HELSINKI – GAC Meeting with the SSAC
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CHAIR SCHNEIDER: Hi.

Yeah. I think we can start right away. Please introduce yourself for a second because not everybody may know you. We have got a number of new members.

PATRIK FALTSTROM: Thank you very much. I'm Patrik Faltstrom. I'm chair of the Security and Stability Advisory Committee here at ICANN. SSAC is just like GAC, an advisory committee, which gives recommendations to ICANN board, the community as a whole. And hopefully people listen to our advice.

[Laughter]

So to some degree we have similar discussions like you, like why do people not listen. Luckily enough, we have been able to write advice that has been of obviously such high quality and clarity so people actually have listened to us.

We do have, though, a couple of occasions where, for example, ICANN board has chosen different directions. But we are one advisory committee just like you, so there's no difference there.

I have with me, Jim Galvin, vice chair of SSAC, and then two other SSAC members here at the table, Danny McPherson and Merike Kaeo. There are also lots of other SSAC members here in the room to help answer questions when we go into the question-and-answer section.

Regarding three different topics from you before this meeting that were topic areas that you asked to have some discussion about, but I do understand that there might be some other issues first that you would like to bring up, Thomas.

CHAIR SCHNEIDER: Actually, there are some discussions in the corridors during this meeting where an issue came up. There has an issue some time ago which is the issue of dotless domains. These are the domains that don't have dots, if I get this technical detail right. That means they are dotless.

[Laughter]

PATRIK FALTSTROM: Close enough.

CHAIR SCHNEIDER: I hope that was clear.

[Laughter]

Maybe we can put an example of a dotless domain on the screen so that you all see how this looks like when there are no dots.

And there was previous advice from the SSAC about the risks related to using them and so on. And the GAC also had opinions expressed on this some years ago.

And now it seems that there is a change in the place where this issue is mentioned in the RAA, and that causes some questions. And since we have the chance to actually have the experts here, I felt it may be good for the GAC to hear from you what you think is new now and what you could explain to us GAC members what do you think that this means or why this is okay or should not be done or what about dotless domains.

PATRIK FALTSTROM: Okay. Purely mathematical view, of course, correct, a dotless domain is a domain that don't have any dots. That's how I understood the English language as well.

But let me be a little bit more specific what this is about. If it is the case that you send email, for example, to me, you send the

email to paf -- which is the username -- @netnod.se. And between Netnod and Se, there is a dot. If you want to go to the Netnod home page, you go to http://www netnod.se/. There are two dots in that domain name.

What we are here to talk about is a question whether it should be allowed, or possible, to use either a URL, which I just gave an example for Web page in http (indiscernible) or an email address where you don't have any dots. So, for example, whether it should be possible to send email to paf@se or go to the Web page, http://se/.

This is something we investigated in SSAC. And we released a report, Number 53, that we released in 2012. And we went through both the current implementations of software which both involves the actual application software itself and the DNS software that is trying to resolve those domain names that do not have any dots.

We also looked at the various protocol specifications from the Internet Engineering Task Force. And we came to the conclusion that any kind of use of dotless domains have unexpected consequences, everything from errors, the ability of phishing, stability issues, to end users just simply be confused. So our report quite strongly is saying that -- or very strongly say don't go there.

ICANN board in 2013, in August, resolved that based on security and stability risks identified in SAC053 and a few other things, the Internet Architecture Board also said don't go there.

The NGPC affirms that the use of dotless domains is prohibited. So ICANN board in 2013 drawed that conclusion.

What has happened -- that was then added in sort of an appendix to the RAA that -- sorry, it's in the RAA that dotless domains is not allowed for registries.

It is, though, the case that any registry can ask for an RSEP process to have changes made in their agreement. And it is actually mentioned in an appendix to the old RAA that dotless domains is one of those restrictions that you might ask an RSEP process for. So there's some text there.

What has happened lately which triggered the discussion is that in a new proposed RAA, which is up for open consultation, up until July 13, that text is moved into the main contract and the text that RSEP process can be confused now explicitly is within the box which says dotless domain is prohibited. And that made people scared because it's sort of more directly says this is something that is prohibited but, by the way, you can use an RSEP process to request this prohibition to be removed in this specific contractual agreement between these two specific parties.

