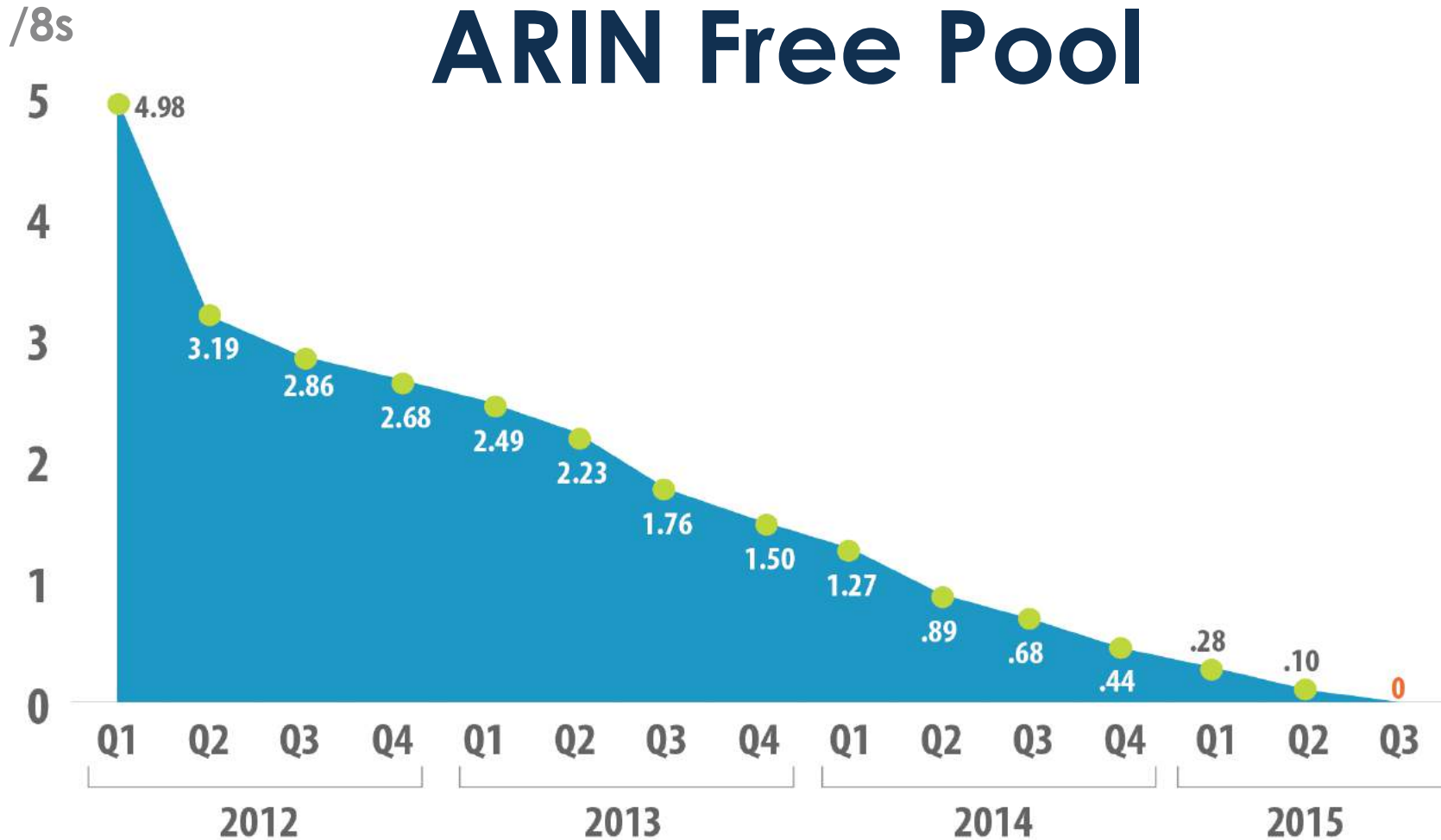




Out of IPv4! What that means for ISPs

John Curran
President and CEO, ARIN

IPv4 Address Space in ARIN Free Pool

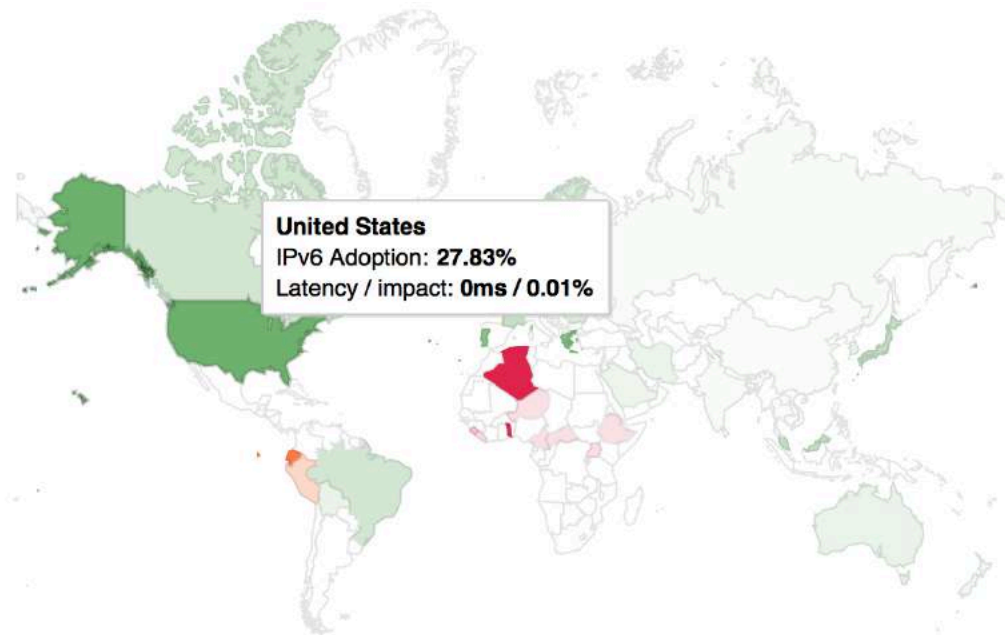


IPv4 Depletion Recap

- June 2015: IPv4 requests reach peak volume
 - 414 total requests
 - A mad rush for the last IPv4 blocks
- July 1st, 2015: First unmet IPv4 request
 - An org qualified for a block size that was no longer available
 - Within a few weeks, only single /24s remained in the free pool
- September 24th, 2015: Full IPv4 depletion
 - No IPv4 blocks available other than those reserved for specific policies
 - Significant drop in monthly # of IPv4 requests

