

**North American Numbering Council
Meeting Transcript
Friday, April 27, 2018 (Final)**

I. Time and Place of Meeting. The North American Numbering Council Meeting (NANC) held a telephone conference call commencing at 9:30 a.m., on a conference bridge provided by the Federal Communications Commission at 1-888-858-2144, Access Code 4160132.

II. List of Attendees.

Voting Council Members:

- | | |
|--|---|
| 1. Honorable Travis Kavulla | NANC Chairman (NARUC - MT) |
| 2. Diane Holland | NANC Vice Chair (USTelecom) |
| 3. Susan Gately | Ad Hoc Telecommunications Users
Committee |
| 4. Jacqueline Wohlgemuth | ATIS |
| 5. Jacquelyne Flemming | AT&T |
| 6. Greg Rogers / Lisa Jill Freeman | Bandwidth |
| 7. Beth Choroser | Comcast Corporation |
| 8. Courtney Neville | Competitive Carriers Association |
| 9. Matthew Gerst | CTIA |
| 10. Craig Lennon | Google |
| 11. Honorable Paul Kjellander / Carolee Hall | NARUC - ID |
| 12. Honorable Karen Charles Peterson | NARUC - MA |
| 13. M. Teresa Hopkins | Navajo Nation Telecommunications
Regulatory Commission |
| 14. Jerome Candelaria | NCTA |
| 15. Brian Ford | NTCA |
| 16. Julie Oost | Peerless Network |
| 17. Richard Shockey | SIP Forum |
| 18. Scott Freiermuth | Sprint |
| 19. Paul Nejedlo | TDS Telecommunications |
| 20. Bridget Alexander White | USConnect |
| 21. Dana Crandall | Verizon |
| 22. Darren Krebs | Vonage |
| 23. Robert McCausland | West Telecom Services |

Special Members (Non-voting):

- | | |
|----------------|---------|
| 1. Tom McGarry | Neustar |
|----------------|---------|

Commission Employees:

Marilyn Jones, Designated Federal Officer (DFO)
Michelle Sclater, Alternate DFO

Kris Monteith, Chief, Wireline Competition Bureau (WCB)
Ann Stevens, Deputy Chief, Competition Policy Division (CPD), WCB
Eric Burger, Chief Technology Officer, Office of Strategic Planning and Policy Analysis
Kenneth Carlberg, Chief Technologist, Public Safety and Homeland Security Bureau
Darlene Bidy, Management Analyst, CPD, WCB
Myrva Charles, Contracting Officer Representative, CPD, WCB

III. Estimate of Public Attendance. Approximately 6 members of the public attended the meeting as observers.

IV. Documents Introduced.

- (1) Agenda
- (2) NANC Meeting Transcript – March 16, 2018
- (3) Call Authentication Trust Anchor (CATA) Issues Working Group (WG) Report
- (4) CATA Issues WG Minority Report
- (5) CATA Issues WG Presentation

V. Table of Contents.

1. Welcome/ Roll Call.....	2
2. Remarks by Jay Schwarz, Wireline Advisor to FCC Chairman Ajit Pai.....	7
3. Approval of Transcript.....	10
4. Overview, Discussion, and Approval of CATA Issues WG Recommendation	10
5. Public Comments and Participation.....	37
6. Other Business	38

VI. Summary of the Meeting

WELCOME/ROLL CALL

Travis Kavulla: Okay, ladies and gentlemen, this is Travis Kavulla and I'll call the meeting to order. The time is 9:30 AM Eastern. The date is April 27th, 2018 and this is the notice public meeting held by teleconference of the North American

Numbering Council. You should all have the agenda in front of you.

For the purposes of housekeeping, let me just ask that everyone who's not speaking keep their phone on mute, please. Everyone is signed in as a participant and so your audio is enabled. So if we don't keep things on mute, it's going to interrupt the flow of our conversation. As well, please do not put us on hold. Whoever has the hold music that inevitably occurs about an hour through a call like this is going to get a lump of coal in his stocking for Christmas.

So with that, let me turn things over to Marilyn Jones and ask her to call the roll.

Marilyn Jones: Sure, Travis. Thank you. In the room here with me is Diane Holland, vice chair. Comcast, Beth is here. Matt from CTIA is in the room. Bryan from NTCA is here. And also Jay from the chairman's office is here standing by for his presentation.

Travis Kavulla: Marilyn, we can't hear you.

Marilyn Jones: Sorry, everyone. I just was announcing who's in the room with me before I started the roll call. So to go over that again, Diane is here from USTelecom. She's a NANC vice chair. Beth from Comcast is here. Matt from CTIA and Bryan from NTCA. Also in the room is Jay from the chairman's

office, he is ready for his opening remarks. So let's start with Ad Hoc. Is anyone here from Ad Hoc on the line?

Susan Gately: Susan Gately.

Marilyn Jones: Thank you, Susan. AT&T?

Jackie Flemming: Jackie Flemming.

Marilyn Jones: Thank you. ATIS?

Jackie Wohlgenuth: Jacque Wohlgenuth.

