



ARIN Update

NANOG 55

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2012 Focus

- **IPv4 Depletion & IPv6 Uptake**
 - Developing, adapting, and enhancing processes and procedures
 - IPv4 Depletion Plan
 - Continuing IPv6 outreach
 - IPv4 Transfers
- **Continued development and integration of web-based system (ARIN Online)**
- **RPKI deployment**
- **Continued participation in Internet Governance forums**

Current IPv4 Inventory



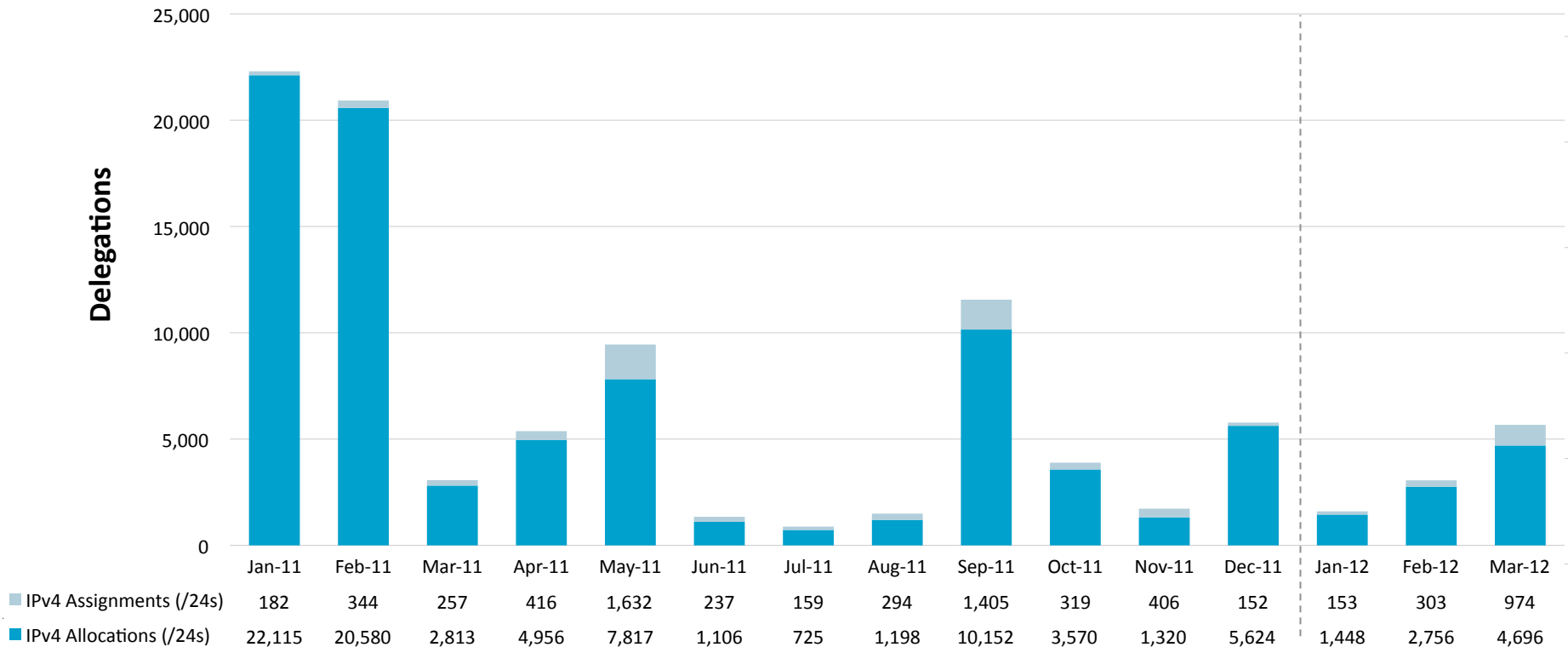
4.37 /8 equivalents
in the pool of
“available addresses”

~4.82 /16 equivalents in the “RRH” bucket
(RRH = returned, revoked, held)