Google's IPv6 Traffic Growing

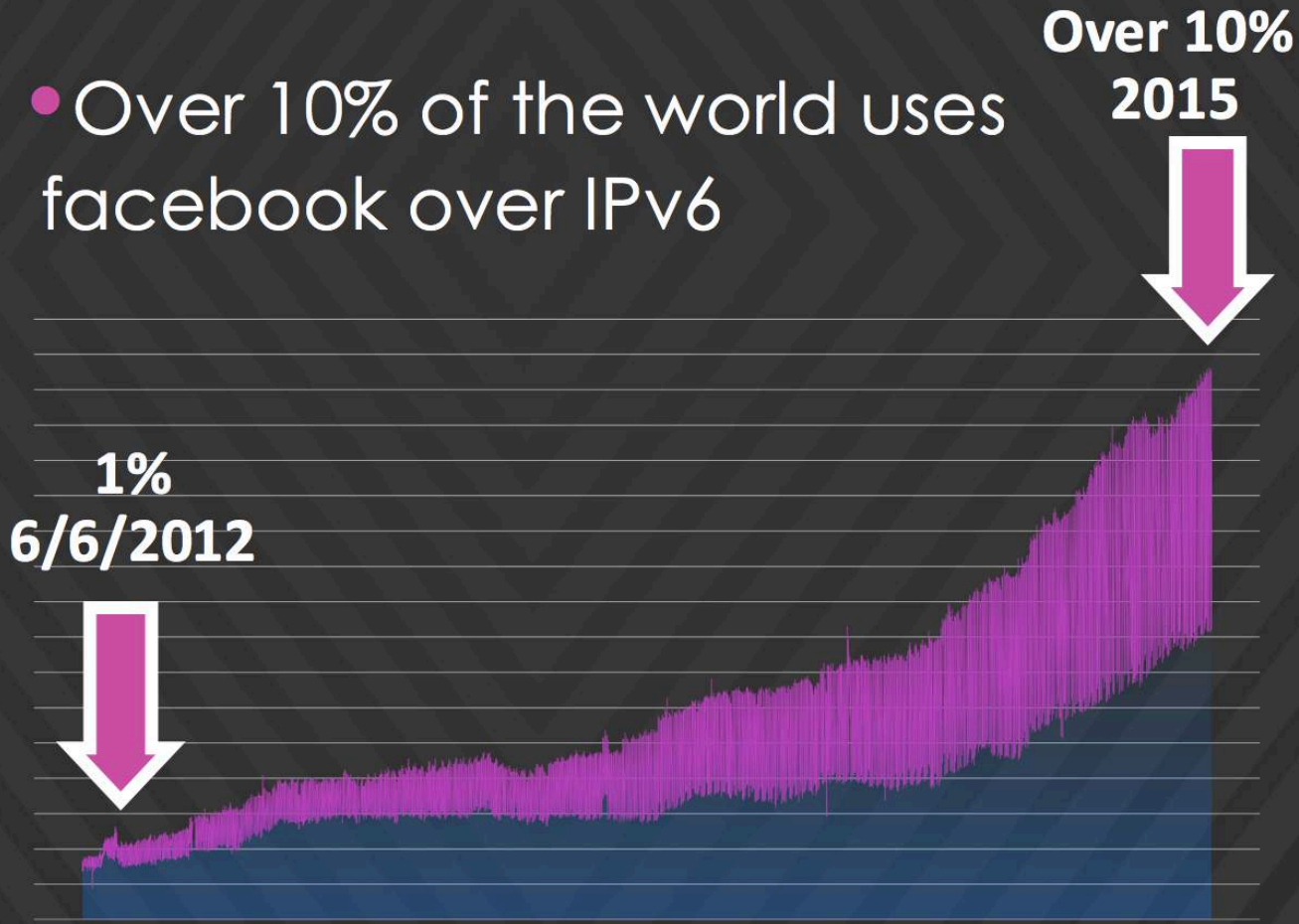
> **25%** of US customers connected to Google via IPv6 - up from **10%** last year & growing rapidly



