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DUBLIN – RSSAC Public Session  
Wednesday, October 21, 2015 – 14:00 to 15:15 IST  
ICANN54 | Dublin, Ireland

UNKNOWN SPEAKER: This is the RSSAC public session in the auditorium, on October 21<sup>st</sup> 2015 from 2 PM to 3:15 PM.

LARS-JOHAN LIMAN: Hello everybody. Welcome to this update session from the Root Service System Advisory Committee. My name is Lars-Johan Liman. I think I know everyone except two people in the audience. I am one of the two co-chairs of the Root Service System Advisory Committee, and I also represent Net Node, who operates one of the servers.

Up here, with me, are Jim Martin from IZ and F Root, [inaudible] from Verisign, Suzanne Woolf who is also representing ISC and F root in this case, but also is our...

SUZANNE WOOLF: I'm here as the liaison to the Board from RSSAC.

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*Note: The following is the output resulting from transcribing an audio file into a word/text document. Although the transcription is largely accurate, in some cases may be incomplete or inaccurate due to inaudible passages and grammatical corrections. It is posted as an aid to the original audio file, but should not be treated as an authoritative record.*

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LARS-JOHAN LIMAN: I was just getting to that. And [inaudible] who has been leading one of our work party efforts, also Daniel [inaudible] who is our liaison to the Internet Architecture Board.

In the audience we have a few more of RSSAC's members, but I am going to dive into this. It's going to be boring, it's going to be short, and that's basically what we are: boring and short. No, sorry.

SUZANNE WOOLF: No, now wait a minute. The CWG, sorry, the ICG session the other day, Alissa Cooper was very articulate on the subject of the quest for boring, and that with many jobs such as ours, if you're doing it right, it's not that interesting.

LARS-JOHAN LIMAN: There is that. Anyhow, I would like to give a quick overview of what we're doing. And I will engage my friends and colleagues here. So this is what we're going to talk about today. Excuse me. First a bit of an overview of what RSSAC is, and how we're put together. Then a quick walkthrough of our two most recent full-fledged documents, RSSAC 002 and RSSAC 003.

We are going to mention the statement we've made on the ICG IANA stewardship proposal. We're going to talk a little about the

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new work that we are undertaking, and we have a bit of questions from you. So, overview.

This is for those of you who have never seen RSSAC in the flesh before. So the role of Root Services System Advisory Committee is to advise the ICANN community and the Board on matters relating to the operations, administrating, security, and integrity of the Internet Root Service system.

This is from the bylaws. It's RSSAC's mission. And you should note that this is an extremely narrow scope. If you try to compare us to SSAC, we are not the same thing, we are a sibling, but we are a very different sibling in some respects. So RSSAC is formed by appointed representatives from the 12 organizations that operate root servers.

And each of these representatives also has the ability or opportunity to have an alternate that can step in if there are regular representative cannot make it to a meeting or has some kind of hindrance. And we also have a number of liaisons to other bodies. I've already mentioned we have a liaison to the Board, we have a liaison to the Internet Architecture Board.

We also have liaisons to the NomCom, to SSAC, to the IANA, and NTIA and Verisign in their roles and capacities at the root zone management maintainers. Sorry, I can never get that right.

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So that is the formal committee, and then we also have the RSSAC caucus, which is an open body, a body of volunteers, subject matter experts, who is really the meat of the RSSAC, because that's where all the experience and competence we need to conduct the investigations and create documents can be found.

Formally, the caucus is appointed by the RSSAC, but it's a very open process, and so far we haven't turned down anyone who wants to help us do work and do investigation. Yes, we should. So how many members in the audience are also members of the caucus?

Yeah, yeah. A few. Thank you, thank you for volunteering. The purpose of the caucus is, as I mentioned, to be a pool of experts, and it also creates a bit of transparency, which goes two ways. One way is that this is a broader body that actually helps us do important things, and they do that in an open fashion, with an open mailing list, and it's also very open to who can participate.

The transparency going in the other direction is that in order to be a member, you have to create a public statement of interest as to why you want to join, and what your affiliation is, and what your various ties are in various directions. And that statement of interest is and remains published on the Internet.