That scared people quite loudly, including us at SSAC because the text was moot. It was red lined, so all alarm clocks went off, of course. But then we saw that the text was moot.

That said, we went back in SSAC this week, investigated whether -- because it was a couple of years ago, is there any reason for SSAC to change our mind? Let me be 100% clear. There is absolutely no reason and there is in no way SSAC is changing their mind on the fact that dotless domains is something that should not be used at all. We will respond during the open comment period. We don't have our written response ready yet. Still -- well, you know how it is to produce text that is submitted. It takes a little while anyways to get the right wording there. But you will see a response end of next week I hope, and that's basically it. So we have revisited it, and we stand firm in our view of dotless domain not being something that should be used. Thank you. I hope that is clear enough. No!

CHAIR SCHNEIDER: Is it clear?

[Laughter]

PATRIK FALTSTROM: Any questions?

CHAIR SCHNEIDER: Questions or comments, please. Yes, we have a request from --

JOHN LEVINE: John Levine, another SSAC member. A few years ago Paul Hoffman and I did an investigation to see what dotless domains actually exist. And it turns out there is about -- there are about a dozen ccTLDs that, in fact, publish dotless data. And we did an investigation of that to see does it actually work. I mean, for example, the dot -- the DK top-level domain for Denmark publishes dotless records that, in principle, would allow you to find the DK registry. In fact, if you type http://dk/ into your browser, it doesn't work. You can usually make it work by putting a dot in but, of course, then it's not dotless anymore.

So to emphasize what Patrik has said, in fact, we have in practice a live experiment for over a decade to see whether dotless domains work. And, in fact, practice shows they don't. I mean, even when the DNS records are present, it doesn't work in a browser and we did similar experiments with email. There's a variety of domain that is publish dotless records that in principle would make email work but, in practice, none of it does.

So for both the reasons of principle that Patrik outlined and just in practice having seen what happened, we've had a decade for

software vendors and authors to make dotless domains work if they had any interest in them. They have not done so. There is no reason to believe they will ever do so in the future.

So both for reasons of principle and reasons of practice, it -- they're a bad idea. And whatever function they're supposed to provide, there's other ways -- other better ways to do it.

PATRIK FALTSTROM: Okay. We got -- yes, please.

IRAN: Just for some people like me, who has asked for that? And why has it been asked for? Thank you.

PATRIK FALTSTROM: No one has, but there are -- there are, of course, various companies, entities, individuals. Of course, I think it would be kind of cool to have the top-level domain "Patrik" and be able to send mail to me at Patrik, that would be interesting. Or a Web page Patrik. So everyone who types in Patrik, if it worked, which it doesn't, in that case, and have advertisement on that or something. It's kind of cool to have a shorter domain name.

Danny. Please.

DANNY McPHERSON: One correction actually. During the initial gTLD application phase, Charleston Road Registry did ask for dotless domain for .SEARCH. I'm not sure they withdrew it, but that's what led to a lot of the follow-on work where everyone said it was a terrible idea.

And one of the reasons is because, in effect, it allows you to control a word on the Internet because all the applications are basic and not know what to do and they are going to have to default to the DNS.

And then if they default to the DNS, then you would, in effect, have control of a word on the Internet. And that's a really bad idea, so... And -- along with a lot of other technical reasons that are in the documents that we published.

PATRIK FALTSTROM: Thank you, Danny, for having better memory than myself. Okay. You see on the screen three different topics.

CHAIR SCHNEIDER: One second. There is a question whether we as GAC would want to reflect something about this or concerns that we've heard and so on in the communique or not. So this is -- if you have further questions, I would just like to give them one more minute because it's -- as we care about security and stability of the

Internet, it's one of the main probably priorities for all our governments and all our citizens. I think this is something that we shouldn't underestimate.

So I see Kavouss has another question or comment.

IRAN: Not another question. On what you asked, you said is there a need that GAC reflect on that or not. Did you ask this question, Thomas, from us? That we also support this or not?

