Life After IPv4 Depletion

Leslie Nobile

Senior Director

Global Registry Knowledge

ARIN NANOG
ON THE ROAD

Overview

- ARIN's IPv4 inventory
- Trends and Observations
- Ways to obtain IP addresses post IPv4 depletion
  - IPv4
  - Transfers
  - IPv6

Check ARIN's Available IPv4 Inventory

ARIN's IPv4 inventory published on ARIN's website: www.arin.net

Updated daily at @ 12 am ET

Available IPv4 Inventory

ARIN IPv4 SPACE
AVAILABLE
.00159
/8s IN AGGREGATE

- Today, only /24s remain to fill general IPv4 requests (104 as of 8/28)

  – Per policy, ARIN issues only contiguous prefixes (cannot issue multiple /24s to satisfy a request)

- Excludes space being held or reserved under policy

*ARIN has issued ~1 /8 equivalent per year over the past several years

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Other IPv4 Inventory

- **Quarantined space (60 day hold)**
  - **~19 /16 equivalents held** in "quarantine" to clear filters (returned and revoked space)

- **Reserved space (indefinite hold)**
  - **64 /16s (1 /10)** for NRPM 4.10 "Dedicated IPv4 block to facilitate IPv6 Deployment"
  - **~218 /24s** remaining in the original /16 for NRPM 4.4 "Micro-allocation". 2nd /16 recently added under new policy
  - **~8 /16** equivalents needing further research (reclaimed space that needs further chain of custody research)

Trends and Observations

- Surprisingly smooth transition to depletion
  - Very few complaints or escalations
  - Community seems to have general understanding of the situation
    - ARIN put depletion plan and communications into place well in advance of the actual event
  - Most criticism directed at policy not allowing issuance of multiple prefixes
- More organizations opting to be placed on ARIN's Wait List for Unmet Resources; 50+ organizations on the list

Post-IPv4 Depletion Options

- More efficient use of existing IPv4 resources

- IPv4 Wait List

- Specified Recipient and Inter-RIR Transfers

- Adopt IPv6

IPv4 Wait List

- If ARIN can't fill your qualified request, you have the option to specify the smallest block size you'll accept

- If available, your request will be filled and you'll be unable to request additional addresses for 3 months

- If no block available between approved and smallest acceptable, you can be added to the IPv4 Wait List

How the IPv4 Wait List Works

- Oldest request filled first (based on approval date)
  - E.g. - if ARIN gets a /16 back and the oldest request is for a /24, we issue a /24 to that org
- One approved request per organization on the list at a time
- Limit of one allocation or assignment every 3 months

https://www.arin.net/resources/request/waiting_list.html

WAITING LIST STATUS REPORT

The table below represents the current state of the Waiting List for Unmet Requests. This list is updated every 24 hours, and is provided in chronological order beginning with the oldest waiting list request. The wait listed date column represents the date and time that the request was placed on the waiting list.

Note: This table is **not** indicative of the order in which requests will be filled. That order depends entirely upon the order, size, and quantity of IPv4 address blocks that ARIN receives and places back into its IPv4 inventory. For some example scenarios, visit the *How Waiting List Requests Work* page.

STATUS REPORT FOR THE IPV4 WAITING LIST

Request's Position on Waiting List	Date and Time Added to Waiting List	Maximum Approved Prefix Size	Minimum Acceptable Prefix Size
1	Wed 01 Jul 2015 13:21:06 -0400	19	19
2	Wed 01 Jul 2015 15:50:31 -0400	16	17
3	Wed 01 Jul 2015 16:48:23 -0400	18	18
4	Mon 06 Jul 2015 11:35:41 -0400	20	20
5	Mon 06 Jul 2015 12:02:24 -0400	17	17
6	Mon 06 Jul 2015 15:13:19 -0400	16	16
7	Tue 07 Jul 2015 17:36:22 -0400	19	19
8	Wed 08 Jul 2015 12:13:22 -0400	19	19
9	Thu 09 Jul 2015 10:27:45 -0400	17	17
10	Fri 10 Jul 2015 11:59:47 -0400	15	15

How Long Might You Wait?

- IPv4 space can become available periodically
  - **Return** = voluntary
  - **Revoke** = for cause (usually non-payment)
    - 3.54 /8 equivalents returned/revoked since 2005
  - **IANA issued** – per global policy for "post exhaustion IPv4 allocation mechanisms by IANA"
    - » **/11** (issued 5/14), **/12** (issued 9/14) and **/13** (issued 3/15) by IANA to each RIR
- Demand will be <u>far</u> greater than availability

Transfers of IPv4 Addresses

- Mergers and Acquisitions (NRPM 8.2)

- Transfers to Specified Recipients (NRPM 8.3)

- Inter-RIR transfers (NRPM 8.4)

Transfers to Specified Recipients (NRPM 8.3)

- Allows orgs with unused IPv4 resources to transfer them to orgs in need of IPv4 resources
- **Source**
  - Must be current registrant, no disputes
  - Not have received addresses from ARIN for 12 months prior
  - Ineligible for further addresses from ARIN for 12 months after
- **Recipient**
  - Must demonstrate need for 24-month supply under current ARIN policy

Inter-RIR Transfers (NRPM 8.4)

- RIR must have reciprocal, compatible needs-based policies
  - Currently APNIC, soon to be RIPE NCC
- **Transfers from ARIN**
  - Source cannot have received IPv4 from ARIN 12 months prior to transfer or receive IPv4 for 12 months after transfer
  - Must be current registrant, no disputes
  - Recipient meets destination RIR policies
- **Transfers to ARIN**
  - Must demonstrate need for 24-month supply under current ARIN policy

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Pre-approval for Specified Recipient Transfers

- Pre-approval offered through ARIN online
  - Based on 24 month need (per policy)
  - Valid for 2 years (no need for re-verification)
- Must meet current ARIN policy
- Can use multiple transfers to fill need without being subject to re-verification

Specified Transfer Listing Service (STLS)

- Optional service intended to facilitate specified recipient and inter-RIR transfers
- All participants have access to each others contact information
  - **Listers**: have available IPv4 addresses
    - Resources must be covered under RSA/LRSA
  - **Needers**: looking for IPv4 addresses
    - Must be pre-approved under ARIN policy to be listed
  - **Facilitators**: available to help listers and needers find each other
- Public summary provided
  - Lists number of available and needed IPv4 address blocks

Tips for Faster Transfer Processing

- Make sure that all registration information is current and accurate

- Request pre-approval for your 24 month need in advance of the transfer

- Provide detailed information to support 24 month need

- Apply under the correct transfer policy

Requesting IPv6 - ISPs

- Have a previous v4 allocation from ARIN or predecessor registry

    OR

- Intend to multi-home

    OR

- Provide a technical justification which details at least 50 assignments made within 5 years

Requesting IPv6 – End Users

- Have a v4 direct assignment from ARIN or predecessor registry

  OR

- Intend to multi-home

  OR

- Show how you will use 2000 IPv6 addresses or 200 IPv6 subnets within a year

  OR

- Technical justification as to why provider-assigned IPs are unsuitable

Summary

- ARIN will deplete its available IPv4 pool sometime this year
- No perfect solution
  – CGN = potential problems
  – Waiting list = uncertainty
  – Transfers = subject to market prices
  – IPv6 = transition effort
- Begin planning <u>now</u>