RSSAC Activities Update

Lars -Johan Liman and Tripti Sinha
RSSAC Co-Chairs | ICANN53 | 24 June 2015

Agenda

1. Overview
2. RSSAC002 Implementation Status Update
3. DRAFT RSSAC Report on Root Zone TTLs
4. RSSAC Public Comment on CCWG Work Stream 1 Report
5. Upcoming RSSAC Caucus Work
6. Community Interaction

RSSAC Overview

Tripti Sinha

What is RSSAC?

- The role of the Root Server System Advisory Committee ("RSSAC") is to advise the ICANN community and Board on matters relating to the operation, administration, security, and integrity of the Internet's Root Server System.

- (This is a very narrow scope!)

RSSAC Organization

- RSSAC
  - Appointed representatives from the 12 root server operators
  - Alternates to these
  - Liaisons
- RSSAC Caucus
  - Body of volunteer subject matter experts
  - Appointed by RSSAC

RSSAC Liaisons

- IANA Functions Operator (ICANN/IANA dept.)
- Root Zone Maintainer (Verisign)
- IANA Functions Administrator (US DoC NTIA)
- IAB
- SSAC
- ICANN Board
- ICANN NomCom

https://www.icann.org/resources/pages/rssac-4c-2012-02-25-en

Caucus

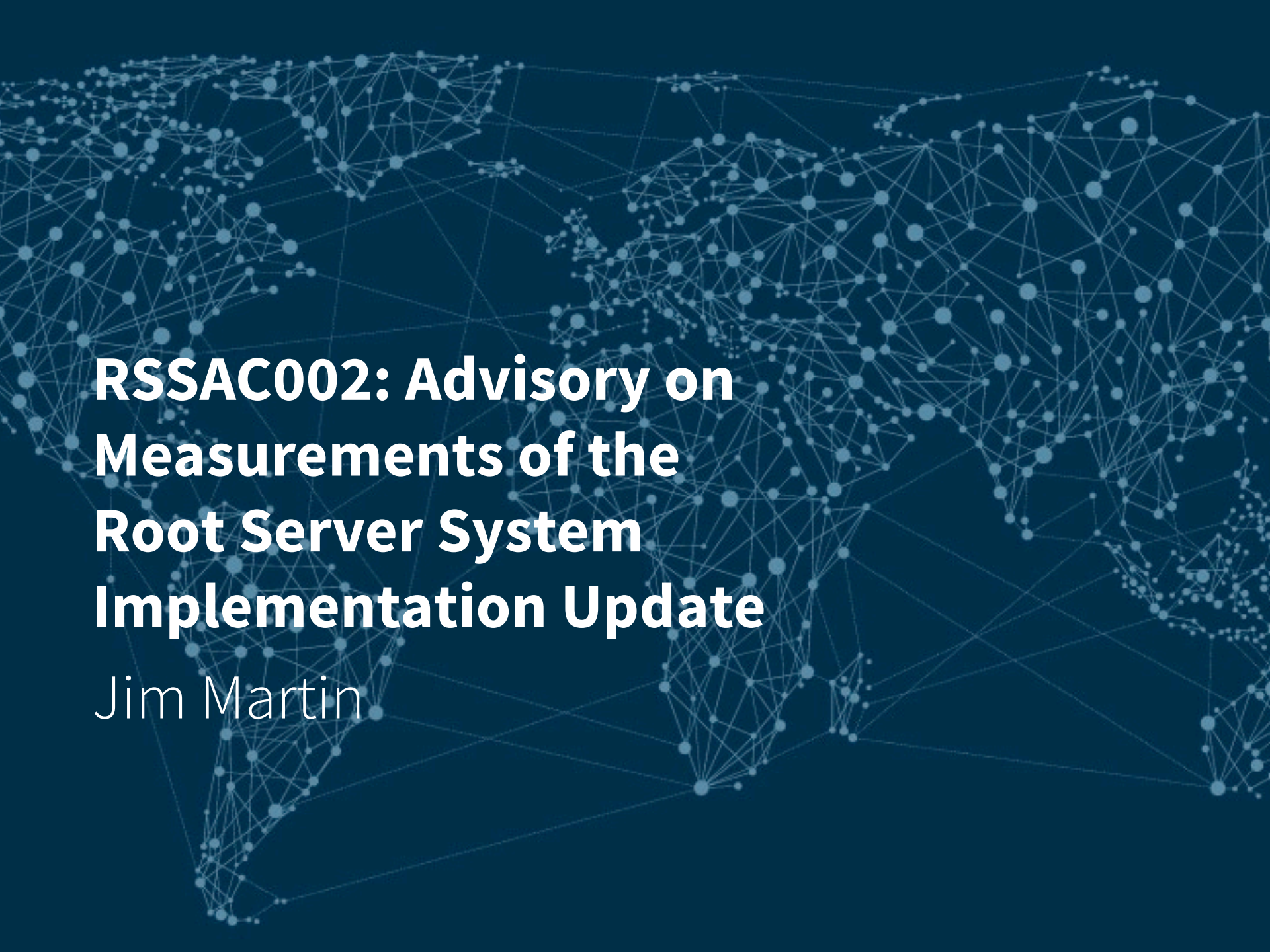
- Purpose
  - Pool of experts who produce documents
    - Expertise, critical mass, broad spectrum
  - Transparency of who does the work
    - Who, what expertise, which other hats
  - Framework for getting work done
    - Results, leaders, deadlines
- Members
  - 61 Technical Experts (43% not from Root Server Operators)
  - Public statements of interest
  - Public credit for individual work

