ARIN 44

31 October - 1 November 2019 • Austin, Texas

Engineering Update

Mark Kosters, CTO

Agenda

- Staffing
- Recent accomplishments
- Statistics
- Engineering plans through ARIN 45
- A challenge question

Staffing Summary

- **Operations**
  - Five engineers + manager
- **Information Systems and Security**
  - Three engineers + manager
- **Development**
  - Ten engineers + manager
  - User Experience Expert
  - User Interface Designer
- **Software Integration**
  - Six engineers + manager
  - Manual/UI tester
- **Project Management**
  - One project manager and one part-time project manager
- **CTO**

Highlights Since ARIN 42

- Main focus areas
  - Stateless website
    - 16 releases since March that required no downtime
  - New POCs
    - Routing
    - DNS
  - Re-networked our provisioning site in Ashburn
  - Technical Debt

Highlights Since ARIN 42 (cont.)

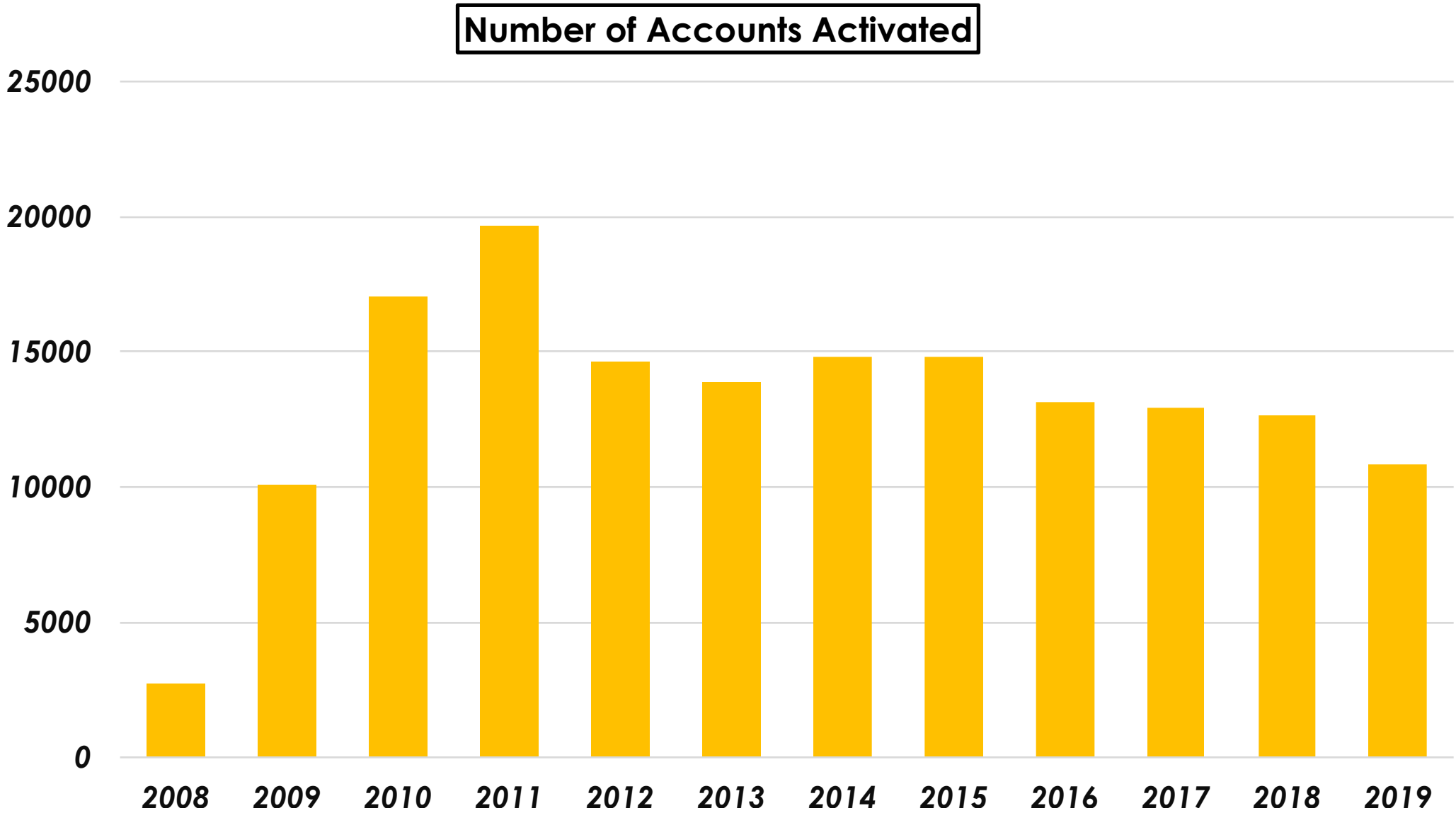
- ACSPs
  - ACSP Consultation: Deleting Aged Report Request Tickets
  - ACSP 2019.3: Add Routing & DNS POCs to ARIN Online
  - ACSP 2019.11: ROA Search Functionality
  - ACSP 2013.29: Improve ARIN Online Form Time-Out Behavior

