ARIN 39

NEW ORLEANS | 2-5 APRIL 2017

Engineering Report

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Staffing Summary

- **Operations**
  - Thirteen engineers + two managers
- **Development**
  - Eleven engineers + UX expert + manager
  - Developer slot open
  - User Interface / User Experience Designer open
- **Software Integration**
  - Ten engineers + manager
- **Project Management**
  - One PM and one PT PM
- **CTO**

Accomplishments since ARIN 38

- Many kinks fixed in the new office
  - **A few more left**
- Modernized Voting Contacts (only done through ARIN Online)
- Lots and lots of UI work
- Focused on fixing technical debt

Operational Achievements

- Have gone agile with the operations staff
- We have had another security audit by a third-party
- Working on a lot of technical debt
  - **For example**
    - **Three monitoring systems – fold into one**
    - **Three CM systems – fold down into one**
- Lots and lots of work to do

Operational Challenges

- DDOS attacks via filling our pipes have thankfully subsided but…

- …evolved to distributed abuse of directory services

- Multiple types of abuse
  - **Legitimate need but very high rates**
  - **Spinning up lots of VM's to target ARIN's directory services**
  - **Code available:** **http://tech.marksblogg.com/faster-ipv4-whois-crawling.html**

tech.marksblogg.com

Faster IPv4 WHOIS Crawling

Benchmarks & Tips for Big Data, Hadoop, AWS, Google Cloud, Postgres, Spark, Python & More…

Operational Challenges

- ICANN's Security and Stability Committee (SSAC) is looking into this as well
  - **Opposite end – trying to get access**
  - **Some very draconian rate limits (*n* requests per hour/per day)**
  - **Example: one registry has one query per day from an AS**

- What is reasonable?
  - **Allow bulk access?**
  - **If so, what should the AUP be?**
  - **If not, rate limit at what levels or do we build out more machines**
  - **Guard against scraping database via directory services – at what level?**

Operational Challenges

- Other RIR services are dependent on ARIN for many things
  - **Example: Directory services – Whois defaults to ARIN, in turn we forward out-of-region requests to other RIRs**
  - **Result: Our query rates are much higher than the other RIRs**
- DNS coordination
  - **Occasional misfires by the receiving RIR on DNS delegations**
  - **Other RIR mistakes that we make sure do not affect ARIN members**

ARIN Online Usage

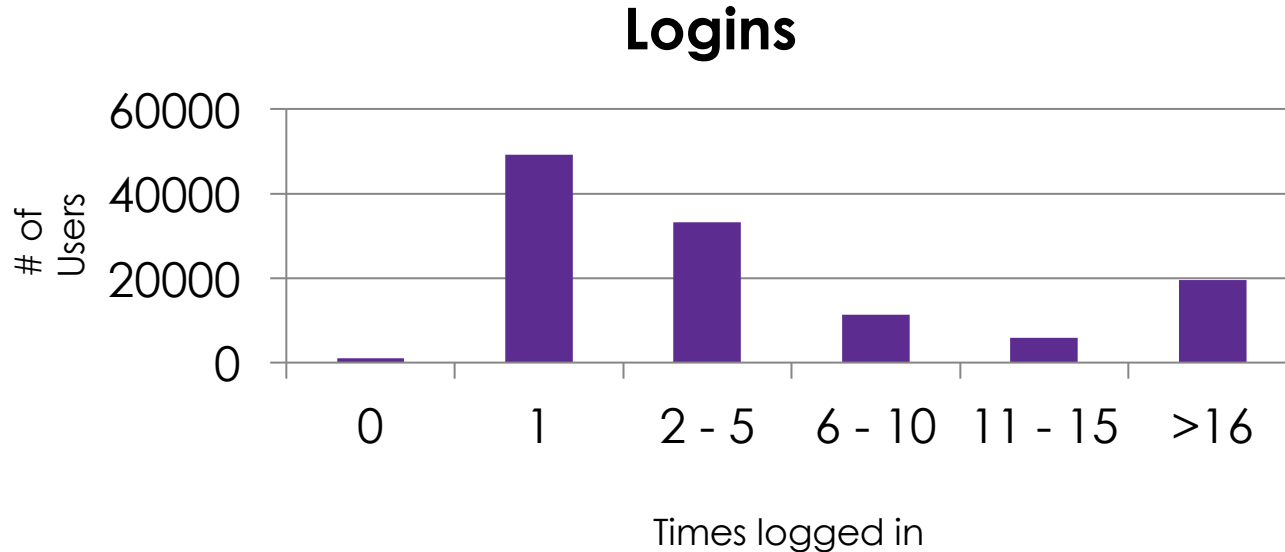## 123,917 accounts activated since inception through Q1 of 2017

