



# “Life After IPv4 Depletion”

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# Recent Observations

- Still strong demand for IPv4
  - Seeing increased activity in IPv4 transfers/transfer market, pre-approvals, and Specified Transfer Listing Service
  - Getting lots of questions from customers about post-depletion options
    - Not all aware we've reach full IPv4 depletion
- Seeing increase in # of blocks targeted for hijacking
  - Blocks with outdated org/contact info, especially legacy, are the biggest target
    - Hijackers target dormant registration records, go through series of registration record modifications pretending to be the original registrant

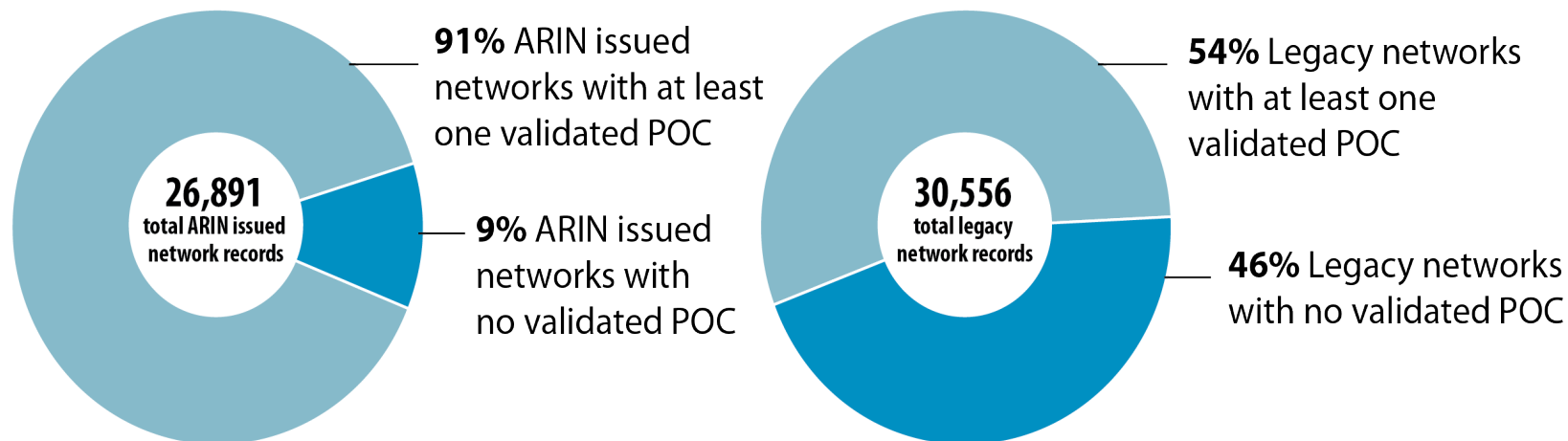
# Evolving Behavior

- See more attempted hijackings at ARIN
  - Hijacking - unauthorized changes made to database records to gain control of IP resources
    - Find dormant registration records in Whois (typically legacy)
    - Check routing
    - Re-register expired domain names
    - Re-register defunct business names
    - Go through a series of registration record modifications pretending to be the original registrant
    - Ultimate goal is likely to sell the IP addresses and transfer them
- Reports of more route hijackings (unauthorized use of IP addresses)
  - Hijackers bringing forged LOAs to ISPs to get them to route the space

# Hijacking Targets

## ARIN Issued vs Legacy

Legacy IPv4 nets are less likely to have at least one validated POC



**\*\*Validated POC – has either responded to ARIN's annual POC validation email or updated their POC record within the past 12 months**

**\*\*There are a total of 345,837 /24s contained in the legacy networks with no validated POC**



# How Can You Protect Your Whois Data?

- Keeping registration info current and accurate is essential
  - Update your Whois information when anything changes
    - “Last Updated” field in Whois reflects new date, lets hijackers know that POC and associated Org are still active
- Respond to ARIN’s annual POC validation request\*
  - Either confirm registration information is correct or submit updated contact information through ARIN on-line

\*<https://www.arin.net/policy/nrpm.html#three6>

# Request Activity

- IPv4 Requests
  - **Decreasing:** IPv4 free pool tickets
- Change of Authority Requests
  - **Increasing**
    - Merger & Acquisition transfers (NRPM 8.2)
    - ORG Recovery Requests
    - Pre-approvals and Specified Recipient transfers (NRPM 8.3)
- IPv6 Requests
  - **Steady** ticket traffic

# Reserved IPv4 Space

- **Space reserved per policy**
  - /10 to facilitate IPv6 deployment
  - 2 /16s for exchange points/critical infrastructure (DNS providers excluding new gTLDs, IANA, RIRs)
- **Held space (minimum 60 days)**
  - Space returned to ARIN or revoked for non-payment
  - Held for at least 60 days
  - Research required to verify ARIN can reissue

# Post-IPv4 Depletion Options

- IPv4 Waiting List
- IPv4 Transfer Market
- Dedicated IPv4 block to facilitate IPv6 deployment
- Adopt IPv6



# IPv4 Waiting List

- Qualify under current ARIN policy and request to be added to the list
- One request per org at a time, limited to one allocation or assignment every 3 months
  - ~362 orgs currently on list
  - About 10% of IPv4 requestors choose to be added to the list
  - 33 wait list requests filled to date by ARIN
  - 33 filled via 8.3 transfer and removed from list (as required per policy)

# Transfers of IPv4 Addresses

## 3 ARIN Transfer Policies Available:

- Mergers and Acquisitions (NRPM 8.2)
  - Traditional transfer based on change in business structure, including company reorganizations, supported by legal documentation
- Transfers to Specified Recipients (NRPM 8.3)
  - [IPv4 market transfer](#) based on financial transaction, supported by justified need under ARIN policy (within region)
- Inter-RIR transfers to Specified Recipients (NRPM 8.4)
  - [IPv4 market transfer](#) based on financial transaction, supported by justified need under ARIN policy (outside region)