Credit: Google

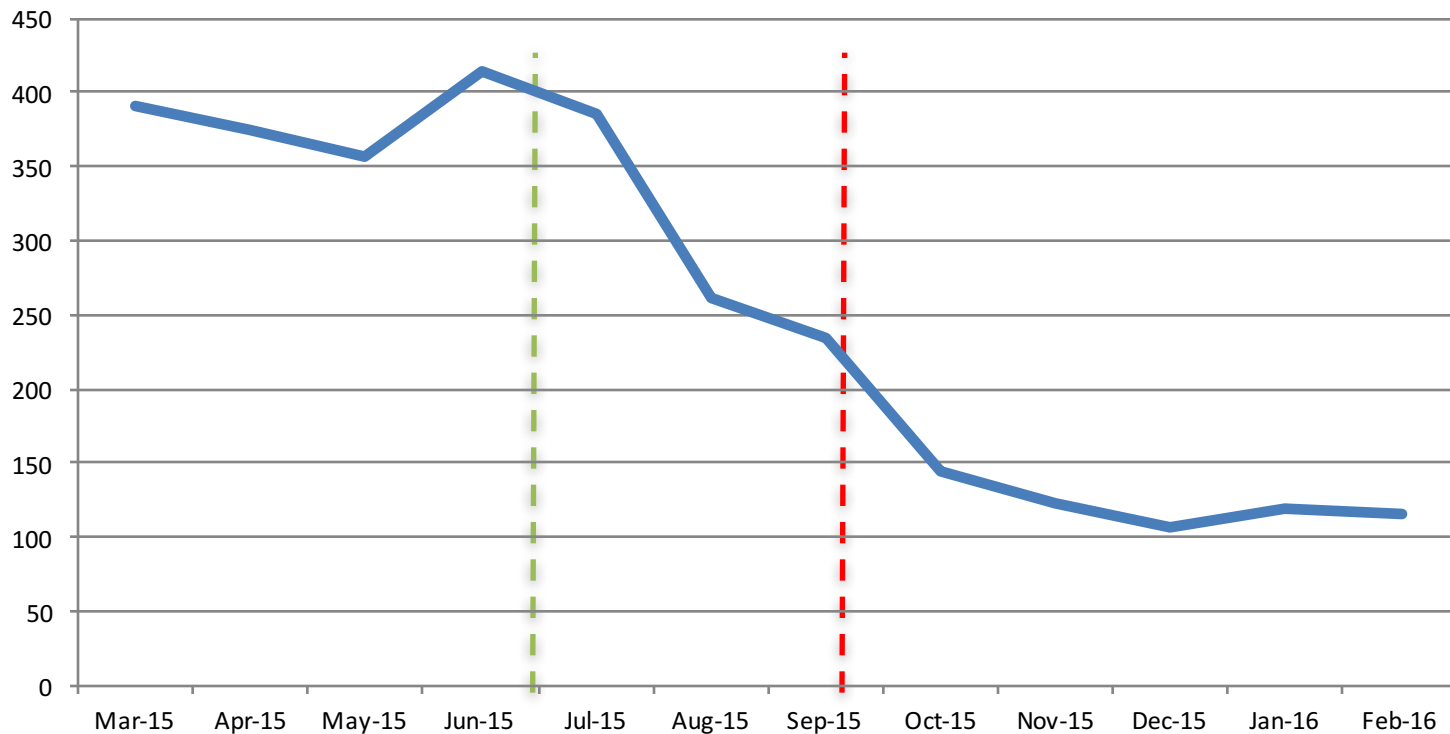
Facebook

- Over 10% of the world uses facebook over IPv6



Credit: Facebook

IPv4 Requests – Past Year



----- = waiting list initiated

----- = IPv4 depletion

Reserved IPv4 Space

- /10 reserved to facilitate IPv6 deployment
- 2 /16s reserved for critical Internet infrastructure
 - Public exchange points
 - Core DNS service providers (excluding new gTLDs)
 - Regional Internet Registries
 - IANA

Post-IPv4 Depletion Observations

- IPv4 demand remains strong
- Lots of questions from customers
 - Not all aware we've reach full IPv4 depletion
 - Education needed on post-depletion options
- Keeping registration info current is essential
 - Increase in # of blocks targeted for hijacking
 - Blocks with bad org/contact info, especially legacy ones, are the biggest target