Number of Accounts Activated
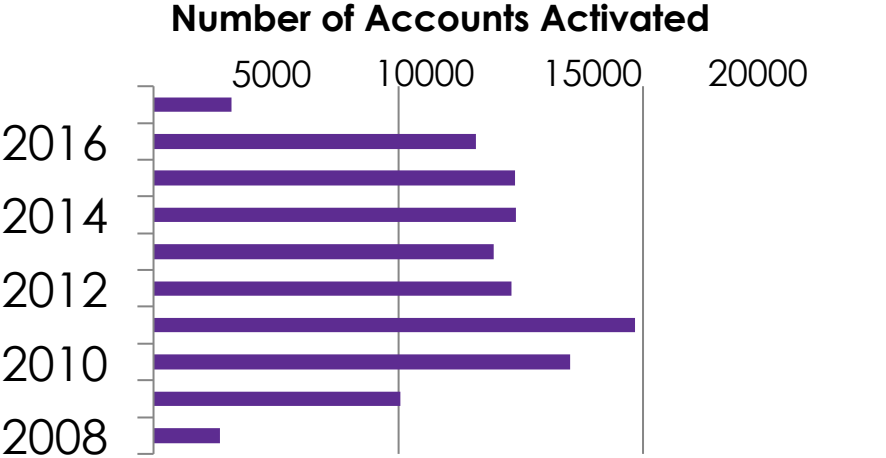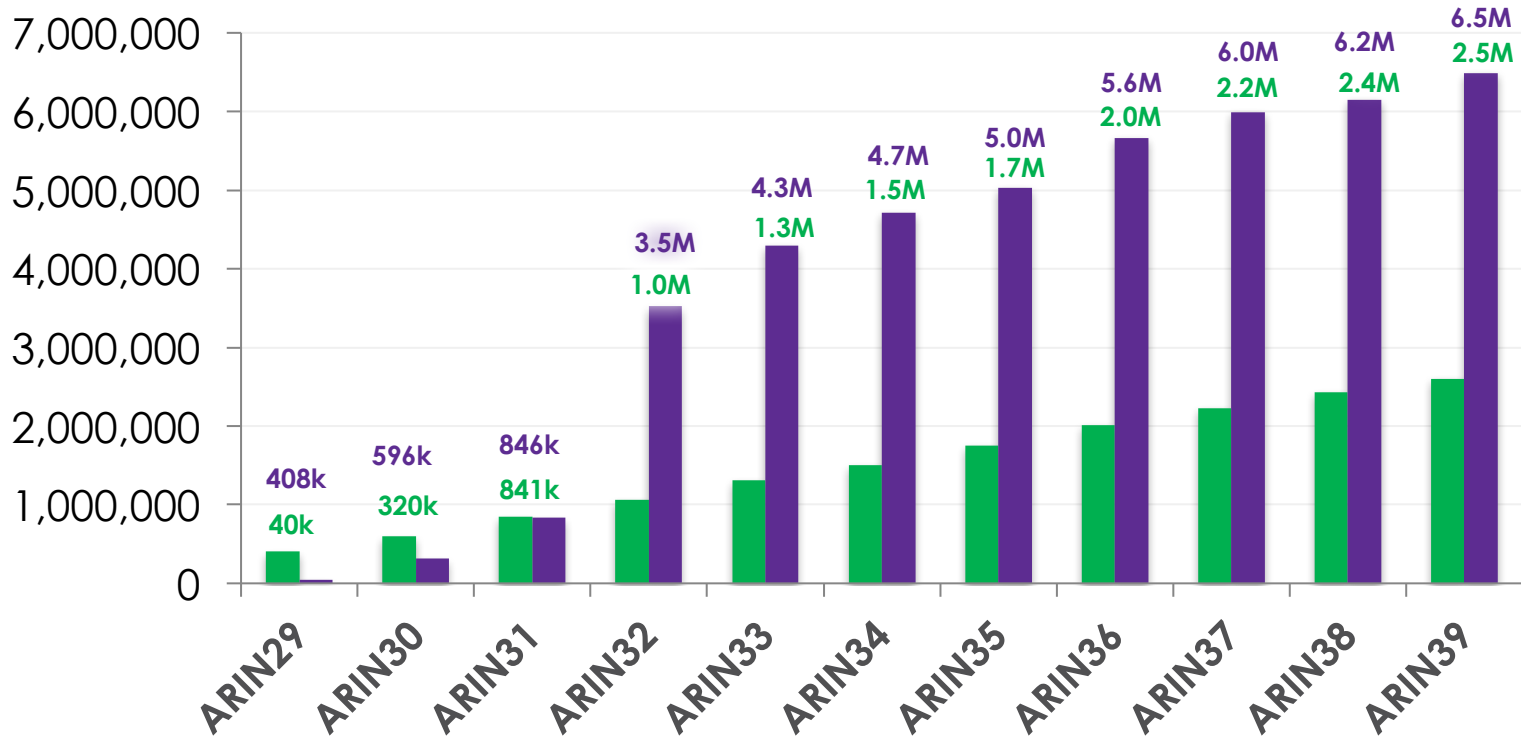

