy to follow.

Delete 6.4.2 - 6.4.4 - These principles don't seem worthy of elevation to special status. 6.4.1 is handled in a separate Draft Policy.

Replace 6.5 - Policies for allocations and assignments with text below (**renumber to 6.2**). This seems to be where most of the changes and simplification are needed.

Delete 6.7 Appendix A: HD-Ratio - The numbers from this table were used to determine the thresholds in 6.2 below, so this section is confusing and no longer needed.

Delete 6.9 IPv6 Reassignments policy - This is redundant and covered better elsewhere.

Move 6.10 into **6.2.3.2** below

2010-7: The Proposal (2 of 5)

Replacement text:

2.12. Critical Infrastructure Providers

Critical infrastructure providers of the Internet include public exchange points, core DNS service providers (e.g. ICANN-sanctioned root, gTLD, and ccTLD operators) as well as the RIRs and IANA.

4.4. Micro-allocation

ARIN will make IPv4 micro-allocations to Critical Infrastructure Providers per section 2.8. These allocations will be no longer than a /24. Multiple allocations may be granted in certain situations.

4.4.1. Allocation and assignment from specific blocks

Exchange point allocations MUST be allocated from specific blocks reserved only for this purpose. All other micro-allocations WILL be allocated out of other blocks reserved for micro-allocation purposes. ARIN will make a list of these blocks publicly available.

4.4.2. Exchange point requirements

Exchange point operators must provide justification for the allocation, including: connection policy, location, other participants (minimum of two total), ASN, and contact information. ISPs and other organizations receiving these micro-allocations will be charged under the ISP fee schedule, while end-users will be charged under the fee schedule for end-users. This policy does not preclude exchange point operators from requesting address space under other policies.

2010-7: The Proposal (3 of 5)

6.2. Policies for IPv6 allocations and assignments

6.2.1. Allocations and assignments

To meet the goal of Fairness, ARIN makes both allocations and assignments according to common criteria. Allocations are made to LIRs, and assignments to certain end users.

6.2.2. Assignments from LIRs/ISPs

End-users are assigned an end site assignment from their LIR or ISP. The exact size of the assignment is a local decision for the LIR or ISP to make, using a minimum value of a /64 (when only one subnet is anticipated for the end site) up to the normal maximum of /48, except in cases of extra large end sites where a larger assignment can be justified.

The following guidelines may be useful (but they are only guidelines):

* /64 when it is known that one and only one subnet is needed
* /56 for small sites, those expected to need only a few subnets over the next 5 years.
* /48 for larger sites

For end sites to whom reverse DNS will be delegated, the LIR/ISP should consider making an assignment on a nibble (4-bit) boundary to simplify reverse lookup delegation.

6.2.3. Allocations and assignments from ARIN

6.2.3.1 Goals

To balance the goals of Aggregation, Conservation, Fairness, and Minimized Overhead, ARIN normally issues IPv6 addresses only in the discrete sizes of /48, /40, /32, /28, /24, or larger. Each organization or discrete network may qualify for one allocation or assignment of each size.

6.2.3.1.1 Allocation and assignment from specific blocks

Each allocation/assignment size will be made out of separate blocks reserved for that purpose. Additionally, non-routed assignments for internal infrastructure, and assignments to Critical Infrastructure Providers per section 2.8, will each be made out of separate blocks reserved for those purposes. ARIN will make a list of these blocks publicly available.

2010-7: The Proposal (4 of 5)

6.2.3.2 X-Small (/48)

To qualify for a /48 allocation or assignment, an organization must:

* Be Multihomed per section 2.7, and qualify for an ASN per section 5; or
* Serve at least 1000 hosts; or
* Demonstrate efficient utilization of all direct IPv4 assignments and allocations, each of which must be covered by any current ARIN RSA; or
* Require a non-routed block for internal infrastructure; or
* Be a Critical Infrastructure Provider per section 2.8.

6.2.3.3 Small (/40)

To qualify for a /40 allocation or assignment, an organization must:

* Have two or more Multihomed sites, each of which would qualify for a /48; or
* Serve at least 2000 hosts; or
* Be an LIR.

6.2.3.4 Medium (/32)

To qualify for a /32 allocation or assignment, an organization must:

* Have 100 or more sites, each of which would qualify for a /48; or
* Be an existing, known LIR; or
* Have a plan to provide IPv6 connectivity to other organizations and assign at least 100 end-site assignments to those organizations within 5 years.

6.2.3.5 Large (/28)

To qualify for a /28, an organization must demonstrate the need to make assignments and/or reallocations equal to at least 25,000 /48s, based on current network infrastructure and customer base.