Post-IPv4 Depletion Options

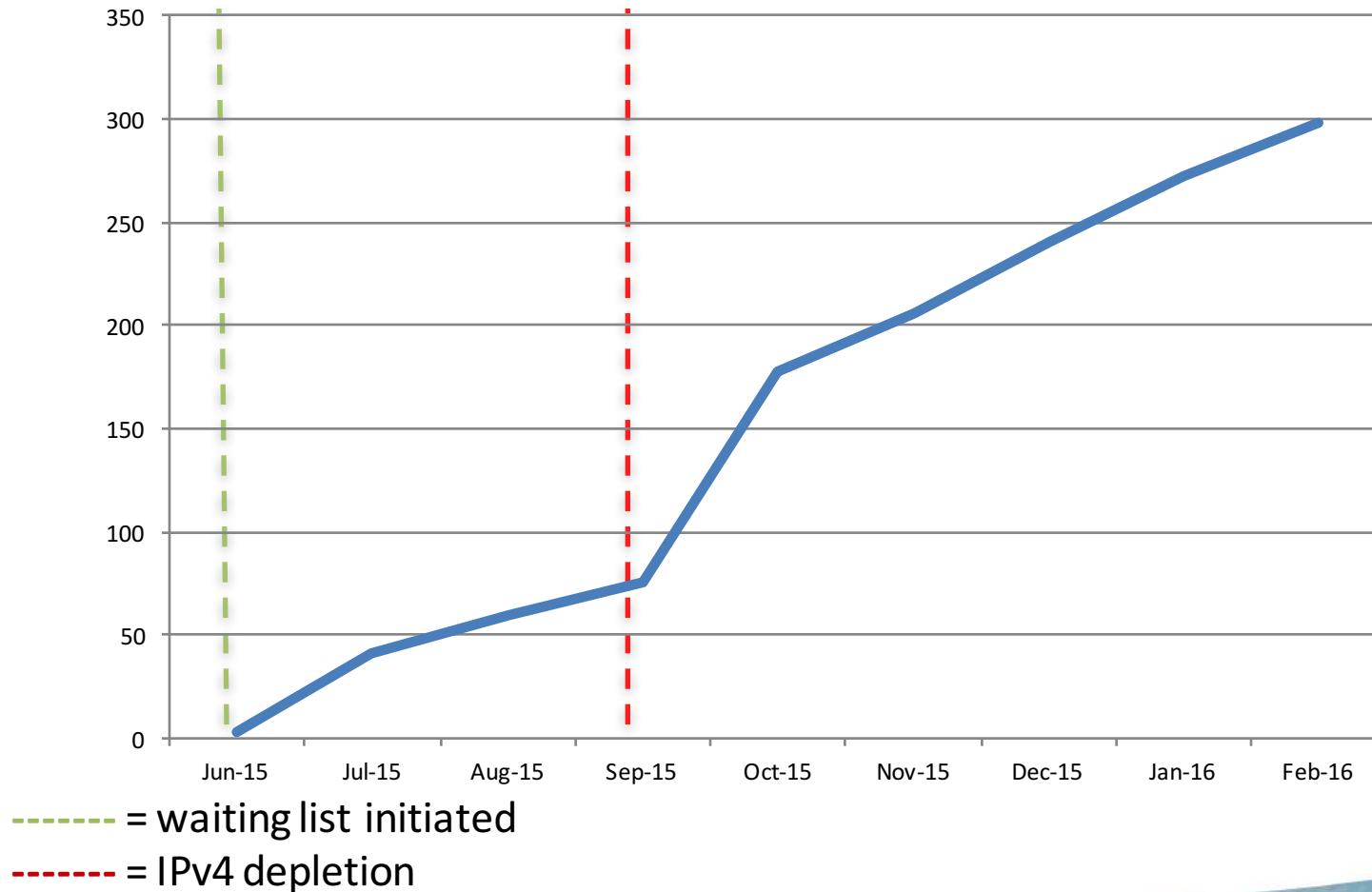
- IPv4 Waiting List
- IPv4 Transfers
- Dedicated IPv4 block to facilitate IPv6 deployment
- IPv6 Adoption

IPv4 Waiting List

- Policy enacted first time ARIN did not have a contiguous block of addresses of sufficient size to fulfill a qualified request
 - Must qualify under current ARIN policy and request to be added to the list
 - Maximum approved size determined by ARIN
 - Minimum acceptable size specified by requester
 - One request per org on the list at a time
 - Limit of one allocation or assignment every 3 months
- Waiting List published on ARIN's web site
 - Approximately /12 needed to fill all pending requests