1 /10 reserved

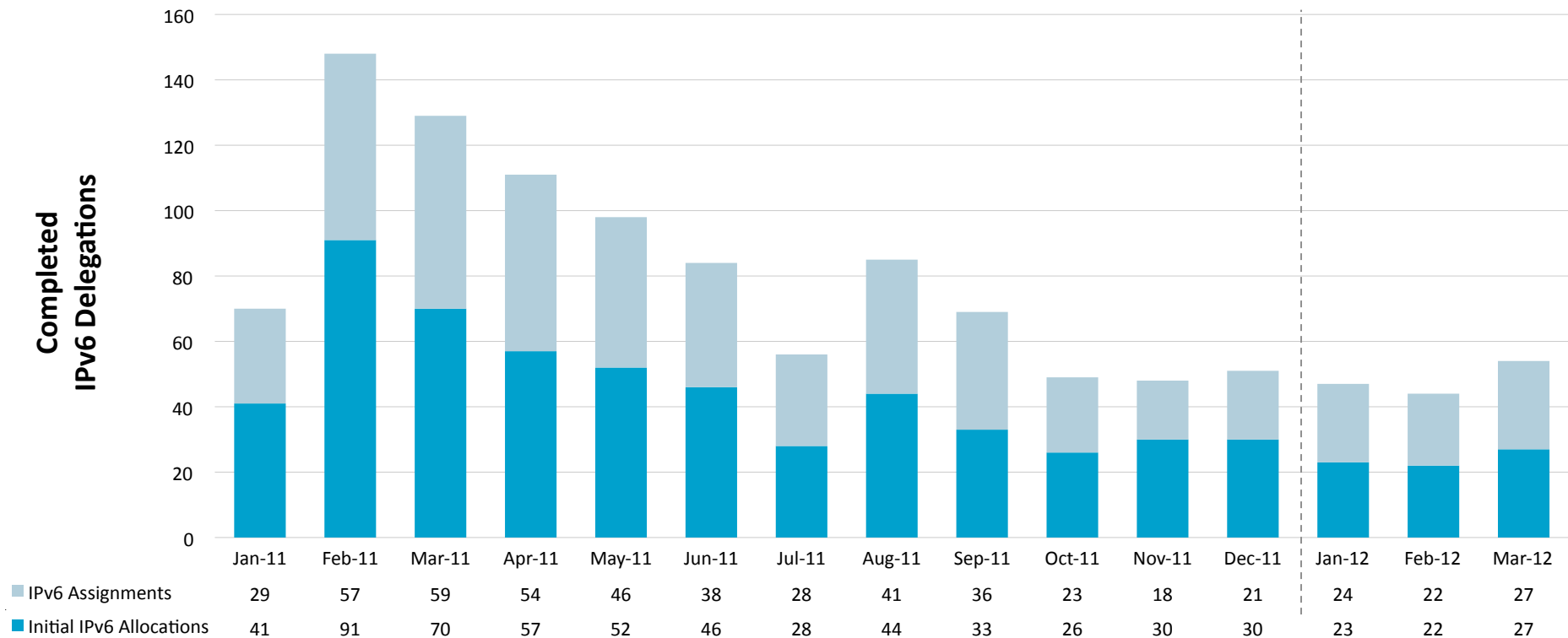
- For NRPM 4.10 “Dedicated IPv4 block to facilitate IPv6 Deployment”