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So you can look on the RSSAC caucus webpages and you will find the public statements for all of the members of the caucus. In addition, when a document is created, all the people who have contributed to the contents of that document will be listed in the document itself, as part of the group that authored the document.

And by having these statements of interest, it's possible for anyone who reads the document to see that that person participated, but he has these affiliations so, and they can make their own judgment of whether that has kind of influenced the opinions expressed in the document and so on. So that's, it was rather important piece of transparency.

And of course, it's to keep credit to the people who actually did the work of creating the document. Right now, the caucus consists of 67 experts and 42 of those are from organizations that are not root server operators, unrelated. And we would like to see that number increase. And if you want to participate and contribute your time to help us create good results, then please apply to the email address mentioned, RSSAC dash membership at ICANN dot org.

So recent publications. We have one which is sitting in draft version waiting to be published, RSSAC 001, which is a service expectation document. It's intended to be published in tandem

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with a RFC from the Internet Architecture Board, and it's now hanging in there for pure administrative reasons.

RSSAC 002, which is an advisory on measurements on the root server system, and I believe Jim will talk more about that. RSSAC 003 which is a report on the root zone time to live measurements, and Gwen will talk more about that, and we also made a few statements which are not full documents. They are just statements from the group, where we've commented on the ICG proposal on the CCWG work stream one report. We've made a statement together with the Internet Architecture Board together with the relationship between the two.

And we've also created a statement with a recommendation to increase the DNSSEC signature [inaudible] of the root zone. That will tie into what Gwen is talking to later on here. And by that, I will turn it over to Jim.

JIM MARTIN:

Good afternoon. I'm Jim Martin from ISC, which is running the F root system. I want to take a couple of minutes to walk us through a little bit of background on RSSAC 002, but more importantly some work that's happening on it right now. So as a background, RSSAC 002 is a document that describes measurements to be taken of the root publishing system from all of the root server operators, that is consist amongst all of the

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operators, so that you can compare and collate data from all of them.

And the idea is that it was to serve as a bit of a warning system, so that we can see changes in the root system as things like the TLD, new TLDs are introduced, to see if there is an issue that needs to be addressed. The data that is collected, is everything from the latency from the time that the root zone maintainer publishes a new zone, through to the time that it makes it all the way out through the last node in the various clusters.

The size itself of the root zone, should be the same in all environments, not always. The number of queries, and the queries are TCP, UDP, v6, v4, to understand how those all look. The query and response size distribution, which is a little bit interesting and I'll get into that in a minute, the various R codes, and then the one sort of stretch goals is the number of sources seen.

And that was the number of unique sources across the entire environment. And the idea, remember this is a recommendation. We're making a recommendation to the root server operators to implement the measurements in this advisory, and that we then have the job to monitor the progress of the implementation, and I'll talk about that in just a second.

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And we then will revisit the actual document on a periodic basis. The goal was originally two years, but as we'll see in a moment, there is the reason to reopen it sooner than that, since it was just published about a year ago.

As of this meeting, the current status is that A, C, H, I, K, and L are all publishing their stats. The remaining letters all have plans to publish this information, or at least that is what we've received as information from them. And all of them are currently scheduled to begin publishing by the end of Q4.

So in theory at least, by the time that we have this meeting again next, we'll be able to say that everybody is publishing. When we say publishing the stats, each of the different organizations publishes them wherever they choose to publish them, however the root zone, rather root servers dot org website, which is the central information for all of the root servers, has pages for each of the individual root servers.

And as you'll see in the red box there, there is a tab for jumping directly to the stats. That is pointing to the individual repositories in each of the various organizations. Beyond that though, DNS [inaudible] has taken on as a task on their own, to pull together all of the RSSAC 002 stats so that there is a common location to archive that all.



When we talk about collecting statistics, just so you understand sort of physically what this looks like, it's a [inaudible] formatted file. It's one metric per day, rather per metric per day [inaudible] formatted files. And it looks just like that. And note some of the indentation there, that will be relevant in a moment.