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

IPv4 Waiting List Growth

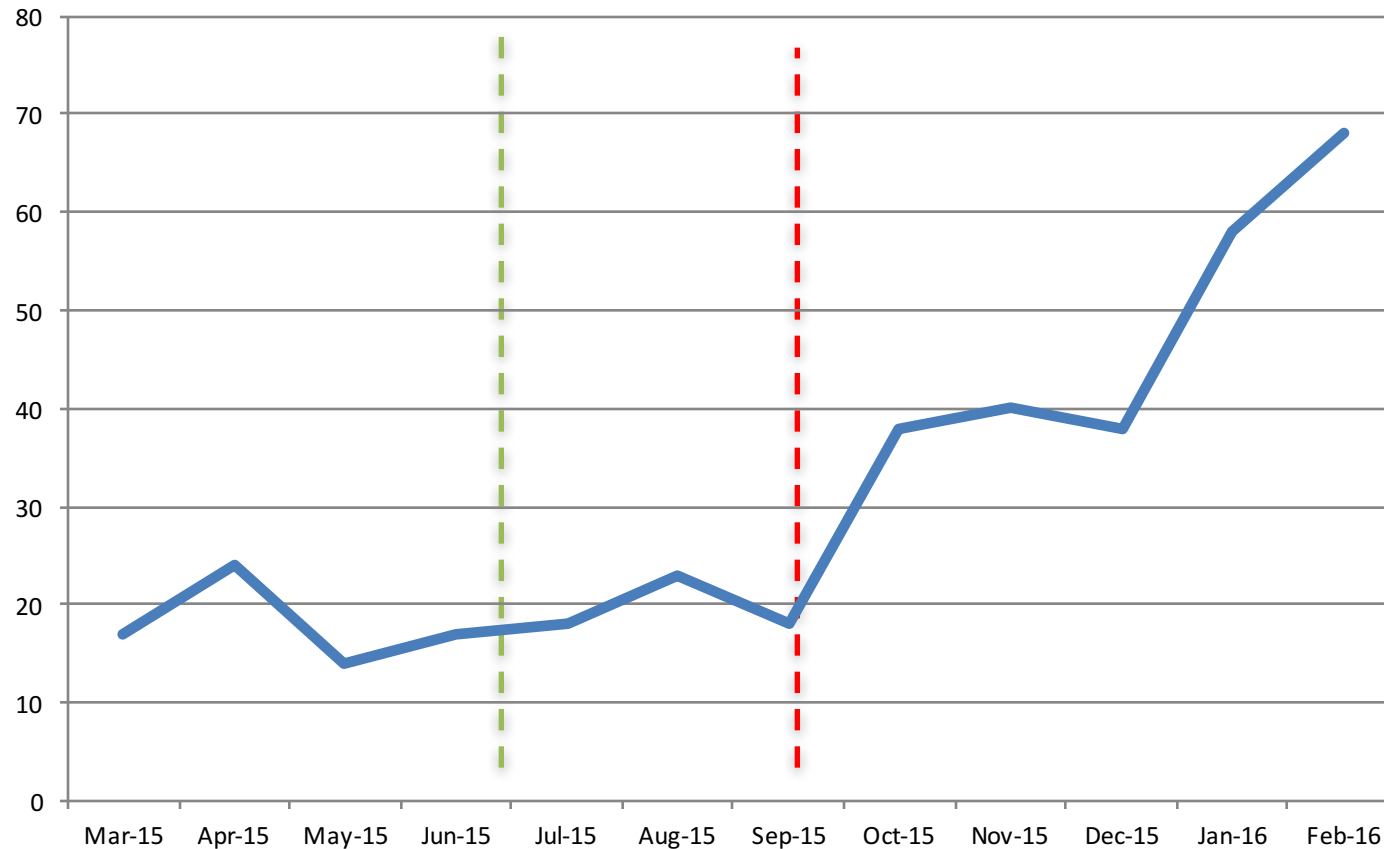


Transfers of IPv4 Addresses

3 ARIN Transfer Policies Available:

- Mergers and Acquisitions (NRPM 8.2)
 - Traditional transfer resulting from a merger, acquisition, or reorganization supported by legal documentation
- Transfers to Specified Recipients (NRPM 8.3)
 - IPv4 transfer from one organization to another that it specifies, supported by justified need (within region)
- Inter-RIR transfers to Specified Recipients (NRPM 8.4)
 - IPv4 market transfer from one organization to another that it specifies, supported by justified need (between regions)