Marilyn Jones: Bandwidth?

LJ Freeman: LJ Freeman.

Greg Rogers: Greg Rogers. Greg Rogers is on.

Marilyn Jones: Charter?

LJ Freeman: And Lisa Jill Freeman.

Marilyn Jones: Thank you. I got Greg and Jill, Lisa Jill.

Thank you. Charter?

Rich Shockey: Rich Shockey with the SIP Forum.

Marilyn Jones: Thank you, Rich.

Courtney Neville: Hey, Marilyn. It's Courtney Neville with CCA. I think my call might have dropped right when you ticked over our names. Sorry.

Marilyn Jones: Thank you, Courtney. Google?

Craig Lennon: Yes, Marilyn. This is Craig.

Marilyn Jones: Thank you, Craig. iconectiv?

Glenn Reynolds: This is Glenn Reynolds for iconectiv.

Marilyn Jones: Thank you. NARUC Idaho?

Paul Kjellander: Paul Kjellander.

Carolee Hall: Carolee Hall.

Marilyn Jones: NARUC Massachusetts? NARUC Missouri?
NARUC Nebraska? NASUCA? Navajo Nation TRC?

Teresa: This is Teresa. I'm on. Good morning.

Marilyn Jones: Thank you, Teresa. NCTA?

Rebecca Beaton: [Audio glitch] Washington state.

Marilyn Jones: I beg your pardon.

Rebecca Beaton: Washington state commission staff, Rebecca
Beaton.

Marilyn Jones: Thank you, Rebecca. NCTA?

Jerome Candelaria: Jerome Candelaria.

Marilyn Jones: Neustar?

Tom McGarry: Tom McGarry.

Marilyn Jones: Peerless Network?

Julie Oost: Julie Oost.

Marilyn Jones: Professor Schulzrinne? SOMOS? Sprint?

Scott Freiermuth: Scott Freiermuth.

Marilyn Jones: TDS?

Paul: Paul Nejedlo.

Marilyn Jones: Telnyx? USConnect?

Bridget Alexander White: Bridget Alexander White.

Marilyn Jones: Verizon?

Dana Crandall: Dana Crandall.

Marilyn Jones: Vonage?

Darren Krebs: Hi, Marilyn. Darren Krebs.

Marilyn Jones: And West Telecom?

Bob McCausland: Bob McCausland.

Marilyn Jones: Thank you, Bob. That completes the NANC roll calls, Chairman Kavulla.

Travis Kavulla: Thank you, Marilyn. Are there any NANC members, members of the advisory council who were not identified as Marilyn was going through the roll call but wish to be identified now as being on the line?

Female Voice: Yes, this is [indiscernible] with Iowa.

Female Voice: Marilyn, this is Michelle [indiscernible].

Travis Kavulla: Anyone else?

[Cross-talking]

Female Voice: DTC. Commissioner Karen Charles Peterson's office.

Sandra Jones: Sandra Jones, Cox Communications.

Female Voice: [Indiscernible]

Travis Kavulla: Okay. Any other NANC members who would like to be identified as being present?

Susan Travis: Susan Travis, Colorado PUC.

Travis Kavulla: All right. Well, thank you very much for joining us today. We're going to work to make this as efficient as possible. When you speak, please do so by identifying

yourself by name and the organization you're representing. I realize that this is a public line, it's been noticed as a public meeting, but we do need to confine ourselves to people's comments who are members of the Numbering Council. So I hope you'll take that under advisement.

REMARKS BY JAY SCHWARZ

WIRELINE ADVISOR TO FCC CHAIRMAN AJIT PAI

We'll now turn to our opening item. We're lucky to have Jay Schwartz who's physically present in the FCC conference room. He's wireline advisor to Chairman Pai. Jay, thank you for being here to make some opening remarks. I will turn it over to you.

Jay Schwartz: Good morning. Thank you, Chairman Kavulla. And to all the NANC members, it's great to have you both here in the room and on the bridge. Kind of sounds like we're on an Apollo mission or something.

So on behalf of the chairman, Chairman Pai, I want to thank you for your service to the NANC. And I know that an enormous amount of work has already occurred on working groups focusing on LNPA transition, toll-free numbering, and the nationwide number portability. But today, I want to particularly focus on the work of the call authentication trust anchor working group, which is, of course, preparing a recommendation.

So as today, you discuss and head towards a recommendation, I want to just take a few moments to re-emphasize how important call authentication is and how it's one really important piece of our ongoing strategy to end illegal robocalls.

So the FCC's been doing quite a lot lately on robocalls. Recently, the fight against these illegal robocalls has included a number of things. We have ongoing enforcement actions, some of which are made public after much review. So, for example, we have the notice of apparent liability against Adrian Abramovich in the amount of \$120 million. But also, of course, much of this work is conducted behind the scenes long before there's a formal public announcement.