So, I mentioned that we're reopening this. The reason is that as time has passed since last November when this was published, people have begun implementing this. And as they implemented it, they found bugs in the document. The first one was, in certain sections of the document, that the example [inaudible] indentation was such that it wouldn't compile, and so we're going in adding or deleting appropriate spaces. So that's going in.

The other two though are an interesting artifact of the way DNS works. It's all based upon when we talk about response sizes, and we're taking response sizes going into buckets, or the zone size being transferred. Sometimes, certainly all the times from a zone transfers, and sometimes for responses, it will go over TCP versus UDP.

And a TCP based DNS response will have two additional bites of length data in the message. And hence, when you... Some of these stats, it's not clear when you included those two bites are

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you didn't include those two bites. So we're clarifying the document to at least make it consistent.

Beyond that, I don't believe that we have any additional plans right now to make modification to RSSAC 002, and this is something that we would expect to wrap up in the next month or two. And with that, Dwayne?

DWAYNE: All right, thanks Jim. So I'm here today to talk to you about RSSAC 003, which is the report from a work party that investigated TTLs in the root zone. You want to ask a question? I'm sorry.

UNKNOWN SPEAKER: Hello. Yes. I'm [inaudible], and I am from India. Is the data being measured, is it for [inaudible] also? Or on the main root server.

JIM MARTIN: It is being measured, it is being measured per letter. Many letters measure it per site...

UNKNOWN SPEAKER: For example, L, we have got two instances in India. The data that is being measured is also covering those instances of India

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as well? Or it will be on the L server which is the main server, wherever it is kept?

JIM MARTIN: I believe, certainly that's being brought into... Well, first of all, I can't speak for L. But my... Terry would you like to answer that? Rather than me not answering for L.

TERRY MANDERSON: Terry Manderson answering for L Root. The dot is aggregated, and so we do include all of that data coming from the Indian instances in the final data set.

JIM MARTIN: Thank you Terry.

UNKNOWN SPEAKER: Hello, my name is [inaudible], I'm from Sudan. I'm a newcomer and it's my first ICANN meeting, first time as a Fellow.

UNKNOWN SPEAKER: Glad to have you here.

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UNKNOWN SPEAKER: Sorry, maybe I ask basic questions. So, on the previous slide, I don't know what is [inaudible] indentation, what is it? And why you use it? Thank you.

JIM MARTIN: I'm very sorry, I didn't understand the question. The indentation issue?

UNKNOWN SPEAKER: Yes.

JIM MARTIN: It was specifically in the [inaudible] format, if you'll notice there that there is indentation in the actual file, and the indentation actually is parsed, and in two of the places in the RSSAC 002 document, the example had an incorrect indentation. So we're simply fixing that so it will be parsed appropriately.

DWAYNE: No more questions about 002? Okay. So I was leading a work party that investigated TTLs for the root zone. Each DNS record has a TTL value, which specifies how long a DNS cache is allowed to hold on to that and reuse it for future queries.

The TTL values in the root zone had not changed in a very long time, and so one of the questions before the work party was, are

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those values in use today still relevant for today's Internet? But before we could even consider changing that, we also wanted to know what would be the impacts of changing that? How would it effect traffic to the root servers, or maybe to particular caches? And another motivation for this was in 2014, we had a change to the signature ability period for records signed by the ZSK, and that went very well.

And an alternative way of solving that problem would have been to change the TTLs. And so the work party considered if that was something that should be done anyway. So this table details the different types and values of TTLs used in the root zone today.

The SOA record, of which there is only one, has a day TTL. That's not a particularly interesting record for most Internet users. The more interesting records are the what we call the delegation records, down near the bottom, it says, TLD NS. This has a two day TTL, and the glue records associated with those delegations also have two day TTLs.

DS records, which are used for DNSSEC, are authoritative in the root zone and those have a one day TTL. The ones that stand out a little bit are the NS records for the root zone itself, and those glue records have a six day TTL, which is quite a bit longer than all of the others. So the work party did some research, and

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were able to verify that as far back as 1991, these are the exact same TTL values that have been used that far back.