2011 & 1st Qtr 2012 IPv4 Address Allocations and Assignments



****Feb 3, 2011- IANA depletion**

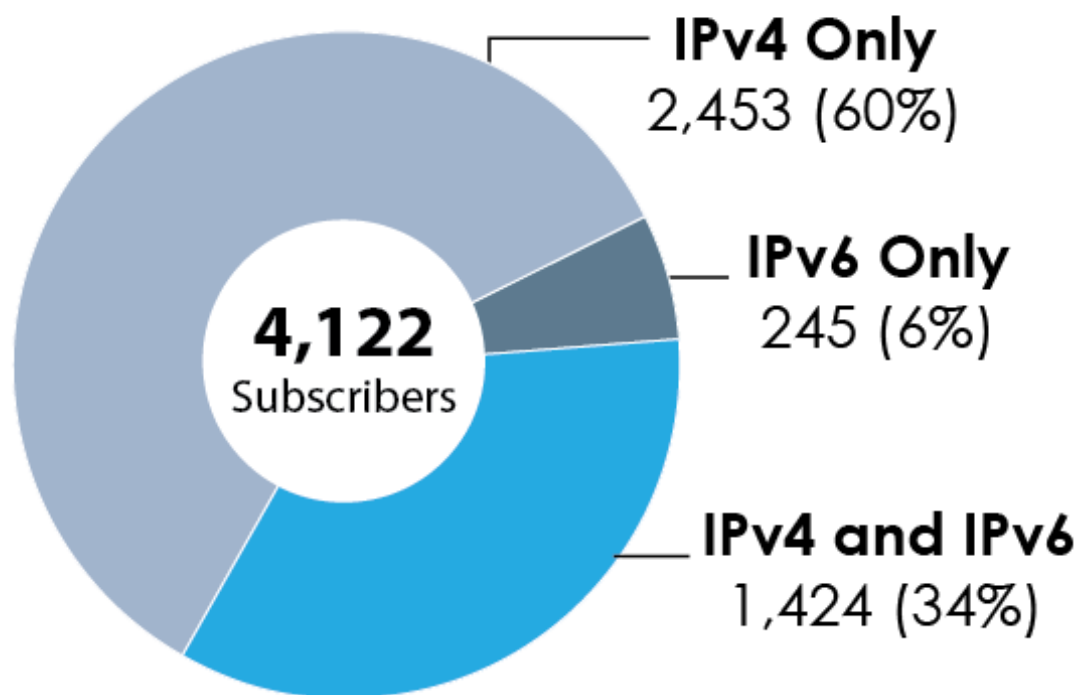
2011 & 1st Qtr 2012 IPv6 Address Allocations and Assignments



****Feb 3, 2011- IANA depletion**

ISP Members with IPv4 and IPv6

Total of 4,122 ISP Subscriber Members



*as of 31 March 2012

New Number Policy

ARIN-2011-9 (Global Proposal): Global Policy for post exhaustion IPv4 allocation mechanisms by the IANA

- Adopted by ICANN Board
- RIRs may return address space to IANA
- IANA may allocate address space back to the RIRs

Draft Policies Moving Forward

- **ARIN-2011-1: ARIN Inter-RIR Transfers**
 - Allows transfers to/from the ARIN region
 - The two RIRs must have compatible transfer policy; transfer based on need
 - [AC recommended adoption](#)
- **ARIN-2012-1: Clarifying requirements for IPv4 transfers**
 - Adds criteria for 8.3 Specified Transfers and inter-RIR transfers
 - Cannot have gotten space from ARIN in previous 12 months or get additional space for 12 months after transfer
 - [AC recommended adoption](#)
- **ARIN-2012-3 ASN transfers**
 - Adds ASNs to specified transfers
 - [AC recommended adoption](#)

Proposals

- **Under Discussion**

- ARIN-2012-2: IPv6 Subsequent Allocations Utilization Requirement

- Allows ISPs to request more IPv6 address space as they increase their number of sites

- **6 new proposals**

- ARIN-prop-171 Section 8.4 Modifications: ASN and legacy resources
 - ARIN-prop-170 Transfer of Number Resources in case of Bankruptcy
 - ARIN-prop-169 Cleanup IPv6 section 6.5.7
 - ARIN-prop-168 Promote 4byte ASN Usage
 - ARIN-prop-167 Removal of Renumbering Requirement for Small Multihomers
 - ARIN-prop-166 Clarify /29 Assignment Identification Requirement

Text available at:

<https://www.arin.net/policy/proposals/>

Public Facing Development Efforts

- **Cost Reductions**
 - Transitioning from Oracle to PostgreSQL
 - Moving from Redhat JBoss to JBoss Community Edition
- **ARIN Online**
 - Billing integration initiated
- **Implemented WhoWas Service**
 - Subject to Terms of Service
- **IPv4 Runout Tasks**

A Couple of Quick Points

- RPKI
- Whois-RWS

Definitions for RPKI

- **Hosted**
 - Managed by RIR
 - Keys held by RIR
 - Generates Repository for all Hosted Internet Resource Holders and ARIN
- **Delegated**
 - Managed by ISP
 - Keys held by ISP
 - Only hold information for Resources of that ISP and perhaps Downstreams
 - Uses Up/Down to notify changes made to resources

RPKI Status

- Working on Hosted Solution
 - Anticipate 2012 deployment
- Move to a programmable HSM has added an extra year of development to satisfy ARIN Board requirements
- Once Hosted Solution is deployed, we will work on a delegated solution
- Participating with the other RIRs on a single global trust anchor with ICANN
- Participating with the other RIRs on a RPKI transfer process that mirrors an emerging global transfer policy

Can You Play with RPKI Today?

