KATHY SCHNITT: Welcome to the Evolution of the DNS Resolution Work Party Teleconference on Thursday the 17th of February 2022. Barry, I guess I'll hand it over to you.

BARRY LEIBA: Okay. So the purpose of this particular meeting, and probably next weeks as well because of how many regrets we've had, is going to be to go through the charter and basically collect people's thoughts on what the scope of this should be an what should be out of scope.

So who's going to put things up on the screen? Kathy or Andrew?

KATHY SCHNITT: Andrew, it's up to you. If you want me to, just [Slack] it to me.

ANDREW MCCONACHIE: Yeah, sure. I'll put the link to the charter in the chat.

KATHY SCHNITT: And I'll be happy to share it.

BARRY LEIBA: Great. Andrew and I had a little chat before this and we decided that we're going to work this work party with the same kind of pattern that we've been doing with the Routing Security Work Party. That is, we would have roughly 50 minutes of meeting and then use the last 10

minutes to summarize what we did and make plans for the next meeting.

And then Andrew would post notes from the meeting—what we accomplished, what we decided, what the action items were and that sort of thing—to the entire SSAC, not just to the work party list so that everybody who wants to can just keep track of what we've been working on. If anyone thinks that's a bad idea, let us know that, please.

So my view on this—and I'll let Russ H. say his thoughts after—is that this is kind of a follow-on to the DoH/DoT Work Party that we did, sort of looking more into the technical issues that are raised by deploying there protocols and the other protocols that sort of change where DNS resolution is done and what the organizational boundaries of them are and that sort of thing—what issues does that raise in network management, in who collects what data, and that sort of stuff; aimed more at the idea of making recommendations where we did not really make recommendations in the DoH/DoT document.

Russ, thoughts from you?

RUSS HOUSLEY: Yeah. I just completely agree with what you said, but there's a little [color] to it. And that was, during SSR2, there was a realization that different applications running on the same machine, including your mobile phone, could be doing name resolution against entirely different sets of servers which could lead to surprising results.

If your browser has DoH enabled and it's going to Cloudflare but your e-mail package is using your ISP, they could get completely different answers for the same query. And what surprises does that leave to the user?

BARRY LEIBA: Well, and even more that the two could be both using DoH and just choosing different resolvers from there. So lots of different options and different split namespaces and stuff.

So I'll open it up for any discussion. What thoughts do the others of you have on all of this? And it doesn't matter whether you said you're an observer or a participant. Please participate in this part.

TARA WHALEN: Okay. I'll start in because I feel like I'm the newest at some of these questions. And I know work at a place that does a lot of DNS, so this is fun for me.

When we did the last run—as you said, the previous with the DoH/DoT—there weren't any recommendations. But you were kind of talking about are there things that are likely to be recommendations.

So I guess to build a bit on what we were just talking here about, you said like different applications getting different answers. Is that likely to be something where you'd be saying, "Is there a recommendation for that?" You know, this is the question that under what circumstances is that the correct thing to do? And in what situations is that, I guess, an

incorrect thing? At what point do people have visibility, maybe into that because some of these cases ...

If I'm just going to maybe speak naively on some of these, it's very difficult, I think, for folks to make decisions often about ... People have limited control over those things, but also they have limited visibility into what's actually happening because a bunch of these decisions are made, and they're quite invisible. And I don't know whether that's the sort of thing that we want to talk about here or not, but I throw it out there as something to muse on.

BARRY LEIBA: Is it something you want to talk about?

RUSS HOUSLEY: Yeah. When we were banging on this charter, we did not expect to produce any recommendations to the Board, but I think we might have recommendations that go to others—network operators, DNS software policy makers, and of course users.

TARA WHALEN: Yes, that is something I'm interested in, although my interests may not dominate. But I am interested in that.

BARRY LEIBA: Lyman.

LYMAN CHAPIN: Thanks. Actually, that feeds right into one concern I had looking at the charter. Everything in here and everything, Barry, that I've just heard you and Russ talk about—what your thoughts are about where this should go—is fascinating, and I would love to have this kind of discussion because I think it's important and I think it's likely to be on the front burner sooner than we might think.