One of the things that we looked at in order to sort of validate the TTL choices is to see what are the TTLs that are published in the authoritative zones by the top level domains. So one of these graphs, which is probably a little bit hard to read, it shows the TTL values for the NS records in the TTL authoritative zones. And there is some long bars there that show that most of them are either one day or two days.

Something like 70% of all of the TLDs use those TTL values. The other graph shows the TTL values for the DNS key records. And again, the red box shows that most of those are one day or two day TTLs. So that's a pretty good match for what's used in the root zone.

This graphic shows the results of a study that we did to understand how would things be impacted if the TTLs were changed, if they were lowered in particular. There is a very large purplish bar there on the left, that represents NX domain responses. So something like 50% of all responses served by root servers are NX domain responses. Those are queries for names that do not exist.

And for those, they are sort of subject to different caching rules, something called negative caching, and those limits tend to be a

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lot lower than the kind of limits we're talking about, they are hours rather than in the order of days. So, anyway, if TTLs were lowered significantly to the hours, then those kind of queries might be impacted, but otherwise not.

But there is a red rectangle over on the right, which is drawn around the section of queries that are subject to TTLs on the order of one to two days, and the number says 0.001%. So this is a very small amount of traffic. This graph tells us that if the TTLs in the root zone were lowered to one day, then the only ones that would be impacted would be that 0.001%. All right.

So some findings from this work study in this report. Increasing the TTLs should be done with very careful consideration to DNSSEC because DNSSEC records have a validity period, and there are some sort of tricky interactions with TTLs and caching ability periods that need to be taken into account. Then we have some more things to say about that in an upcoming slide. But for the most part, we learn that the root zone TTLs appear not to matter for most clients, and that's for a number of reasons.

One is that, for most of the responses in the root zone, the TTL values are not for authoritative data. And the authoritative data actually takes precedence, right? Another fact is that implementations don't necessarily have to follow TTL rules, and

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there may be some other reasons why a recursive name server would query the root zone more often than dictated by the TTL.

Then overall, we found very few compelling reasons to consider changing the TTLs to the root zone, and in the interest of being conservative and preferring stability, we recommended to not make any changes to TTLs in the root zone.

So earlier I mentioned some interesting interactions with DNSSEC, and there were two very unlikely problems discovered by the report, which resulted in a recommendation to address these. And these have to do with records that get cached by a recursive name server that is not doing DNSSEC validation. But that recursive name server maybe serving other clients who are doing validation.

And if a certain number of unlikely conditions are met, one of those being, for example, a root server stops updating, a root server instance stops updating for many, many days, then it may be in the position to serve data that can become stale in caches. So the report makes a recommendation to address this, and that is something that RSSAC is currently working on.

This is just kind of what I was just was talking about. As I said, the issue is not particularly urgent because even though we can reproduce this say in a laboratory setting, we're not aware of



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any instances of this problem actually occurring or anyone being affected by this issue in reality.

So also it says there again, no changes to the root zone TTLs to be made at this time, and that brings me to the end of RSSAC 003. Happy to take any questions now if we have some?

LARS-JOHAN LIMAN: Thank you Dwayne, I'll turn it over to Suzanne.

SUZANNE WOOLF: Right. Suzanne, who gets the briefest sections here. RSSAC generally stays to strictly technical advice. We take our remit seriously, our scope as Liman explained. But we did feel that we should comment on the proposal to transition the stewardship of IANA functions from the US NTIA to the global multistakeholder community, which is almost longer than the comment we filed.

But what is usually referred to as the ICG proposal. We did take the responsibility to review it seriously. And also to not delve too far into the governance and specific oversight activities there. But we did review the plan from our perspective, and the process. Track the process closely.

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Liman and another colleague of ours, Daniel Karrenberg, actually are on the ICG. RSSAC does support the proposal from the operational perspective. RSSAC believes that the plan is workable, which is to us, a key criteria. It will be a positive step to replace US government oversight of the IANA functions with community oversight.

So we hope we're part of moving that forward. And Joe will get us back to a technical discussion.