CHAIR SCHNEIDER: The question is: Do we want to signal in our communication -- i.e., in the communique -- that we've heard about this and then our position that we have? For instance, this is something that we could say, "Our position on dotless domains that we had in the past has not changed, i.e., that we still think that this is not something that should be allowed."

So that is something that we could think about. Adding a sentence or two in the communique. Which is basically the same logic that the SSAC is applying. They refer to their past recommendations and say there's no reason to change their past recommendation and just to restate their position. This is something that we could do as well.

Yes, Iran.

IRAN: Yes, I think it is necessary that we reaffirm or confirm or reconfirm our previous position and also saying it after hearing today's and we have this position.

I think it is necessary, if colleagues agree with that. Thank you.

CHAIR SCHNEIDER: Canada?

NEW ZEALAND: Thank you. New Zealand, actually.

[Laughter]

NEW ZEALAND: I just want to check. Has the GAC issued advice on dotless domains before? This seems to be quite a technical area for us to be involved in. Thank you.

CHAIR SCHNEIDER: We did, didn't we?

DANNY McPHERSON: Yeah. In the Durban communique, you did provide some advice and you simply reaffirmed and reaffirmed -- to your point -- that it was a bad idea, and so if -- you know, if it may need to be enforced again, I certainly defer to the GAC on that, but you should check the Durban communique for that information.

CHAIR SCHNEIDER: So Durban was June or July 2013, if I'm not mistaken, so we can actually have a look at -- or maybe Tom or somebody can find that section in the communique and we can have a look at what exactly we wrote there.

Thank you, New Zealand.

European Commission?

EUROPEAN COMMISSION: Yeah. Thanks, and -- to Patrik and all the team.

Just a clarification. If we put this in the communique, I'm presuming this is not in the advice section but in the information section, which says we had a report from SSAC and we reviewed this issue and we reiterated our previous position on it, rather than new advice.

CHAIR SCHNEIDER: Well, we can discuss where we put this while we work on the communique, but the question is not that we should have an agreement or whether or not we would like to have something.

I see Sweden. Thank you.

SWEDEN: Thank you, Chair. Hi, Patrik. I hate to be the one that goes against Patrik or goes against the GAC, but I'm just wondering: What would be the reason for us to include this in the communique? I mean, is there a particular reason that implores us to react or -- because if there isn't, there's a lot of old advice that we still stand by. Thanks.

PATRIK FALTSTROM: Let me -- while Thomas is thinking about the answer, let me respond, answer.

Let me explain why SSAC will say something, even though we said so before.

We will respond and say we have not changed our mind because we have been explicitly asked. So that was the trigger for us. We were asked, "What is the SSAC's view? Has your view changed?"

CHAIR SCHNEIDER: Thank you. Well, you're right, we are not -- not always repeating advice. The thing is that since this issue has come up here on a quite an urgent -- in an urgent -- in a feeling of urgency, let's put it that way, we may just say that this is still referred to the Durban advice.

Actually, Tom can -- his computer is faster than mine. He has a private sector computer, I have a government computer, so mine is not there yet, so please, Tom, if you can read out the short text of the Durban communique.

Thank you.

TOM DALE: Thank you, Thomas.

The GAC's Durban communique advises the board to, as a matter of urgency, consider the recommendations contained in the SSAC report on dotless domains, SAC053, and internal name certificates, which is a separate matter, SAC057. So there was formal advice to the board to, as a matter of urgency, consider the recommendations in the SSAC advisory at that time.

CHAIR SCHNEIDER: Thank you. I saw a few more hands up. Panama?

PARAGUAY: Paraguay, actually. Thank you, Mr. Chair.

CHAIR SCHNEIDER: It's been a long week. I've been here since Friday, working through the weekend, not just like you.

PARAGUAY: That's all right. It's all right.

CHAIR SCHNEIDER: Thank you.

PARAGUAY: Patrik, if it's so clear, if it's so crystal clear and evident for everyone, where -- is there any kind of pressure coming from any advisory committee or any country in particular or any company or corporation or -- I don't understand. I kind of, like, have the same question Sweden asked. You know, where does the whole thing come from, if it's so clear? Thank you.

