OZAN SAHIN: Good morning, good afternoon, and good evening. This is the RSSAC Caucus meeting at IETF 110 held on the 7th of March, 2021, at 15:00 UTC. On the call today, we have Fred Baker, Jeff Osborn, Baojun Liu, Chris Ishisoko, David Lawrence, Duane Wessels, Hiro Hotta, Karl Reuss, Ken Renard, Kevin Wright, Mallory Knodel, Paul Hoffman, Peter Devries, Shinta Sato, Steve Crocker, Sresh Krishnaswamy, Wes Hardaker, Yazid Akanho, Yuji Sekiya. And I see Abdulkarim Oloyede is joining the call. From support staff, we have Andrew McConanchie and myself, Ozan Sahin. I'd like to remind you to all please state your names before speaking for transcription purposes. Over to you, Fred.

FRED BAKER: Okay, thank you. What we're looking at right now on the screen is the agenda for this morning. If people would like to comment, please raise your hand. Okay. So, the first item is a call to order and a review of the agenda, which is where we're at right now. We're going to have Jeff Osborn talk about the Caucus Membership Committee and what has been going on with that. I'll talk briefly about our recent publications.

Ken Renard will talk about work parties in the RSSAC, and then Andrew is going to talk about a project he has been doing. I've been interested in looking at the RSSAC 02 data and seeing if there is a way to visualize that. Andrew did that, so he's going to talk about what he has been doing. From there, we'll go to AOB and adjourn. Does anybody have any changes that they would like to make to the agenda?

STEVE CROCKER: Fred?

FRED BAKER: Okay. Steve Crocker, you've got your hand up.

STEVE CROCKER: Yeah, thank you. I'm curious what's happening with the deliberations over RSSAC's 37/38, the GWG. I don't know if that's in scope here or not but I'm curious about it. If it's in scope, maybe somebody can touch on it briefly.

FRED BAKER: Well, let's hear. Hiro is here. Liman, I believe, is here. I don't see Brad's name. But yeah, we could get a brief description of what the GWG is doing. Hiro, can I turn to you for that?

HIRO HOTTA: Yes.

FRED BAKER: Okay, thank you. So, we'll take that in AOB. Anything else? Okay. Failing that, let's actually do the agenda. We've come to order. We've reviewed the agenda. Jeff, it's your turn to talk about the caucus.

JEFF OSBORN: Fair enough. Thanks, Fred. Good morning, good afternoon, good evening, good day. The big piece of news with the RSSAC Caucus

Membership Group is we basically spent the last couple of years being concerned that, if we had people who weren't particularly active, that they either joined up and started becoming active or we would let them know that, maybe, they shouldn't be part of the group.

Today's update basically shows where we have gotten rid of some inactive people. We've increased the number of active people in the percentages work. But when I presented this to the RSSAC a week or two ago, they raised the point that, given we're in a pandemic and we have pretty good numbers now, why don't we issue an amnesty?

The Membership Committee had come up with, for six months, why don't we just say, "Let's stop riding people to ensure that they show up for something." I can't remember who from the RSSAC proposed, "Let's just make it 12 months." So, I'm going to go through what we're doing here in terms of following up on activity and ensuring that everybody has got an acceptable level of activity.

But what we're actually going to do is give it about a one-year break to let the world catch up to the pandemic. So, here we're reviewing the levels of activity required. It's either attendance at meetings or in work caucuses, contribution to publications, or acting as liaison or representative. Next page.

As you see here, over the last two years, we have dropped a lot. We had almost 40% of people who were inactive and we're down to about a sixth. So, when you include the exempt members—because we give you a year to catch up with things—we're in a place where we have a much

higher level of activity and we thought it seemed safe to say, “Let’s just give it a one-year break.” Last page.

So again, we tracked some people and found out whether they either wanted to be more involved or less. We feel like we’re at a good percentage now so we’re going to leave it alone for a year. That’s that. Any questions on membership? Thanks. Thanks to Ozan, who does such great slides. It’s really painless trying to present anything because he just does such a good job with them. Thanks, Ozan. Back to you, Fred.

FRED BAKER: Okay, thank you. Let me add that, while this process of calling out people that aren’t doing anything might seem somewhat draconian, it’s something we talked about as people entered the caucus. So, this is simply following through on our stated procedures.

In the review that Jeff, and Ozan, and others did, one of the things that they found was that a number of people had changed their affiliation or otherwise were no longer interested in being members of the caucus. So, doing this turned out to be helpful in that regard. Okay.