* Through Q1 of 2017

Active Usage of ARIN Online

Logins from inception through Q1 of 2017

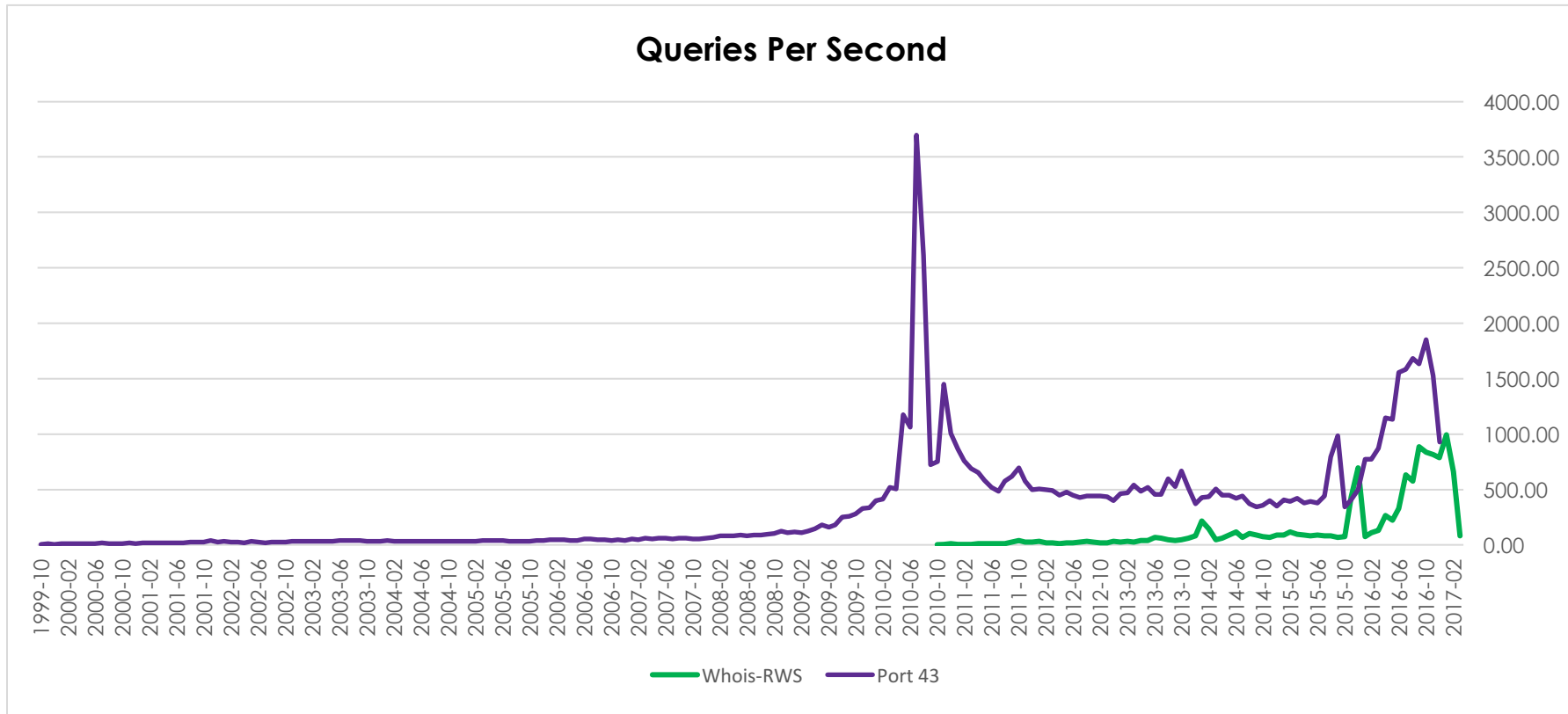### Logins

Reg-RWS Transactions
(cumulative – *restful*/*templates*)

ARIN	restful	templates
ARIN29	408k	40k
ARIN30	596k	320k
ARIN31	846k	841k
ARIN32	3.5M	1.0M