In addition, our enforcement bureau has been working with industry to quickly trace robocall schemes back to their source. We also conduct consumer and enforcement advisories, including CGB alerts, that's our Consumer and Government Affairs Bureau. CGB alerts to consumers about new scams. We have EB notices to industry and consumers about the statutes and the rules. And both of these advisories will typically include guidance about how to report and respond to suspected abuses.

The FCC also, of course, cooperates and coordinates with other government agencies. In addition to the FTC, the Federal Trade Commission, we also confer routinely with state attorneys general, DOJ, FBI, and other agencies. And we do have

cooperative relationships as well with enforcement authorities in other countries. I'd also just note that the FCC has several important rulemaking proceedings addressing things like blocking, illegal call identification and reassigned numbers, which is all part of our overall strategy.

And then I'd note that we've had two recent events. One in March called Fighting the Scourge of Robocalls. That was an FTC-FCC workshop. And then just not too long ago in April, we had the Stop Illegal Robocalls Expo with the FTC. So I go through all of that just to point out that the call authentication work that you're doing is really one of the key pillars into this overall effort. And so that's why it's so important as we focus on getting things like the STIR/SHAKEN frameworks deployed.

So chairman looks forward to receiving the NANC's recommendations on the criteria for the governance authority. And we look forward to working with you all and others in industry and elsewhere on setting up an effective call authentication system as soon as is practicable. So thank you very much. I will let you guys get to your discussions and we very much again appreciate all your work.

APPROVAL OF TRANSCRIPT

Travis Kavulla: Thank you for making the time today, Jay. We appreciate those remarks. We'll get right into our business. And the first order of business before I turn things over to the substance of CATA workgroup is to review an approval of the minute transcript of the previous meeting that have been circulated to you by email from Marilyn. Does anyone have any revisions at this time? If not, are there any objections to marking it approved? Hearing none, those minutes will be marked approved.

The next agenda item is an overview discussion and approval of the Call Authentication Trust Anchor Issues working group recommendation. A slide deck has been prepared for this presentation which you should have received I believe from either Beth or Jackie last evening. You can refer to it there.

OVERVIEW, DISCUSSION, AND APPROVAL OF CATA ISSUES

WG RECOMMENDATION

And just to give you sort of a stage setting of the documents that might be useful to have in front of you. There's been a revised CATA workgroup report of both the redline and the clean circulated to you. You have a minority report from Professor Schulzrinne. And those two or three documents,

depending on what are you working off, the redline or the clean edition, plus the PowerPoint slide deck are the things that would probably be useful for you to refer to for the purposes of our deliberation today. Beth, I will turn it over to you to, as the co-chair of the working group, to walk through that slide deck.

Beth Choroser: Thank you, Travis.

Travis Kavulla: Go ahead.

Beth Choroser: Okay. So, first of all before I get started on the deck, I just would like to make a few comments. We had an incredibly committed and knowledgeable team working with our working group and really appreciate everybody's hard work. The group recognizes the urgency of mitigating illegal robocalls and the billions of unwanted calls received each month by consumers. We recognize that bad actors through spoofing perpetrate scams that prey on vulnerable populations. And we understand that the commission would like us to move as quickly as possible in terms of industry action, and maybe there's some disappointment if we can't move as quickly as folks would like.

So we did come together one more time yesterday after having submitted our initial report and we try to reach agreement to see if we could move up the framework. And what I heard on the call yesterday and I think what we all heard was that a firm deadline for all service providers, even just all

voice over IP providers, of a year or even 18 months or more would in some cases establish unreasonable expectations for a goal that some could not meet. I think what we heard and what I probably didn't realize before coming into this working group that people are at different levels of evolution in their networks, in their network infrastructure, and in their interconnection. We all know is that STIR and SHAKEN is something that really doesn't work to its fullest unless there is end-to-end voice over IP or IP interconnection.

So what we try to do is we try to move up things where we could and we work to move up the timeline for implementation of the governance structure. And we work to move up the timeline for implementation of SHAKEN itself for those service providers that do have the network infrastructure in place to be able to do that.

And also, just in terms of setting realistic expectations, some of the very smart people on our team reminded me that illegal robocalling is a multifaceted problem. I think we heard about all the different things from Jay that the commission is working on, that it requires multifaceted solutions. And right now, we can contain but not wholly eliminate the problem. So with that, I think we can move on to the presentation.

So in terms of the scope, we were asked by the commission really to tackle two different sets of issues. And the first

set of criteria really had to do with standing up the governance structure for STIR/SHAKEN: Defining the criteria by which the governance authority should be selected; describing the evaluation process of applying the criteria; recommending what the commission's role would be if it were not to serve as the governance authority itself; and then recommending the process by which a policy administrator would be selected. So I think we can move on.

And then the second set of instructions as I mentioned was more about actually implementing the protocols of STIR/SHAKEN. That was to set a reasonable timeline or a set of milestones for adoption and deployment of the framework, including metrics for measuring progress. Incentives or mandates that the FCC might put in place to ensure that the milestones were matched. And additional steps the commission could take to facilitate deployment of the framework. And then steps the industry or commission could take to ensure that the system work for all participants in the NAMP.