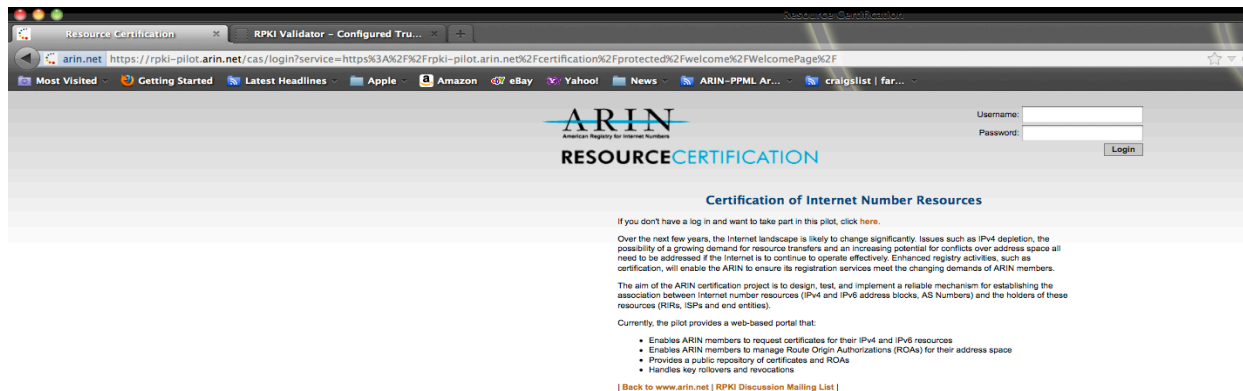
- **Yes! You can Provision your ROAs within ARIN's Region**
- **Steps to make RPKI work**
 - Register with ARIN's Pilot <https://rpki-pilot.arin.net>
 - Create ROAs
 - Pull down a validator
 - Compare the results with the routes you receive
 - Look at the results

ARIN's RPKI Pilot

- **Available since June 2009**
 - ARIN-branded version of RIPE NCC software
 - NOT integrated into ARIN Online
 - Data will NOT transfer to Production
- **55+ organizations participating**
- **Allows you to Experiment NOW**
 - Create ROA's
 - Use a Validator and other tools to match your data from the Pilot with emerging RPKI repositories from the various RIRs and others
- **ARIN's Pilot Trust Anchor Locator (TAL) is now easily found**
 - <https://www.arin.net/resources/rpki.html>

RPKI Pilot

- Request your account
 - <https://rpki-pilot.arin.net>

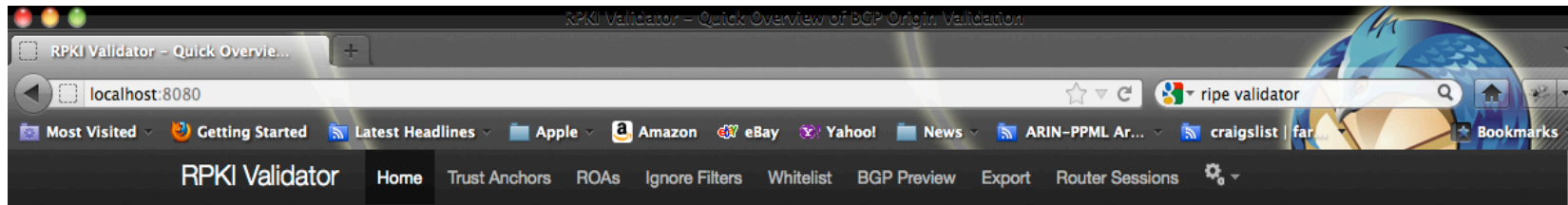


- Receive an user id, password via email
- Play with a snapshot of your resources through the pilot

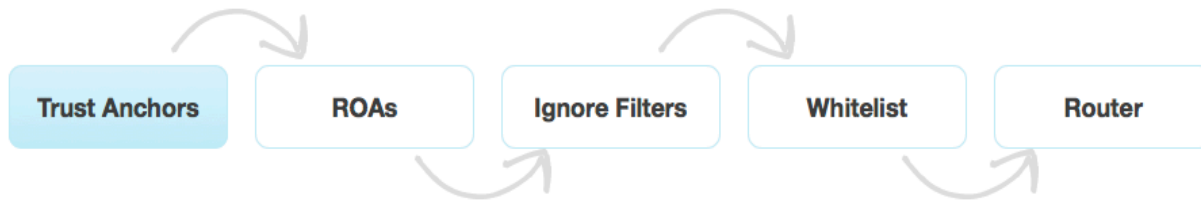
RIPE's Validator

- Integrates all the RIR's and Routing Data (from RIPE's RIS database)
- Find validator at top of page at:
 - <http://www.ripe.net/lir-services/resource-management/certification/tools-and-resources>
 - Go through a preview...