ARIN33	4.3M	1.3M
ARIN34	4.7M	1.5M
ARIN35	5.0M	1.7M
ARIN36	5.6M	2.0M
ARIN37	6.0M	2.2M
ARIN38	6.2M	2.4M
ARIN39	6.5M	2.5M

DNSSEC

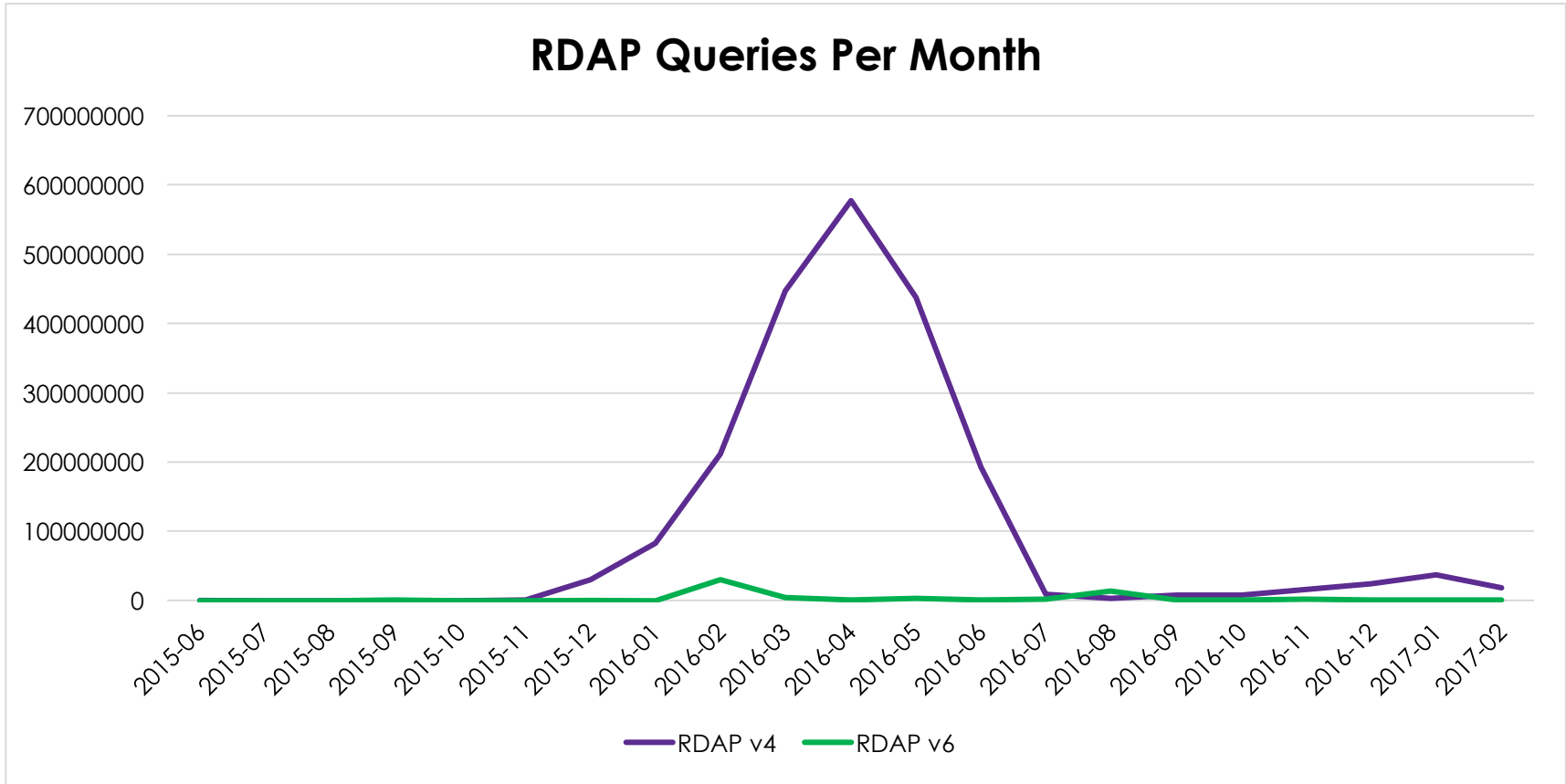|	ARIN 39
Number of Orgs with DNSSEC	139
Total Number of Delegations	620,412
DNSSEC Secured Zones	671
Percentage Secured	0.11 %