PATRIK FALTSTROM: To be honest, I don't know. I think it was the case that some people found the red-line. It might be the case of it being red-lined. It might be the case that there are some parties that actually are thinking about issuing an RSTEP.

The parties that have asked me or SSAC to have a look at this, none of them that are -- have talked to me want to have dotless domains. All of them support the SSAC statement. They wanted us to revisit to make sure that we are still standing so they don't have to change their mind, if you see what I mean, just like GAC asked us.

So it might very well be the case that even -- that just because we are reiterating our statement that we stand firm, that no one else have to say anything. That might be the current situation. I cannot really evaluate that.

CHAIR SCHNEIDER: Okay. So I think we'll take two more, please be short, and then we will let this settle during the coffee break because we have two, three more items, so the Netherlands and Sweden. Thank you.

NETHERLANDS: Yes. Thank you. Thomas De Haan from the Netherlands. Just a very short question.

If this is very technical in the sense that you have to know how to implement this technically, is there also not an RFC which will support this, or a best practice in IETF?

Thank you.

PATRIK FALTSTROM: We talked a little bit about that in our report, and in fact, it is the case that the -- the -- the protocol for electronic mail do require a dot in an email address. That is one example. Which means that in the cases that it might happen and might actually work in implementations, those implementations are violating the specification for electronic mail.

So to some degree, it's the other way around.

The Internet Architecture Board, on the other hand, have issued a report saying that dotless domain is problematic in the similar way that we in SSAC issued that report.

So that's how it is specified. Thank you.

CHAIR SCHNEIDER: Thank you. Sweden?

SWEDEN: Thanks. I'll be brief. I'm just concerned that perhaps we're rather waking a sleeping bear, if the GAC acknowledges this issue as well, or perhaps rather let it be, because we don't want to see it rise.

But on the other hand, if we were to do that, perhaps then we should direct attention to the confusion that Patrik mentioned in the -- in the -- was it in the contract where you had contradicting information? Maybe that would be the problem to be -- to address in that case. I don't know.

PATRIK FALTSTROM: To some degree -- to some degree -- and we in SSAC had the same discussion with ICANN board -- why is this coming up and what do we really have to say at the moment. And at least we have done our homework and we think that is the -- was the most important thing at this week, as most people's view behind the GAC statement, behind the ICANN board statement, was based on our findings.

So we felt that we, at least, had to go back and look at what we're doing, what -- it's -- that we go back and validate and verify that we are not changing our mind. Now that is done.

So to some degree, personally I agree with you. SSAC has done its homework. Don't change its mind. That implies that nothing else changed because everything else is based on things that have not changed. So to some degree, yes, we're done.

CHAIR SCHNEIDER: Okay. Iran?

IRAN: Thank you, Thomas.

I come back to what was said about the communique in Durban.

The text is very soft, and in fact, it say nothing. "As a matter of urgency, consider." What do you mean, "consider"? Okay. They consider. Thank you very much. I considered that.

So -- but in previous text -- not -- in previous paragraph on other things here, the GAC reaffirmed its positions. So we have to really say something but not say "consider." "Consider" is a most -- the weakest word ever used legally. Thank you.

CHAIR SCHNEIDER: Thank you. I think let's leave it at this for the time being. We have a little time to decide what to do with this, but it's -- I think it's important that we get the expertise directly from you, so I think that was very useful and let's now move to the other issues.

Your proposal was to take the --

PATRIK FALTSTROM: Last one first.

CHAIR SCHNEIDER: -- DNS abuse report and the implications activity as next, so I'm fine with that. Please.

PATRIK FALTSTROM: Yes. Because of the scarcity of time we have been discussing in SSAC in what order we would like to have these and we will start with the last one, so Merike, please.

MERIKE KAEO: Okay. And so the wording that we got is what was listed, so, "Is there any further implication/activity arising out of the DNS abuse report?"

We at SSAC see a number of different abuse -- DNS abuse reports, so one of the clarifying questions that I have, is this specifically due to the new GLT program safeguards to mitigate DNS abuse? Is that the report that was being asked about?

CHAIR SCHNEIDER: I think so, yes.

MERIKE KAEO: Okay. Just wanted to make sure.

