



Engineering Report

Mark Kosters

Staffing

- Tim Christensen
QA Manager
 - **Passed away August 5, 2014**
 - **Worked for ARIN for 14 years**
 - DBA
 - System Architect



Staffing

- **Operations**
 - 6 operations engineers + 2 managers (One vacancy in operations)
- **Development**
 - 8 programmers + manager
 - New Software Integration head taken from engineering
 - New hire – filled vacancy created by transfer to SI
- **Software Integration formerly known as Quality Assurance**
 - Leadership Change
 - 5 engineers, 1 contractor + manager
- **Project Management**
 - 1
- **CTO**
 - 1

Accomplishments since ARIN 33

- **DNS (and DNSSEC) now have near-real time updates**
 - TTL's added for NS's and DS's
 - Hardening of signing infrastructure
- **DNSSEC enabled for ARIN's forward zones (and reverse)**
- **Shared tickets**
- **Display agreements associated with organizations**
- **User interface improvements for payment processing**
- **Transfers**
 - 8.3 Released
 - 8.2 and 8.4 underway
- **Movement away from ARIN HQ to Colo for back office production underway**
- **Movement from EMC to NetApp underway**

Accomplishments Cont...

- **Fault Tolerance Improvements**
 - **More efficient system backups**
 - **Moving Production Systems from ARIN HQ to Colo**
 - **Moving backend services to physical hardware when merited**
- **Corporate Help Desk and IT Support**
- **ARIN Member Meeting Support**
- **Care and Feeding of Servers & Network**
- **OT&E**

OT&E

- **Operational Test & Evaluation**
 - Place to test code
 - Place to test process
 - All services now under ote.arin.net
- **Replicated Core services**
 - Reg-RWS (provisioning API)
 - Whois-RWS (directory API)
 - Web Interface
 - RPKI suite (up/down and hosted)
- **Participation**
 - 30 new requests since February
 - 152 networks registered to access OT&E

YTD Efforts Cont...

- **IETF Participation**
 - SIDR (RPKI), WEIRDS (RDAP)
- **ICANN Participation**
 - SSAC
 - RSSAC
 - Technical Advisory Group

Operational Challenges

- UPS incident
- DOS attacks
- ISP availability

UPS Incident

- ARIN HQ is in a cheap location – however suffers from
 - **Lack of power diversity**
 - **Lack of connectivity options**
- ARIN hosts the provisioning systems at HQ
 - **Mail, web, and reg-rws**
 - **Long running project to move gear out to colocation site**
- UPS outage
 - **Complicated and long-running fix**
 - **Resulted in “almost” new UPS**
- Lessons learned
 - **We did a pretty good job recovering gear that had not suffered power cycles for a long time**
 - **Renewed emphasis on moving to colo for production services**

Other Operational Concerns

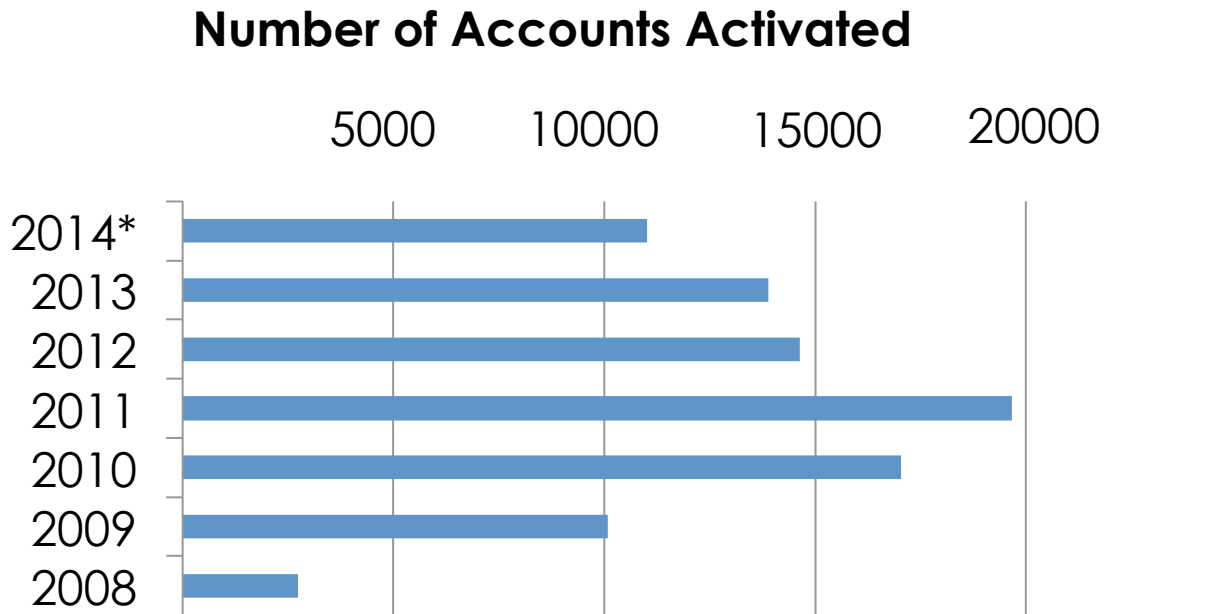
- Periodic DOS attacks
 - **Hitting our provisioning network**
 - **Need to implement DOS mitigation with upstreams**
- ISP Availability
 - **Multiple connectivity outages with ARIN HQ**
 - Unannounced maintenance
 - Fiber availability
 - **Issues with west coast PFS site**