Caucus: Launch Meeting

- Held “kick-off” meeting at IETF92
- ~ 40 Caucus members participated
  - Dialogued on work procedures.
  - Brainstormed about current and future work items
  - Invited new ideas and input from the Caucus.
- To join: contact rssac-membership@icann.org

Recent RSSAC publications

- Reports
  - RSSAC001: Service Expectations of Root Servers [20 November 2014] (approved by RSSAC, held in publication in tandem with a complementary RFC by IAB)
  - RSSAC002: Advisory on Measurements of the Root Server System [20 November 2014]
- Statements
  - RSSAC Comment on CCWG Work Stream 1 Report [5 June 2015]
  - IAB Liaison to RSSAC [12 February 2015]
  - RSSAC statement on the Increase of the DNSSEC Signature Validity Period of the DNS Root Zone [17 December 2014]



RSSAC002: Advisory on Measurements of the Root Server System Implementation Update

Jim Martin

RSSAC002: Advisory on Measurements of the Root Server System

- Identifies and recommends an initial set of measurement parameters for establishing a baseline and trends for the root server system

- Implementation of the advisory will form an early warning system that will assist in detecting and mitigating any effects associated with growing size of the DNS root zone

RSSAC002 Proposed Measurements

- Latency in publishing available data
- The size of the overall root zone
- The number of queries
- The query and response size distribution
- The RCODE distribution
- The number of sources seen

RSSAC002 Recommendations

1. Each root server operator implement the measurements in the advisory.

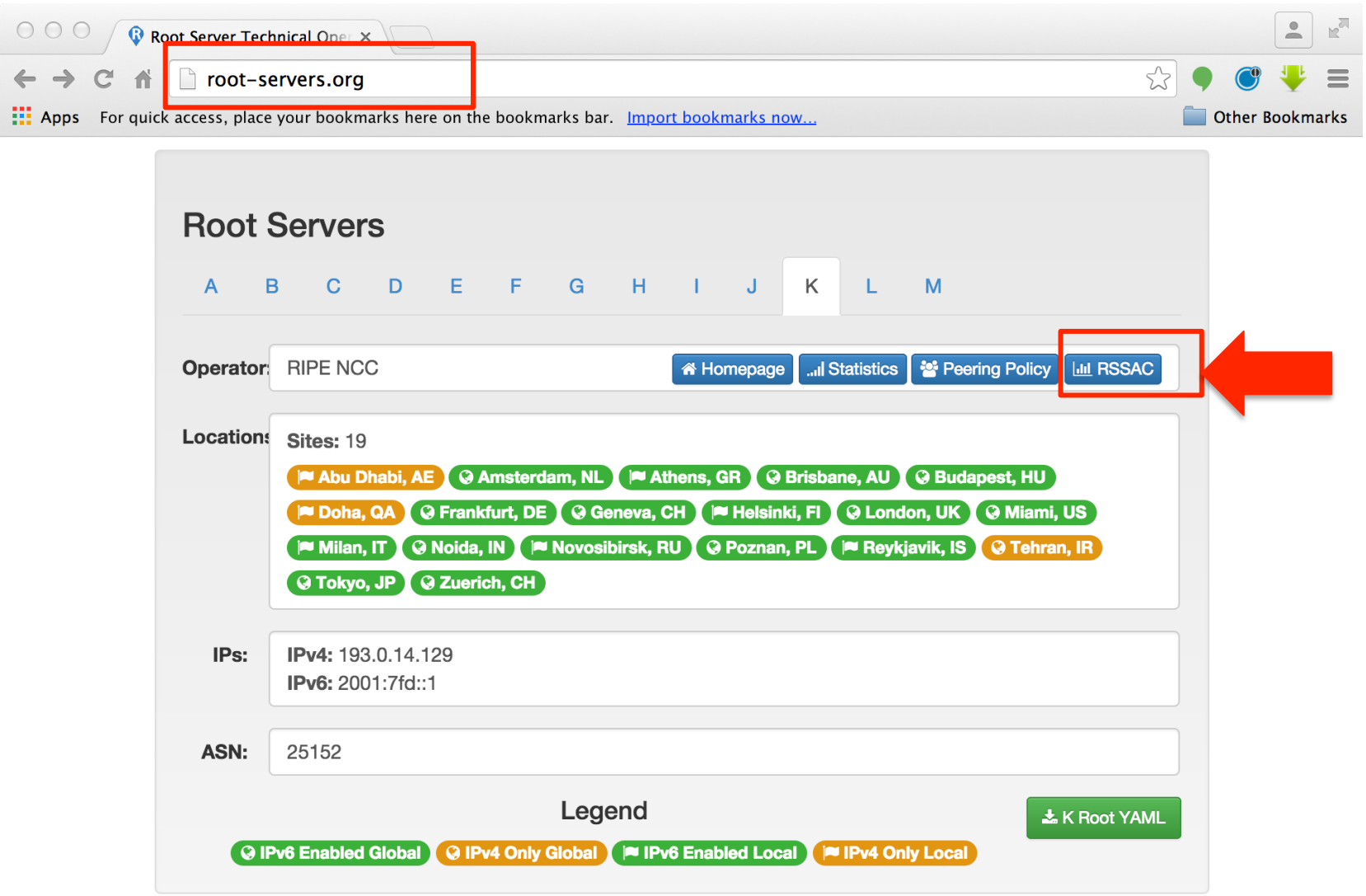
2. RSSAC should monitor the progress of the implementation of these measurements.