So, the next thing on our agenda. We wanted to talk about some recent publications that came from the RSSAC. Yeah, okay. So, we have three recent documents: RSSAC 52, 53, and 54. Some of these, it frankly seemed like it might be better to send as an e-mail. But our stated procedure is that, when we get around to saying something, we want to issue it as a document and put a number on it.

So, we did, and here we are. Now, OCTO-15 is a statement by OCTO, by the Office of the CTO in ICANN. It reflects statements that were made by the RSSAC and by the Security and Stability Advisory Committee, SSAC, regarding the root zone. We kind of said, "Gee, if things get bad in the root zone, we'd probably like to know that sooner rather than later. So, it would be good to have some sort of an early warning system."

Where did we say that? It was RSSAC 31, I believe. So, the SSAC made a similar statement. This is a similar statement, really, from the Office of the CTO. And so, we're giving them comments on the version of the document that they showed us before publication.

We really made just a couple of statements. One of them is that there were a number of references to root operators, RSOs, in the document. We said, "Well, from ICANN's perspective, it would be better to talk about the Root Server System." So, that comment is there.

And I'll give you some personal history. When ICANN was first formed, the CEO at the time, a fellow by the name of Mike Roberts, sent a note to the chair of the IETF, who happened to be me, and asked … What he was essentially asking was, "What is the addressable market that ICANN has? Is there a maximum number of names that one could have in the root zone? Is there something that they should know in order to address that?"

What I told them was that I thought that that wasn't actually a technical question—that was a business question. If they had a large number of people that had a reasonable business opportunity then they should

have that many names. And if they only had a few RIRs or registries that might be reasonable business plans then they should have a few names.

What they have done in the 20-plus years since then is push fairly hard to make there be a large number of names in the root zone. At one point, for example, they wanted to have every major city in the world possibly have a name in the root zone, and so on, and have added a number of different things.

The comment of the RSSAC has been that we would like changes that are made to the root zone to be manageable—that if the are exploratory changes made such as those and things go awry, we wanted to be able to back out the change. So, you'll find those comments in RSSAC 22 and RSSAC 31. So, next slide, please.

PAUL HOFFMAN: Actually, Fred, can I comment on that since that was my document you were commenting on?

FRED BAKER: Oh, sure.

PAUL HOFFMAN: So, if we can go back? So, two things. Just to be clear, OCTO documents are done completely outside of RSSAC. This is one that we happened to do a public comment on. We mostly don't ask for public comments on our documents, except when ICANN or OCTO specifically is doing a

document that says, “Here is how we intend to implement something. We want to get implementation guidance.”

So, on the two RSSAC recommendations, the first bullet that Fred talked about, he wanted to change, or RSSAC wanted to change, the focus from the RSO to the Root Server System. We actually rejected that simply because it would mean that whatever warning came out would come out later.

That is, a warning about an individual Root Server Operator having problems, having scaling issues and such, would get hidden by the fact that the other Root Server Operators weren’t having scaling issues. So, we actually rejected that idea because … And by the way, we don’t think that there are ever going to be any of these issues.

We’re going to have to build the systems, anyway. But we really—and this is in agreement with RSSAC—don’t expect this to happen. But if it does happen, we do want it to be as early as possible. On the second bullet, while in complete agreement about that, it doesn’t actually have anything to do with early warning.

It’s mostly saying to ICANN as a whole, “Don’t do something stupid in the root zone,” which I think is a perfectly reasonable thing to keep saying. But we didn’t include that in the revision to OCTO-15, either, because we don’t want to indicate anything like we are looking for all of ICANN to not do something stupid. That’s not really early warning.

One of the things that’s in OCTO-15 and is in the revision to it says that we will be asking folks all over, “Hey, are you seeing anything?” Really,

the way that we're doing early warning is by asking people, "Do you see anything? Do you see anything?"

And certainly, the Root Server Operators would see if, all of a sudden, the root zone had so much stuck into it that they were concerned and they would report it to us. So, if you're interested, you can go to the OCTO page on ICANN and you will see that there is now OCTO-15 v2 with the changes that were requested from RSSAC, from SSAC, and a few other communities, as well. Thank you.

FRED BAKER: Okay. Thank you, Paul. Yeah. So, I wanted to actually make it pretty clear that we were commenting on a particular version of the document in this, and that's why I started out that way. So, okay. Ozan, could I see the next slide, please? And Paul also touched on this but we have advice in RSSAC 31. We said, in essence, that we still agree with ourselves on that point, that what you want in the root zone are things that are going to be generally useful to the Internet worldwide.