Operational Highlights

- 100% uptime on our public facing sites over the past 6 years
- Services include
 - **Whois**
 - **Whois-RWS**
 - **DNS**
 - **Mailing lists**
 - **FTP**
- Will do the same with RPKI

ARIN Online Usage

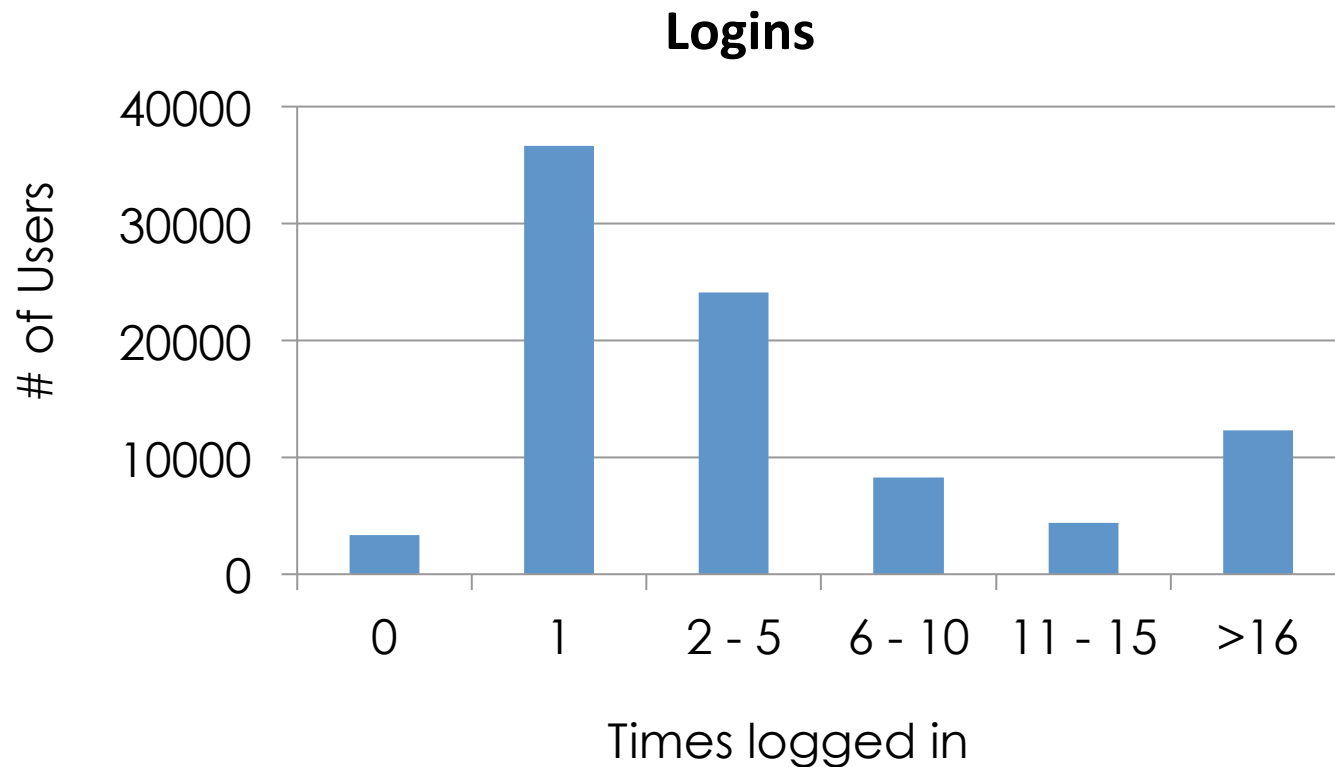
- **81,984 accounts activated since inception through Q3 of 2014**



