IETF 109 Plenary Minutes

18 November 2020, Online

1. Welcome

Slides: [IETF 109 Administrative and Operations Plenary](#), Slides 1-6

2. Updates

Note: Reports available in the [Datatracker](#)

2.1. IETF Chair Update

Slides: [IETF 109 Administrative and Operations Plenary](#), Slides 7-13

2.2. IAB Chair Update

Slides: [Internet Architecture Board (IAB) Report](#)

2.3. IRTF Chair Update

Slides: [Internet Research Task Force Plenary Report](#)

2.4. NomCom Update

Slides: [NomCom 2020-2021](#)

2.5. IETF LLC Board Update

Slides: [IETF LLC Briefing for IETF 109](#)

3. In Memoriam

Slides: [All Slides: IETF 109 Plenary](#), Slides 57-58

4. Jonathan B. Postel Award

Slides: [All Slides: IETF 109 Plenary](#), Slides 59

5. Internet Engineering Steering Group (IESG) Open Mic Session

Alissa Cooper: Any questions for the IESG?

Kirsty P: I just wanted to say thanks to the IESG for putting up a vulnerability disclosure policy. Or will put up very soon. I saw the comments on the list and I think it's a very positive step forward for the IETF to formalize the policy and have something public and it's really good to see so thank you.

Roman Danyliw: Thank you Kirsty, as you know there is more work to do, but this is the first step in getting something out there.

6. Internet Architecture Board (IAB) Open Mic Session

Jason Livingood: I just want to say thank you to the IAB for organizing the workshop on COVID network effects. I thought it was a great format across three days, there was a lot of great participation, and it brought a lot of value to the community. Thank you.

Mirja Kühlewind: Thanks for that feedback.

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Andrew Campling: I was also going to say thank you for the COVID workshop; that was a great format. On the other hand, there's a disappointing lack of bookcases for this particular panel. You need to read more. Make a note for next year.

Mirja Kühlewind: Thank you.

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Gorry Fairhurst: I wanted to say thank you for the IABOPEN session. It was really nice to see a little bit more about what was going on inside the IAB.

Mirja Kühlewind: Thank you for that, as well. A lot of thanks; that's great.

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Mark McFadden: I also want to thank you for IABOPEN, but I have a constructive suggestion, and that is that perhaps an hour is not enough. I found the question-and-answer discussion at

the end really productive, and really useful, and I also felt like it was cut short a little bit. So, perhaps scheduling it in March for a little longer might be helpful. Thanks.

Mirja Kühlewind: Thank you. I mean, we had some technical problems as well, that did cut everything short. We were also trying to not take away too much time from the working group agenda time.

Wes Hardaker: It did seem like an hour and a half might be slightly better, yes. We were hard-pressed for time to get that all in.

Mirja Kühlewind: Yep.

7. IETF Administration LLC Open Mic Session

Michael Richardson: I don't want to talk about the Henrik situation but I do want to talk about tools.ietf.org; we seem to have a whole bunch of our infrastructure in various ways reliant on it and it's not really officially supported. I just want to know what is our plan to rationalize what we're doing here and figure out how we can have a single point of contact for issues that do affect us regularly?

Jay Daley: On the single point of contact for things, as you know there are currently multiple different ways you can send a ticket through to people. That all goes into various different queues and into an RT system in the back end. The Secretariat and some people from the NOC and the Tools Team have been looking at this and soon after 109 we'll be replacing that with a new support system and we'll be amalgamating all the various different email address to a single address, support@ietf.org so you can have a simple reporting mechanism. As for tools.ietf.org, while it's named as if it is an officially supported part of the IETF, it is actually maintained and supported directly by Henrik with some support from the LLC and the tools team. If that's not quite right I'm sure Henrik will correct me. There is a plan that the tools team have for migrating various sets of services off that, and there are more things then that need to be discussed for us to understand where they go. While Henrik is stepping back from being a developer he very much intends to carry on with tools.ietf.org, so we're not expecting any kind of problem there. It is understood that what started as a space for people to experiment with tools has turned into an operational service for many people and some work needs to be done to tidy that up a bit.

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Richard Barnes: Good morning. Thanks for taking the time. I'm showing up with my ISOC Treasurer hat on and just want to thank the LLC Board and Jay for, as Jason mentioned, one of the most important jobs the LLC does is manage the financial relationship with ISOC. We've had some good discussions lately about the ongoing funding of the IETF and I just want to thank the

LLC board for doing a really good job of that financial stewardship and presenting a clear story for ISOC to understand and for the community to understand. Thanks.

Jason Livingood: Thank you.