3. Measurements outlined in the advisory should be revisited in two years to accommodate changes in DNS technologies.

RSSAC 002 Implementation Status (As of 19 June 2015)

Root Letter	Current Status	Expected Completion
A	Publishing	Done
B	Collecting	Q4 2015
C	Collecting	Q2 2015
D	Collecting	Q3 2015
E	Collecting	Q4 2015
F	Collecting	Q4 2015
G	Collecting	Q4 2015
H	Publishing	Done
I	Collecting	Q3 2015
J	Publishing	Done
K	Publishing	Done
L	Publishing	Done
M	Collecting	Q3 2015

Where to find the statistics (root-servers.org)



DNS-OARC is also collecting and consolidating the RSSAC002 data (https://www.dns-oarc.net/node/348)

RSSAC002 Metrics

Metrics are stored in per-day, per metric YAML formatted files.

Available metrics

'load-time'
'zone-size'
'rcode-volume'
'traffic-sizes'
'traffic-volume'
'unique-sources'

```
service: j.root-servers.net
start-period: '2013-08-26T00:00:00Z'
end-period: '2013-08-26T23:59:59Z'
metric: traffic-volume
  dns-udp-queries-received-ipv4: 31272
  dns-udp-queries-received-ipv6: 11211
  dns-tcp-queries-received-ipv4: 12
  dns-tcp-queries-received-ipv6: 2
  dns-udp-responses-sent-ipv4: 131079
  dns-udp-responses-sent-ipv6: 16833
  dns-tcp-responses-sent-ipv4: 94