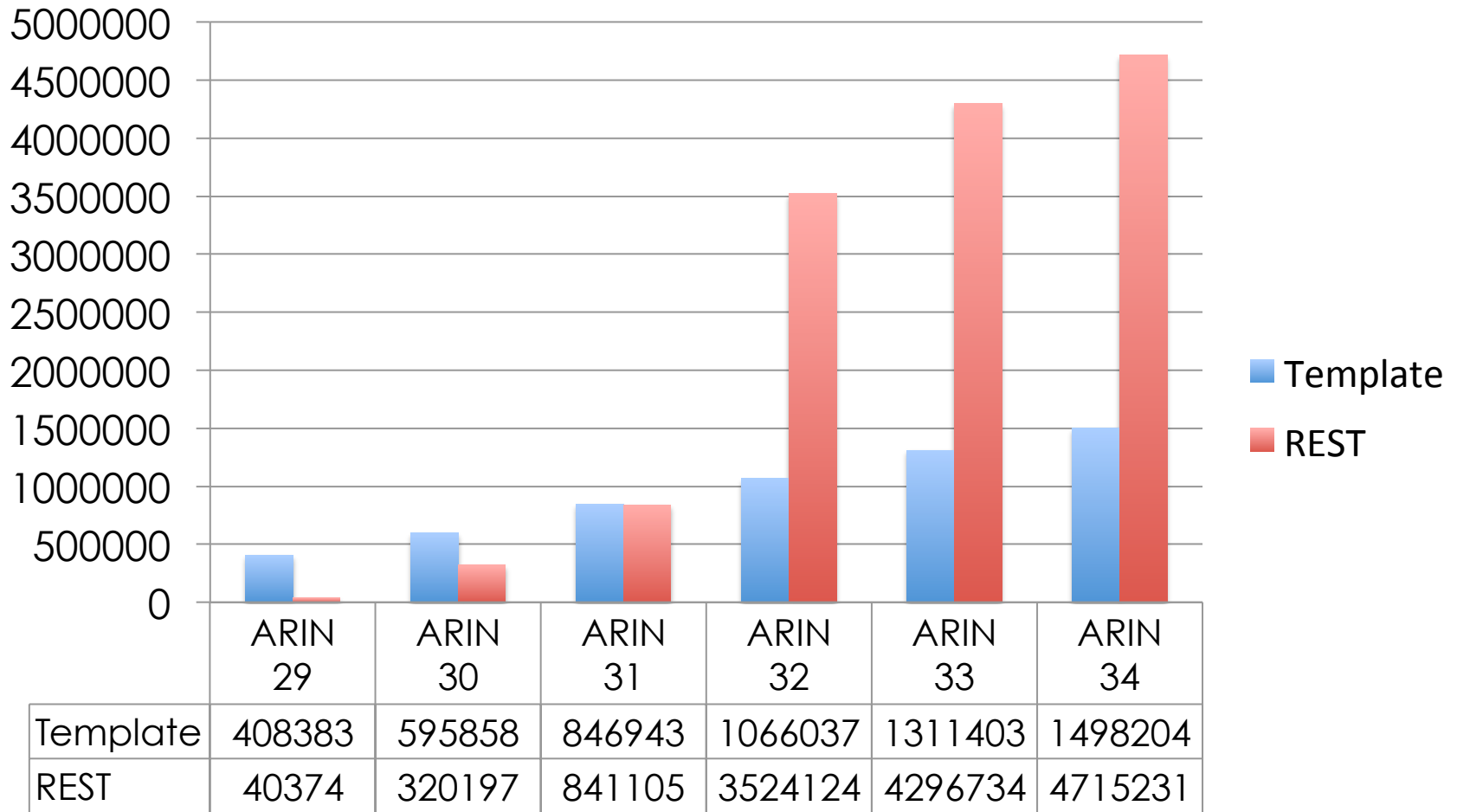
* Through Q3 of 2014

Active Usage of ARIN Online

- Logins from inception through Q3 of 2014



Reg-RWS Transactions



Reports Via REST

- Requests since inception

	ARIN 33	ARIN 34
Associations	176	9,445
Reassignments	25,219	69,320
WhoWas	253,135	382,619