JOE:

Thanks Suzanne. I actually didn't make any slides, because this is a work in progress, and I just wanted to give a very quick update. So, RSSAC issues a scope of work to examine the way that root servers are currently named. I think most people here are familiar with the naming scheme, but they are named a letter dot root servers dot net, and the letter can go from A to M.

That is the scheme that has been used for quite some time, and the document also aims to document the history, to describe the history that arrived at that naming scheme, as well as doing a comprehensive analysis, as comprehensive as we can manage, on any other naming scheme we might use, and to weigh the pros and cons to make a technical recommendation.

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So the status, we have not yet published the draft. We had an original deadline of October 1<sup>st</sup>, I believe, which I think was recognized as being unrealistic, the scope of work took a long time to produce. And by the time it was issued, there really wasn't that much time left.

We took a few weeks with our team of volunteers to figure out what our velocity was, so we can give a reasonable second deadline, a suggestion for an update for a deadline extension, which we did after about three weeks. And the new deadline is November 13<sup>th</sup>, which I chose because it is a Friday.

So work continues. We have several of the contributors contributing a lot of text. And to be honest, most of the technical analysis is now done, and the work remaining is trying to cut down what has turned into a 60 page document, into something that people might actually one day read.

We imagine that this will actually be produced as at least two documents, we think separating the history and the technical analysis makes sense because we think they have different audiences. We don't want to frighten the non-technical audience who is interested in the history with pages and pages of output.

And it's also possible that we might separate the technical analysis into the details of the experiments that were run. Put

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them in one document so that's the raw data, and put the analysis in a separate document. We think that might be easier to read.

We expect to meet our deadline. And everything is going fine. So that's my update. If there is anybody who is interested in particular in some of the ideas, wants to talk more, then I'm very happy to talk to you. And there are other people here also in the work party who I'm sure would be happy to share their experiences.

And if anybody didn't notice that there was an opportunity to contribute to this work, and would desperately like to contribute, we can always use more volunteers. That's it. Thanks so much.

LARS-JOHAN LIMAN:

Thanks Joe. Thanks Suzanne, I almost forgot to thank you. Any questions for [inaudible] Joe or Suzanne?

Nope. That brings us actually very quickly to... That was actually a slide for you.

The very last part, which is just general questions. We are constantly striving to reach out to people better with how the root server system works, what RSSAC does, and anything related to the root. So we are very happy to receive feedback on

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how we can improve on this. This is just one way to do it. We created for this ICANN meeting, we created the how it works sessions that we ran twice and it was at least decently attended.

What else can we do to help disseminating information about how the root server system works and how RSSAC works and what we do and what we don't?

I see Shane.

SHANE CURR:

Hi. Shane Curr. I'd look at the agenda for this meeting, and I noticed that there were five slots that had RSSAC somewhere in the title, three of which were closed sessions. And if I looked at all of the closed sessions for ICANN, about half of them were RSSAC sessions. I guess I have a few questions. My basic question is, what are you guys doing that is so super-secret that other people can't just sit in the room?

And if there aren't any reasons, in the interest of transparency say just leave them open if you don't expect people to be able to participate.

LARS-JOHAN LIMAN:

Yes. Point well taken. It's something that I, as a chair, would like to look into at least. We haven't discussed it in RSSAC yet, but

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it's something that I would like to address because as I say, I don't think that at least all of the agenda points that we deal with require sessions. So thank you for mentioning that, I will take it back and we will try to work with that internally.

SHANE CURR:

To be clear, I recognize that there are, almost certainly, items that need to be done in a more confidential way. So I don't, I certainly don't advocate that all conversations that RSSAC does be published or something like that, but I think the default should be open. That's all.

LARS-JOHAN LIMAN:

Thank you. Any more questions or comments? Kaveh.

KAVEH RANJBAR:

Kaveh Ranjbar, the K root. Just to mention a comment. Basically we publish the minutes as well. So yes, I agree. We should look into openness, but basically there was no secret things, at least in these meetings, and the minutes are online. So you can find them online.

LARS-JOHAN LIMAN:

Thank you. If there are no more comments, I am going to release you to coffee and hallway chat. Thank you for attending.

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