  dns-tcp-responses-sent-ipv6: 7
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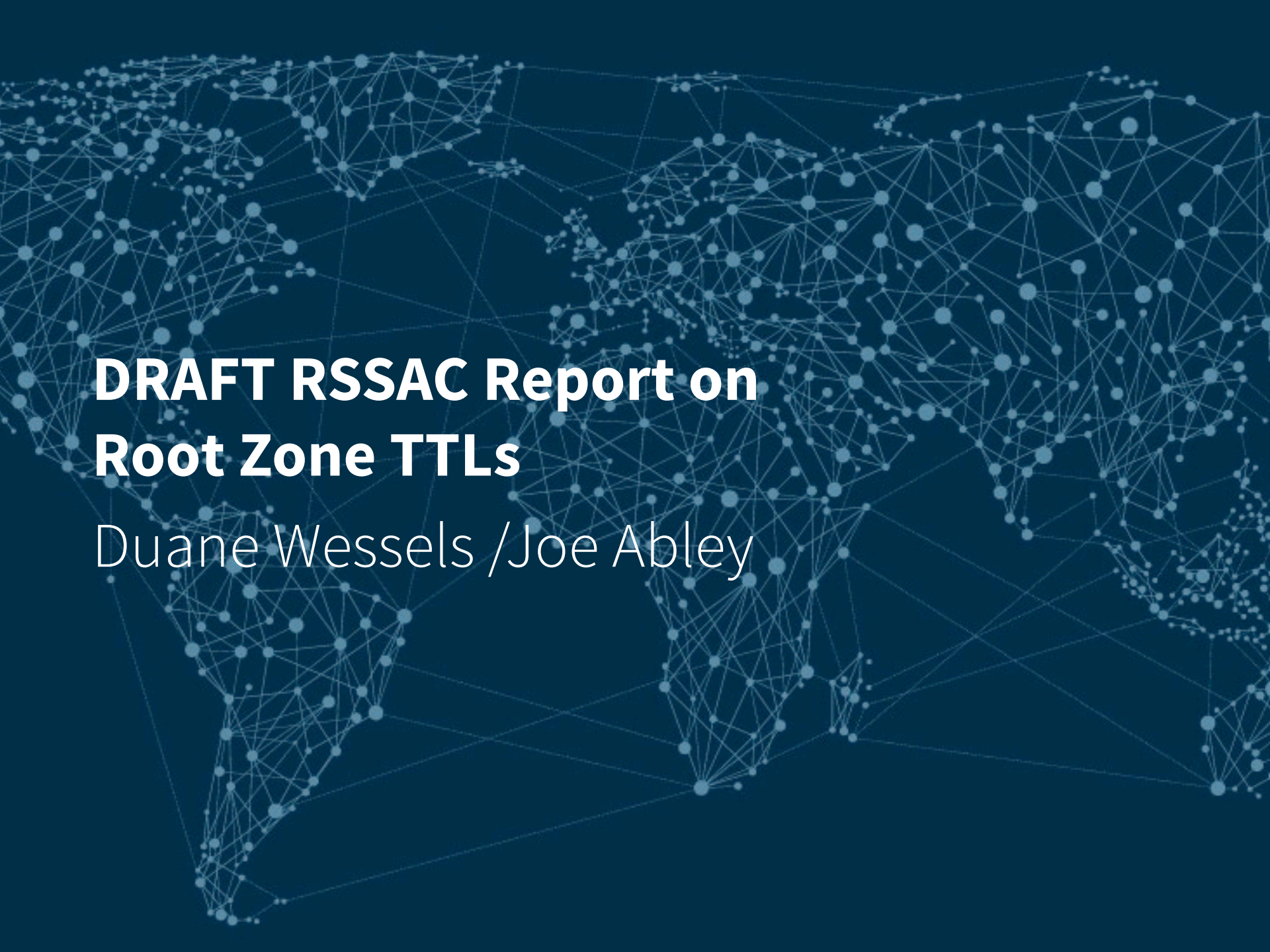


DRAFT RSSAC Report on Root Zone TTLs

Duane Wessels /Joe Abley

Root Zone TTLs

- WP Members: Duane Wessels,* Warren Kumari, Jaap Akkerhuis, Shumon Huque, Brian Dickson, John Bond, Joe Abley, and Matthew Thomas.

- Scope – Consider the extent to which:
  1. the current root zone TTLs are appropriate for today's Internet environment
  2. the 2014 change to increase ZSK signature validity to 10 days sufficiently addresses the issues of interactions between the SOA refresh timer and serving stale data
  3. the impacts that TTL changes would have on the wider DNS

Root Zone TTLs - Study Areas

1. Document the history of TTLs in the root zone
2. Obtain a measure for TLD managers' technical preferences for NS and DS TTLs by surveying what those managers have published in TLD zones.
3. Survey "max-cache-ttl" parameters of various recursive implementations
4. Analyze DITL data for the extent that recursive resolvers honor TTLs
5. Study interactions between the SOA refresh timer and serving stale data

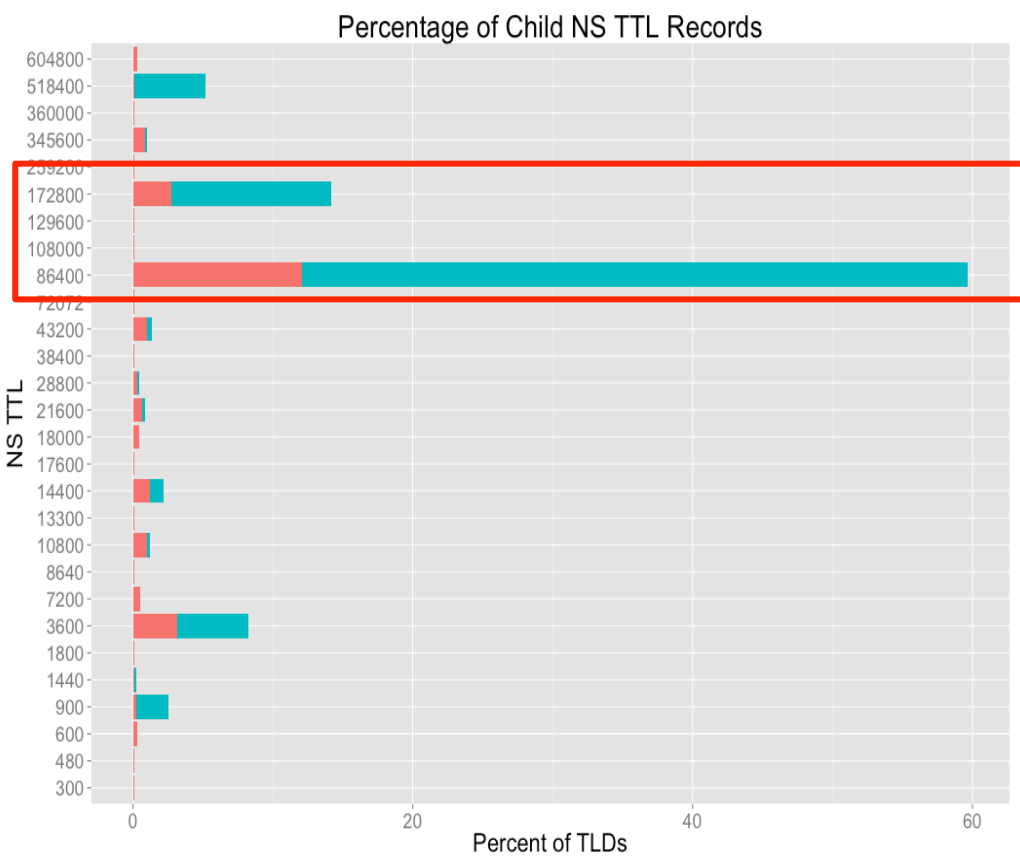
Current Root Zone TTLs