8.3 Transfers Completed



----- = waiting list initiated
----- = IPv4 depletion

Reserved IPv4 Block for IPv6 Deployment Requirements

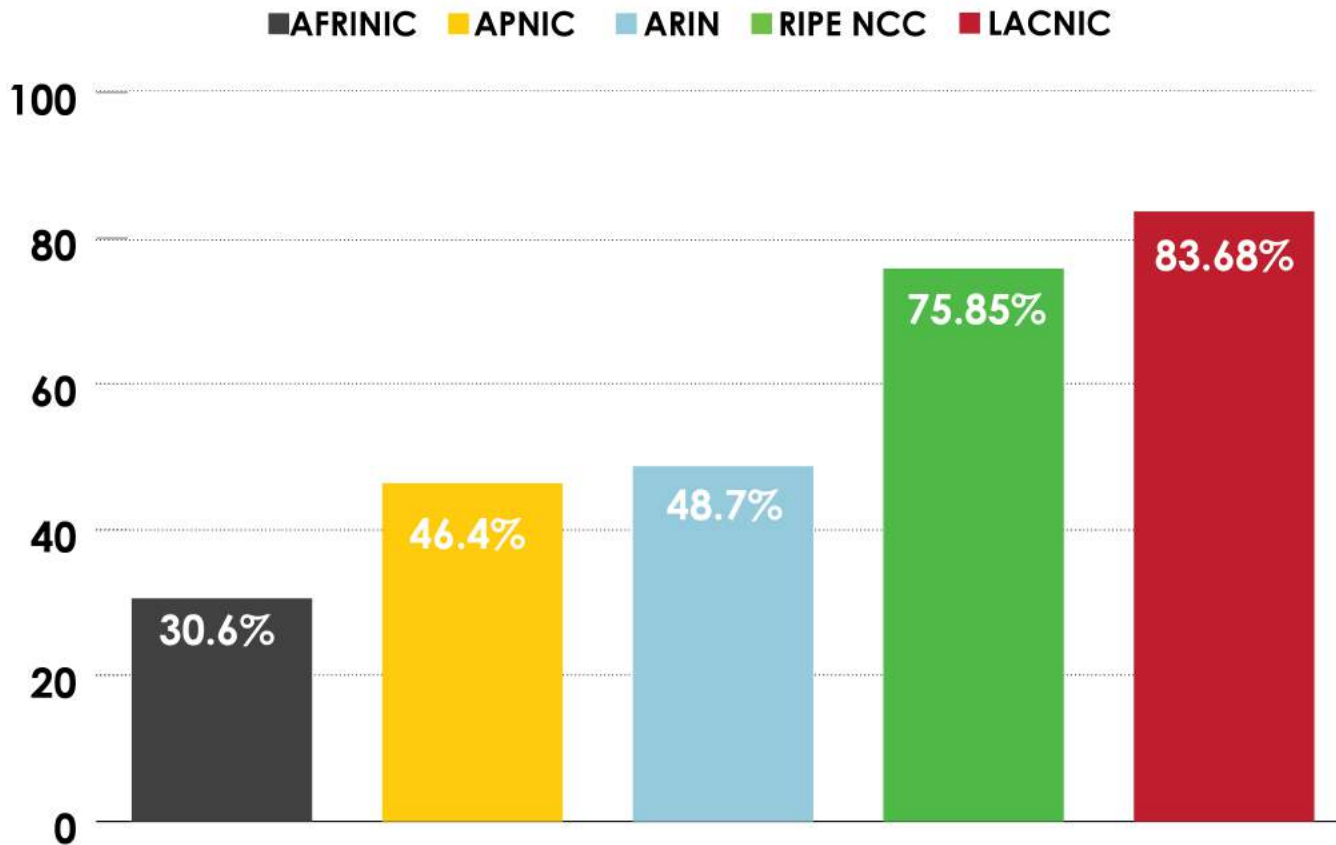
- Used to facilitate IPv6 deployment
- Need cannot be met from your existing ARIN IPv4 space
- Have an IPv6 block registered
- One /24 per organization every six months

Help! What Should I Do?

- Small networks can get a /24 once per six months for IPv6 transition
 - Cost likely to be lower than the transfer market
 - Reserved block likely to last several years
 - Can also have a request on the waiting list
- Larger networks can get pre-approved for 24 month need and seek IPv4 on the transfer market
 - Waiting list probably not a realistic option unless you can delay your IPv4 needs indefinitely
- All networks should begin IPv6 adoption