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David Schinazi: I wanted to ask a question about bespoke tools. I've noticed in IETF we have a lot of tools that are custom built and specific to what we do. I understand the impulse. Not at IETF, in other things, I've built a lot of custom tools myself. It's very tempting to think that you're a special snowflake and nothing fits your needs just quite right so you need to build something custom, but the problem is something custom will never reach the economies of scale that a big provider can do. I'd like to ask the question, are we making the right call here? Take tools.ietf.org, the main place people use to read drafts and RFCs, it takes seconds to load a draft, which I still don't understand how it's possible. If you take Meetecho compared to other VC solutions, I was chairing webtransport on Monday and we had an eleven minute outage, in iabopen we had a five minute. They don't quite work as well as more commonplace things. I just wanted to ask the question, is this the right move? I think the Meetecho team has been working really hard and they have good things but at the same time I'm not sure this is the direction the IETF should be going in at this point.

Jay Daley: I think your question is conflating a number of things there. I'll try to pull them apart and tackle them. First of all, the primary assertion in your statement that building bespoke tools is more expensive and more complex than off the shelf tools is in my experience is not a simple assertion by any means. It depends on the complexity of your business processes, the maturity of the industry and software that's available to you, and various other things. I've been a corporate IT manager for decades, and implemented these things backwards, left, right and center, and it's never straightforward and simple. You have to make that decision based on a whole set of complex circumstances. The other thing, perhaps the most important thing though, is that our tools largely are volunteer driven. There is no point at which there is somebody in the LLC sitting here saying no, we need to get rid of Datatracker and replace it with Salesforce. That's not the way that it's worked, the volunteers have driven the development of the way things go. Secondly, some of the things about performance, certainly there are some regular complaints about that, and that is something we don't yet have the monitoring in place to be able to tell and their work is necessary. There's definitely an issue there. The tools team will know more about that. Finally about Meetecho. I think it's very important to recognize that we've asked an enormous amount of Meetecho and they've customized and developed their tool to meet our needs in a way that no other organization that provides a standard tool like this would do. We have also expected to have a tool that uses open standards as much as possible so it's webrtc based, and webrtc as we know is still a developing technology, and particularly the interaction with privacy. We have an xmpp based chat system built in which nobody else on the planet probably would use anymore, and we also have another thing I'm struggling to remember. But it's very much open standards based which makes it quite unusual in that

regard. We have asked for and had a significant amount of customizations put in place for us. The other thing is we expect it to run on IPv6. So we're running it on different cloud platforms, having moved cloud platforms, asked them to move cloud platforms, in order to improve the IPv6 capability. In a context where we are demanding so many changes and getting so many changes, there's inevitably going to be some fluctuations in things. It takes a while for these things to settle down and be put in place. but we have to make the tradeoff of whether we want something that is so well designed for our needs or whether we want something that is entirely off the shelf and works differently. And just a final point, I think so many people are judging Meetecho by a different standard to the way they would judge something else. We would not expect Zoom or someone like that to make a customization for us. We would not be up in arms in Zoom if something were five pixels to the right or using a phrasing we weren't happy about. But because we have worked with Meetecho so long because they make so many changes to things, we have people expecting things from them that perhaps goes a bit beyond what's possible. That's a broad answer to quite a complex question, I think.

Jason Livingood: Let me just add to that. We certainly heard in the process of discussing with ISOC about funding the concern over bespoke or legacy or non performing tools come up as a regular concern. It came up a number of times from their board and community so that was a part of that discussion. At the same time in a lot of the IASA2 formation documents, you can see in the design requirements document a specific section about tools and technical platforms more generally. It talks about that tension between the bespoke created tools and more mainstream publicly supported ones. That's a natural tension and as the IETF organization matures it's natural for the community to ask those questions. Ultimately it's for the community to make those decisions and we're here to execute whatever direction the community wants to go in. So if the community got together and decided we wanted to move from one particular technology to another, we would be there to help in the contracting and finding bidders or whatever it may be. But ultimately it's something the community needs to come together and decide, it's not something we would decide and impose top down.