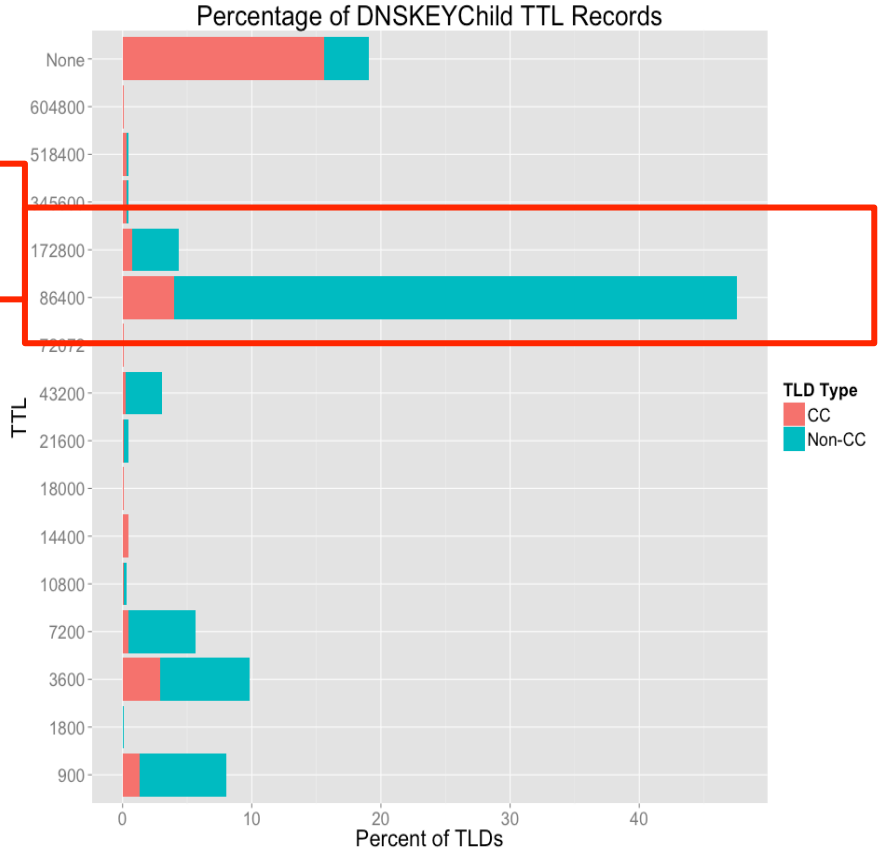
Resource Record	Type	TTL
Root SOA	authoritative	1 day
Root DNSKEY*	**authoritative**	**2 days**
Root NS	authoritative	6 days
Root Glue (A, AAAA)	glue	6 days
Root NSEC*	**authoritative**	**1 day**
TLD NS	delegation	2 days
TLD Glue (A, AAAA)	glue	2 days
TLD DS*	**authoritative**	**1 day**

Since 1991, TTLs in the root zone were 6 days for authoritative data, 2 days for delegations, and 2 days for glue.

Root Zone TTLs – Preliminary Findings

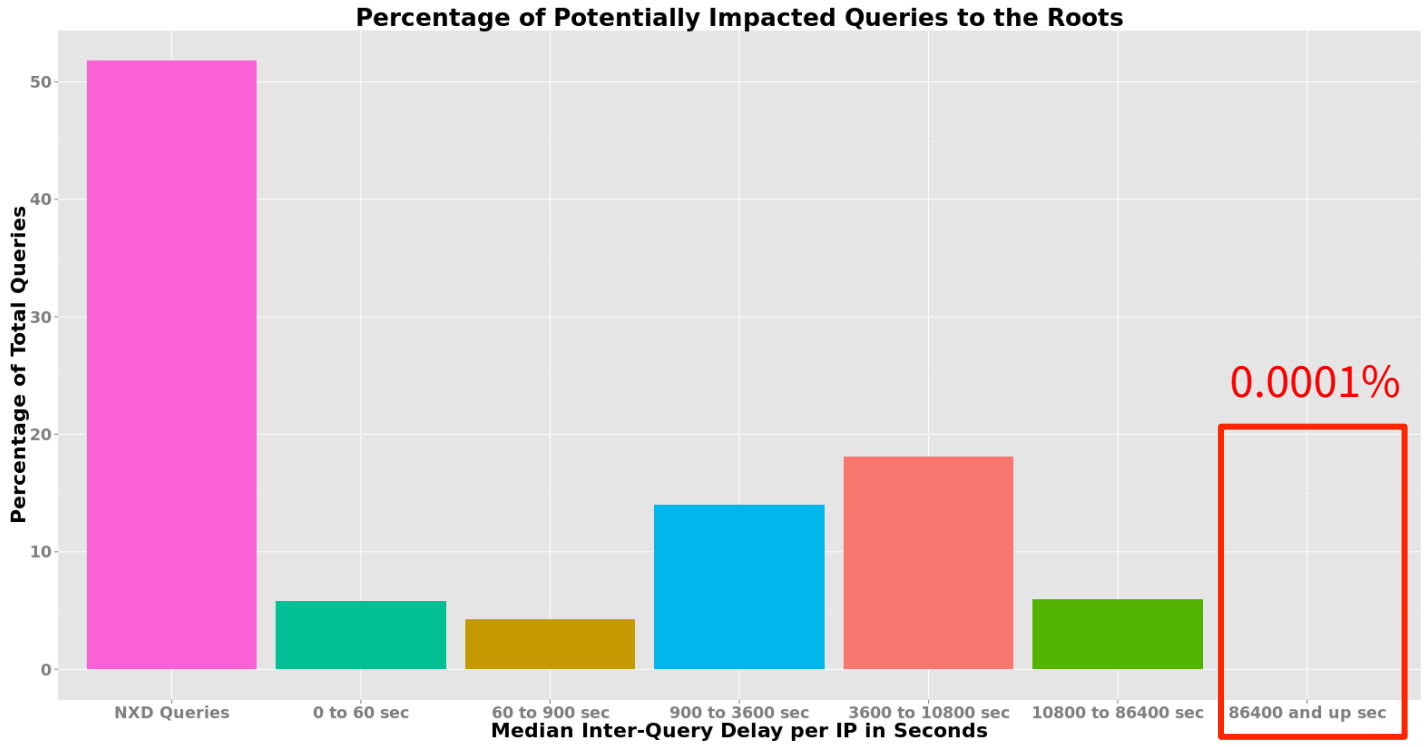
1. The root zone delegation TTLs are still appropriate for today's environment





Root Zone TTLs – Preliminary Findings

2. Root zone TTLs values could be reduced to 1 day without any significant impact on the amount of traffic to root servers.



Root Zone TTLs – Preliminary Findings

3. Increasing root zone TTLs should only be done with careful consideration of DNSSEC-related implications.

   - Some theoretical DNSSEC-related problems have been identified
     - In practice, no real-world problems have been observed
     - Operational practices of root server operators make actual problems very unlikely

Root Zone TTLs – Preliminary Findings