- RDAP improvements
  - Linking entities in search results
  - Improvements to single-word query behavior
  - Returning nameservers in domain queries

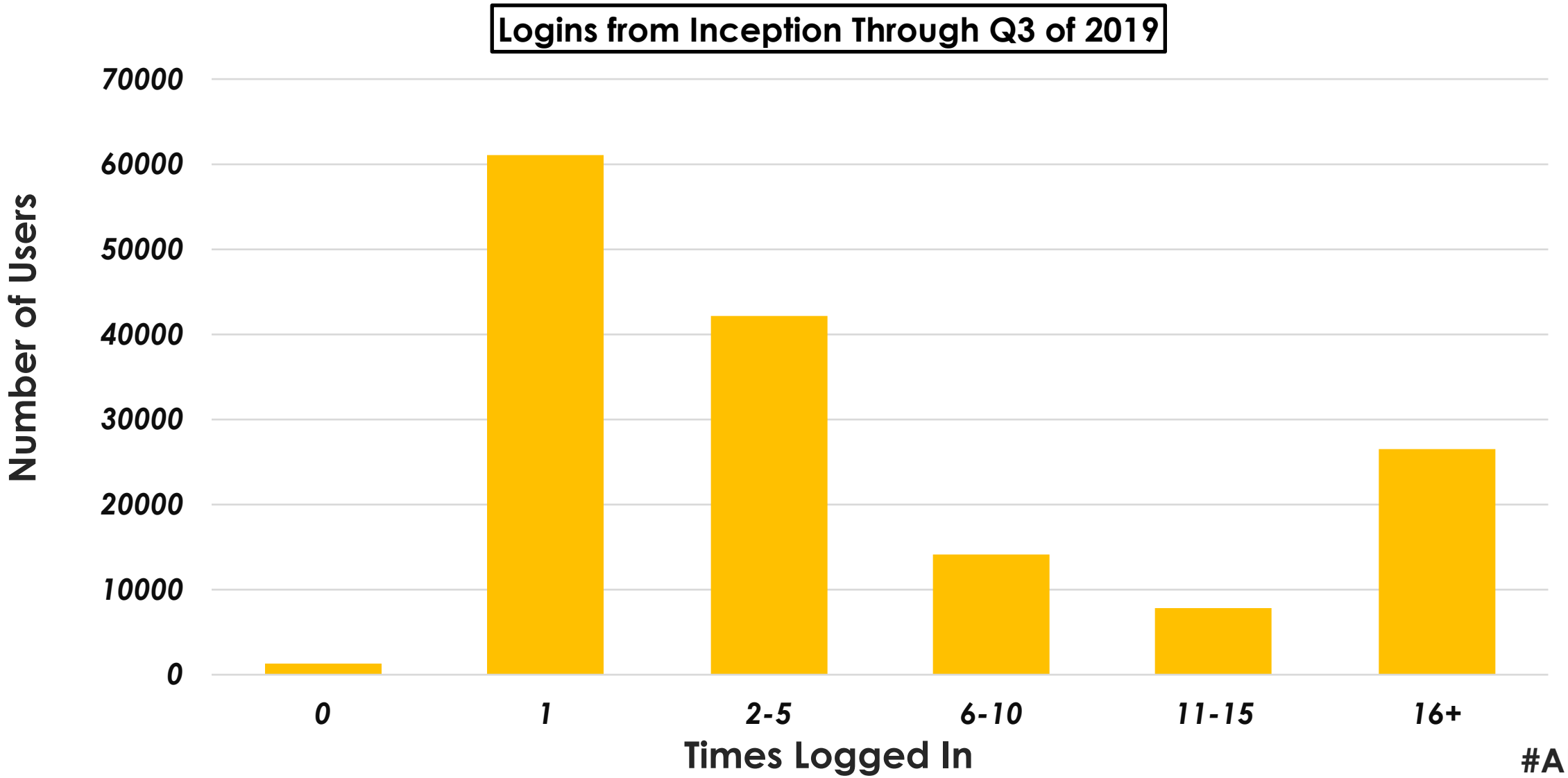
- NRO
  - Identifier Technology Health Indicators (ITHI) Reporting