David Schinazi: So just to slightly answer those points if you'll give me 30 seconds. On the standard front I totally agree. As the IETF we have to eat our own dog food. That said, there is a wide pick of existing providers out there that support webrtc, IPv6, many of that, and I'm definitely not advocating oh, go pick the one that's made by another part of my employer's company. But there are many of them out there that do this and do this well. So on the community point I totally agree. I'm just asking the question, let's ask the community. The final point I'll make is that I totally agree with Jay that it is a tradeoff where on one hand we have the bespoke tools where we can ask for specific features, that's true. If you go to one of these big providers and ask for something completely IETF specific that no one else would ever want they're probably not going to build it. My personal take is that while these IETF specific features are nice, they're not as important as reliability. In my personal experience. So for example chairing a session, having the ability to have this raise your hand tool was cute, and other providers have that. It was the virtual humming tool that was cute. But I would personally much prefer to have an entire 2 hour meeting where we can have a meeting, as opposed to having to

reconnect audio multiple times and having it drop off completely as there. So it is completely a tradeoff and both standpoints have complete merits, but it might be worth it to open it to the community to see which side of the tradeoff might be best. Thanks so much for your time.

Alissa Cooper: Can I just add one thing? Just that on this point about the community discussion, this works the best when there's principle level guidance from the community. Having the community pick very specific tools doesn't really give us the ability to evolve at the pace at which we would want to in order to meet peoples' expectations. Some framework that gives the principle level guidance around this set of tradeoffs would be quite useful and I encourage people to bring that to SHMOO for the remote participation piece. I guess that's totally within the scope of the charter but trying to do this tool by tool is just a rathole. That's my plea for people.

David Schinazi: 100% agree with you. Thank you, Alissa.

Jason Livingood: Next in the queue we have Andrew.

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Andrew Campling: Hi. Two things. Firstly I just wanted to say to Jay, and I put this in the chat earlier, thanks for covering some of the human aspects in your earlier comments. That was very welcome to see, so thank you for that. I was going to comment anyway, as it happens, on Meetecho. Just really to compliment the Meetecho team on how they've evolved the tool since IETF 108 and maybe to balance David's comments. From my recollection of IETF 107, even though I didn't have any issues with Webex, a hell of a lot of people did in the use of that continuously throughout the week. So I think given the wide variety of platforms and devices and things that people use, some people will inevitably have problems whatever choice of conferencing platform, to my experience, Meetecho is the best of the mainstream platforms that I've seen. It worked really well at RIPE a couple of weeks back as well, and certainly the feature set has improved a fair bit since IETF 108 so I think the Meetecho team are to be congratulated, and it would be a shame to move to a different platform. Good choice, in my mind. Thank you.

Jason Livingood: Thank you Andrew. Next up is Cullen.

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Cullen Jennings: I think the answer was not really, I think it was a little disingenuous. I think it come back to things like is this volunteer driven or is this actually community driven, or is this driven by Jay making a decision? I understand it's a complicated blend of all those things, but statements like the Datatracker was community driven is just simply not true. I mean no, it was a group wrote a contract and yes some volunteers wrote it and whatever but it didn't work that way. Around the selection of these tools as well, I do not feel as a community member that really, that yes, maybe we gave some broad input, but I don't believe, I believe this is a decision this group is making. I don't think it's making a good decision, I think we should be measuring

these tools by the ability to get the job done that we're here to do. And we don't, you know, the voting tool could easily be separated out into something else. Every single one of the major conferencing vendors has APIs and plugins to adopt them and modify their environments into different things but we don't use them. The statements about xmpp, webrtc, ipv6 are categorically all wrong; it reflects not really a deep understanding of what these services are or even having looked at them. So I think we should revisit what we're trying to accomplish with these tools, whether the tools met our needs well this week. Every single meeting I've been in this week has had people not be able to contribute at some point due to Meetecho problems, uh, it has reliability that is so low it's almost unmeasurable this week.

Bron Gondwana: I'm just barging in here because according to my view I see myself at the top of the queue above Cullen. I'm not sure if anyone else sees that.

Cullen Jennings: That's hilarious, and it speaks exactly to my point.

Bron Gondwana: I started up the chat window in another window and as I tried to scroll down Meetecho crashed and restarted itself and I've now got a frozen copy of everyone's video and a live copy of everybody's video and I see myself at the top of the queue.

Cullen Jennings: What do you see, Jason?

Jason Livingood: Bron, I don't see you at all in the queue.

Cullen Jennings: Anyway, I think I've said all that I wanted to say and I will cede the floor to Bron.

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Bron Gondwana: [crosstalk] unreliable. I was supporting it a day ago but my experience of it in the day since is that it's been very unreliable and Meetecho's responses on the mailing lists have been very dismissive and victim-blaming about people who have been screwed over by its bugs. They said we restarted the server and everything works fine, and I posted them a screenshot showing them I had duplicate copies of slides, duplicate copies of videos, and they said just refresh your browser. That's not really a reliable solution to everything, particularly given that I'm in a situation that says I'm at the top of the list, but according to everyone else, I'm not in the queue. So the fact that I have an unreliable view of the world is a real problem. I'm going to refresh now.