# 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
- **Recipient**
  - 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 and RIPE NCC
  - Under discussion at LACNIC and AFRINIC
- **Transfers from ARIN**
  - Source cannot have received IPv4 from ARIN 12 months prior to transfer
  - Must be current registrant, no disputes
  - Recipient meets destination RIR policies
- **Transfers to ARIN**
  - Demonstrate need for 24-month supply under current ARIN policy



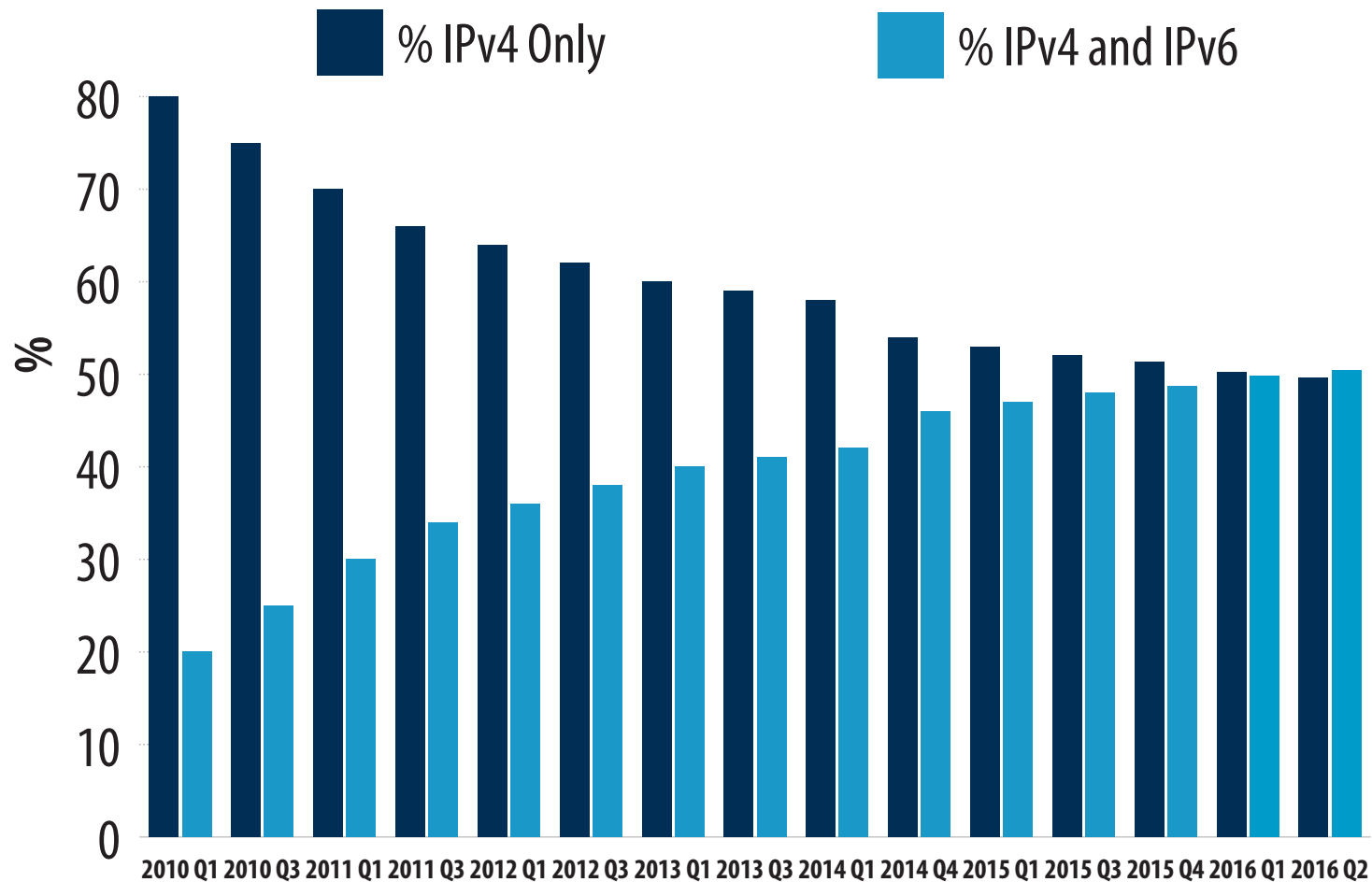
# **Pre-approval for Specified Recipient and Inter-RIR Transfers**

- Optional free service to confirm your 24 month projected need for IPv4 addresses via transfer
  - Must qualify under ARIN IPv4 policies
  - Same documentation requirements as transfers
  - Good for 24 months from the pre-approval date
  - Once pre-approved, must still submit 8.3 or 8.4 transfer request in new ARIN online ticket
  - Can use multiple 8.3 or 8.4 transfers to fill pre-approved amount

# Reserved IPv4 Block for IPv6 Deployment

- /10 reserved under policy in April 2009 ([23.128.0.0/10](https://www.iana.org/assignments/special-use-ipv4-addresses/special-use-ipv4-addresses-1-to-4.txt))
  - 40 /24s issued to date
- Must be used to facilitate IPv6 deployment
  - Examples include IPv4 addresses for key dual stack DNS servers, and NAT-PT or NAT464 translators
- You must already have your IPv6 allocation or assignment in order to receive a /24 from this block
- One per organization every six months, /24 maximum size

# ISP Members with IPv4 and IPv6



**\*5,346 total members as of 30 June 2016**

# IPv6 Adoption Rate by ISP Size