DNSSEC

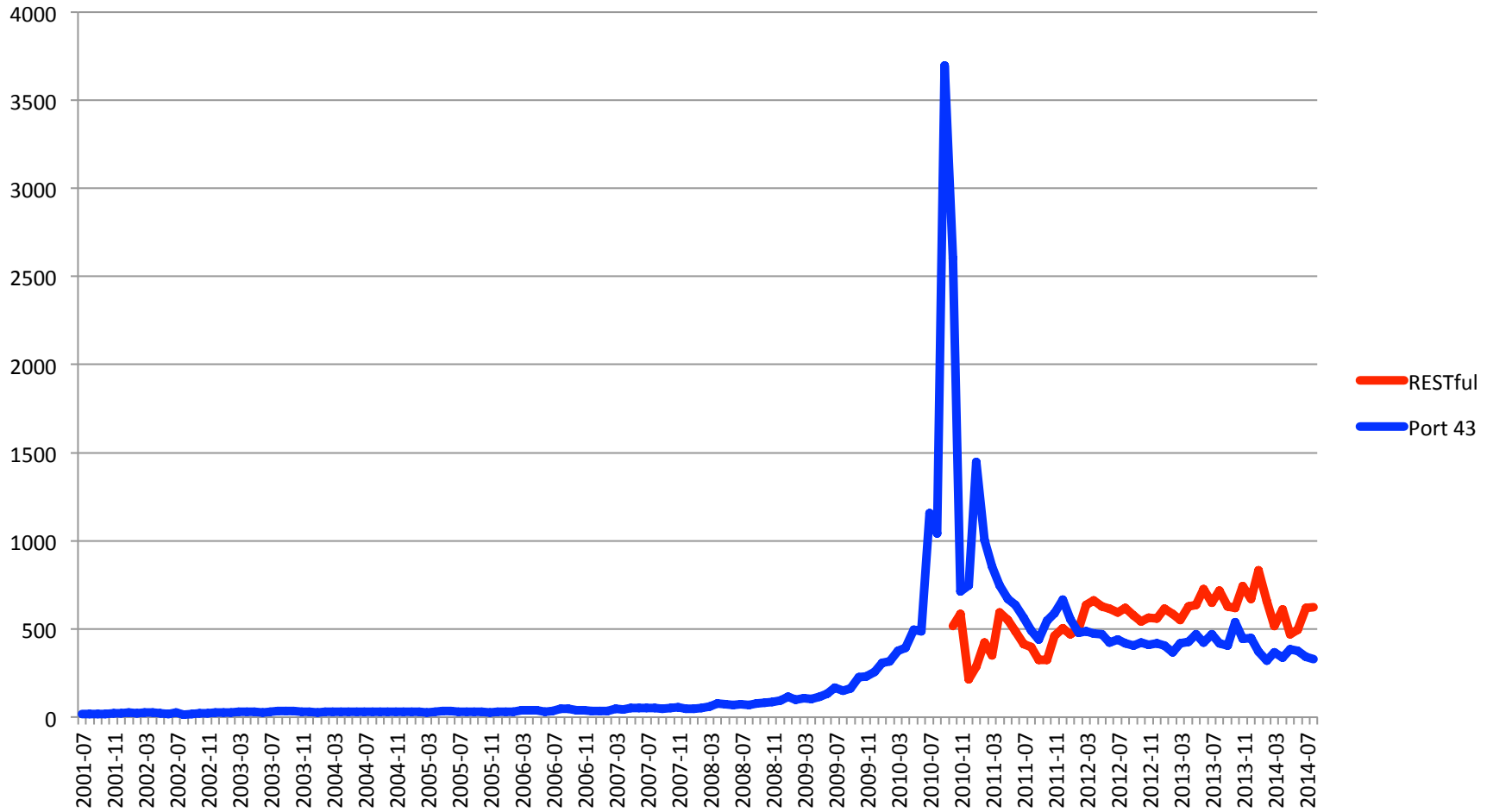
ARIN 34

DNSSEC Secured Zones	648
Number of Orgs with DNSSEC	94
Total Number of Delegations	552,329