So, we tend to take a fairly conservative approach to the content of the root zone. Next slide? Okay. So, the next slide is RSSAC 53. I may as well read it, what it says. The IANA Function Review initial report made four recommendations and they all sounded reasonable to us.

So we said, "Sure. Fine. Let's do that." So, next slide. Slide 54. OCTO was in the process of coming out with OCTO-16 and, again, ran it by us for our comment—not that they were asking for review, per se, but said it would be nice, perhaps, to get a viewpoint other than their own, just to keep track of things.

And in this case, there were three things that the RSSAC was specifically concerned about. OCTO-16, at least the version that we reviewed, spent a lot of time talking about L-root, which is the IMRS, and kind of interchangeably talked about that or the Root Server System, as if the IMRS was the entire Root Server System.

And, there being 11 other Root Server Operators, we scratched our head and said, "That's not the view of the world that we have." And we would really like, when OCTO has something to say about the Root Server System, that it talks about the Root Server System. If it's talking about the IMRS, they're free to say anything they want but they should talk about the IMRS and they shouldn't conflate the two.

So, we made that comment. And Paul, I'll give you a moment to interject on this in just a moment. I'm sure you're itching to touch the keyboard. We didn't like the way RSS performance was portrayed in that particular document. We basically asked OCTO to change the way that they viewed it.

With hyper-local, the document, frankly, read as an advertising blurb, that the way of the future is to have hyper-local roots. Well, okay. But we're not sure that all of the other operators see it that way. We have another experiment being done at RSI. We kind of felt that, if you're going to talk about hyper-local, you should at least talk about each of the existing implementations. And hyper-local actually has some downsides and none of the downsides were mentioned. So, we asked that the downsides be mentioned. Paul, do you want to get in on that?

PAUL HOFFMAN: No, but I guess I have to, anyways. So, OCTO-16 was published. It also went out for public comment, which is where RSSAC 054 came in. RSSAC and a few others commented on it, here. Hang on a sec, let me paste into … I've just pasted into the chat. Whenever ICANN does a public comment, staff are required fairly soon after the public comment is closed to do a report.

And so, I've just pasted in the link to the report, which basically says, "Yep, we need to revise this." So, that is still ongoing. To be clear, it is not my document, whereas the early warning system was my document. This one is definitely not. So, I don't know where it is, like where it is that we have agreed, "Yep, we need to update it."

And again, for everybody's comments. We take all public comments seriously and sometimes public comments come from groups that really understand what's going on, like RSSAC, the case of talking about the root name server strategy. But we also get public comments from people who barely understand what's going on. It's still our responsibility to deal with all of them.

So, I would expect a new version of OCTO-16 coming out sometime in the future. That's all we committed to. I don't know where it is. But certainly, the public comments were heard and I know they have been discussed inside, as well. So, when that happens, I don't think there will be another public comment period, but I'll certainly let RSSAC Caucus know when the new version is coming out.

FRED BAKER: Okay. Thank you, Paul. Yes, I put you on the spot, there, speaking for OCTO. So, that said, this ends the section where we talk about recent documents. Those documents were, essentially, an exchange between us and OCTO. Does anybody have further comments before I move on?

Seeing no hands, we'll go to work parties and work products. We have two work parties at the moment, both of which are in the process of winding up. We talked about a third work party and we'll let Andrew talk about his work, which I think, frankly, is a little bit more to the point. Ken, could I get you to talk about the work parties?

KEN RENARD: Sure. Thanks, Fred. Can you hear me all right?

FRED BAKER: Yes, I can hear you.

KEN RENARD: Great. So, the purpose here is to give an overview of the work parties and the documents that are being written by them. So, caucus members here today, we encourage everyone to review the working documents—these are draft documents—provide comments either by posting comments or suggestions in the Google Documents themselves.

Ozan, if you wouldn't mind posting links to both work party documents, I'd appreciate that. Another way to participate is to post suggestions or discussions to the RSSAC Caucus mail list. Any of those would be really

appreciated. Both these work parties, as Fred said, are wrapping up soon.

So, if you're going to propose fundamental changes, we may not be able to address them at this point. But again, we would really appreciate the comments from the larger group. The next meetings for each of the two work parties are during the ICANN week. You can see the agenda here on the Zoom session, as well as the ICANN agendas for the RSSAC sessions.