So I had taken a look at the report. We as SSAC have not yet been asked to review it or provide any kind of comments. We

have in the past had numerous work items that deal with different mitigation abuse issues, and so I would like to ask the GAC whether or not we're getting a formal request as SSAC to take a look and actually comment on this report, and so I'll leave it at that.

CHAIR SCHNEIDER: Thank you for these -- for this question. Well, we haven't really discussed this. We just asked for input of things that we could discuss. I guess the -- for us the question is not -- is more whether you think that there are issues that have security and stability implications that made you think about doing something with this or whether you think it's not -- it's not necessary or not in your scope of work that you need to take care of this.

But it's just because people in the GAC care about abuse and fighting abuse and mitigating abuse and like to hear whether this is an issue for you or you think this is something for law enforcement or other areas in ICANN, maybe.

PATRIK FALTSTROM: Yeah. Maybe you should explain a little bit how we are following abuse and how we are watching and understanding and

drawing conclusion whether we should pick up anything new, our cooperation with other groups or something like that.

MERIKE KAEO: Sure. So just to talk about some previous work that we had undertaken, so a few years ago we had actually done some work that was addressing what kind of different DNS abuse there would be, and then we had undertaken a survey to kind of see how people handle abuse.

So we never published anything for that because we didn't quite have any specific statement to make or a request in terms of what we would do with this particular information. And of course now with some of the work that ICANN itself is undertaking to provide more transparency on some of these issues, you know, we're trying to figure out what is the relevancy in terms of some of the work that we undertook a couple of years ago.

Also, as we find different methods of abuse that are being utilized, where we find that we have technical controls that people should be aware of, we have work items.

For example, we just recently published SAC074, which dealt with credential management life cycle best practices, and that was also a way to help with authentication and credential issues

where, you know, there was a lot of issues surrounding that where there's abuse.

So that's some of the work that we've undertaken at the time.

PATRIK FALTSTROM: Is there any specific questions regarding abuse?

Okay. In that case, let's go to the first item, as we have another five minutes.

Security implications raised by IPv4 scarcity and IPv6 deployment such as issues in SAC79, do they raise any public policy considerations.

Danny?

DANNY McPHERSON: Yeah. Sure. Thank you, Patrik.

So -- yeah. So SAC079 had a number of implications that this advisory pointed out and there were a couple of recommendations there related to IPv4 scarcity and IPv6 deployment.

The implications of IPv4 scarcity or that application designers need to consider, the fact that IPv4 addresses may no longer

necessarily identify a unique endpoint in a stable manner. So that was one of the implications of that.

Another was that law enforcement forensic functions need to consider that an IPv4 address alone may not be sufficient to correlate Internet activity observations with an endpoint.

Again, so that an IPv4 identifier is not necessarily a stable identifier like a phone number may be, for example, is the point we're making here.

And then certainly another aspect of this, an implication that we point out is the data retention mechanisms and policies that record a reference in I.P. address need to refactor their actions and requirements to consider the increasingly potentially large volumes of ancillary data that are required to match an IP4 address and endpoint.

In other words, if there are no longer stable identifiers for and end system, they may be, for example, an identifier for a middle box. Then you need to make sure that you have the ability to correlate that middle-box activity with other aspects of transactions for those endpoints.

Those were the three implications. I definitely recommend you read that.

There are also two fairly generic recommendations that are provided in this advisory.

UNKNOWN SPEAKER: Slower, slower.

DANNY McPHERSON: Okay. Thank you, Mark. I'm going to slow down.

Network operators should deploy IPv6 which is something that certainly the Internet technical community and the number resource community, including all the RIRs, have said all along. That's something that we're very adamant about, is the only way you're going to get past these problems is for much broader IPv6 deployment.

And then, finally, the second recommendation in this advisory was that device manufacturers should accelerate plans to support IPv6 as well and ideally with parity in their IPv4 capabilities.

So in short, we recommend that, you know, you have a look at SAC079 and, I don't know, I think I may have a minute for specific questions. I'm -- I think I read fairly quickly there. I was just reading the text from the front of the document, mind you, if you want to go reference that.

But were there any specific questions related to this advisory that -- that folks may have had?