RIPE's Validator



Quick Overview of BGP Origin Validation



Feedback

Trust Anchors are the entry points used for validation in any Public Key Infrastructure (PKI) system. This validator is intended for the validation of Resource PKI (RPKI) systems. It is pre-configured with Trust Anchors for all the RIRs who are running such systems now.

If you would like to add or change the Trust Anchors that are used by this validator, please see the README.txt file for details.



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ARIN
American Registry for Internet Numbers

RIPE's Validator

BGP Preview

This page provides a **preview** of the likely rpk validity states your routers will associate with BGP announcements. This preview is based on:

- The [RIPE NCC Route Collector information](#) that was last updated 3 hours and 8 minutes ago.
- BGP announcements that are seen by 5 or more peers.
- Validation rules defined in the [IETF standard](#).
- The validated ROAs found by this validator after applying your filters and additional whitelist entries.

Please note that the actual validation of announcements is done in your routers and that the announcements that your routers see may differ from the announcements used here.

Show entries Search:

ASN	Prefix	Validity
16086	78.27.64.0/18	VALID
8426	78.40.32.0/21	VALID
44486	78.41.88.0/24	VALID
44486	78.41.89.0/24	VALID
44486	78.41.90.0/24	VALID
44486	78.41.91.0/24	VALID
42187	78.41.92.0/22	VALID
35492	78.41.112.0/21	VALID
28878	78.108.128.0/20	VALID
50880	78.110.0.0/20	VALID

[First](#) [Previous](#) [55](#) [56](#) [57](#) [58](#) [59](#) [Next](#) [Last](#) Showing 561 to 570 of 6,913 entries (filtered from 427,736 total entries)

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RIPE's Validator

The screenshot shows the RIPE Validator web application interface. The browser address bar displays 'localhost:8080/roas'. The page title is 'RPKI Validator - Validated ROAs'. The navigation menu includes 'Home', 'Trust Anchors', 'ROAs', 'Ignore Filters', 'Whitelist', 'BGP Preview', 'Export', and 'Router Sessions'. The main heading is 'Validated ROAs'. A light blue box contains the text: 'Validated ROAs from APNIC RPKI Root, ARIN Test Lab, AfriNIC RPKI Root, LACNIC RPKI Root, RIPE NCC RPKI Root.' Below this, there is a search bar with 'ARIN' entered and a 'Show 10 entries' dropdown. A table displays the results with columns: ASN, Prefix, Maximum Length, and Trust Anchor. The table lists 10 entries, all with 'ARIN Test Lab' as the Trust Anchor. At the bottom, there are pagination controls (First, Previous, 1, 2, 3, 4, 5, Next, Last) and a status message: 'Showing 1 to 10 of 76 entries (filtered from 2,052 total entries)'. The footer includes the RIPE NCC logo and copyright information: 'Copyright ©2009-2012 the Réseaux IP Européens Network Coordination Centre RIPE NCC. All rights restricted. Version 2.0.4'.

RPKI Validator - Validated ROAs

localhost:8080/roas

Most Visited Getting Started Latest Headlines Apple Amazon eBay Yahoo! News ARIN-PPML Ar... craigslist | far... Bookmarks

RPKI Validator Home Trust Anchors **ROAs** Ignore Filters Whitelist BGP Preview Export Router Sessions

Validated ROAs

Validated ROAs from APNIC RPKI Root, ARIN Test Lab, AfriNIC RPKI Root, LACNIC RPKI Root, RIPE NCC RPKI Root.