But I didn't see in the charter what the specific—just to pick the two letters out of SSAC—security and stability issues are that we expect to address. And if the answer is that the point of doing this exercise is to essentially surface any such issues—in order words identify them, find out if there are any—then that's fine and I'd be perfectly happy with that. But I just wanted to hear you and maybe Russ talk about it because you've spent more time discussing this.

Is there a specific security or stability angle to this? Or is it something that, you know, we may discover some issues and it's our responsibility to examine things like this in order to determine if there are any?

BARRY LEIBA: Well, I think there's some of each. Certainly, the latter. But Russ raised, for instance, the one of what is the stability ... What view does a user have of the stability of this system in the face of the different applications on the same computer making different choices of resolution or where to find their resolvers and getting different results as a result of that.

LYMAN CHAPIN: But in that scenario, the user's not going to know.

BARRY LEIBA: Right.

LYMAN CHAPIN: The user won't see a thing.

BARRY LEIBA: Well, I'm not sure of that. The user won't know, but the user may see odd things happening. And that speaks to stability in that sense. So [inaudible].

RUSS HOUSLEY: Yeah. I would word it this way. If the user is surprised, he's going to wonder about the stability of the naming system.

BARRY LEIBA: That's exactly what I'm getting at.

LYMAN CHAPIN: That's a good way ... I like that, Russ. Thanks.

BARRY LEIBA: And I also see security issues involved in the choices that applications make with this, how that interacts with network management stuff and

what issues there are with limitations that service providers may put on this sort of stuff for network management purposes and how that affects both security and stability. So I can see a number of angles.

LYMAN CHAPIN: Okay, good. Thank you. I feel good.

BARRY LEIBA: Okay. I'm always glad to make you feel good, Lyman.

LYMAN CHAPIN: And I'm glad to hear you say that, too. It's like I'm going to have a great day for the rest of the day.

[RUSS HOUSLEY]: I'm sorry you've had a bad day so far.

BARRY LEIBA: Merike.

MERIKE KAEO: Thanks. I have a question. The statement of the scope where it says, "The SSAC shall recommend any necessary any audit activity to assess the current status of DNS." What is means by "audit activity"? What was the intent behind that?

BARRY LEIBA: I don't know. I guess that one goes to Andrew. I think that's your text, Andrew. What was the thought there?

ANDREW MCCONACHIE: It could have simply been me cutting and pasting.

BARRY LEIBA: Where is that in the ...

MERIKE KAEO: Up by the scope. The last sentence.

BARRY LEIBA: "The SSAC shall recommend any necessary any audit activity to assess—
"

ANDREW MCCONACHIE: Oh, that's from the bylaws. That's just a direct quote from the ICANN Bylaws.

BARRY LEIBA: Oh, okay. Yes.

MERIKE KAEO: Okay.

BARRY LEIBA: Okay, so that's just by way of explaining—

ANDREW MCCONACHIE: Yeah.

BARRY LEIBA: —using that bylaw to explain why this—

LYMAN CHAPIN: Yeah. I think the intent there was just to make sure that the scope was within SSAC's role.

BARRY LEIBA: Exactly.

LYMAN CHAPIN: So it was just a quote from the bylaws. Right?

BARRY LEIBA: Yes.

MERIKE KAEO: Okay. I appreciate that. Yeah because, again, I'm now in an environment where the users in an organization that's not necessarily so savvy with DNS is trying to figure out how to instantiate DNS. And I'm finding it fascinating in terms of how little is known in terms of any DNS-related

security issues or even how to look at anything. Right? And definitely no knowledge regarding DoT and DoH.

As we continue with this, in the back of my mind is going to be, well, if we're going to be making recommendations to the community, who is the community? Because from my observations, a lot of the organizations who use DNS just don't know what to ask and what to look for.

BARRY LEIBA: Right. Agreed. So, yeah, I think the intent here is to go somewhat in the direction that the Routing Security Work Party is going of trying to put this at a level that will be useful to technical people but will also be understandable by less technical people.

Russ Mundy.