ARIN Online Usage

157,230 accounts activated since inception through Q3 of 2019

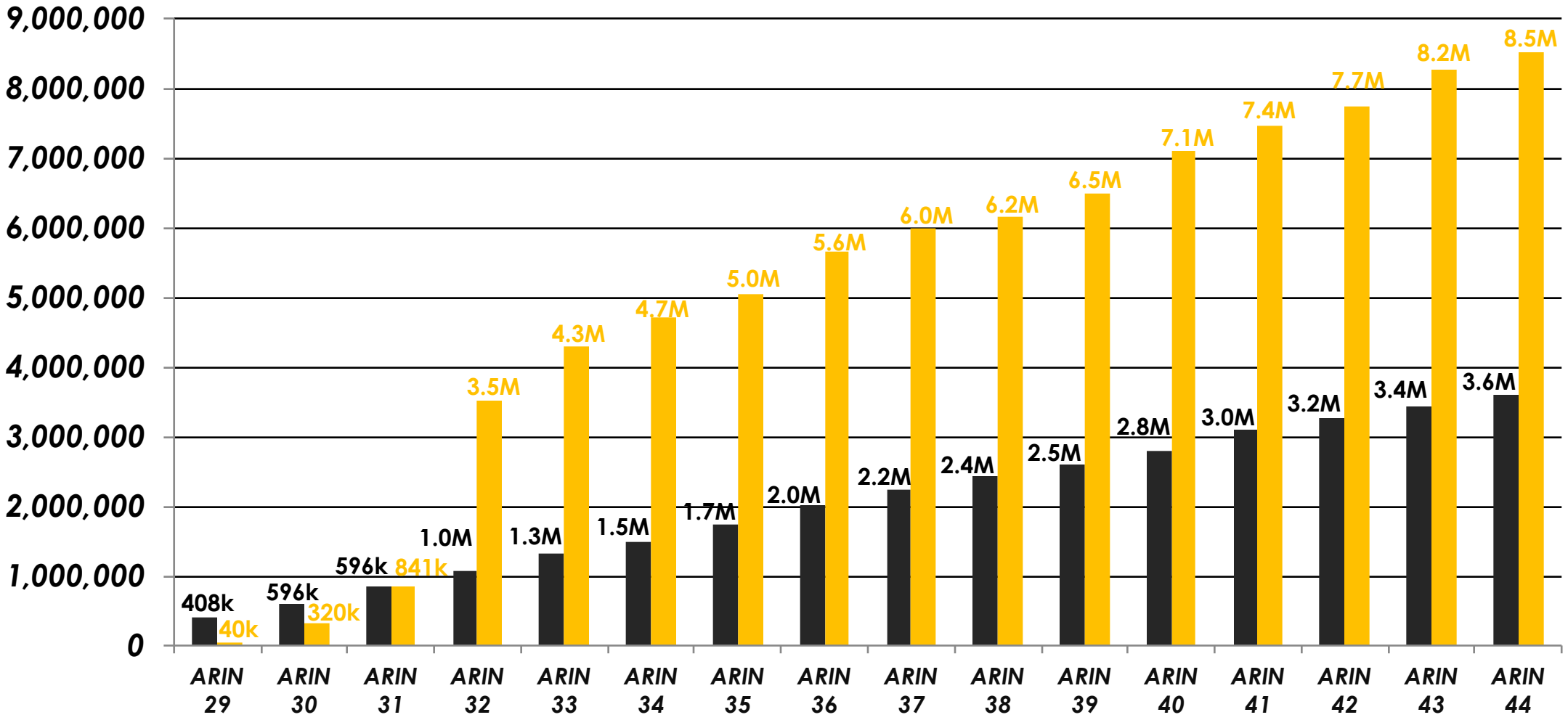


Active Usage of ARIN Online



Provisioning Transactions