Show 10 entries Search: ARIN

ASN	Prefix	Maximum Length	Trust Anchor
1	10.0.1.0/24	24	ARIN Test Lab
1	192.168.1.0/24	24	ARIN Test Lab
21	10.4.0.0/16	16	ARIN Test Lab
22	10.255.1.0/24	24	ARIN Test Lab
174	204.75.169.0/24	24	ARIN Test Lab
174	204.75.170.0/24	24	ARIN Test Lab
174	2620:100:f000::/44	48	ARIN Test Lab
234	10.4.0.0/16	16	ARIN Test Lab
1234	10.5.0.0/16	16	ARIN Test Lab
2386	204.127.128.0/17	24	ARIN Test Lab

First Previous 1 2 3 4 5 Next Last

Showing 1 to 10 of 76 entries (filtered from 2,052 total entries)

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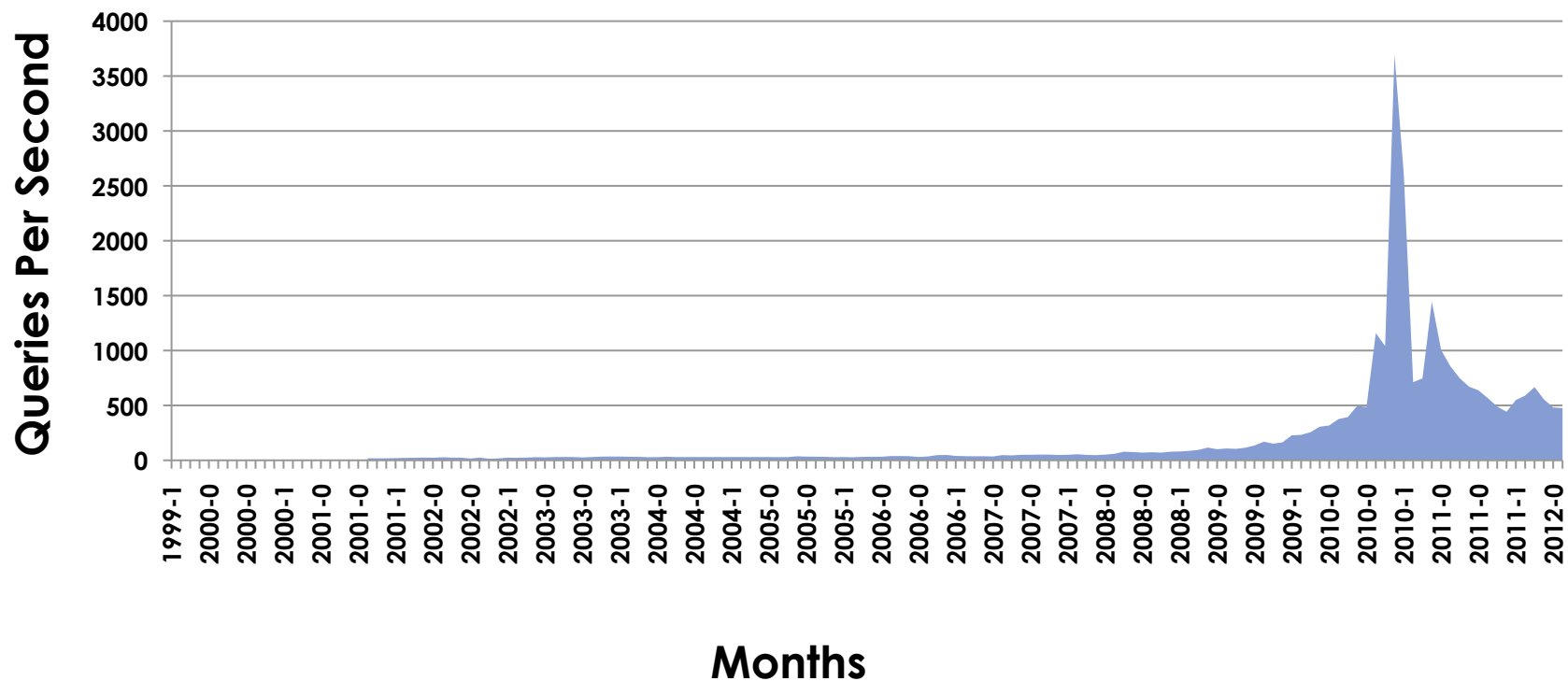
1 + 2