With that, I will go into the Rogue Operator Work Party. So, this work came out of RSSAC 037, which is the Governance Model, where it does describe potential scenarios for the removal of a Root Server Operator. One of those is if the Root Server Operator goes rogue.

So, the idea here was to expand further on what it means to be rogue and to inform the future governance body of what it means or a foundation for how that governance body would describe rogue or interpret rogue and what the RSSAC Caucus thinks at this point.

We do this in the document by describing scenarios where an RSO is violating some of the guiding principles of the RSOs. So, those guiding principles are described in RSSAC 037. They are likely going to come out as a separate supporting document, as well, because they are very foundational. Look for that in the future.

But we focus on the activity of an IANA-designated RSO, not the activity of anybody else. So, some details in that description but, basically, we're talking about activities of actors within our purview. We're not going out and talking about people outside of RSSAC or RSSAC Caucus. So, our

advice to the governance body is that they are going to have to determine intent somehow.

So, we're only describing types of behavior that are rogue but we specifically call out that accidental, mistaken, or temporary conditions that are reasonably remediated are not rogue. What are rogue are things like the true intent to deceive or negatively impact the query source.

We have a set of objective observations that are examples of rogue behavior. These include changed answers, incorrect additional answers, bad error codes, omitting DNSSEC when requested, or just bad DNS usage as in protocol usage. So thanks, Paul, for coming up with those titles. We can refine those, if we see fit, later on.

We also have some subjective observations that could describe rogue operations, which are intentionally degrading service, maybe to a specific region, ASN, or country. And then, one we're really trying to wrangle with here that we could really use some input on. That revolves around trying to incite reduction of or trying to reduce the trust of the Internet community in the Root Server System.

So, would really appreciate some thoughts if you do get a chance to look at the document. That one is a little bit touchy, and it's open-ended, and, again, since this document is meant to inform the RSS governance body, we think that they will understand the situation properly.

We do worry about others that read this that may try to use this in a way that's not intended. So, that's the Rogue Operator Work Party. Go ahead and take any comments, thoughts, or ideas. Anybody? All right.

The other work party is about a tool for the local perspective, for measuring the local perspective. Abdulkarim, do you want to have any opening statements for that? I have some other thoughts to share shortly.

ABDULKARIM OLOYEDE: Ken, you can go ahead. Thank you.

KEN RENARD: Thanks, Abdulkarim. So, the purpose of this work party and document is to describe a tool that can perform measurements of the Root Server System from various points on the Internet. It is a complementary tool to what is described in RSSAC 047, which focuses more on measuring the performance of the Root Server System and RSOs specifically.

So, instead of measuring from, maybe, well-connected vantage points, we want to measure from lots of different vantage points. So, we're looking to describe use cases for a tool that really focuses more on operations and usage of the RSS, Root Server System.

So, not really focusing on just general research but we certainly would not exclude any use of the data collected, within reason. So, we've come up with a set of use cases, and try to describe the important measurements for such a use case, and then describe some procedures and details of how we would collect them with such a tool.

So, the three scenarios are informing the determination of underserved areas. So, that one is looking to [collect tool] to support that analysis. We're not going to say, "This tool will tell you if you are or are not an

underserved area," it's just, "there are the measurements that would be of importance."

Those measurements are latency, availability, root server instance identification, path information to each of those root server instances, and reference latencies to, say, Google or Cloudflare, to kind of get an idea of how well-connected the site might be.

So, give some sort of reference point. The second use-case is evaluating third-party requests for hosting an Anycast instance. So, this case would be an RSO gets a request from some network or organization that says, "Hey, we'd like to host an instance of your root server."

Each RSO is going to have their own determination/decision process but we're focusing on providing information, providing measurements, that could help support that decision. Ones here are latency, availability, root server instance identification. One thing that would be useful is to determine the size or the scope of their Anycast catchment.

Specifically, that one is outside the scope of our tool because it's actually well-covered by another tool which we refer to. The third use-case is a recursive operator wanting to understand their view of the Root Server System. This may help them decide if they need to move the recursive resolvers within their network or organization, maybe change routing, things like that.

So, the measurements we're looking to do there are accuracy, availability, and latency. In the document, for each of these use cases, we also talk about the procedures—how you would actually go about

what measurements, how you would take those measurements; some of the specifics.

Then, we will go on to describe each of those measurement procedures and build almost pseudo-code of, "These are the measurements collected from these three different use cases." That's going to really start to outline what a tool needs to do. From there, we go into a few recommendations.