So we've just put this timeline up for sort of a graphical display of where we ended up in terms of our timeline for being able to put our report together. And originally, I think we had thought we would have closer to four months. But as it turned out, this group put this report together in less than three months. So just in terms of the process for putting together

the report, the group met at least once weekly since our working group team was populated. We had dozen to our meetings, and I'm not going to read the dates but you can see them right there. The last of those meetings was yesterday. We actually intended to cease meeting on the 19th when we submitted our report, and again the group as I mentioned came back together yesterday to sort of give it one last ditch effort to try and see where we could accelerate things. And I think we were successful in doing that. I'll talk about that in a minute.

We had an average of 33 attendees on each of our meetings and we had very broad participation. Twenty seven different organizations were represented. We had over 50 written contributions from over 15 different contributors, companies, or vendors. And this is just a display of the membership and there is an asterisk next to those who've submitted and actually written contributions. But I do want to say that even those companies that did not submit written contributions, there was a lot of great discussion and input from everybody on the working group. So we really appreciate that. We can move on.

So in terms of the contributions, they covered really all aspects of the instruction in the referral letter. And I won't read through them, we just went over those, those instructions. But our contributions really did try and delve into each one of those instructions. There were some areas which we put in the

appendix of the working group report where the working group agreed that the items were out of scope. And we recommended that they be referred to the appropriate working groups, generally technical working groups. And those included things like whether there should be multiple policy administrators. We thought, okay, it's a valid question to ask, but it's not the question that we should be addressing through this working group. We had a lot of other work to get done and thought that was something the technical working groups could take up later. Consensus was reached on the content of the final report. And as I think Marilyn or Travis noted, we do have one minority opinion from Professor Schulzrinne.

So in terms of the selection criteria, we started to put together a really long list of criterion. We did put together quite a robust list of criteria. And I have to say, in the end, I think it became apparent to the group that we were putting together a list of characteristics that should be embodied within a governance authority rather than a set of criteria for selecting a governance authority. And we had pretty broad agreement in terms of some of those criteria: The ability to adapt to change; openness and transparency; consideration of costs because we want broad participation in the ecosystem; accountability for actions; and then just that the governance authority might need some legal and liability protections. And

the characteristics fell into basically three buckets: Adapting to changes, the participation model, and the organization or set up of the governance authority.

And I just want to say that in terms of this, we really thought it was important that this entity be able to react very quickly because we know there's going to be evolving threats. The bad actors are actually very good at what they do, sadly. And we feel like this governance authority needs to be able to move and evolve and be flexible in terms on their reactions to the bad actors.

So our evaluation process. Again, rather than an evaluation process, the group sort of came to the conclusion that what we really needed to do was to develop or recommend a process for standing up the governance authority rather than just sort of applying this list of characteristics. So our recommendation is to allow the industry to collaboratively form the SGI governance authority. And we noted that the approach has been used successfully for other industry initiatives which we included in the appendix of our report. This would allow the industry to begin work immediately without the need for the commission to have to go through a formal rulemaking and comment process and for things to get off the ground more quickly and allow us to maintain that flexibility that I just talked about in responding to evolving threats.

In terms of funding, we realize there's going to need to be some level of funding here at some point. But we decided that that needed to be outside the scope of the working group. We started to get into a couple of discussions about funding and we just realized that that would subsume the entire working group for whatever period of less than three months we had. So we decided to put that off to the side and just note that there are a number of funding models that can probably be used and that they might evolve over time when the governance authority stood up to when we get to sort of a full working protocol.

In terms of the role of the FCC, in our recommendation, we had decided to recommend that the industry stand up, the governance authority on its own. So we then look to what the role of the FCC might be if it were not acting in that governance authority role. And our recommendation is that the FCC would serve in an oversight role that includes driving progress and helping us to set objectives and timelines and then supporting the model recommended by the industry. Performing the governance authority and governance structure itself. Acting as an escalation point for resolution of grievances that could not be resolved within the governance structure. And then establishing incentives for service providers to participate in the ecosystem.

In terms of the selection process for the policy administrator, the team recommended the use of an RFP or other transparent process. I think the team just felt like there might be other methodologies out there and did not want to limit themselves to an RFP although that might be the most likely methodology by which the policy administrator would be established. And that in any RFP or other process we would look to ensure that the policy administrator has all the necessary characteristics, the track record, the experience, and the management and operational capabilities to perform the role that's needed. And that there should be at a minimum appropriate legal or financial separation between the governance authority and the policy administrator. So in other words, we're recommending that they not be the same entity.

Also in terms of a contract or any contract that's put in place for the policy administrator, the team recommends that that contract should be terminable at will, non-exclusive, because, again, I talked about pushing off this concept of whether there might be multiple policy administrators. So we just want to make sure we have the flexibility to be able to do what's needed later should decisions be made to go that direction. And we just need to accommodate the flexibility to allow for the evolution of the model and re-bid the contract if it was deemed necessary by the governance authority.