RPKI Usage

	Oct 2012	Apr 2013	Oct 2013	Apr 2014	Oct 2014	Apr 2015	Oct 2015	Apr 2016	Oct 2016	Apr 2017
Certified Orgs		47	68	108	153	187	220	250	268	292
ROAs	19	60	106	162	239	308	338	370	414	470
Covered Resources	30	82	147	258	332	430	482	528	577	640
Up/Down Delegated			0	0	0	1	2	1	2	2

Whois Queries Per Second

Queries Per Second

#ARIN39

Directory Service Queries over IPv6

Directory Service Queries over IPv6

RDAP

RDAP Queries Per Month

IRR Maintainers

Maintainers

Data points: 2011: 1726, 2012: 1850, 2013: 1951, 2014: 2102, 2015: 2322, 2016: 2485, 2017: 2575
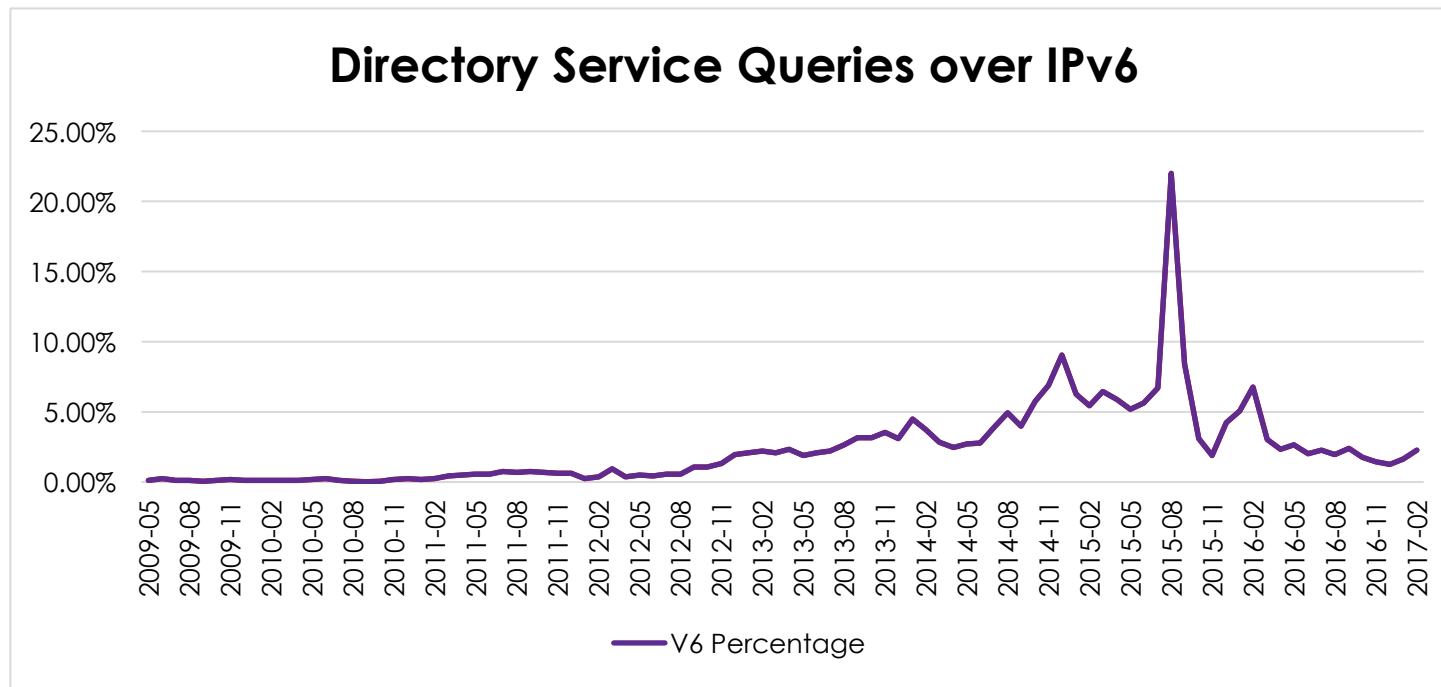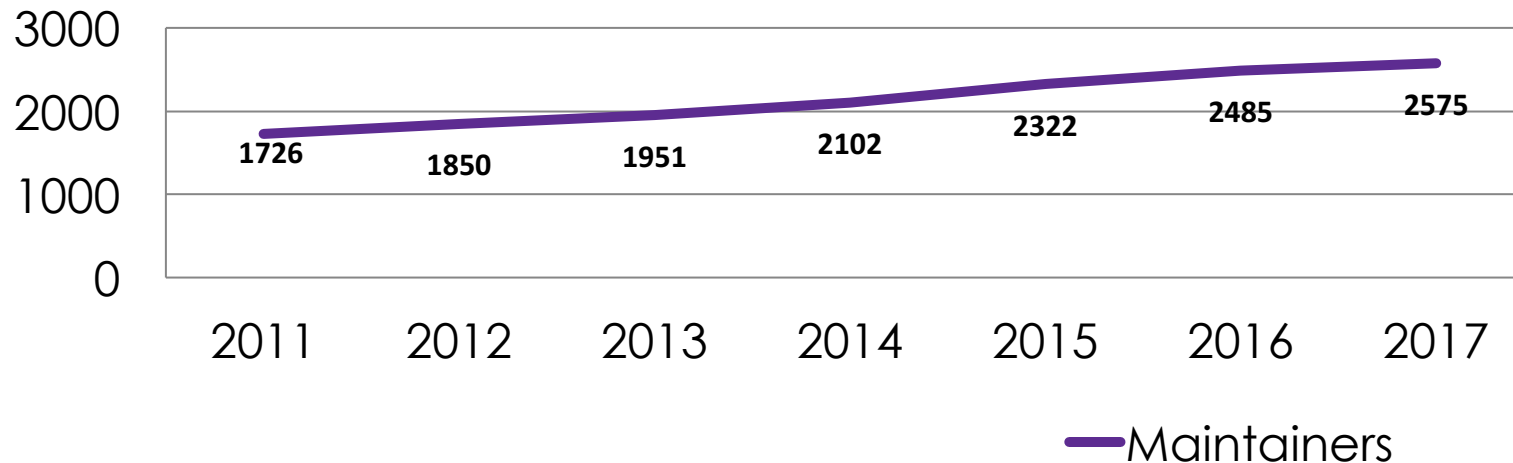
2017 Data through Q1