RUSS MUNDY: Thanks, Barry. Yeah, I have not been tracking the charter as closely as I should have been. But one of the things that has been a little puzzling to me—and you certainly touched on an aspect of it there, Barry, in terms of the planned consumer of the output—if it's intended to be the lesser technical folks that are part of the ICANN community, if it's intended to be folks that are more technically centered like DNS operators, or if it's software developers.

And that's sort of been troublesome to me as I've looked through the charter because I think it's pretty vague as to what the plan is, as far as producing an output that's useful to whomever.

BARRY LEIBA: I think at this stage it's intentionally vague we need to flesh that out.

RUSS MUNDY: Okay.

BARRY LEIBA: One view is that we should ... I would like to see us have something where there are pieces of it that talk to all of those people, that talk to software developers who are trying to figure out how to write software that implements this to operators—to resolver operators as well as network operators—and perhaps even to the end user/ALAC community who just want to understand what's going on. So I'm not sure how much of that last group will benefit from it, but I would like to keep it all in mind as we decide what to say.

RUSS MUNDY: Okay, thanks. It seemed so open to me that I really wasn't sure what the plan or direction was even hoped for here. Okay, thanks.

Tara.

TARA WHALEN: Sure. I don't know if I should open this particular box, but I know there was the discussion around the NFTs and blockchains that came up, and whether either 1) we just have no appetite for that or, 2) that should be in a different area. But it's conceivable that this is talking about

evolution and future directions. Do we need to anticipate spillover effects of that and how that may be affecting DNS resolution or dealing with that new use of the namespace? I merely throw it out there.

BARRY LEIBA: No, thanks for raising that because that's an important thing for us to decide, whether we want to stick with the protocols like DoH, DoT, and DNS over QUIC and all that kind of stuff, or whether we do want to branch into the idea of morphing thing into blockchain-based systems. Do other people have thoughts on that angle? Because at some level, this is your work party. We work on what everybody wants to work on.

Russ Mundy.

RUSS MUNDY: Yeah. I think it's something that we should not automatically exclude. I don't know that we know enough yet if it really fits in reasonably or not. I think it is an area for consideration.

I'd like to just raise another area for consideration that's maybe a bit more subtle. But as our liaison to the RSSAC, I want us to keep in mind if we happen to turn up something that would impact the root server operations, I'd like us to be sure that we flag it and pay it attention, if you will.

BARRY LEIBA: Well, and that raises the question of whether we should consider inviting non-SSAC people to join us for all or part of the work that we

do. Now I could certainly see inviting some RSSAC people if we would up getting into areas that touched on their work. It might be useful to reach out to others as well. I don't know. Do others have thoughts?

Okay. We can leave that for another time.

RUSS MUNDY: Let me just add one thought then, Barry, if I could, to that. When we go over our work party statuses at the joint RSSAC-SSAC meeting, this could be an opportune time to see if there were interested folks from RSSAC that might want to participate in this work party.

BARRY LEIBA: Perfect idea. And we have one coming up in not too long.

RUSS MUNDY: Right. It's during the ICANN meeting, yeah.

BARRY LEIBA: Yeah.

RUSS MUNDY: I think it's Tuesday. I forget exactly what time.

BARRY LEIBA: Right, yes. So any other comments about scope that we want to take about? Things people do want to work on that's not already been

discussed? Thing people don't want to work on? Things people want to stay far, far away from?

Russ Housley, any thoughts from you on prodding discussion?

RUSS HOUSLEY: No. I'm pretty happy with what I'm hearing. I'm a little skeptical about going into blockchain, but I can understand where we might end up at least talking about it.

BARRY LEIBA: Yeah. We could wind up talking about it and deciding not to put anything in the document about it. But I think it's a conversation we should have.

And like I said, I can see that we're going to have basically this same meeting again in a week when all the regrets can attend. So basically, half the people who said they wanted to be on the mailing list at least—whether they want to be participants or observes—gave regrets for this week.

Andrew, is there something more you need to hear this week?

ANDREW MCCONACHIE: No. I've just been taking some notes on the conversation. I don't think there are any specific action items for anyone. Please correct me if I'm wrong.

BARRY LEIBA: Not that I'm aware of.

ANDREW MCCONACHIE: Okay.