We recommend to ICANN that such a tool be built, that it actually could be a very simple tool. It could be something easily built and hosted by any organization. Also, recommend that a data collection mechanism be established—not necessarily by ICANN—to collect the data and provide a way that folks can get that data and analyze it.

One important footnote here is that many of the measurements that we are specifying for this tool are also available via RIPE Atlas probes. So, there is a very large set of overlap which could mean that we have a 10,000-user-installed base right out of the bat. Well, we expect there to be a few differences.

So, this tool could be useful to specifically address those additional measurements, or maybe we could even propose to RIPE Atlas to add some measurements. Regardless, having a tool, something that is potentially very simple to download, run, run a few times, and report some statistics, that's probably lighter-weight than going through the process of getting an Atlas probe, [yourself].

So, those are the two work parties. Again, the next work party meetings are during the ICANN week. We would really encourage everyone to go

out and review the documents. Both the links are provided by Ozan. Thank you. And go ahead and discuss/provide comments in the document, or on the mailing list, or even right now. So, I appreciate your thoughts and take any questions on either work party. All right. Everybody is still waking up.

FRED BAKER: Yeah, right. I don't see any hands. People are certainly welcome to jump in. But let me tell you about a particular instance where I thought this would be a useful tool to have. At an ICANN meeting about two years ago, Andrew gave a tutorial and talked about the RSS and how things worked. I was in the room and a fellow from Zimbabwe approached me, asked me to talk about what was involved.

Basically, he wanted to get a root server instance in his country, which, okay, let's talk about that. The first thing that we did was I brought up root-servers.org and found that, yes, there were in fact no servers in Zimbabwe. There were servers in a neighboring country, Malawi.

I don't recall whether these servers were there at the time but, in Blantyre, there, NASA has a root server. [NIMRS] has a root server and the University of Maryland has a root server today. They might have been there at the time. But there were none in Zimbabwe.

So, my first question representing a Root Server Operator was, "Okay. The different computer instances that you find in Zimbabwe probably use the root servers in Blantyre. Is that a problem?" This tool would be interesting in that context, it being able to determine whether there is a problem.

What has since happened in the couple of years since then … I see that the University of Maryland has brought up a root server in Harare, so there is now a root serve in Zimbabwe. So, this is at least part of the kinds of questions that one would hope that this tool might answer. Now, I'm looking at the list of participants. I still don't see any hands. Ken, do you have any further comments?

KEN RENARD: No, that's it. Thanks, Fred.

FRED BAKER: Okay. Well, thank you very much for that.

ABDULKARIM OLOYEDE: I'm sorry, can I quickly have one—

FRED BAKER: [inaudible], go ahead.

ABDULKARIM OLOYEDE: So, I want to just find out that we are approaching the one-year mark and, probably, I'm not sure, [inaudible] we need a little bit more time. I don't know if Ken wants to talk a little bit about that.

KEN RENARD: Thanks, Abdulkarim. Yeah, we brought this up in the RSSAC meeting and it seemed like—Fred, I'll have to follow-up with you on this—adding a

short amount of time didn't pose too many problems. I think we would all rather have a more complete and correct document than a specific timeframe. Fred or anybody else, any further thoughts on that?

FRED BAKER: Well, I don't see other people jumping in, so I'll respond. Yes, the whole point of a work party is to get a correct document out. It would be nice if it happened within the scheduled timeframe but, if not, well, okay. I believe that the work party said that they wanted to continue for another two months. Am I correct in that?

KEN RENARD: I think, yeah, that was a number thrown out that's a good intermediate between being too lazy and trying to drive ourselves to be done.

FRED BAKER: Well, yeah. So, we would like the work party to be done. We would like to have it have a useful outcome, as well. So, sure. The RSSAC has talked about that and we're willing to work with you on that.

KEN RENARD: Thanks.

FRED BAKER: Now, a couple of months ago, I sent an e-mail to the caucus in which I was talking about the use of RSSAC 2 data and wondered if people in the

caucus would like to take a look at that data and see what it would take to graph it. We started to think about having a work party in that regard.

Meanwhile, Andrew McConachie went and actually did a prototype which I think he did a really good job. So, hat's off to you, Andrew. So, Andrew is going to talk a little bit about the work that he did with the RSSAC 2 data. Andrew, your ball.

ANDREW MCCONACHIE: Thanks, Fred. Everyone should be seeing the start of a presentation, now. So, this is a project I've been working on for a couple of months. I've got a short presentation, and then a short demo, and then, at the end, I've got a question to the RSSAC Caucus on how they'd like to move this further. Please keep all your questions to the end.