IRR Route / Route6

100000

33791
31464
27255
23535
21204
19969
18636

10000

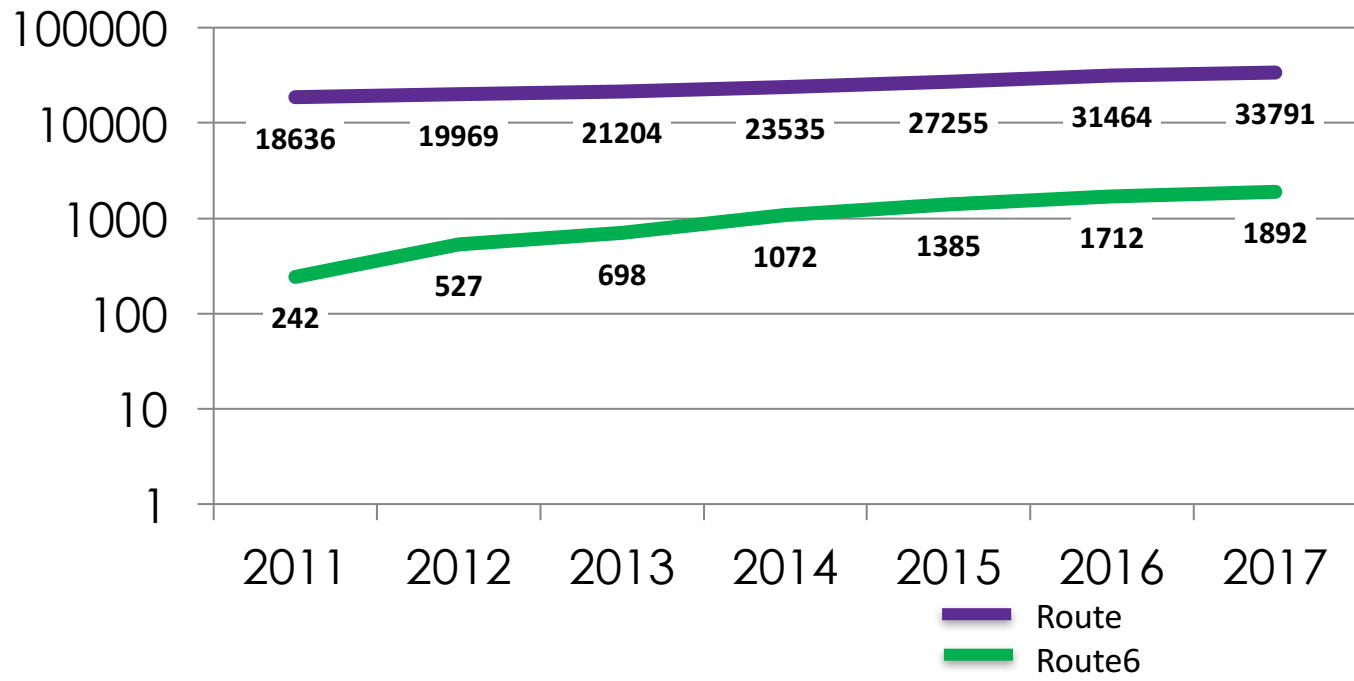1000

1892
1712
1385
1072
698
527
242
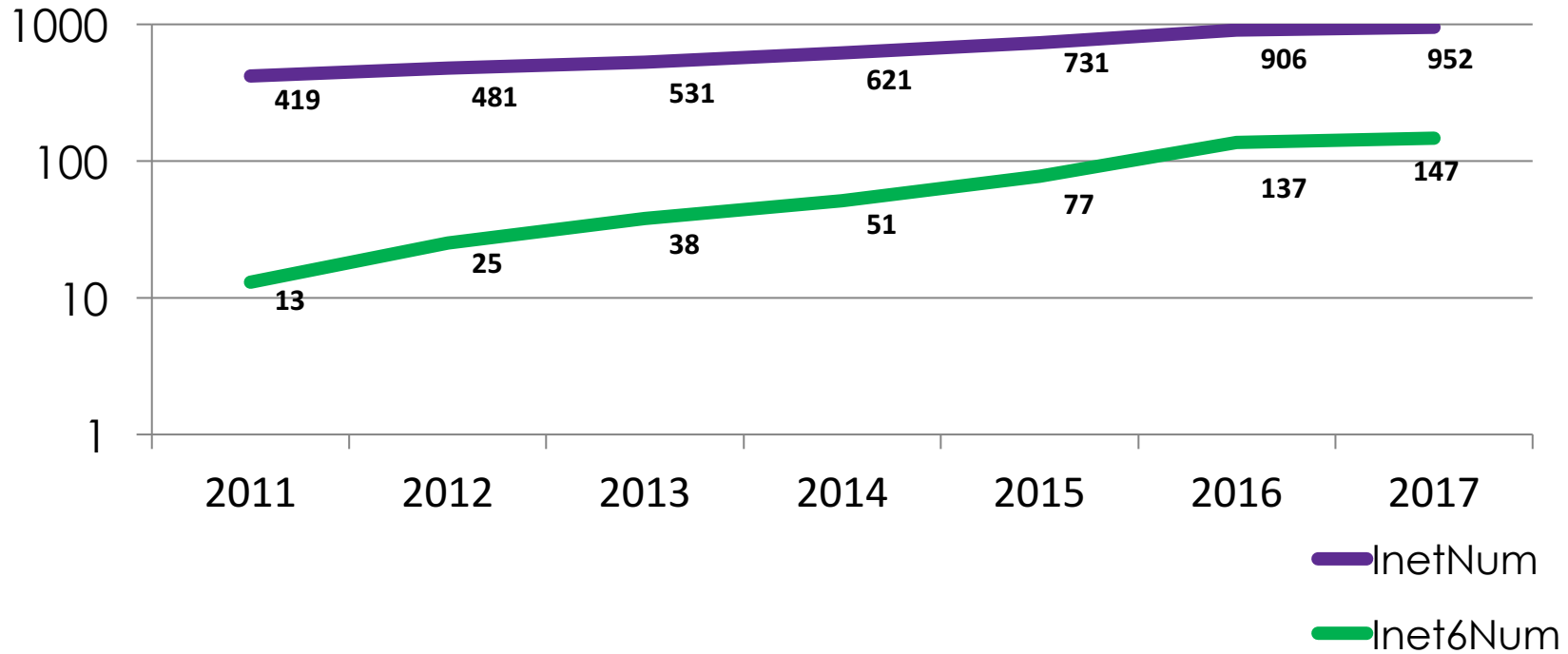
100

10

1

2011 2012 2013 2014 2015 2016 2017

■ Route
■ Route6

2017 data through Q1

IRR InetNum / Inet6Num

2016 data through Q3

IRR object breakout by Organization

Number of Organizations	Number of Objects
5	1001-2000
44	100-1000
4	90-99
4	80-89
4	70-79
18	60-69
8	50-59
428	10-49
580	5-9
1144	1-4

What we are working on through 2017 Q3

- Automated installation of software coupled with work on fully redundant services (like Reg-RWS)
- Integration of OAuth into RDAP
  - **Allow for authenticated users to receive unlimited query responses (ACSP 2012.20)**
  - **Use also in ARIN Online to remove timeout issue (ACSP 2013.29)**
- UX engineering
  - **User Accessibility/Responsive Website (ACSP 2016.2 and 2011.21)**

What we are working on through 2017 Q3

- Technical backlog
  - **Moving from Java6 to Java8 for application servers**
  - **Overhaul monitoring system – transitioning to Sensu**
    - **2 legacy systems that are being folded into Sensu**
    - **One is almost done**
    - **Improved logging is and ability to start doing predictive analysis will be a happy result**
  - **Automated build systems using Ansible**
    - **Folding three puppet iterations into Ansible**

Coordination work with the other RIRs

- Transfer logs – will be released at the end of Q2 for all RIR's
  - **Logs transfer movement explicitly**
  - **Good addition to the extended statistics report (that shows an RIR's assignments, allocations, and inventory)**
- Example
  - **http://www.arin.net/pub/stats/arin/delegated-arin-extended-latest**

Coordination with the other RIR's

- Trust Anchor Alignment for RPKI using 0/0
  - **5 RIRs currently establish trust anchor in 3 different ways**
  - **When finished, there will be alignment with the RIRs**
  - **Facilitates "make before break" for transfers**
  - **Proposal documented in the IETF (but not accepted in the working group)**

Comments?