Whois-RWS Traffic Loads

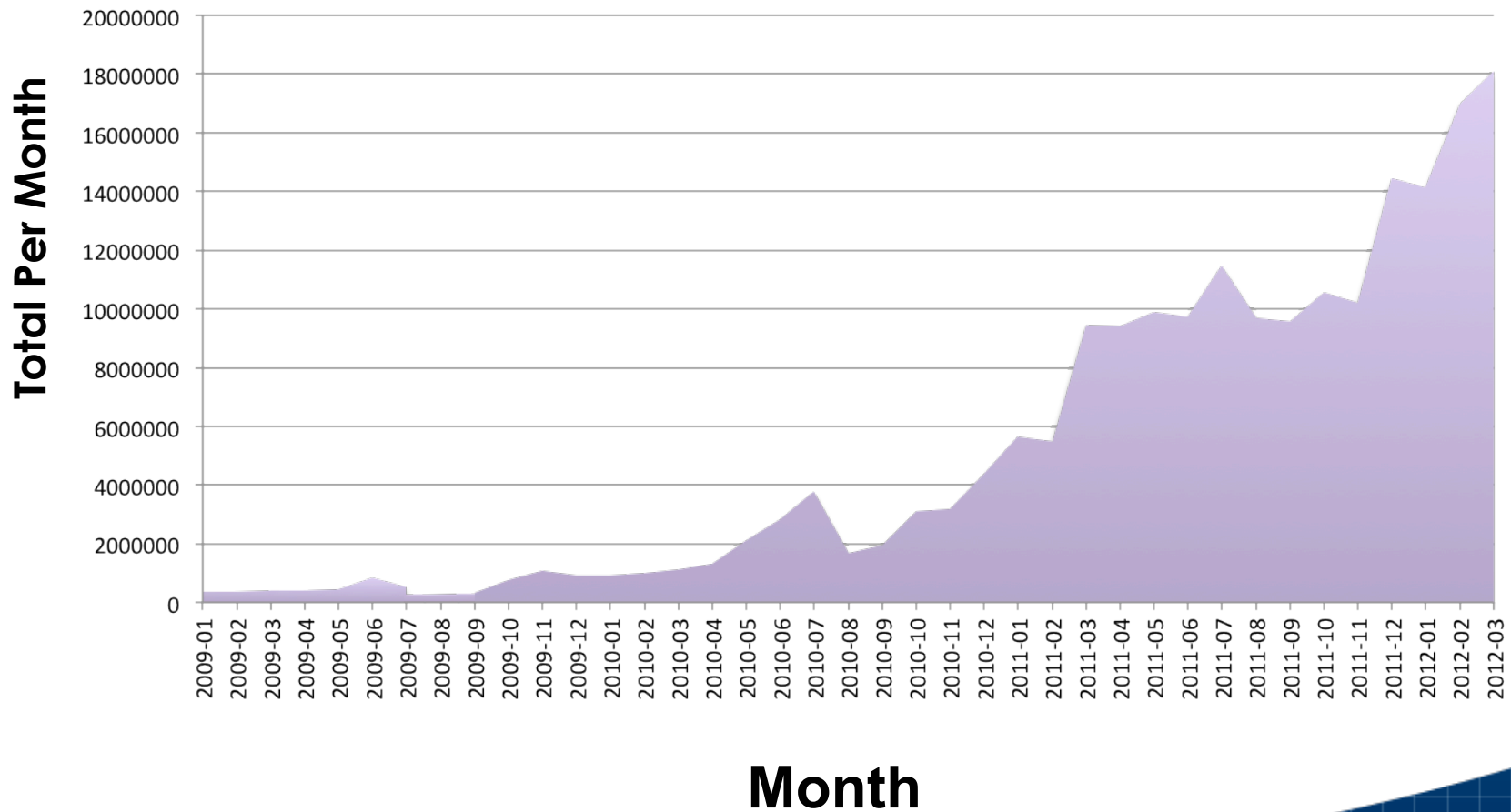
- **Have had a pretty good run**
 - Multiple highs in 2010 and 2011
- **Today**
 - Running “normally” now at 475 queries per second
 - RESTful calls have overtaken port 43 calls
 - 1.8 Billion RESTful calls for March
 - 1.2 Billion Port 43 queries