BARRY LEIBA: So I guess—

TARA WHALEN: [Was] someone checking the RSSAC, the joint meeting? So that—

BARRY LEIBA: Yeah, I guess that's it. You should ...

ANDREW MCCONACHIE: That's on March 8th.

BARRY LEIBA: Right. And that's going to be me and Russ, I guess. Me and Russ Housley are going to be doing that part of the update, so we'll [probe] at that point.

ANDREW MCCONACHIE: Do you want to look at the slides? Because I just made the slides for that.

BARRY LEIBA: Oh, yes. Sure, let's have a look at that.

ANDREW MCCONACHIE: All right. Let me dig those out.

BARRY LEIBA: In the meantime, I'm going to call on the two people who haven't said anything yet. Ondrej and Jaap. Any comments from you guys?

ONDREJ FILIP: So I [thought] ... I was just listening. I'm an observer, so I didn't want to be very active in the discussion. I have, also, mixed feelings about the blockchain because the title is "DNS Resolution" and I'm not sure ... The linkable with blockchain is pretty weak to me. So that's something I would probably avoid, even though I can't much contribute. I don't feel to be an expert in this area. So if this would be included, I cannot help much yet, although I'm learning.

But other than that, I was fine with this discussion.

BARRY LEIBA: Okay. Jaap, any comments from you?

JAAP AKKERHUIS: Yes. [inaudible] late time for me. I'm getting really ... All of my evenings are now spent [to SSAC] so I won't show up at every meeting here. But I have to say my first reaction to the blockchain was, no, we should not

touch it. But given that it's on the forefront of a lot of people's thoughts or beliefs—however you say this—we probably will be forced to say at least something about it. That's my current thought. Yes, which [it might] just be explaining why we don't want to touch it [inaudible] just what Ondrej mentioned, that we're talking about resolution.

And the other thing that pops us is [inaudible] in the minds of people will might actually use the idea that [DNS] [inaudible] namespace is [inaudible] different applications. My [inaudible] would be people make [inaudible] interested in going alternative [inaudible] stuff like that. So maybe we should, in the scope, say something about [that we are] scoping this within the realms of the ICANN root servers and don't want to touch the other stuff.

BARRY LEIBA: Okay, thanks. I saw that Andrew just put up the slides. Lyman.

LYMAN CHAPIN: Just really quick question. This is maybe mostly for Andrew. Do we feel this ... This is kind of like preliminary groundwork that you do when you start up a work party.

Do we feel like we have, either among us volunteers or via Andrew through other resources, all of the information that we expect we're going to need about the current state of DNS resolution and the things that are on the table already that people are talking about for changing the nature of DNS resolution?

Or do we expect that at some point we're going to be kind of looking around at each other and saying, "Well, I don't know the answer to that" and "I don't know the answer to that," and we've got to go find it?

So I'm just wondering if we've done that kind of due diligence before we start out.

ANDREW MCCONACHIE: So, everything related to the changing nature of DNS resolution? I certainly don't feel like I understand that, but I do hope that if we do ... You guys can certainly use me as a resource and tell me to go figure stuff out as you come up with those questions. And I think [inaudible].

BARRY LEIBA: I do think we have a lot of expertise in SSAC about the ... Not necessarily all from the same two or three people. But across SSAC of the different issues that are being raised, people have been following what's been discussed and what the protocols are doing and what the implementers are doing and what the deployments are doing.

So I think we have a good background, and I think we do know where to find the information when we come up with something that we don't know. I certainly hope that when we realize we don't know something, we do go looking for it.

Russ Mundy and then Merike.

RUSS MUNDY: Thanks, Barry. I don't know if there's much in there that directly deals with the evolution of resolution. But what came to mind in this discussion was the large security survey that was mostly put together by staff and looked at a fair bit by the SSAC, but never published. But it is a fairly broad-reaching document that might cover some of these issues.

BARRY LEIBA: Okay. Merike.

MERIKE KAEO: Yeah. I was going to follow up what you were saying, Barry, in terms of, I do think within SSAC we have the knowledge. Right? I was just looking. I'm pretty sure DNS-OARC is today which is why there are some apologies. And so, certainly, the members that participate there will have the visibility.