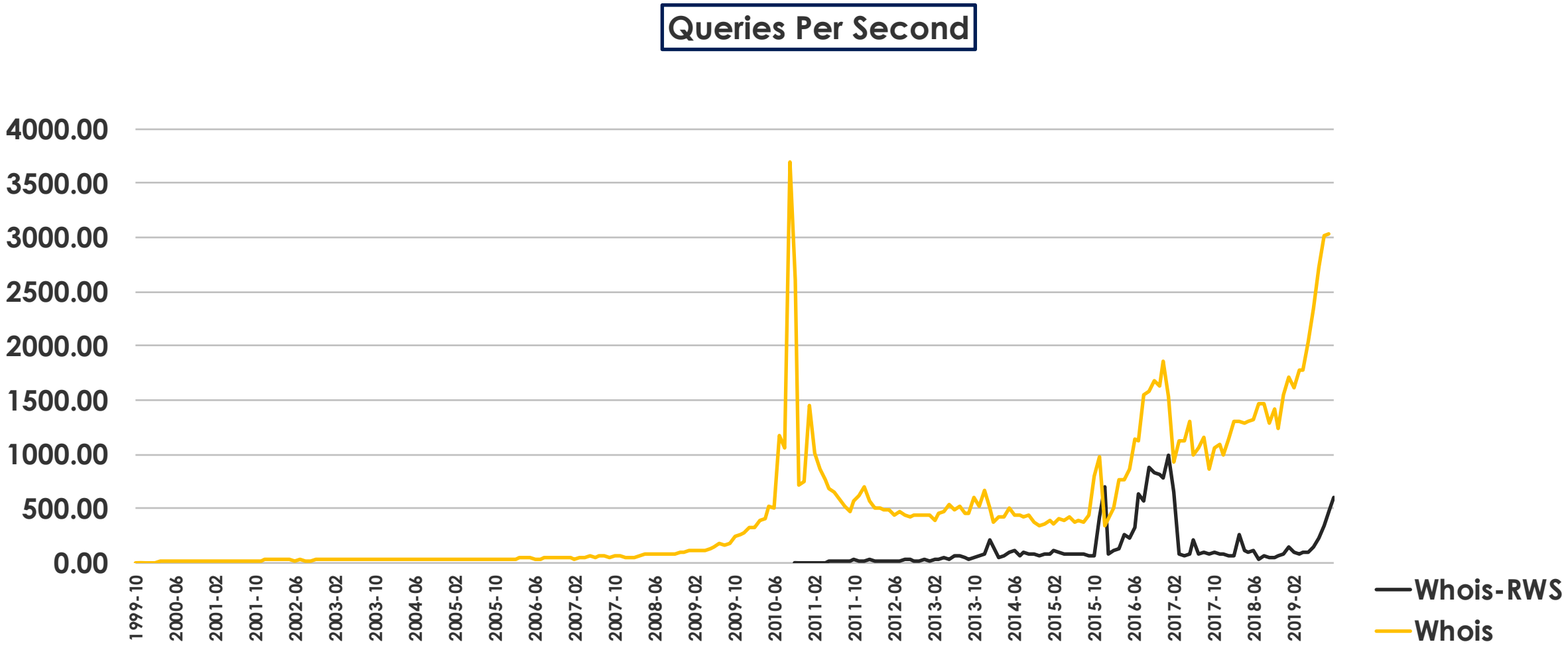
*(cumulative – **RESTful** + **templates**)*



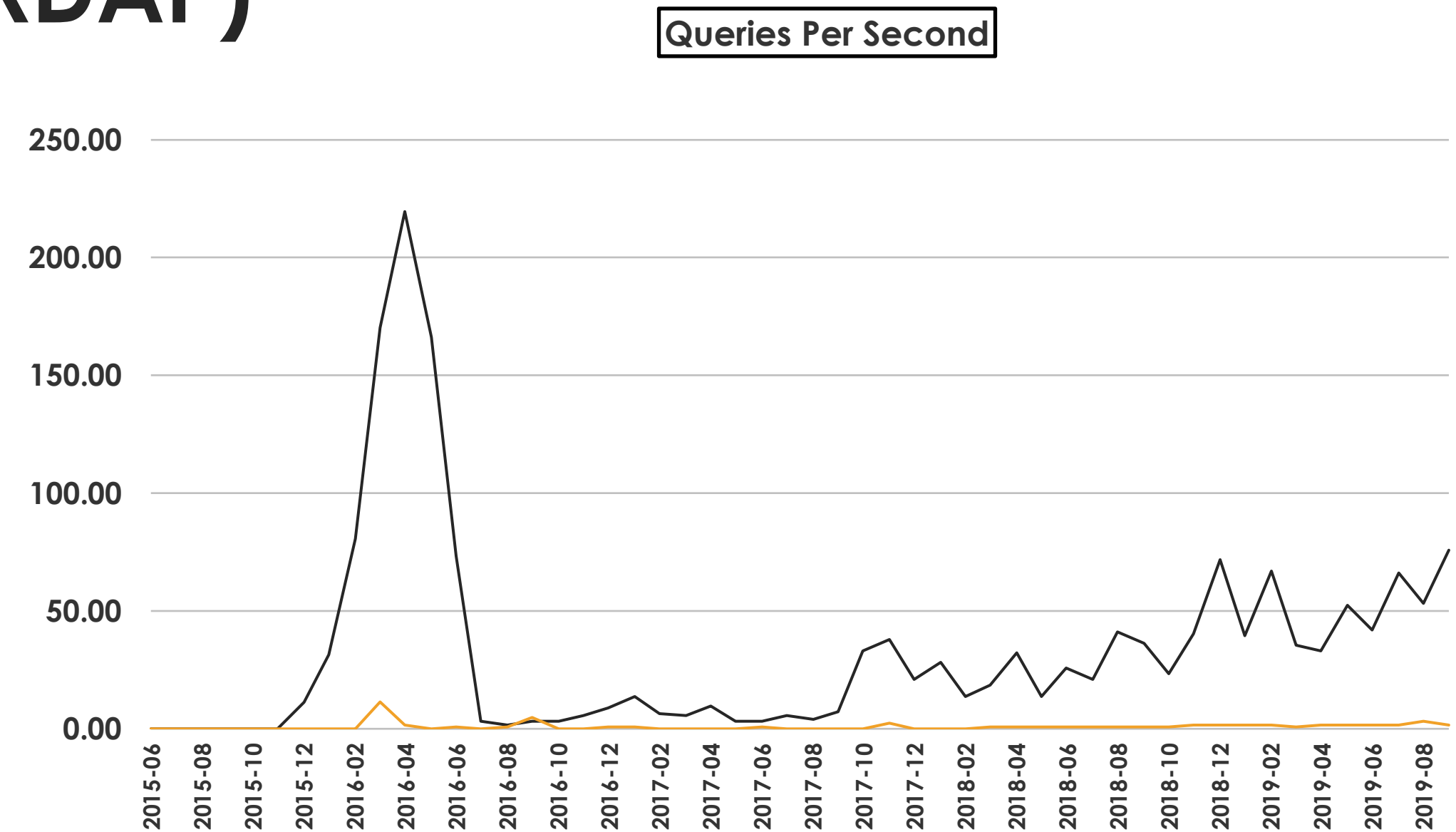
Resource Public Key Infrastructure (RPKI) Usage