Whois-RWS Statistics

Queries on Port 43



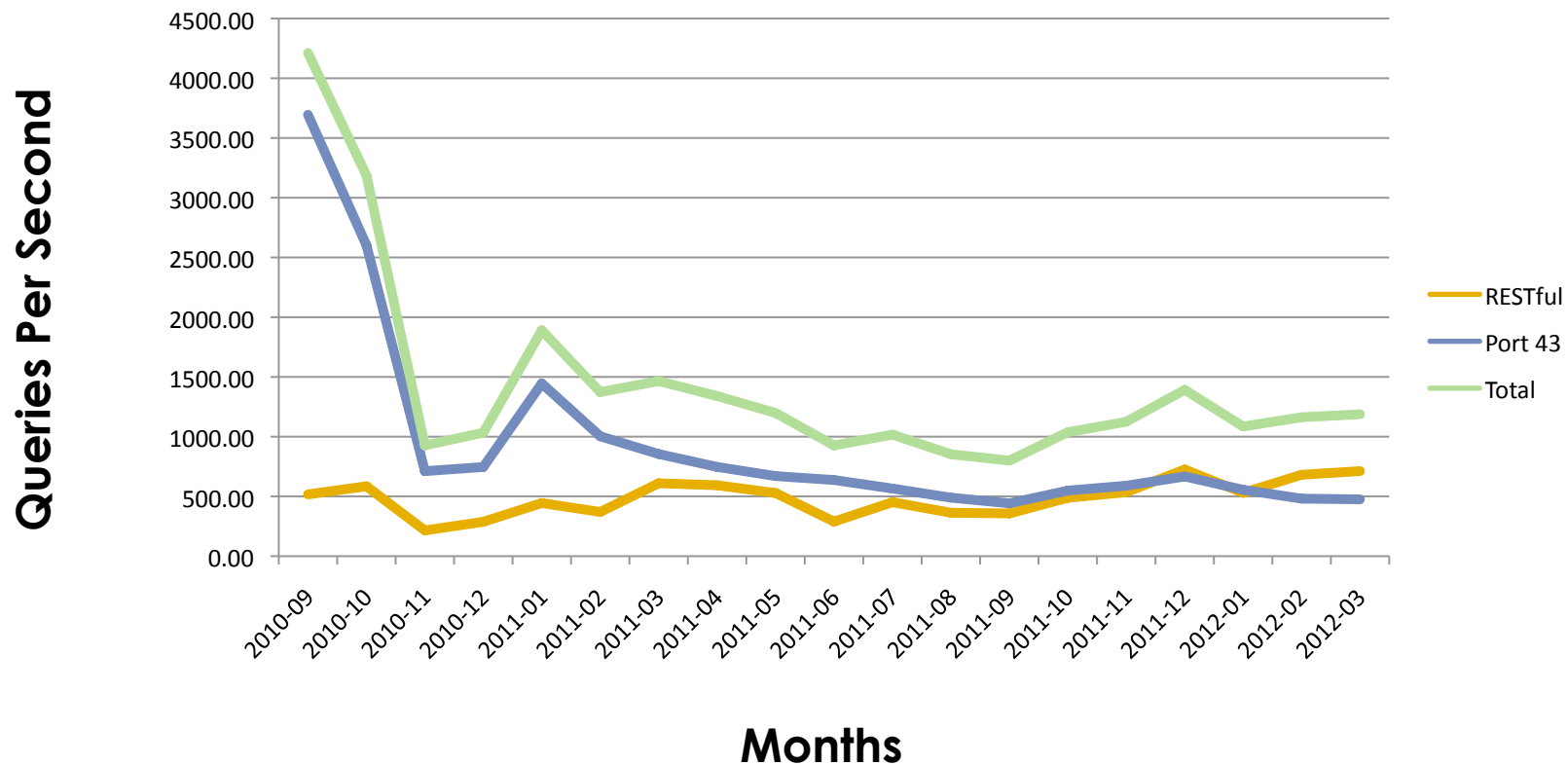
Whois-RWS – IPv6



Now this is Interesting

- WHOIS protocol (tcp port 43) used for directory lookups
 - Firmly Established for NIC-like providers
 - Clients everywhere
- Introduced a new RESTful directory service in Sept 2010
- RESTful calls have overtaken port 43 calls
 - 1.8 Billion RESTful calls for March
 - 1.2 Billion Port 43 queries

Whois-RWS Statistics Queries



Upcoming ARIN Meetings



Spring 2013 – *in progress*