6.2.3.6 X-Large (/24)

To qualify for a /24, an organization must demonstrate the need to make assignments and/or reallocations equal to at least 330,000 /48s, based on current network infrastructure and customer base.

6.2.3.7 XX-Large (larger than /24)

Allocations or assignments larger than /24 may be made only in exceptional cases, to organizations that demonstrate the need to make assignments and/or reallocations equal to at least 4,500,000 /48s, based on current network infrastructure and customer base. If approved, the allocation prefix length will be based on the number of /24s justified (at 4,500,000 /48s each), rounded up to the next whole CIDR prefix. Subsequent XX-Large assignments may be made if justified using the same criteria.

2010-7: The Proposal (5 of 5)

6.3. Registration (Copied from NRPM 6.5.5)

When an organization holding an IPv6 address allocation makes IPv6 address assignments, it must register assignment information in a database, accessible by RIRs as appropriate (information registered by ARIN may be replaced by a distributed database for registering address management information in future). Information is registered in units of assigned /56 networks. When more than a /56 is assigned to an organization, the assigning organization is responsible for ensuring that the address space is registered in an ARIN database.

6.3.1. Residential Customer Privacy (Copied from NRPM 6.5.5.1)

To maintain the privacy of their residential customers, an organization with downstream residential customers may substitute that organization's name for the customer's name, e.g. 'Private Customer - XYZ Network', and the customer's street address may read 'Private Residence'. Each private downstream residential reassignment must have accurate upstream Abuse and Technical POCs visible on the WHOIS record for that block.

6.3.2. Reverse lookup (Copied from NRPM 6.5.6)

When ARIN delegates IPv6 address space to an organization, it also delegates the responsibility to manage the reverse lookup zone that corresponds to the allocated IPv6 address space. Each organization should properly manage its reverse lookup zone. When making an address assignment, the organization must delegate to an assignee organization, upon request, the responsibility to manage the reverse lookup zone that corresponds to the assigned address.

2010-7: Note and FAQ (1 of 2)

Note: In the event of an M&A transfer per section 8.2 that would result in more than one block of a given size class being held by the combined organization, the organization should be encouraged to renumber into a single larger block and return the smaller block(s) when feasible. However, as long as the organization doesn't require any additional resources, this policy does not force them to make any changes. OTOH, if they request a larger block and still hold two or more smaller blocks, they would be required to return the smaller block as a condition for receiving the larger one.

Q1: How did you come up with the thresholds?

A1: /48: Many of the criteria for a /48 were copied from existing policy. The notable exception is that any Multihomed network that qualifies for an ASN can also get a /48. /40: Since we don't give out multiple /48s (except in the case of MDN), anyone outgrowing a /48 needs a /40. Hence, the /40 requirements are 2x the /48 requirements. In addition, LIRs who don't qualify for a /32 can get a /40, since they need to be able to assign /48s. /32: Some of these requirements were inherited from existing policy. The existing 200 sites requirement was reduced to 100, and made to apply to assignments as well as allocations. /28: Since we don't give out multiple /32s (except in the case of MDN), anyone outgrowing a /32 needs a /28. The /28 requirements are based on the current HD-ratio-based requirement for a /32 (6,183,533 /56s) converted to /48s (24154) and rounded up to 25,000. /24+: Similarly, the requirements for a /24 are based on the HD-ratio requirement for a /28, and the requirement for more than one /24 are based on the HD-ratio requirement for a /24.

2010-7: FAQ (2 of 2)

Q2: What about timeframes for meeting the allocation criteria?

A2: All requests are based on current usage, so no timeframes are involved. For example, if an ISP has a /32 and is applying for a /28, they will be required to demonstrate that they have already assigned 25,000 /48s. Since there are 64k /48s in a /32, there is no longer any need to make predictions about future assignments.

Q3: The proposal says "Each organization or discrete network may qualify for one allocation or assignment of each size". It is fairly clear how staff would evaluate whether a network qualifies for a given block size, if it's the first block, but it is not clear how it would work if the network already has a block assigned or allocated to it.

For instance, suppose a network has 50 sites. They qualify for a /40. A year later they come back, have 150 sites, and want a /32. Do they qualify for a /32, because they have more than 100 sites, or is some consideration given to how the existing /40 has been used? It seems like the former would be the logical interpretation, since the policy doesn't mention anything about consideration of existing blocks, and says you can have one of each block size.

A3: Correct. If you qualify for a larger block, you also qualify for one of each smaller size.