	Oct 2012	Apr 2013	Oct 2013	Apr 2014	Oct 2014	Apr 2015	Oct 2015	Apr 2016	Oct 2016	Apr 2017	Oct 2017	Apr 2018	Sep 2018	Apr 2019	Sep 2019
Certified Orgs		47	68	108	153	187	220	250	268	292	328	361	434	591	793
ROAs	19	60	106	162	239	308	338	370	414	470	538	604	1013	4519	5454
Covered Resources	30	82	147	258	332	430	482	528	577	640	741	825	1953	5816	7514
Up/Down Delegated			0	0	0	1	2	1	2	2	2	1	1	1	1

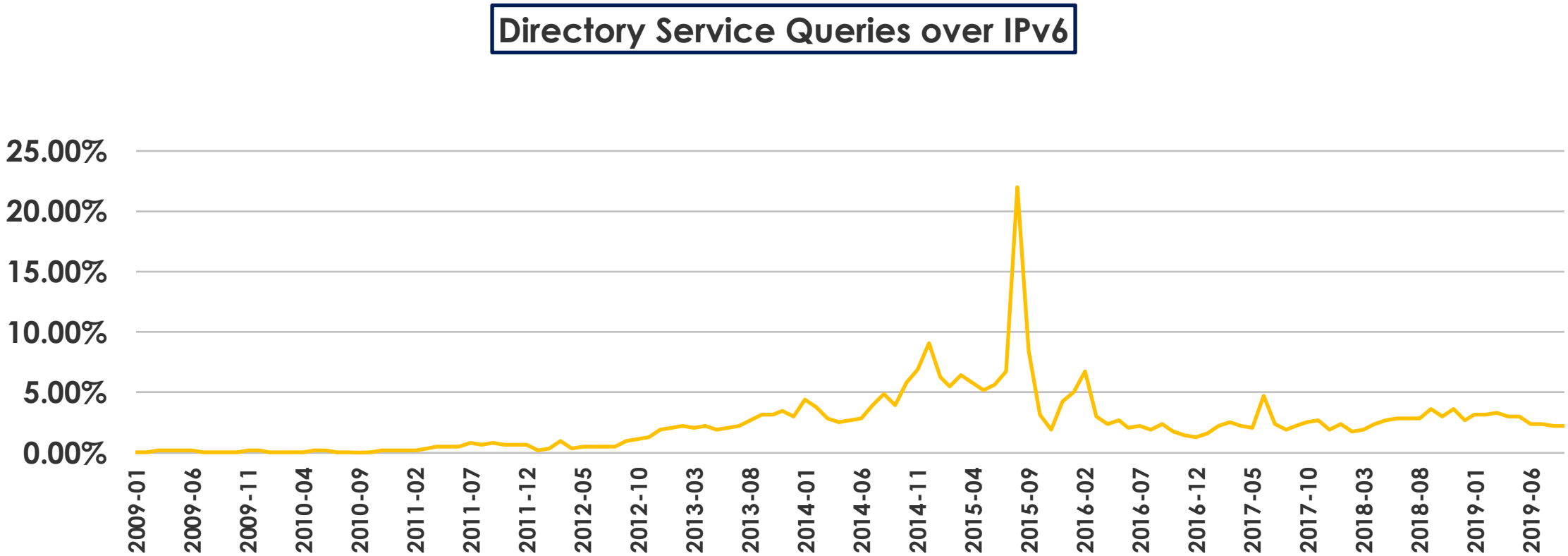
Whois/Whois-RWS Queries Per Second



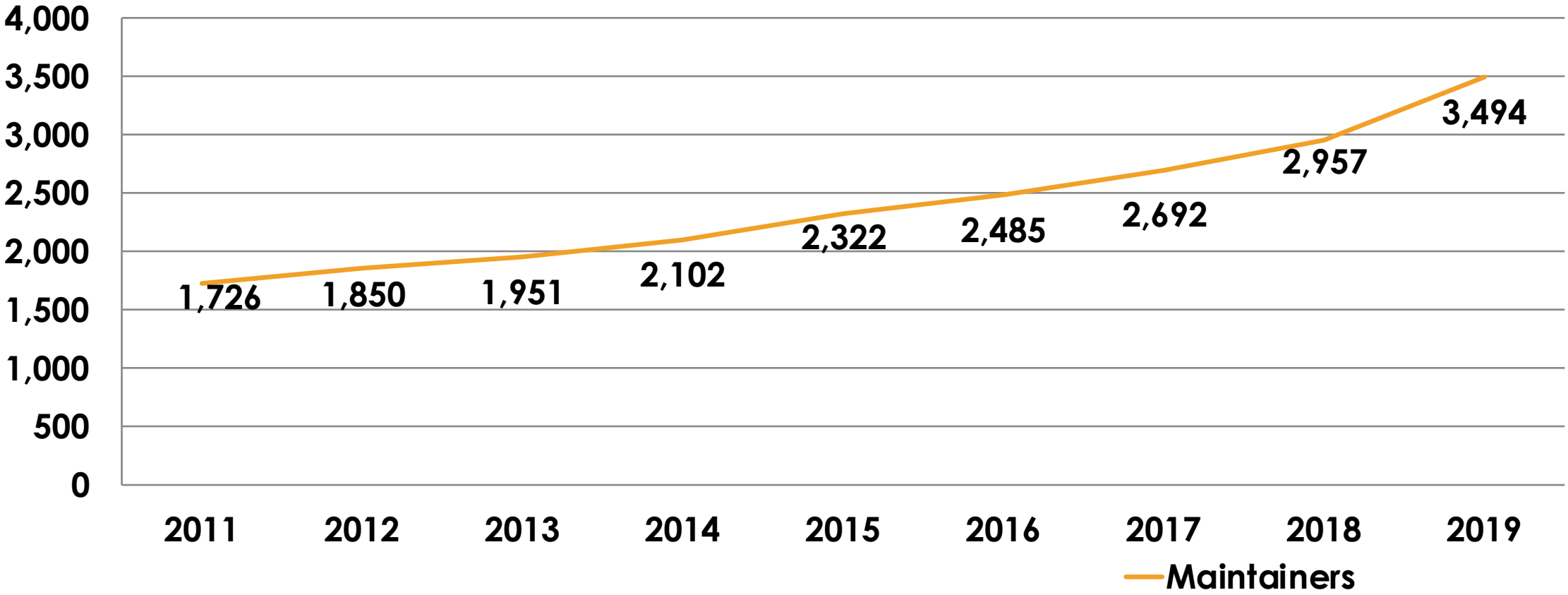
Registry Data Access Protocol (RDAP)