Jason Livingood: It points out the possibility that maybe as we work on our 2021 work plan, pulling in some sort of a tools assessment with the community and figuring out this balance. Jay, would you like to comment?

Jay Daley: While I understand there are people who have some strong problems with this, I do not think that the LLC can respond by simply changing the tool based on that. I don't think it's within the LLC's remit to do that. There has to be a community process that tells us what are the things you think are important and what are the things that need to be delivered by the tool, possibly even a community process to choose the tool or something. That is what needs to happen for us to do that. This is one of those things where we have a status quo, I don't know the history of how we got here, nor do I think the history is potentially relevant, but we are in this place now and in order to move from this place, we need a proper process to do that. I don't want to be rude about it, but a level of complaint is not sufficient for us to be able to do that because it is a personal point of view that others disagree with strongly. We need to go through a rational process to get there.

Jason Livingood: I'll just add on to what Jay's saying. Clearly we have the ability to help facilitate that sort of process, and there's also the SHMOO wg, so I suspect that we can sort out ways to help have this conversation as we move into next year. We've certainly learned a lot more about our reliance on these tools as we've only been able to meet online.

Alissa: I actually think the history is relevant--

[audio/video cut out for several minutes]

Jason Livingood: We do see some people with their hands up in the queue and we'll get to you shortly. We'll give it a few more minutes for people to rejoin. Bron, I see you're not in the queue anymore. Did you still want to be in the queue?

Bron Gondwana: I'll pop back on. I see I'm on the other video camera now. Reliability is much more important than a lot of things and I think what we've found is that we haven't had reliability during this meeting for pretty much any session. I've been quite lucky in the ones I've hosted, thankfully, but I've attended a lot of sessions that had a lot of problems. I think that is a serious consideration. It's a thousand peoples' time that's being wasted if something goes down and I think reliability needs to be a more important consideration than even using specific standards. Using specific standards is nice, but working is really important and I don't think we give that enough consideration. I think the customization is nice but reliability and consistency is significantly more important. I found it was very difficult to report usability issues in my experience with Meetecho test calls, which I have attended as many as I could before each IETF, and have pointed out usability issues that cause people to have trouble, and they haven't been dealt with. There are a lot of things I like about Meetecho but the reliability of the tech stack is really important for a conference of this size and I think we need to focus on that above the specific technologies and specific features that we think might be nice. That was my main point. Actually what I was in the queue for was to talk about something completely different, which is that I have had a couple of occasions where people have come to me saying, I want to

bring this work to the IETF, can you explain to me how submitting a draft works? And I've shown my workflow and they have found it very difficult to understand how to write a draft, how to specify what all the values in all the fields are, in the header information, in the tracking information, dealing with what's xml and what's markdown, and where can I find canonical documentation that tells me how to do this stuff, then how do I submit it and what's the workflow after I submit it. I spent quite a while in Gather Town in a break between meetings today explaining it to a new person. I'm not sure that I have a great idea either. Someone's audio is now feeding back to me, if whoever else it is can mute. That's quite frustrating. I think that area of tools is quite difficult. We have a very large barrier of entry still in our document creation tool chain and I think that's a significant barrier to new people coming to the IETF to learn how to generate a document and we should be looking at that as much as this as an issue for those of us who already kind of know what we're doing three times a year, but the document generation toolchain is an issue all the time and that onboarding process is still pretty rough based on the experience of people who have been coming to me as new members of my working groups.

Jason Livingood: Thanks for that feedback. I think we've heard the same. Obviously Jay has a survey out about some of the tools and work processes and that's helpful. We heard this as a point raised by the ISOC board when we were in funding discussions, particularly in the context you noted in terms of new participants and it being a barrier to entry, especially when someone might be making a decision between participating in an open source community or some other standards organization and the barrier to entry can be high. So we understand.

Bron Gondwana: The final thing, while I've got the microphone here instead of coming back later, that I wouldn't mind floating, is that we've had a couple of people leave recently and it's difficult as a person who wasn't directly involved in it to know whether they left because they've been treated badly by the IETF or if they left because the IETF is trying to build some accountability and structure around a world that was very much that everyone has their own fiefdom and runs it as they see fit. That's a tricky one to understand and certainly I don't have a problem with building accountability and structures. I think it's really important that people feel included and feel involved and it's also very important that we continue to build processes that are good for the IETF and good for everybody, and it will ruffle some feathers I'm sure. Thanks.

Jason Livingood: Thank you, Bron. Next up in the queue I see Eric.