RPKI Usage

	ARIN XXX	ARIN XXXI	ARIN XXXII	ARIN33	ARIN34
RPAs Signed	27	72	130	162	208
Certified Orgs		47	68	108	153
ROAs	19	60	106	162	239
Covered Resources	30	82	147	258	332
Web Delegated (REMOVED)		0	0	0	0
Up/Down Delegated			0	0	0

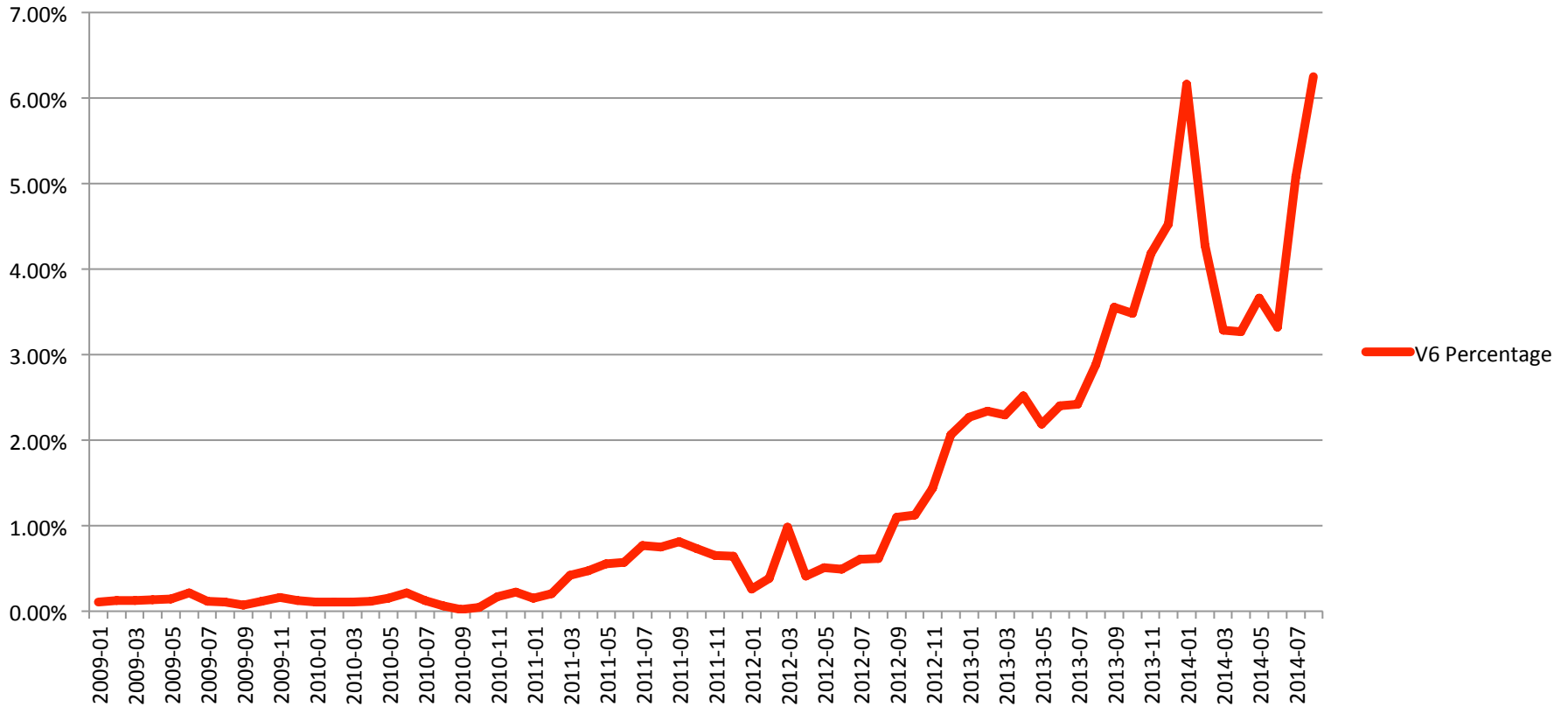
Whois Queries Per Second



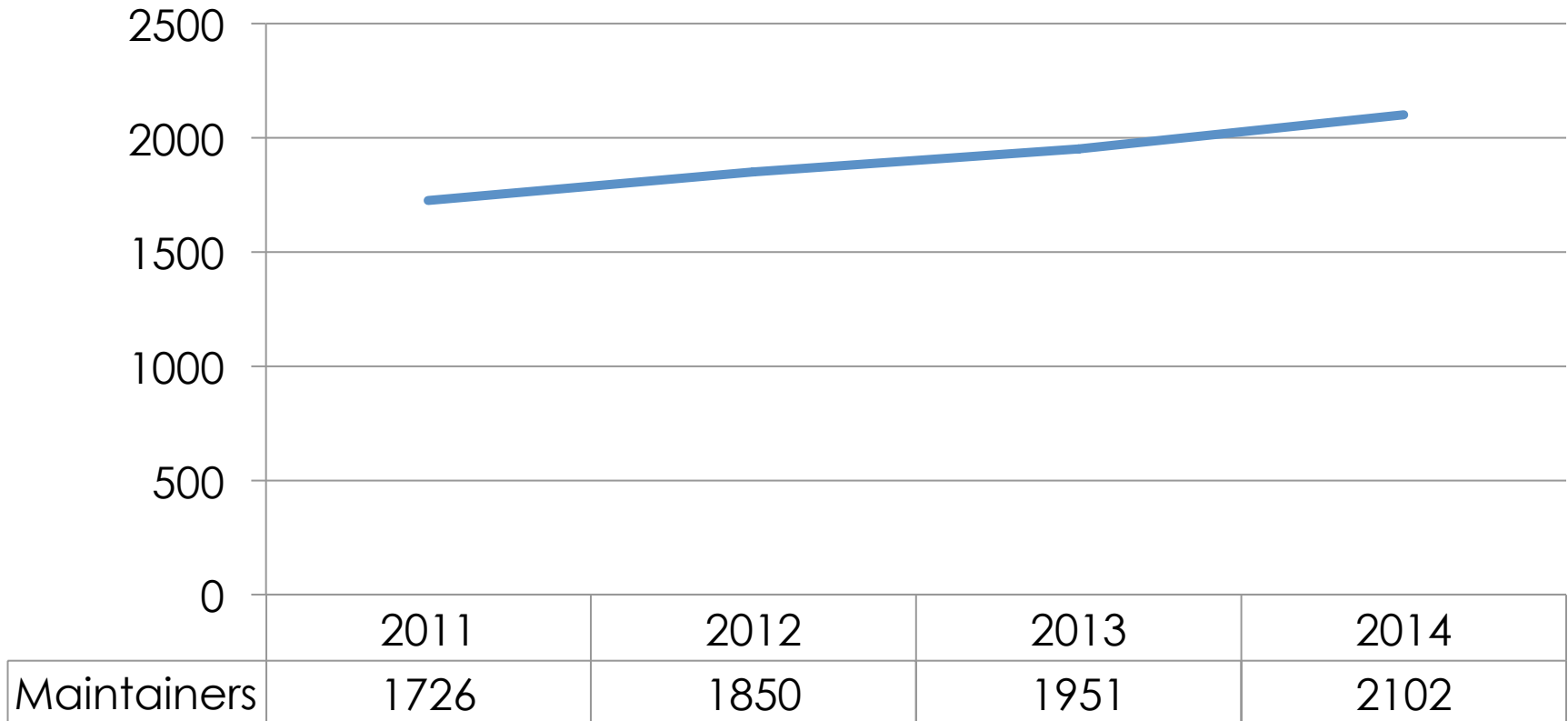
Whois via IPv6

Percentage of traffic over IPv6

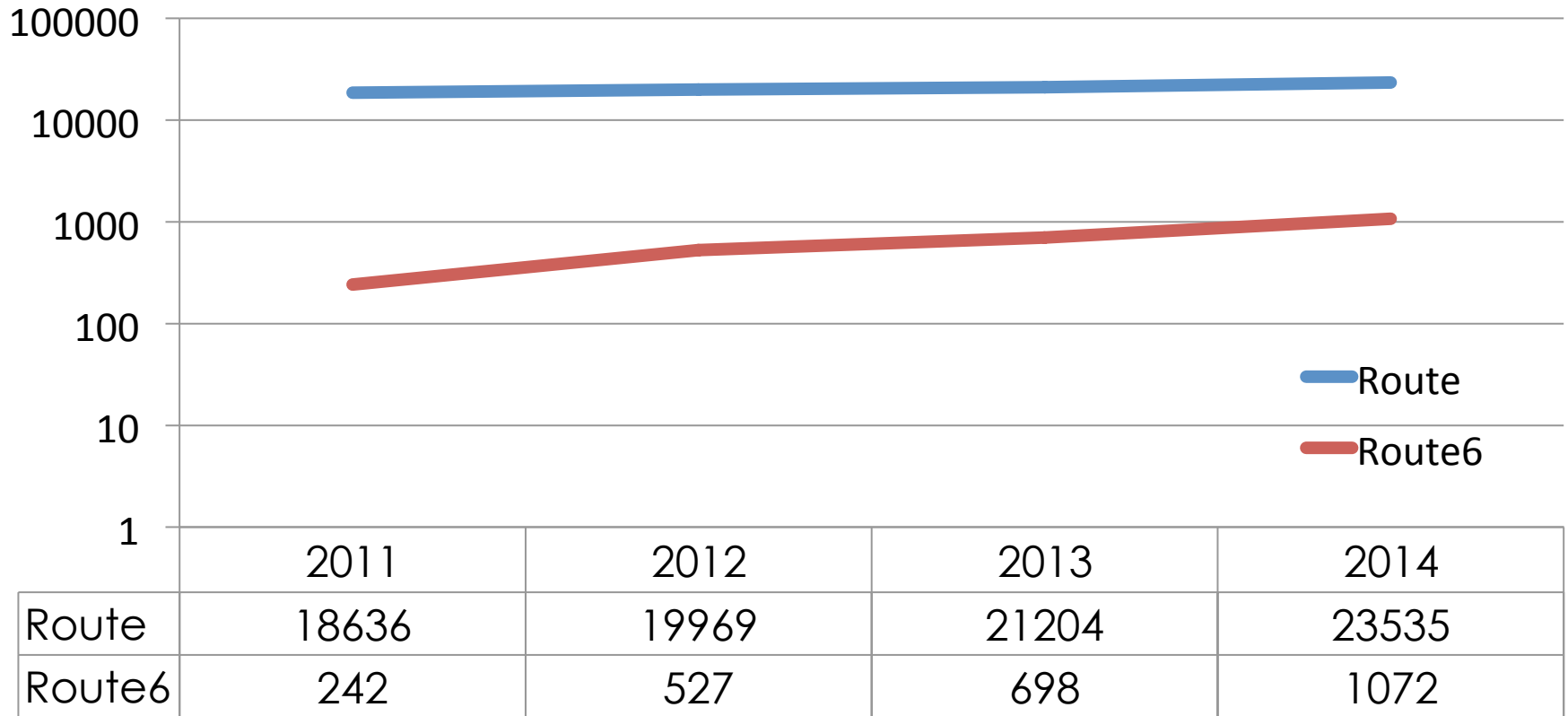
V6 Percentage



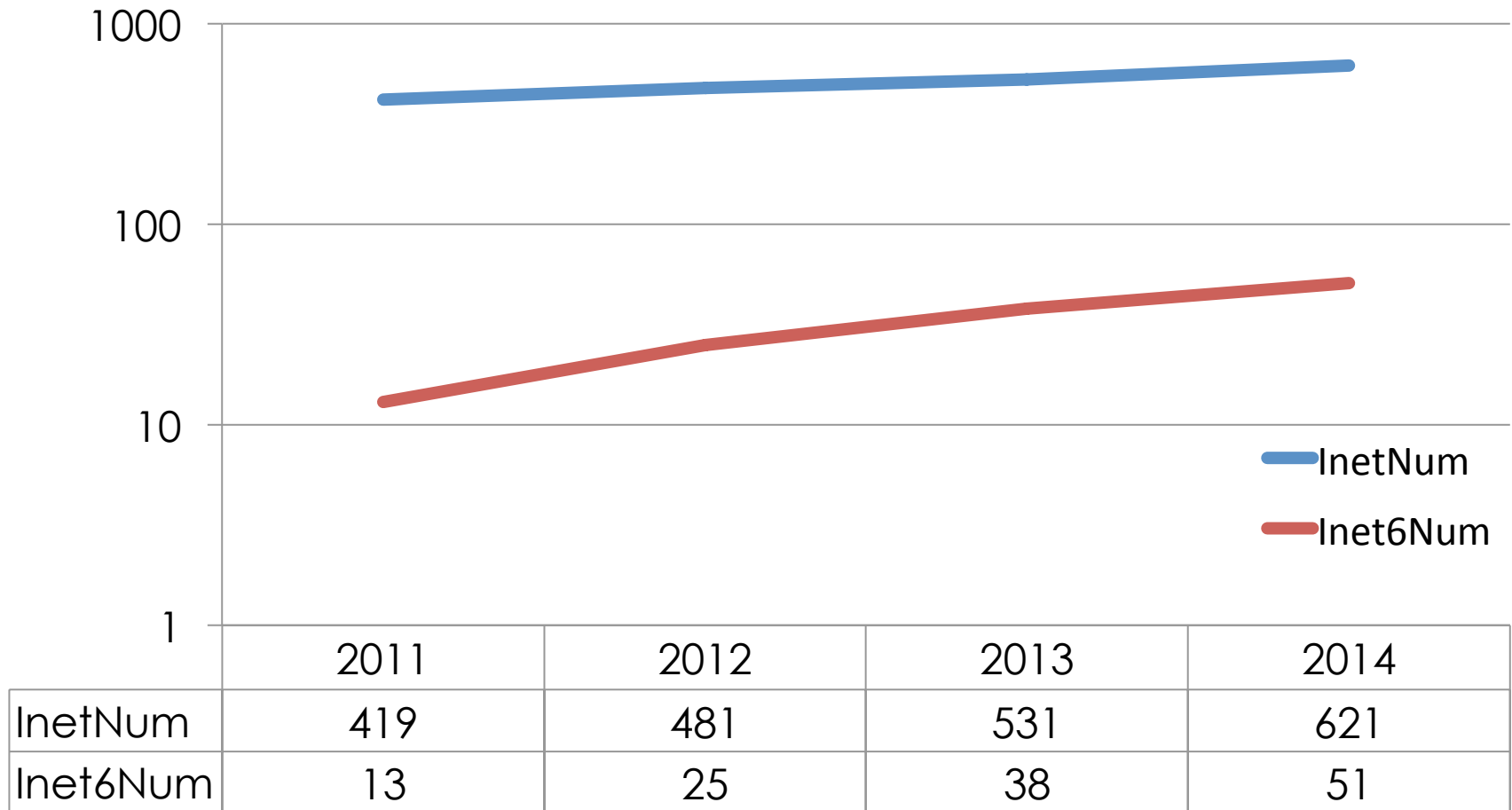
IRR Maintainers



IRR Route / Route6



IRR InetNum / Inet6Num