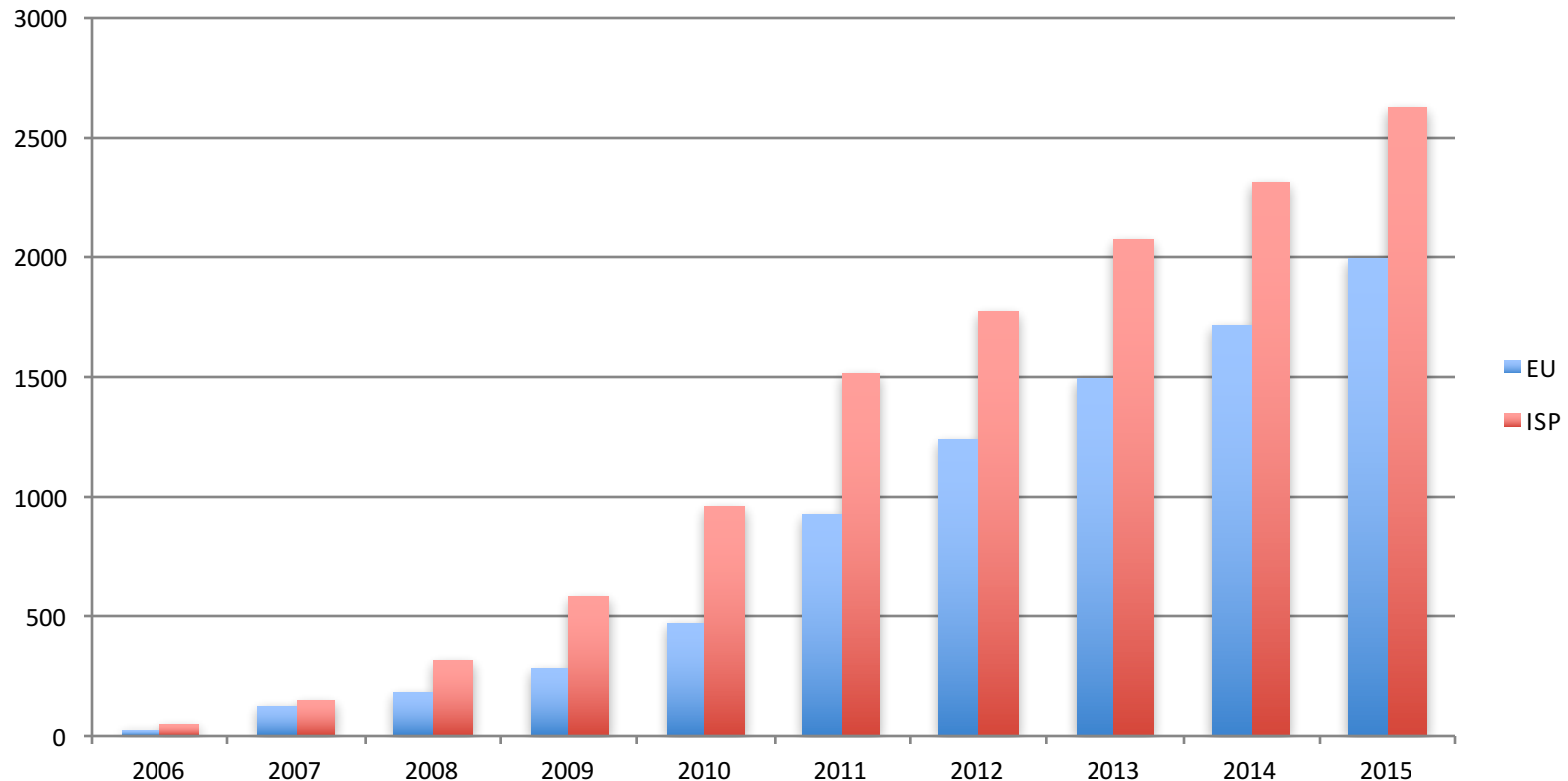
Global IPv6 Status

Percentage of Members with IPv6



IPv6 Blocks Issued Over Time

ARIN IPv6 Allocations and Assignments



Your IPv6 Checklist



- Get your IPv6 address space
- Set up IPv6 connectivity (native or tunneled)
- Configure your operating systems, software, and network management tools
- Upgrade your router, firewall, and other hardware
- Get your IT staff training
- Enable IPv6 on your website

Enable IPv6 on Your Website

WEBSITES THAT ARE FULLY

IPv6
ENABLED

MUST:



PUBLISH
AAAA RECORDS



BE REACHABLE OVER AN
IPV6 CONNECTION



SERVE DNS
OVER IPV6

Steps To Get Your Website IPv6-Enabled

TeamARIN.net/get6



ARIN's Policy Development Process (PDP)

- 1) Proposal – Someone in the community thinks a policy can be improved and documents
- 2) Draft Policy- Discussion on the list and possibly at meeting(s) - Is there really a problem? Is this a good solution?
- 3) Recommended Draft Policy - More discussion and presentation at meeting(s). Does community support turning this into policy?
- 4) Last call
- 5) Board Review
- 6) Staff Implementation (NRPM)

If you submit a proposal, you can participate further, or let the ARIN process “shepherd” it through the steps

How Can You Get Involved in the PDP?

Two ways to learn and be heard

1. Public Policy Mailing List - open
2. Public Policy Consultations/Meetings - open
 - ARIN meetings (April and October)
 - ARIN Public Policy Consultations at NANOG
 - Remote participation supported

Questions?