So in terms of timelines and milestones, I noted that there's really two sets of timelines and milestones. One is for establishing the governance structure itself. And this is where again we got together yesterday. The team worked really hard to see if we could accelerate that, accelerate that timeline and we accelerated it substantively. So we're now giving a three-month period each for standing up the governance authority, issuing an RFP, asking for responses to that RFP, and then making the selection decision for the policy administrator. And then we also want to note that service provider interoperation and implementation of the actual framework and testing for the framework would continue in parallel with that process. So these are not things that need to happen in a serial fashion, that they can happen simultaneously.

And this is just again a graphical display of what that timeline would look at. So May 7th would be the formal date for submission of the report. And then we're talking about a one year period, May 7th of 2019, to actually have in place the full governance structure for STIR/SHAKEN.

And then in terms of and incentives and mandates, the group had thought that some form of a safe harbor for inadvertent blocking of calls would be helpful to the group and would be certainly an incentive. And I think this goes to more about the applications that can be put on top of STIR/SHAKEN and the

certifications, rather than just passing certificates themselves. Also, incentivizing IP to IP interconnection to allow the most fulsome level of attestation. We've talked about how really that IP to IP interconnection and that end-to-end voice over IP traffic flow is really necessary for this to work and to scale.

And then we realized there are smaller service providers that are a part of this ecosystem. And if there is some way to have some level of funding whether through the NAMP or other means for start-up costs, particularly for those providers that are working with smaller budgets and have smaller footprints, that that would be something that should be considered.

And then in terms of additional steps to facilitate deployment, we think if the FCC certainly finds that things are lagging beyond what's reasonable, that they could direct more robust interoperability testing for those who were able to do so and are moving a little slower than we would like, and then encouraging service provider interoperation and vendor implementation of the framework to proceed in parallel with establishing the governance structure.

And then in terms of making the system work for all participants, we've noticed that this is just a piece of the solutions for enabling us to mitigate the robocall problem, that this just lays the groundwork for a variety of techniques, and

that establishing the call authentication trust anchor will not by itself insure that the system works for all participants. Again, noting that this is really a system that is going to work in an IP-based environment. I don't think we're there for legacy PSTN networks and we're not there yet even for all providers that are operating IP networks.

And then providing a secure certificate management infrastructure for SHAKEN, which is the primary objective of putting the governance authority and policy administrator in place that, that is a starting point for us to promote broad adoption.

And then here's where we get into I think what we hit yesterday in our meeting. And again, we had gone into the meeting yesterday thinking, okay, can we really accelerate this thing in terms of asking that across the ecosystem, that everybody in the ecosystem, at least the voice over IP providers in the ecosystem, shoot for implementing this thing in a year? And again, what we heard was we're just going to be setting up unreasonable expectations, that some even large providers don't have the infrastructure that is necessary to accommodate the protocols and don't have the IP interconnections, have not therefore done the testing that would be required, and that it's a little bit longer of a timeline.

But what we did recommend is that those companies that are capable of signing and validating VoIP calls that do have the appropriate infrastructure to do so that they should implement the standard within a period of approximately a year after completion of the CATA working group report. And that the evolving nature of the technology will allow additional enhancements, such as tracing back illegal robocalls. So even if there's not a full attestation on an end-to-end IP traffic exchange, that it there's gateway attestations, that at least perhaps helps us to be able to aid in the trace back process, to have improved call analytics for consumers and more effective enforcement actions. And then we thought in terms of helping to accelerate the deployment, that we should be reporting back to the NANC and the commission on the percentage of IP calls where STIR and SHAKEN is being used so we can at least see how progress is moving forward.

And that's really it. I don't know if we want to take questions now are how you want to move forward, Marilyn, but happy to answer questions. And just say that Jackie is out there or the rest of the team are out there. Sherwin, I want to thank you very much for your guidance and help along the way. I guess we'll open it up for discussion and questions.

Travis Kavulla: Yes, thank you Beth and Jackie and your working group for all of the work on that. I think questions

would be appropriate at this time. I do also want to give an opportunity to Henning [phonetic] since he had a minority view on the working group to explain his thoughts and the minority report as well. But let's first take any clarifying or other types of questions for Beth.

I guess one that I have, Beth, and it's sort of a threshold question is, I mean, what amount -- I mean, how much in terms of percentage of call volumes is SHAKEN-ready? In other words, it is VoIP at this point. I mean, obviously, I know in my state there is still a lot of legacy infrastructure, a lot of it's wireline. But I'm just trying to get a sense of the scope of the impediment to full implementation.

Rich Shockey: Mr. Chairman, this is Rich Shockey of the SIP Forum, I can sort of address that. We're certainly in terms of interconnected VoIP, basically a set amount of space, we're about over 50 percent of the call volume. And it's really not a landline wireless but I say pretty much 100 percent of cable is ready. Also, the advanced landline systems that would be UVerse [indiscernible] files [sounds like] enterprises by the way who are using SIP trunking, I would say that 90 percent of all Fortune 1000 companies are using SIP IMS platforms, both at the edge and within the [indiscernible] at works to a certain extent.