And with the applications and QUIC and those kinds of aspects that are changing the nature of DNS resolutions, I think one thing that would help is to actually start writing down what we know in terms of what are some of the changing technologies that are impacting the resolutions. And then [we can go] that route.

BARRY LEIBA: Yeah. And I think it's also, as I noted earlier, we can also invite people to join us if we find other expertise that we want to bring in.

Andrew.

ANDREW MCCONACHIE: Yeah. So one thing we sometimes do when we start up work parties is, you know, staff will do a literature review where if there's a really specific well-defined topic, we can go look at everything that's been said on that topic. I didn't do it this time because I didn't really know what it is that this work party wants to talk about. And I know that's what we're handling right now and that's what we're working on right now.

But as we get closer to nailing down our scope, that might be one activity that the work party wants me to engage is, to go out and do a literature review of everything on a specific topic. And I'm more than happy to do so.

BARRY LEIBA: Excellent. I'm always happy to throw work your way.

ANDREW MCCONACHIE: You mean person.

BARRY LEIBA: To make sure you're not bored.

ANDREW MCCONACHIE: It's my job. I get paid for it. It's fine.

BARRY LEIBA: Yeah. Okay, well I'm happy to say we're done for today and we need to have more of this discussion next week when, presumably, absent people are present.

Any final thoughts before we [inaudible] along?

JAAP AKKERHUIS: Well, this one. Okay. I'll lower the hand again. Yesterday there was an NCAP Discussion Group and I was surprised about the strange interpretation the EnCirca people had about what delegation means. And they have a way wider idea about what it means than we as technical people have. And so we should be very careful about defining our terminology because, before we know, we get the same confusion as the EnCirca people [inaudible] the root delegation or [just a thought] about it.

They see it completely as part of a business idea and not what the DNS technicians think it is. We should watch that if you talk to the more ALAC people and things like that. That's all. I just wanted to give [inaudible] an interesting confusion.

BARRY LEIBA: Okay, thank you. Other last thoughts before we wrap up for today?

ANDREW MCCONACHIE: So I shared this slide. This is the SSAC-RSSAC joint meeting slide for this work party. It's going to be the same slide, I think, for the SSAC activity as for the presentation to the SSAC public meeting.

Barry and Russ, are you comfortable speaking to this slide? This would also be the opportunity where you might want to mention to the RSSAC that we may want to bring in some of them as well.

BARRY LEIBA: Yeah, I'm certainly comfortable with talking to this slide. Russ, are you good?

RUSS HOUSLEY: Nothing's jumping out at me but, anyway, you could talk.

BARRY LEIBA: Yeah. It's just to let people know that we're starting a new work party and this is vaguely what we're going to be discussing because it's early stage. But yeah, we don't need to put anything on the slide that we show RSSAC, specifically asking them. I will do it when I talk.

ANDREW MCCONACHIE: Okay.

BARRY LEIBA: Layman, your hand flashed up. Did you want to say something?

LYMAN CHAPIN: Well, I had a startup task for Andrew, but maybe I can take that offline. My sense is that the way DNS resolution happens is code. And so whatever is in the code libraries that people download in order to build

their applications, that's how DNS resolution gets done. It doesn't get done because developers are sitting there thinking, "Oh, I wonder what kind of script I should write to do this." They just download a code base from somewhere.

So it might be interesting to do a bit of a survey through GitHub and other repositories and just find out what are the most frequently used code bases that people are sucking into their applications in order to do DNS resolution. And is anybody putting new stuff out there on an experimental basis that might get picked up by people who are [doing] [inaudible]?

BARRY LEIBA: And when you say "code", Lyman, you mean like stub resolvers and things that users are doing on their computers whether it be a stub resolver or a recursive resolver or a caching stub resolver or whatever we're calling them these days?

LYMAN CHAPIN: I think the most flux right now, the most fluidity, is with people who are building applications—principally, applications for your mobile device. Okay? And they are either downloading a library that does a standard query to a recursive that almost certainly defaults to their ISP. But my suspicious is that people are doing a lot of other creative stuff now, too—

BARRY LEIBA: [inaudible].