Whois/Whois-RWS/RDAP Queries over IPv6

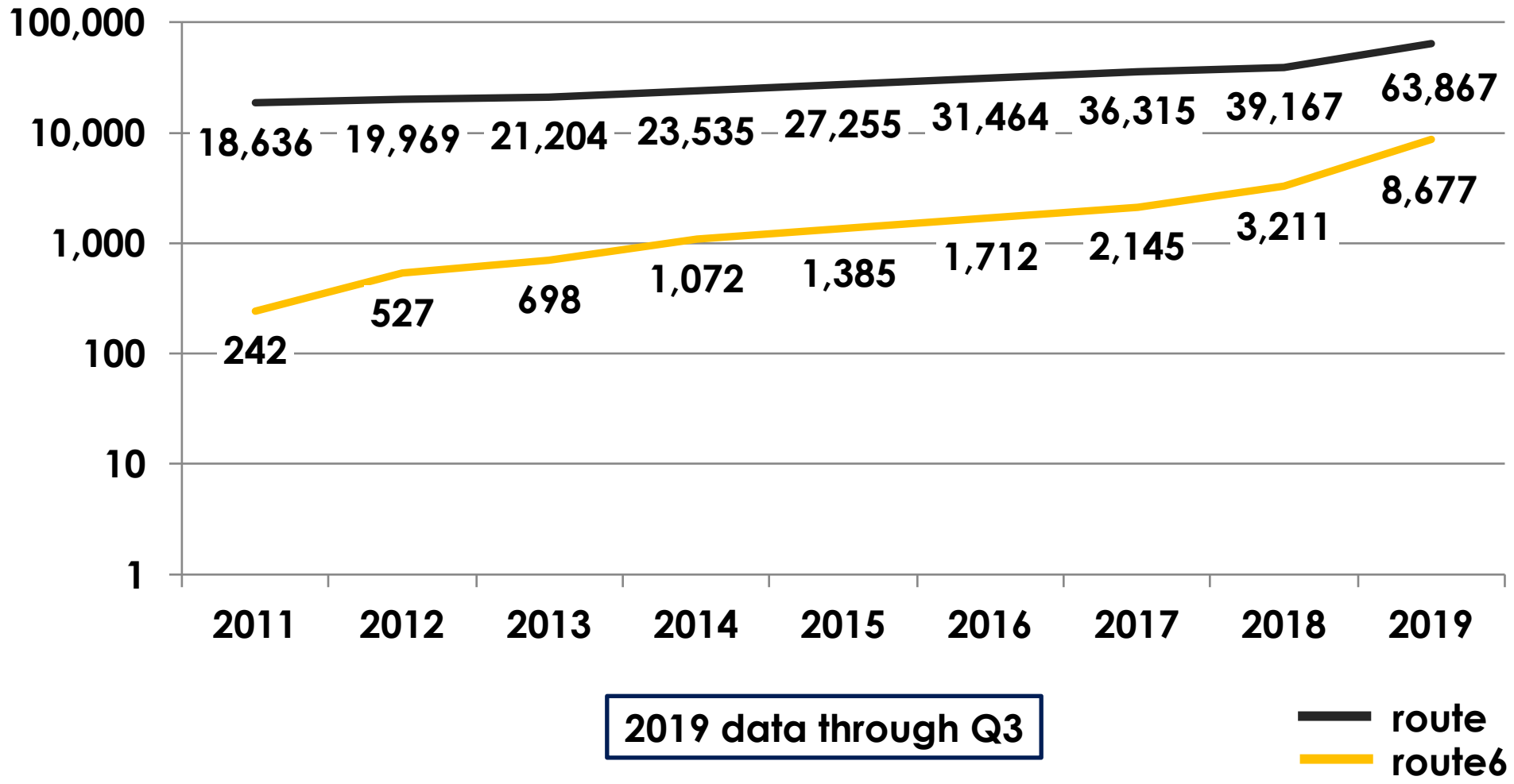


Internet Routing Registry (IRR) Maintainers

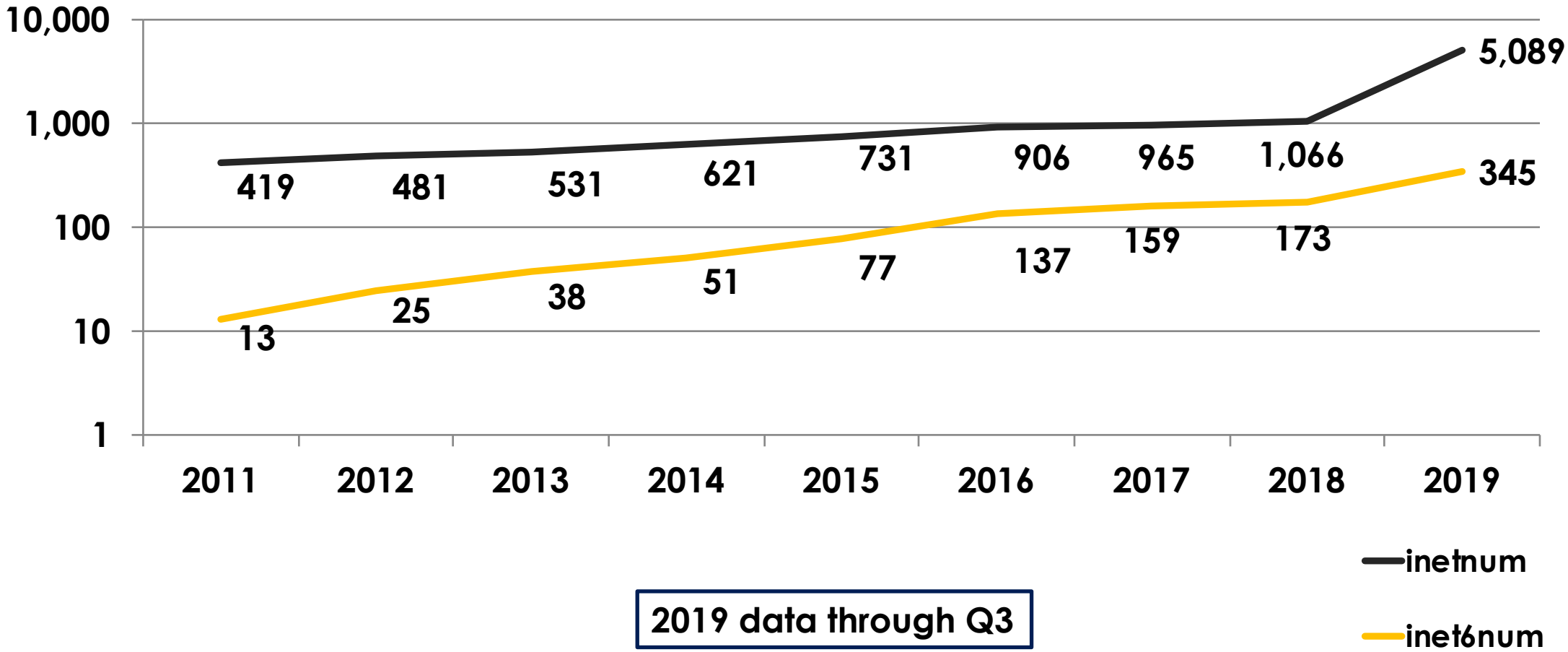


2019 Data through Q3

IRR route / route6 Objects



IRR inetnum / inet6num Objects



2019 data through Q3

IRR Object Breakout by Organization

Number of Organizations	Number of Objects
7	1,001-19,574
59	100-1,000
6	90-99
9	80-89
12	70-79
19	60-69
22	50-59
654	10-49
798	5-9
1,943	1-4

Factors That Influence Priorities

- Legal and regulatory
- Ratified policies
- ARIN Consultation and Suggestion Process (ACSP)
- Board of Trustee initiatives
- Operating plan objectives
- Defects, maintenance, and upgrades
- Mailing list ad-hoc requests
- Environment changes
- Customer feedback (via feedback button)
- Customer Survey

What We Are Working on Through 2020 Q1

- IRR
  - Development started work in Q3 2019
  - Working on back-end management interface
- Website phase II
  - Website chat
  - Website usability improvements

What We Are Working on Through 2020 Q1 (cont.)

- Technical backlog
  - Some services hosted on Java 7, JBoss, and CentOS 6
  - Upgrading bump-in-the-wire DNSSEC signer
    - Need to roll keys for the various /8s
    - Set it up to move off of Secure64 if necessary
  - RPKI HSM Upgrade – moving to the IBM 4767 from the IBM 4765
- Global Service Load Balancing for ARIN Services
  - Currently using round-robin DNS

What We Are Working on Through 2020 Q1 (cont.)

- Tackling technical debt and IRR work at the same time
- Using Kubernetes to move from monolithic architecture to micro-services
  - Tackle things in smaller components
    - ARIN Online user interface upgrade was a multi-year effort with our monolithic system
    - Tackling things in smaller chunks will end up with a more manageable system by eliminating middleware (i.e., JBoss)
  - Utilize current themes in technology
  - Modernize incrementally
- The end result will be more robust and easier to maintain

Coordination Work with the Other RIRs

- Working out differences on