4. Root zone TTLs appear to not matter to most clients

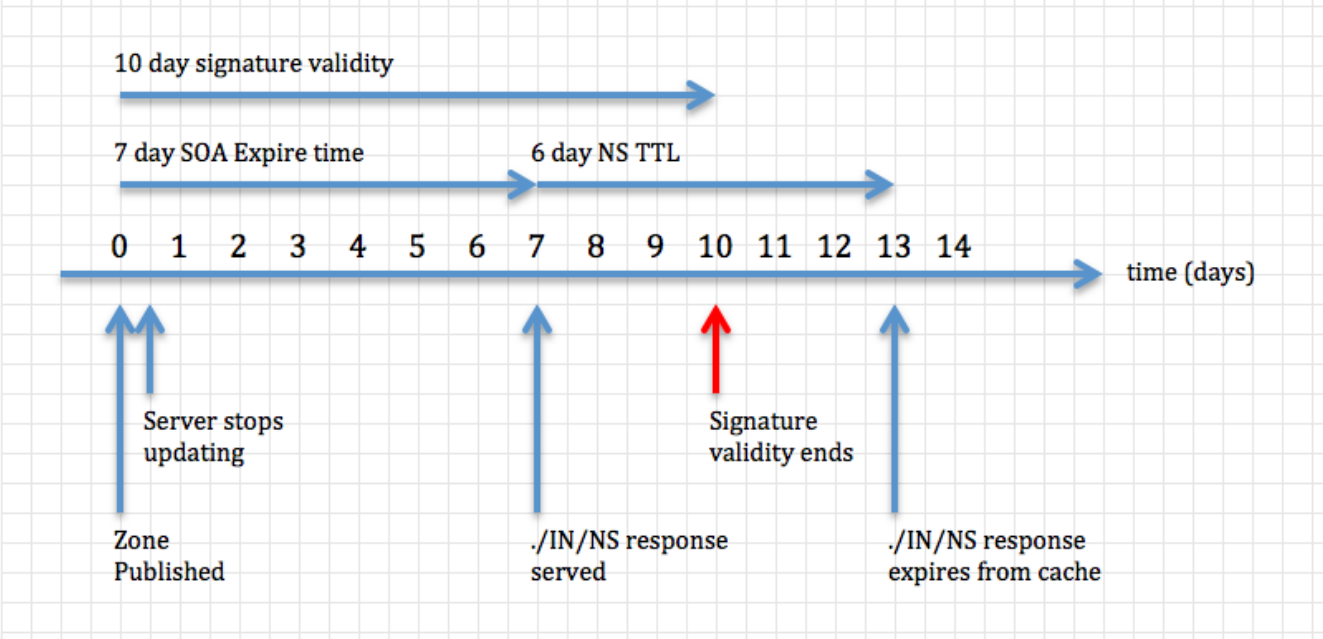
   - Time intervals between queries under the same TLD are highly skewed toward small values.
   - Most root server clients appear to send same-TLD queries at rates far higher than would be predicted by strict caching based on root zone TTLs.
   - Of the top 20 TLDs, more than 50% of clients send same-TLD queries more than once per hour.

Root Zone TTLs – Preliminary Findings

5. Few reasons exist today to consider changes to root zone TTLs
   - As a general principle of *conservatism*, changes to the root zone are to be made slowly, and deliberately. Delegations (TLDs) are added well in advance of queries from end users. Root name servers themselves are renumbered infrequently and with great care and planning.

Root Zone TTLs – Preliminary Findings

6. Two theoretical problems related to the interaction between the SOA Expire value and the root zone's signature periods exist, and the report suggests several approaches for mitigation



Root Zone TTLs – Preliminary Recommendations

1. Mitigation of the theoretical DNSSEC-related problems could be addressed with TTL changes, but there are also other options.