And among the wireless operators, obviously voiceover LTE is deploying, however slowly. But they're pretty much ready in the mobile network because of their unique architecture. Should be able to deploy most of this relatively quickly.

Female Voice: Rich, I think I heard on the call yesterday even some large cable providers, significant-sized wireless providers, say that they don't have the infrastructure and that it's not just a matter of providing voice over IP. That it's a matter of their actual network infrastructure not being capable of handling the protocols yet and not having the volume of IT or SIP interconnections in place. I know it's a matter for Comcast, we do have quite a robust or significant volume of our traffic is, but I heard from folks yesterday on that call that it's not just the small providers and that it's some of the larger providers that are --

Rich Shockey: Well, that's why I'm saying it's certainly over 50 percent. Obviously, what we did understand was some service providers are at different points in network evolution. But certainly, the trend lines have been an accelerated adoption of SIP IMS space platforms. But what we do know is that there are some provide, typically landline, that are nearly 100 percent time division multiplexing that are going to be sort of left out in the rain about this because there was virtually nothing we can do to help them.

Travis Kavulla: So, as a practical matter, we've been addressing governance and implementation of policy for CATA. But if I'm just sort of a member of the public who sort of wants answers, wants to be informed about what industry is doing to address this problem, what's my takeaway here? I mean, I appreciate the expedient timeline for setting up this sort of governance architecture within a year, but does that mean if I'm receiving calls from a VoIP interconnected service on either end that I can expect some kind of authentication regime within a year, two years, as a practical matter?

Rich Shockey: Mr. Chairman, do you want me to answer that?

Travis Kavulla: Whoever wants to be so brave. Richard, I know you're brave and go for it.

Rich Shockey: I'm definitely opinionated. We can see some reasonable deployments on a pairwise basis with advanced service providers. We can see that perhaps as early as the fourth quarter, certainly early in 2019. But there's a lot of moving parts in the modern voice communication stack work. And even the most advanced service providers have already run into snags, namely - this is for the geeks out there - the size of the SIP headers that comprise the signaling are being broken apart and fragmented because the particular versions of certain network elements don't like big SIP headers. And those are going to have to be software upgrades and those software upgrades take

time. They take time to develop, they need time to be tested. And virtually all service providers have a vigorous and rigorous testing programs on their own to make sure that when these new features and functionality enter the network, that they are thoroughly and absolutely tested.

And one thing that I certainly try to point out as well, the other contributing factor to the situation is at the same time we're quite seriously talking about National Number Portability. So when you combine the two, basically CATA and National Number Portability inserted into the network, this becomes a bit of an ouch factor for any number of providers.

Travis Kavulla: I don't want to dominate the questioning. I would invite other people who have responses to the couple of questions that I asked to make them self-serve. Or if anyone has other questions, now is the time.

Bob McCausland: Mr. Chairman, this is Bob McCausland at West Telecom Services. I'm a member of the CATA working group. I have one minor point regarding your previous question. There is a bit of a risk factor. The bad guys may begin to shift more of their call originations overseas to countries that don't work with the U.S. on STIR/SHAKEN, so please do note that, that is a continuing risk.

Travis Kavulla: Thank you, Bob. Anyone else?

Diane Holland: Hello. Travis?

Travis Kavulla: Yes, go ahead.

Diane Holland: This is Diane Holland at --

Travis Kavulla: Diane, you might --

Diane Holland: Is this better?

Travis Kavulla: That's a little bit better. Thank you.

Diane Holland: I don't think my mic was on so now I'm on.

So I had just two sort questions. Well, one's a real question. The first one is regarding the characteristics that were laid out for the governance authority. And something that jumped out at me was you said the word neutrality. And I was wondering if the group talked at any length on what that would look like for this type of group. I mean, certainly with the numbering [sounds like] administrations, there are models for ensuring neutrality of administrators. This seems like it would be a little bit different. And I was just wondering if that neutrality was meant in the same sense as, say, the LNPA neutrality or was there any discussion on what looks like?

Beth Choroser: I think what we attempted to do was to recommend establishing a board that would have representation essentially from a broad set of constituencies within the industry. So the recommendation of the consensus report was that, that board would be composed of service providers only. Not vendors because we thought that could create an issue in terms of neutrality in selecting policy administrator and

selecting the certification authorities. So we thought it should be just the service providers and those that are using the protocols.

And we recommended that there be representation from a broad range of constituencies. Again, large incumbents, small incumbents, large wireless, small wireless, large cable, small cable, over the top voice. And then, you know, rural carriers say somebody represented from NTCA, somebody from more of the smaller local associations. So we're looking to ensure that we have everybody's interest covered by having the board have that broad representation.

Diane Holland: Okay, thanks. And the second one was whether there was any discussion that attempted to quantify what startup costs would look like? I know that you proposed perhaps using NAMP funding, either for initial getting this the governance authority set up and the PA set up or for ongoing. So were there any attempts to quantify what it would look like, what the number would be?

Beth Choroser: Now, we did make a determination that the funding would be outside our scope, and so we did not do that. I know there are some models out there where other organizations had started to look at that, but I have not yet heard a dollar figure per se.