I'll send this presentation, and links, and whatnot to the RSSAC Caucus list after this call. There we go. So, as I said, I've been working on this for a couple of months. It consists of two parts. There is a web API, an RSSAC002 web API, which outputs JSON. It takes in the YAML from RSSAC002 data and outputs JSON.

And then, what good would the API be if I didn't have a website hosting some charts that make some pretty visualizations of the data? All the code I wrote is open source. Thanks a bunch for all … I've gotten a bunch of feedback so far from Fred, and Ray, Paul, Brad, and Duane. Thank you very much for your feedback. I look forward to feedback from others, and links to everything, and questions at the end.

So, first off, the API. This is really just a HTTP Git interface to RSSAC002 data. As I said, it returns JSON-formatted data. I used Duane's RSSAC002 Git repo just because it's a really handy way to just get access to all the RSSAC002 data. I just pull the Git repo. I wrote it in PHP.

I don't do anything before January 1st, 2017. I just kind of picked that data as an arbitrary cut-off date because stuff before that is really messy and stuff after that is less messy. Yeah. So, what I do is I parse the YAML, and then store it as serialized data structures, and then, when a call comes in to serve it via JSON, I just read it from disk and then serve it.

So, I'm not parsing YAML at every HTTP call. These are the various interfaces that I support. There are really just three arguments to every interface. It's a list of RSIs, for example A through M, or you can also do comma, separate it, like "A, B, C," or you can do a mixture. You can do "A, B" and "D-L" or whatever.

And then, the start-date and the end-date in those formats. A little bit about the charts before I show them. These are all interactive JavaScript charts made through AJAX calls. I use jQuery. They obviously use the web API to get their data. They're all kind of manipulatable in the browser. So, you can zoom-in on them and kind of play with them a little bit. I'll show you that in a demo.

And they're all pretty much time series, so most of these are going to be either line charts or stacked line charts because the X-axis is almost always just time in these. There are a couple of exceptions to that. With regard to the time, again, I started January 1st 2017. They're all delayed

by two weeks. So, the data I'm using in the charts themselves is always two weeks old.

The API itself will just … You know, whatever is there. So, whatever I pull from Git, it will serve. And if there is no data there, it will just send a "null." So, I have to be able to deal with nulls sometimes in the charts, but it's because there is this delay.

And so, this really just shouldn't be used as like a real-time analysis of what's going on with the RSS or anything like that. It's really about a larger, slightly older view of what went on in the RSS before two weeks ago. And I use the highcharts.com charting library. That's the library I use.

Oh, that. So now, the demo. Let's see, here. It's not that. And then, this other thing. Here. He should be looking at Firefox. So, just a quick demo of the API itself. Everything is sorted. You can kind of see the call a little bit up here. I won't spend too much time on this.

But it returns JSON data that's sorted by RSI and then, underneath that, there are dates, and then, underneath that, there is the actual data. This is traffic volume. You see the RSI list is A through M, but you could just do that and get a … It's 2020, January 1st, to 2020, January 31st.

So, it's basically the month of January. But what good is an API if you don't have some pretty graphics with it? So, I haven't got a lot of charts, here. I am not going to show them all because there are a lot. But I encourage people to go and play with this after this call and play with it yourself. I mean, all the charts are interactive. So, for instance, this is just queries received per day. This is [a double] RSS. You can do things like

zoom in. What's one [inaudible] go through, here? Let's look at queries received.

[FRED BAKER:] What's that spike in January? No, in … It must be August.

ANDREW MCCONACHIE: I don't know. I don't actually … I mean, I just take the RSSAC002 data. I don't know answers to questions like that. But this is a stacked chart, just showing all the different RSIs. And then, you've got line down here. You can, of course, remove an RSI or just show one at the end if you so wish. [Isolate] queries by protocol.

There is a little bit of a delay because it takes a bit of a time for the browser to render them. By doing it like that, it really allows you to have them be manipulatable in the browser. I don't even know if manipulatable is a word, but anyways.

And again, you can zoom-in on these if you so wish. So, this is by protocol. This is by RSI. So, you see the RSI is listed up here. This is all a scale of billions of queries per day, essentially. You can remove these things, as well, if you so wish. And so, I won't go through all the charts and queries received. You can do that, yourself.