2. No other changes to Root Zone TTLs should be made at this time.

Root Zone TTLs – Next Steps

1. Complete the RSSAC Caucus review process [June 2015]

2. Revise the Report [July 2015]

3. Send to RSSAC for formal action [August 2015]

RSSAC Public Comment on CCWG Work Stream 1 Report

Suzanne Woolf

RSSAC Comment on CCWG Work Stream 1 Report

- RSSAC found the proposal difficult to evaluate in its effects so had little consensus on its substance.

- Some RSSAC members are uncomfortable with the “empowered community” mechanisms proposed as long as RSSAC is structured as a board appointed committee.

- RSSAC is generally concerned that becoming part of ICANN’s decision-making processes would require changes in structure and process not compatible with its advisory nature

RSSAC Follow-Up on CCWG Work Stream 1 Report

- Met with CCWG chairs here in BA, as they were interested in clarification of RSSAC concerns

- Follow up:
  - Placeholder in ICANN mission revision for RSSAC to provide text
  - RSSAC concerns to be documented in CCWG report

Upcoming RSSAC Caucus Work

Lars-Johan Liman

Upcoming Work Parties

1. Naming and signing:

a. Investigate pros and cons with renaming the root servers.
   - This would ***NOT*** affect the reachability of the servers, but could have positive effects on packet size and DNSSEC signing.
   - This has successfully been done in the past.

b. Investigate pros and cons with signing the root-servers.net zone with DNSSEC.

Upcoming Work Parties

2. TCP/UDP counter alignment in RSSAC-002

The counter for a certain parameter in RSSAC-002 (Root Server Sytem Measurements) is underspecified, which was discovered during implementation. This is a small adjustment of RSSAC-002 and will result in an revised version of the same document.

Identified Potential Future Work

1. Improving information about the root servers system and making it more accessible.

2. Creating a testbed to validate root server conformance to RSSAC-001 (Service Expectations) and RFC-2870bis (Protocol Requirements).

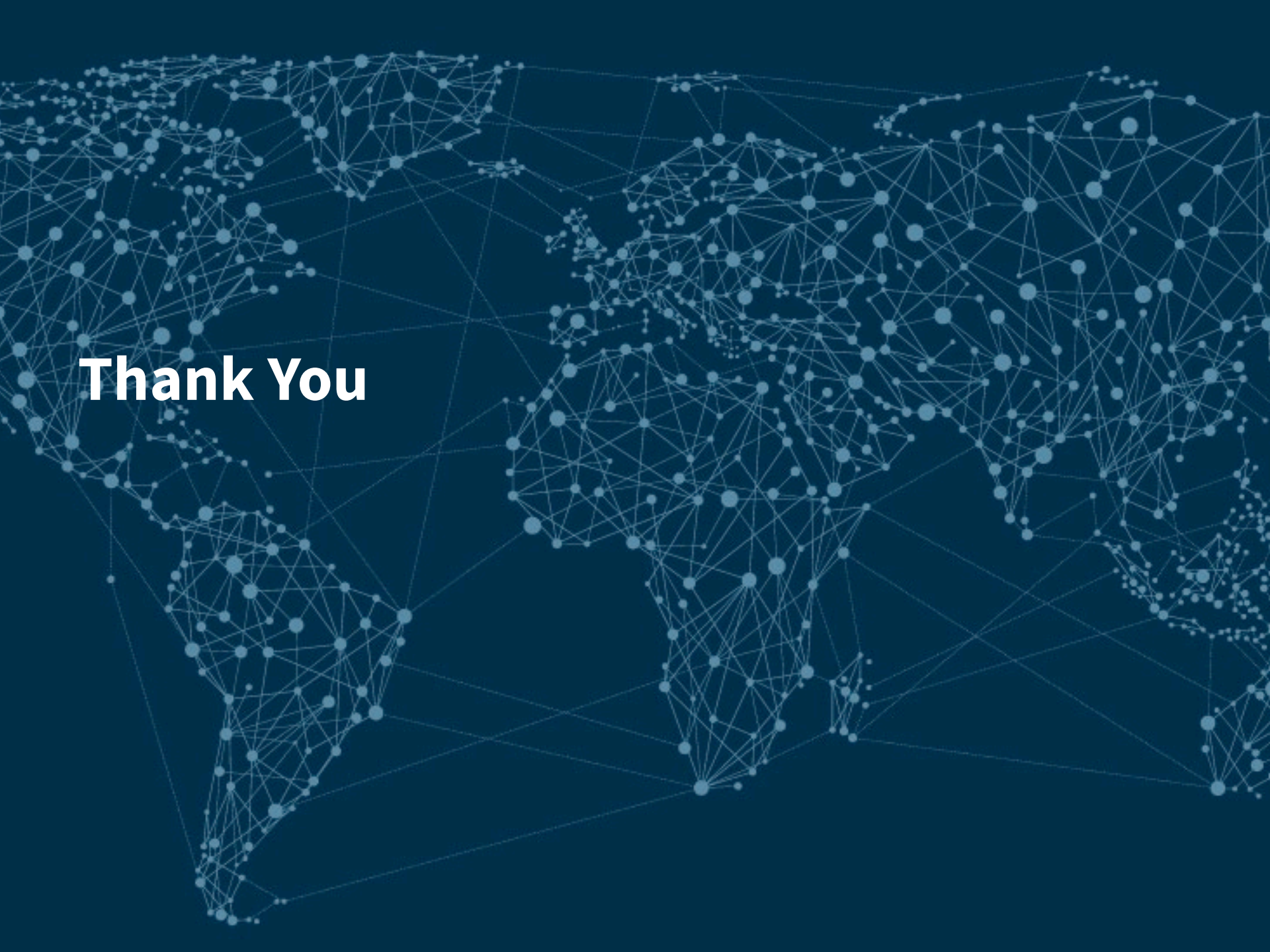
3. Expanding DITL measurements to analyze traffic spikes and trends.

Community Interaction

Lars-Johan Liman

Questions to the Community

- Are you able to find the available information about the RSSAC and its work?
- How can we improve on it?
- Are you aware of the various ways to interact with the RSSAC?
- Q & A


Thank You