Diane Holland: Okay, thanks.

Travis Kavulla: Other questions? I will just for the sake of clarifying things for me, and thank you for indulging me, just maybe ask one more. So let's imagine that some of the biggest players did get this done in terms of a practical matter actually start implementing the framework in Q4 or early 2019 as Richard seems to suggest as possible. Does that mean that traffic that's exchanged between those carriers then shows up to the end user as authenticated, and other calls that are not IP interconnected or not otherwise participating in the SHAKEN framework will simply not have any authentication signal associated with them? How soon can one expect to be seen green checks, a big carrier who's participating in SHAKEN is calling another big carrier participating in the same.

Beth Choroser: I'm going to defer to some of the technical people, but I do understand that the display of the level of attestation is something that needs to be worked on as well. So I think that's something that the technical groups are working on. If there's somebody from the wireless side or others that want to speak to it?

Rich Shockey: I guess I have to chime in one more. This is Rich Shockey. The ATIS/SIP Forum network-to-network task force is actively reviewing call authentication display framework parameters, which is we do have some solutions now and we saw them on Monday from companies like Hiya and First Orion

and one way or the other for wireless operators, and they can display quite a bit of data. I cannot speak for the cable operators but there is certainly -- I believe Comcast did in fact demonstrate that they are prepared for the green checkmark at some particular point in time on our big 60-inch television sets.

Other vendors are looking at inserting data into the classic 15 character ASCII data stream so that residential customers with traditional sort of black phones would be able to see things. And we are very actively looking at how to take call authentication data and direct it specifically at enterprises. These would be major call centers. There's been a lot of activity and ex parte filings from Edison Electric Institute, the American Bankers Association and various health care groups that need this data as well. And that would bring it the CATA data directly to the enterprise. And we need to fill out the pieces of the protocol standards and stuff like that, but those use cases are well-understood and we're making considerable progress in it.

Bob McCausland: Mr. Chairman, this is Bob McCausland at West. I think it's worth noting that USTelecom is again sponsoring a follow-up workshop to facilitate an understanding among industry members of appropriate scoring and labeling of

robocalls efforts that are underway in the U.S. The next meeting of that is a week from today.

Rich Shockey: Exactly. And USTelecom and Kevin Rupy in particular, they've done a wonderful job moving the conversation forward about this.

Travis Kavulla: Thank you for that, and I think hopefully that provides some helpful contextualization of where the governance framework fits in to the rubber meets the road question. I've read a number of drafts of the report, including the one that just came out of the working group yesterday. I know how much work went into it. I think it's quality work product and I'm glad that it is more ambitious on some of the timelines to set up a framework that will facilitate its deployment.

We can take more questions and to have an open discussion in a moment. I do want to turn if Henning is on the phone. And Henning, if you would care to overview the contents of your minority report from the working group, I'd be appreciative. Has Henning joined the call? If not, I'm going to ask Beth to be put in the awkward position and summarize the minority report. I realized it's not the consensus work product of the work group but just for the sake of getting a sort of full exposure to the minority view I think that would be beneficial. Beth, would you like to just -- I know you don't have slides.

Beth Choroser: I'm going to ask Jackie to chime in too because she may have had the latest conversations with Henning. But I think there's a couple of issues that where Henning had just a slightly different view. I think his thought was that there ought to be consumer participation and perhaps state utility commission participation on the board. It's going to be hard because I'm going to defend where we came out and note that Henning has a valid disagreement and it is his opinion and it's fine to have a different opinion.

But I think he believes that the board should have that representation. The group thought that this was a very technical area. We're talking about certificates and passing certificates and setting up technical specifications. So what we recommended as part of our report, sort of as a response to Henning was that the group would report back to the robocall working group or committee within the consumer advisory committee, within the CAC.

Henning also I think was of the opinion that there should be the option for multiple policy administrators. And as I noted, I think earlier that's something that we had decided was out of scope for the group and that we would refer that to the technical working groups. I don't think there's necessarily anybody in particular is opposed to the idea in the longer term, but I think the consensus of the group was again that it was

just out of scope for this particular group to be making that determination. And I can't speak -- I know Henning has a lot of technical expertise so I'm not going to do justice if I try and describe his thoughts on a more aggressive timeline for implementation of the actual framework. I think that's something we'd really need him here for. But I think he felt that the framework, the actual implementation of the framework itself, should be accelerated.

And we did try and incorporate some of Henning's thoughts sort of at our last-minute meeting into the consensus report, but I just think we couldn't get all the way there in terms of an agreement that the entire ecosystem or even that all VoIP providers would be able to reach or be able to implement the framework in a year. And Jackie, I don't know if there's anything you can add in terms of your thoughts on Henning's report because I'm sure I didn't do it justice.

Jackie Wohlgemuth: No, I think you represented it well as much as, like you said, of what we understand of it. I will say that Henning has provided an email just this morning indicating that he would be interested in revising his report, the CATA working group report had been updated. But he is unavailable or thought that he would be unavailable potentially for this call and unable to make a revision in time for the call. He didn't

clearly state, however, what parts of his report he would be able to edit.