Systems at the forefront

- RPKI
 - Up/Down available – no takers so far
 - Removed web delegated
 - Upgraded the HSM's to IBM 4765
- RDAP (IETF WEIRDS)
 - “Soon” will be an RFC
 - Public testbed
 - <http://rdappilot.arin.net/restfulwhois/rdap>
 - Work is underway to make it production
 - ARIN has open source software at
 - <http://projects.arin.net>
 - Other RIRs are also deploying RDAP

Systems (cont..)

- We are a small engineering shop
 - Lots of demands
 - Attempting to provide exceptional service
- Creating API's to core services
 - Allows YOU to create tools
 - Allows YOU to follow your timeline
- **projects.arin.net** (ACSP completed years ago)
 - If you find your tool is cool
 - Way to allow others to come find and use it
 - We had one taker so far since ARIN 33 with a new tool (**ArinWhois.NET**)

What we have accomplished since ARIN 33

- Finished up more ACSPs
- DNSSEC on forward zones (arin.net/arin.com)
- Moved RPKI to a new HSM
- Making DNS changes near real-time
- Started automation on transfers
- Moving core production from ARIN HQ to colo
- Moving SAN from EMC to NetApp

What we are working on through 2015 Q2 (provisional)

- **Moving the RDAP pilot into production ***
- **Further automation on transfers ***
- **Complete core production from ARIN HQ to colo ***
- **Complete migration of SAN from EMC to NetApp ***
- **Add Links to Whois Query Responses (ACSP 2011.29)**
- **Change Whois Output for Certain /8 Records (ACSP 2013.4)**
- **Start “SWIP Easy” – a web-based tool to send in reassignment information**
- **Deploy Two-Factor Authentication (ACSP 2013.8)**

* Part of 2014 Board-approved Operating Plan

Comments?