But you see responses sent. The same kind of queries are under both. Moving down to some charts on unique sources. We've got this done by RSI. Same kind of thing for IPv6. You can do some comparison between IPv4 and IPv6. See, that's pretty steady, although it looks like IPv6 is going up a little bit. Moving down to some of the tricker ones.

So, I said most of these are time series. Not all of them are time series. These are the only two pie charts I have. And here, you can do a bit of a comparison. On some of these charts, you'll see you can say, "Oh, I'd really like to know what's going on. I'd like to compare, let's say, 2018—so that would be the … February. So, it would be 2018. We can compare that to 2019.

So, you can do a bit of a comparison there and you can also click on this and say, "Well, who is sending all these no-errors?" and then you get the list of RSIs. I mean, with our codes, it's a little bit uninteresting because there are really just two that are mostly sent.

So, there is this NOERROR versus NXDOMAIN, which is almost all the R-codes that are being sent. You can zoom-in on this, as well. Moving down to packet sizes. I'll show a couple here. Let's do UDP queries by RSI. What I do with the packet sizes is, because there are so many packet sizes and most of them are just registering zero, there is nothing actually being counted there, I just take the top ten.

So, all of these UDP queries by RSI, TCP queries by RSI, and their responses, are just the top ten. So, here we see the top ten UDP request sizes from the point of view of A. You can delete them if you want to drill down on one. You can, of course, zoom in, as well. And then, one final chart I'd like to show you is TCP responses comparison.

So, this is kind of funky and this takes a little bit of explanation. But like the pie chart, what you can do here is you can say, "Let's compare 2018 to 2019." Maybe we're … Okay, that's January. And what this is showing

is every packet-size range that has more than 1% of all packet sizes registered is being graphed, here.

And you can see the percentage is at the top of each bar, and it's a stacked bar. You can't actually delete these like you can in the other graphs but you can just put that here. So you can just said, "I just want one RSI," or, "I want whatever," and it will show a comparison of packet sizes. Those are for all the different packet sizes.

So, that's the demo. I encourage people to go play with this themselves because there are many more that I can go into but I just like playing with these things. Let me then get back to my final slide. So, that's pretty much the presentation. The question and the ask I have for the RSSAC Caucus is, does the RSSAC Caucus wish to see ICANN Org host this project on behalf of the RSSAC?

So kind of like, how should we move forward with this? Currently, this is just hosted on a little VM that's underneath my personal domain. Obviously, it can't live there forever. So, what's the best way forward to this? Is this something that ICANN Org should host on behalf of the RSSAC? Do people have other ideas? I will open the floor to that. It looks like Duane has his hand up. Duane, go ahead.

DUANE WESSELS: Hey, Andrew. Thanks. So, two things. One of your earlier slides said this was Duane's RSSAC Git repo. It would be great if you could say that it was … It's really the RSSAC Caucus' Git repo. I mean, I happen to be the one that mostly populates that and maintains it but it's really the caucus' Git repo. It's under the RSSAC Caucus account, if you will.

ANDREW MCCONACHIE: Okay.

DUANE WESSELS: So, that's one thing. And to your question about where this should be hosted, I'm a big fan of what you've done here. I mentioned to some of the Root Server Operator colleagues that I think the Root Server Operator should try to host this.

We have a little group that we call our [inaudible] group who maintains a server. We all agree there that that would be a good thing to do. So, the Root Server Operators are very much willing to take what you've done and put it on some kind of system that they will maintain going forward as a place where people can see this.

[FRED BAKER:] So, that would be from rootservers.org?

DUANE WESSELS: That would be, yes, some domain, TBD, under rootserver.org, something like rssac002.rootserver.org, or something like that, yeah.

[FRED BAKER:] Okay, cool.

[DUANE WESSELS:] Wes?

WES HARDAKER: Yeah. Thanks, Andrew, for the demonstration. I tinkered around with it and you've done a lot more than I realized you have done. I think this does bring in the bigger question of, when we come across projects like this that require some sort of web service, where is the best place to hold them from RSSAC generically?

So, I think Duane already mentioned this is sort of perfectly in-line with what rootservers.org might host, or something like that. But in the bigger sense, we have an RSSAC Caucus GitHub repo, which was great for storing code.

But for a thing with an interactive database or things like that … And I think that we're going to get into that more as we measure tools for measuring the latency or whatever else. We're going to end up with this problem a lot of the time. We've never really had a good answer for that of, where can we generically say, "Look, the caucus did this great work on this particular project. Where do we put it now?"