Travis Kavulla: For our purposes, I think that's fine. I mean, we do at this meeting need to take action on the substance of the working group's consensus report subject to any sort of typographical errors or additions of references that need to be made since the report is due on I believe May 7th. But as for the minority report, I think it can essentially be updated right up until the time we intend to submit the working group's polished formatted final report to the Wireline Competition Bureau. So I can work with Beth and Jackie and Henning to sort of streamline that process for submission.

I know Henning seemed to indicate that he believed rather than a voluntary industry-led governance, which is the sum and substance of what the report portends for a governance authority, that Henning didn't think that there was a sort of first actor problem. In other words, that since people participating in the framework would be authenticating calls that originate with them and possibly benefiting than other people's end users to whom they're interconnected, that you're essentially asking the big industry participants to do something that whose benefits sort of go down to the customers of other entities. In order to address this, Henning thought that a mandatory approach was more appropriate on the part of the FCC.

I gather that's not obviously something that the report endorses, but it was part of the minority report. Beth or anyone, if you'd like to respond, that might be appropriate.

Beth Choroser: I think two things. One is in terms of again getting this governance structure up and running. We can do that much faster I think on our own without waiting for an NPRM and notice and comment. So that's the first point. The second point is we do feel like there are some benefits to the originating providers even though it is not their customers who will see the validated call on the other end. That perhaps there's an improvement in the call completion of those originating calls, the answer-seizure ratios, and that there are some benefits that would occur for the originating providers as well.

There was one call where I think people in the industry that are participating in this working group are pretty passionate about this work. And I think people feel like we do have an incentive in terms of benefits to the industry and our customers to accelerate this as quickly as we can. That providers who are able to do so, are working as part of the test bed to test the protocols now, and as a matter of wanting to provide the best service possible to our customers that we do have incentives to do this. So that's really all I have to say on that subject.

Travis Kavulla: Well, now is the time should anyone have any discussion or further questions about the draft report we're deliberating upon. So please make yourself heard if you do have any commentary. I've tried to set the stage for ignorant questions. No question is dumb, so if you have one now, this really is your opportunity to ask it.

Well, I think hopefully that's the sound of consensus. I'm not quite sure, I don't think we need an official rollcall vote or anything like this in order to approve the report. I guess just for the record, I'll ask one more time if there are any participants, NANC members, I should clarify who've joined the call since we began who are not identified in the roll call at the beginning? If there are such people, if you'd register your attendance now by just stating your name and affiliation, I'd be grateful.

I don't hear any. Let's, just for the sake of recording, the support of the document. I guess we should have a motion and a vote on the draft report. So I think a resolution or a motion to approve the draft report submission subject to typographical modifications and awaiting the finalization of the minority report to the Wireline Competition Bureau would be in order. Beth, would you like to make that motion?

Beth Choroser: So moved.

[Cross-talking]

Rich Shockey: Travis, it's Rich Shockey. I'll motion to approve the document.

Travis Kavulla: Is there a second?

Bob McCausland: This is Bob McCausland at West Tel, I'll second.

Travis Kavulla: Is there further discussion on the report and the motion? Hearing none, I'll call back question and ask that all people in favor of that motion please indicate by saying aye.

Female Voice: Aye.

Male Voice: Aye.

Group: Aye.

Travis Kavulla: Thank you very much. Is there anyone opposed to the motion? Okay, we'll mark that motion approved. Again, thank you for all your work, Beth and Jackie. The good news about having such a short timeframe is that I think the work of your working group is substantially concluded even while the other working groups toil on. Congratulations on having produced the report.

PUBLIC COMMENTS AND PARTICIPATION

We'll close out that item on the agenda and we'll now move to any public comment on participation and we'll ask that any speaker limit themselves to five minutes if there are any. And this public comment can be made on anything related to the

NANC's work, not just on this but on any number of matter.

Would anyone like to offer a public comment?

OTHER BUSINESS

Okay, I don't hear any. As far as other business, just for the good of the order, we'll work to get the report we've just approved finalized and sent to the WCB by the deadline. The other working groups have been told to have a deadline, and I hope I'm not misremembering this as May 18th for their near final draft to be submitted to the full NANC membership to allow five full business days of review before the NANC's next full meeting which will be an in-person meeting on May 29th at the FCC. That meeting has already been the subject of a public notice. And there, the NANC will be deliberating on the near final draft reports of the toll-free numbering modernization as well as the nationwide number portability working groups will also have time on that agenda, I'm sure, for a transition update and other numbering matters should they need to come to our attention.

Marilyn or Diane, do you have any other business that needs to be addressed at this time?

Diane Holland: I don't.

Marilyn Jones: I don't either. Thank you.

Travis Kavulla: Does any other member of the NANC have anything that needs to come to our attention? Seeing none,

thank you for joining us this morning. There's no further business on our agenda and our meeting is adjourned. Thank you very much.

Marilyn Jones: Thank you.