LYMAN CHAPIN: —and it would be interesting to know ...

Now, people who are building commercial-scale code bases, like people at Google ... Tara is not ... Those folks, they're not doing this. Okay? They have different timelines and different agendas. But there are lots of people just building apps, and DNS resolution happens at lots of different levels.

The app-based resolvers, obviously, are stub resolvers in almost every case unless someone is building an app that's intended to be a recursive. But it would be just interesting to know what's happening in that space.

BARRY LEIBA: Well that itself is part of the change. You say they're stub resolvers. Traditionally, what goes into the app isn't even a stub resolver. It's a call that calls into the stub resolver. And one of the changes is that now they are building stub resolvers into the apps.

LYMAN CHAPIN: That's exactly right, yeah.

BARRY LEIBA: So, yes, looking around to see what's available and who's writing them and what they do would be useful.

LYMAN CHAPIN: It's an area that's changing so fast that ... It's a classic example of one of those things where, if I stop paying attention or 6 months, the next time I turn around it's all different and I don't know what I'm talking about.

ANDREW MCCONACHIE: And does anyone actually understand the interaction between systemd and libc on Linux?

UNIDENTIFIED MALE: Not I.

ANDREW MCCONACHIE: [inaudible] from the diagrams and explain that and how that works to resolve that [inaudible]? It's maddening. They have these flow charts with like 50 bubbles on them. So I'll look into that space. That's a [inaudible].

BARRY LEIBA: That would be great.

LYMAN CHAPIN: Yeah. I'm not looking for answers. I'm just thinking that might be a good place to start canvasing and gathering information and starting to think about what we might need to look into a little more deeply.

ANDREW MCCONACHIE: Okay.

BARRY LEIBA: [inaudible] Lyman. I think that's [inaudible].

LYMAN CHAPIN: Thanks.

BARRY LEIBA: Jaap.

JAAP AKKERHUIS: Yes. [As part] of Unbound, we get quite some questions of people who are actually using just the [inaudible] required of Unbound for their application and it's unclear what they're building, which applications. And sometimes they're pretty esoteric questions about [inaudible]. And they're often referring to applications they're building, but they are very tight lipped about what it is. I mean, it's difficult to get your hands on that part.

And yes, I agree with Andrew about systemd. It's not only the systemd itself that doesn't really know what it is doing and [inaudible] between a lot of different Linux distribution out there. So the confusion is pretty high. But that's one example of creative use of DNS and DNS [inaudible].

A lot of people we see questions about nowadays are also people using their own firewall, malware things, using things like Pi-hole which actually has some where [inaudible] hidden inside. So that spills over to use as well as support questions. And there are more of that. It's not only Pi-hole. There are more of these things.

The Handshake people also claim that they're using Unbound in their blockchain—whatever they call it nowadays. [inaudible]. But what they're doing, I don't know. They're horrible people to work with anyway. [inaudible] they're complete [inaudible]. But I tried.

[inaudible] [I'm afraid] there's way more out there than we really can tackle or really know what to do with.

BARRY LEIBA: Okay. I guess we're ready to wrap up. So Andrew, there's I guess nothing, really. You've taken notes about the suggestions people have made and the conversations we've had.

ANDREW MCCONACHIE: Yes.

BARRY LEIBA: I guess the only action is for me to remember to talk about, when we talk to RSSAC, to ask them about their interest in this.

ANDREW MCCONACHIE: And I have an action item to go research the weird behavior of, you know ...

[LYMAN CHAPIN]: People.

ANDREW MCCONACHIE: Yeah, well, DNS resolution on clients, I guess I'll call it.

BARRY LEIBA: Right. Okay.

ANDREW MCCONACHIE: I think that's it.

BARRY LEIBA: Well, everybody, thanks for joining, especially those of you who joined at 10:00 PM. And I hope to see you all next week plus some of the nine people that said they couldn't make it this time.

ONDREJ FILIP: Thank you.

JAAP AKKERHUIS: See you next time.

ONDREJ FILIP: Bye-bye.

[LYMAN CHAPIN]: Bye.

[END OF TRANSCRIPTION]