PATRIK FALTSTROM: Yes, please.

ANDREAS DLAMINI: Thank you. Yes. You were a bit too fast.

[Laughter]

My name is Andreas Dlamini from Swaziland.

You were a little bit too fast, but I think from the little that I caught from your presentation -- yeah -- it raised some questions to me as to when you're talking about instability arising from IPv4 address use, so what's the future of IPv4 addresses now? Seeing that Africa still has quite a lot in their reserves in IPv4 addresses, so what's your -- what would be your specific recommendation in terms of taking more IPv4 addresses?

DANNY McPHERSON: So, yeah, I'm not going to speak to that because I don't think the SSAC has an aligned opinion on that, necessarily. I think the technical community generally does.

But I think the -- the implications we wanted to point out in SAC079 isn't that -- necessarily that it causes instability because of IPv4 address scarcity. It's that an IPv4 address as an identifier is not necessarily stable any longer, and so that's the -- that's the important implication. Because, you know, for things like infrastructure management or for forensics and law enforcement and so forth, it has a lot of implications on that, and that's what we wanted to hit on.

We do believe that -- certainly that the number resource organization and the five RIRs have a lot of activity occurring now related to the aspects of Internet identifier management, you know, with numbers in particular with IPv4 and IPv6 addresses and so forth.

And there's a lot of discussion in those regions on that topic.

The other point of this advisory was simply that if you're a network operator or an equipment manufacturer, you'd better be getting ready for parity in IPv6 deployment and capabilities because it's coming and it's inevitable is, I think, what we wanted to get at.

PATRIK FALTSTROM: Patrik Faltstrom, Chair of SSAC. Let me add to that, just specific -- just because the IPv4 scarcity might have implications on

various policies use related to I.P. address management, let me -- we in SSAC do a very strong view that it's important that discussions around all of that policy use meets use of I.P. addresses is managed in the RIRs. So if it is the case that you have issues with or questions related to I.P. address management and policies, you must participate in those PDPs that are not host in ICANN but at the various RIRs.

CHAIR SCHNEIDER: Thank you. I actually have a question myself because so far I had not heard that IPv4 addresses are unstable in a technical sense because I think we've all been using them for the past years and years.

If the difference is -- from what I understand is that it is possible to track down a particular device with an IPv6 address, which, of course, makes the life of our law enforcement colleagues easier, for instance, but at the same time is a concern for people that deal with privacy issues because it can be identified on which machine, which is your machine. So is stability related less to a technical issue but rather to a political issue in that case? Or is there technical instability that is new that we hadn't been aware of all the years that we are using -- we have been using IPv4 addresses?

PATRIK FALTSTROM: Before I let Danny jump in here, let me explain that there's a difference between identifying what individual is using an address and stability which implies that the same user is using the same I.P. address and how often and whether you can -- whether it is one or more users using the same I.P. address.

When we talk about stability, it has nothing to do with the ability to identify. So these two things must be separated from each other. So when we talk about stability, has to do with the fact that if I use an IPv4 address and my application, for example, fetches email and stop fetching email, that same I.P. address the next second might be used by you. That is what we're talking about.

But over to you, Danny.

Thomas just whispered in my ear, that is not something new. That is true. But just because all IPv4 addresses today are in use, there is no free space, unused I.P. addresses, that are sort of laying there in waiting. You have -- all addresses are in use. So as soon as I stop using my I.P. address, it will be started to use by someone else for IPv4. So that's where the instability comes in.

And another thing that is increased, which we wrote in our report, is that -- is that it's a higher likelihood today, as Danny explained, that there's some kind of middle box that reuses the same I.P. address for both you and me at the same time, which

means that if you see traffic from one I.P. address, it is less likely that all of that communication is from the same computer or same individual.

CHAIR SCHNEIDER: Okay. Thanks for this explanation. I see Norway and United Kingdom.