  - Registration Data Access Protocol (RDAP) implementations
  - Extended statistics file formats
- Identifier Technology Health Indicators (ITHI)
  - Working on coordinated reporting between the RIRs
- Resource Public Key Infrastructure (RPKI)
  - Providing operational feedback on various protocol enhancements within the Internet Engineering Task Force (IETF)
  - Examples are:
    - RPKI Validation Reconsidered
    - RPKI Signed Object for Trust Anchor Locators (TALs)
    - Where to easily find the various TALs

Challenge Question – What to Do with Duplicate Services?

- We have several overlapping services
  - Easy to add new services
  - Hard to retire services
  - Each service has cost and effort to run
  - There are many – will just focus on three
- Report access
  - FTP
  - HTTP/HTTPS
- Provisioning for reassignments
  - Templates
    - Been around since before 1991
    - Mail based – very complex
  - Reg-RWS
    - RESTful API
  - SWIP-EZ
    - Web-based input

More Duplicate Services

- Directory services (e.g., Whois)
  - Port 43 Whois
    - RFC 812 – published in 1982
  - RWhois
    - RFC2167 – published in 1997
  - Whois-RWS
    - RESTful interface to Whois data over http/https
  - Web-based Whois-RWS
    - https://whois.arin.net
  - RDAP
    - The IETF sanctioned way for getting directory services data
  - Web-based RDAP
    - https://search.arin.net

Consultation on Retirement of Legacy Services

- Requires YOUR input on why you rely on legacy services – examples:
  - Not useful
    - It's the way its always been done
  - Useful
    - We need to upgrade our internal interface with ARIN
    - We are missing key functionality

- Consultations for potential retirement of legacy services planned in 2020
- If a service is to be retired, you will have plenty of time for transition
- Important to consider for managing ARIN's overall technical debt; i.e. cost-effective maintainability of ARIN's technical infrastructure

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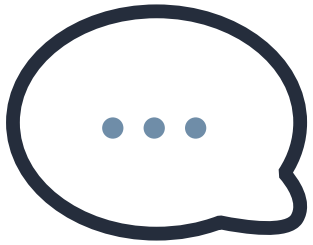
Thank you.

Any Questions?



Discussion