Code, we have an answer for, but we don't for things like this. So, I suspect that this can be transferred easily to what Duane was talking about but there are going to be cases where that is not appropriate and we should really think about that long-term, as well.

FRED BAKER: Well, okay. I don't see any other hand right now, so let me stick myself in the queue. I think there were a couple of things that we learned in the process of you writing this and us kicking it around in e-mail. One of

them was that we discovered that F had made some errors in the data that had uploaded to the comment repository.

We went back … I represent F. I represent ISC on the [inaudible]. We went back, and took a look at that data, and corrected it. And then, you can also kind of see in the graphic the fact that the Root Server System changes. It's not completely stable and various things happen.

So, one of the objectives—and I think Brad probably stated this best—in doing this kind of work was to have it out there, visible, and have people be able to say, "That doesn't look right," or, "there's something that we should be looking at."

So, I think this is very useful from that perspective and would encourage the caucus to look at it once we get it posted. So, when we figure that all out, we'll make the links available to the caucus. You have, of course, made the current links, the prototype links, available on this page. So, I think this is very useful work and I thank you for doing it.

ANDREW MCCONACHIE: Okay. And as far as where we host it, I guess we'll just continue having that discussion?

FRED BAKER: Yeah. I'm sure somebody will tell me somewhere along the way that someplace under rootserver.org is probably a good place to have it, I would think. Yeah.

ANDREW MCCONACHIE: I guess if people have thoughts on that they can send them to the link. That sounds sensible.

FRED BAKER: Right. Okay. So, thank you very much for that. Let's move ahead. We had a question: what's going on with the evolution of the root zone? Let me make a couple of comments and then turn the agenda over to Hiro.

So, the RSSAC did a whole bunch of work over a period of time and came up with RSSAC037 and 038. 038 kind of says, "We think the ICANN Board should read 037." The ICANN came back with a response to two things that we didn't spell out.

We figured somebody needed to be able to handle the money, which we call the financial function, and somebody needed to be able to do the background paperwork, which we call the secretariat function, and ICANN suggested that they might do that.

Okay, we all agreed on that. And then, ICANN created the GWG, which is an organization designed to figure out the next steps in the evolution and tell ICANN how to get all that started. The composition of the GWG is some people from the registries and three people from the Root Server Organization. So, Brad, and Liman, and Hiro. So now, Hiro, could you fill us in on the current status of the GWG and how it sees things moving forward?

HIRO HOTTA: Okay. One of these we represented from our results in the GWG, as Fred said. I'll try to report what RSS GWG has now … I see a couple of

colleagues in this meeting today who regularly attend the GWG meetings. So, please help me by correcting me or adding to what I will say. So, RSS GWG has biweekly meetings from February last year and it means that the GWG has had around 25 meetings so far.

The initial plan says that it will … Or it works for two years. So, it means that, early next year, there will be a concrete result and we will resolve. The GWG meeting is designed to be transparent. And so, the agenda minutes and recording of the meetings are open to the public on ICANN's community page. It had discussed organizational framework based on RSSAC037.

It's now intensively discussing and drafting the document, including the PRS, which means the Public Root Services, which is responsible for the service of the whole Root Server System and which is a subsidiary of ICANN. That's [a design] at this moment, as much as PTI for IANA. The document is still fragile and we are making it firmer and firmer. Drafting as a text helps the GWG identify necessary points that need to be discussed more. PRS agrees with the … "Agrees" means that they have a contract, or MOU, or LOI in some form.

PRS agrees with each RSO. SAPF will be kind of as advisory team, which I understand, to PRS, and maybe to the community, how RSS, Root Server Systems, should be, and should be evolved, and so on. The detailed formal position of SAPF is still to be discussed, I think. For designation removal of RSO from the set of RSOs, I think it needs more discussion about the role of the multi-stakeholder reviews and how final decisions of designation or removal is made. I think that's the overview of what RSS GWG is discussing. Thank you.

FRED BAKER: Okay. Thank you, Hiro. Now, let me ask a question. That was … I forget who it was but somebody asked what's going on with the GWG. Did that answer the question?

[STEVE CROCKER:] Yes.

FRED BAKER: Okay, cool. We're coming to the close of our agenda and we're actually in the any other business phase. Does anybody have additional things that they would like to talk about? Hearing none, and pretty much at the end of the period that was set aside on the calendar, let me give you 23 minutes back in your day and adjourn the meeting.

UNIDENTIFIED MALE: Thanks, Fred.

[END OF TRANSCRIPT]