NORWAY: Yes, thank you, Chair. Just a quick comment. And thanks to SSAC to point us to this report. So my understanding based on the summary in the report based on the advisory points and related to the question regarding Africa, to my understanding, does this mean that this problem is not that relevant in Africa since they have quite a lot of addresses left on IPv4? But still that should not be used as a sort of argument not to have an high focus on implementing IPv6 also in Africa. So I think that sort of relates to that it is equally important for both -- for all continents to have focus on implementation of IPv6. But still the sort of rationales for to -- where this advice is based on is not that, well, present, as you can say, since they have more IPv4 address space left in AfriNIC.

But as you said, Patrik, I think it also important, as you said, that everyone must participate in the RIR policy development and

the operational advice they all give on using the address space, both v4 and v6. I think that's the also sort of important point to take out of this discussion, to pay attention to the advices from the RIR community as well. Thank you.

CHAIR SCHNEIDER: You want a quick comment? So let's move to the U.K. and then we need to close down the meeting.

UNITED KINGDOM: Thank you, Thomas. Yes, Nick from the U.K. Good morning. As I understand this issue sort of from my background, it's where network operators who are still operating IPv4 are employing carrier grade nat. So I think that's the sort of thing Patrik was talking about, where you can have sort of -- sort of a private I.P. space through that middle box at the network level so you can have multiple users. And they often seem to do this for mobile devices, as I understand.

You sort of move that sort of space sort of up into the sort of the publicly visible sort of networking layer space, as it were. That's where the issue comes for the public safety organizations because it's the ability to sort of identify the single user becomes more difficult. And you have to sort of have further information such as sort of portage -- port numbers and that.

But a lot of the network operators don't have the technical capability, or so they told me in previous engagements. They don't have the technical ability themselves when they go into their -- sort of their data to be able to discern an individual user.

So, yeah, it's definitely an issue for public safety. It's something I certainly found, and it's sort of bound up in the whole carrier grade nat thing.

And I think I would say as well as the getting engaged in the PDP process at the RIRs, it's also a market issue. And it's about sort of, you know, if governments really think this is an issue, they should go -- they should go back to, you know -- sort of their countries and sort of look at the engagement they have with their telecom providers.

So I've kind of got a question on the end of this. I was just wondering: Is it really so expensive to get sort of network operators to sort of upgrade their kit and stuff to deploy IPv6?

PATRIK FALTSTROM: To answer the question directly, it's not that expensive in the form of software and hardware because IPv6 do actually exist in almost everything you buy. With an exception of all technologies like DSL and a few others, it might be a little bit more problematic.

The problem is more just like with DNSSEC, it is number four on the list of important things that the ISP is going to deploy. And they can only afford three. It could be manual labor. It could be, like, whatever.

The big problem at the moment, I think -- specifically when I look at Sweden, which is one the countries that has the lowest IPv6 deployment in the world, believe it or not, is that -- is that you have to look at the access networks just like you did with mobile but you also have fiber to the home and other kind of access technologies that whoever has the access -- controls the access is quite often a monopoly which means that the end user cannot -- if they want IPv6, they cannot swap to a competitor.

So to some degree, I agree with you that it is important if it is the case, which I hope -- most countries actually do have a policy that IPv6 employment is important. There are connections to issues which have to do with monopolies or not regarding local loop. There are some connections there. And let me just stop there.

CHAIR SCHNEIDER: Talking about stopping, I think we have to stop this meeting as we are running a little late, although it's really interesting. And I think we have one issue which is about metrics in trying to find data. Health index is one example.

PATRIK FALTSTROM: Can I make one statement?

CHAIR SCHNEIDER: Yeah, okay. I just want to say, we will probably hopefully have another meeting not in 15 years' time but actually sooner so we can continue that discussion.

PATRIK FALTSTROM: Regarding the metrics for new gTLDs, the take-away from the SSAC report is that correlation does not imply causation. Just because you have data, you cannot draw whatever conclusions you want. Start looking at what kind of conclusions you want to draw and then find the data you need to be able to use that as an evidence.

We wrote the report because we see too many discussions here inside ICANN when things are done backwards, and we encourage everyone to start the correct way. Thank you.

CHAIR SCHNEIDER: This is actually a lesson learned in many courses on statistics, that just because there are numbers, that doesn't mean that they are related to each other. Thank you very much for reminding this very fundamental principle. Thank you very much. It was a pleasure. This is the coffee break.

[Break]