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Eric Rescorla: Bron said a number of things that I agree with so I have a few points I'd like to make but I will do it briefly. First, I don't think that any of the tools we currently have were in fact selected by the community, they were selected in a bunch of ad hoc fashions by leadership at the time. That's not necessarily bad, I think in fact that's some of the structure that we should have now, which is that the community gives us guidance on what we're trying to achieve but the LLC should be empowered to decide the kind of question of what tools we actually use, and so we should tell you what the priorities are and you should decide which videoconferencing

tool, or whatever, we use. So I certainly don't think you should ask the community should we use Meetecho or Meet or Zoom or whatever, quite the contrary. Ask us what our priorities are. I also don't think we should have to wait two years for a long community effort for you to reconsider the toolchain, we should do the best we have under the circumstances, which isn't to advocate for any particular outcome. Second, in terms of the Maslow's hierarchy of needs here the most important thing is to get the job done and that means having things that work reliably and predictably. Customization is a thing on top of that. People all across the world do videoconferencing or other things like this without any kind of customized tooling and so while customization is nice it is not in fact the most important. The most important thing is that it works. Third, it's increasingly expensive to have bespoke tools when you compare them to the commodity tools you can get off the shelf. I work for an organization which is a software development organization and yet we've increasingly moved towards having commodity tools because it's simply so expensive to maintain our own independent tool chains of things, when you compare to the tools you get off the shelf that work relatively good even though as I said were not as well customized or built into our structures and functions as one might have liked. Next, while I do think it's important to be able to eat our own dog food, I think we have a tendency to go overboard here. While it would be nice to have every tool we use support every last protocol that we designed, I don't think that's the most important thing. Once again I think the most important thing is to use tools that let us get the job done. With all that said, there are a number of webrtc based video conferencing tools, I'm very attached to webrtc and spent a lot of time working on it so if the extent to which one wants to use webrtc we do have a number of choices here, it is not only one. Thank you.

Jason Livingood: Thank you, Ekr. I think I'm hearing from you definitely themes of focusing on reliability and productivity in the tooling and certainly we've heard in the past when that some aspects of the toolchain were created there were no other alternatives or substitutes and so things had to be developed, but that may not be the case any longer given your example, so thank you for that. Next up is Toerless.

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Toerless Eckert: With respect to Meetecho and the tooling, it's really been a great history of us eating our own dog food and developing our tooling. I think the same should continue to be done for our conference meeting experience. It would be bad to go to a model where we're only buying services. It would be great to continue having a tools team and ideally it should be independent of any given choices. I'm not sure to what extent the Meetecho team as an integration customization team would be able to do that but I think that would be my ideal preference, to basically have the best of both worlds. To be open to integrate and use whatever the best starting tools are to not replicate work but then to get the outcomes we want with respect to our own customized experience. The other point I wanted to quickly bring up, I hope this is the right place here. With respect to the timing of the meeting I think it was a mistake to think that using a time local to a place we don't go to is a good thing if everybody is working in their own time zone and the majority of the participants will likely be working between midnight

and 6 am. If we were to go on longer with the virtualized meetings I guess that would be easy to fix and avoid the timing we had this time. It will be a lot more difficult if we go over to a longer term that will be more hybrid, having a lot more people continue to attend virtually instead of unnecessarily traveling but also having a traveling audience. I think that's one of the big question marks that I'd like to see some thoughts being put to, whether it's SHMOO or whatever the right places are. Thanks.

Jason Livingood: Thanks. Next up is Benjamin.

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Ben Kaduk: My understanding is that mostly thanks to Ray Pelletier we had pandemic insurance up through the end of this year for our in-person meetings but we couldn't get it going forward. Are we at all worried about risks that there might be something that happens and we end up significantly in the hole financially?

Jay Daley: It was precisely for that reason we made such an early decision to move IETF 110 online. For next year we have two meetings [currently scheduled in-person], the San Francisco meeting and the Madrid meeting afterwards. We know the Madrid meeting is possible to move because we moved it once already and they were good about that. San Francisco is not so clear yet. The answer is there is a risk to us, it is problematic to quantify the level of risk at the moment. The booking of San Francisco significantly predates these things but the pandemic insurance was only ever bought a year in advance. It was fantastic insurance and I'm very glad we had it but it doesn't apply to that. That's the best answer I can give at the moment. If the risk eventuates we'll have to manage it carefully.

Ben Kaduk: Thank you.

Jason Livingood: I'll add that we maintain an operating reserve to serve as a buffer on unexpected financial events. These extraordinary sets of circumstances certainly fall into that. The most challenging period will be when hopefully sometime in 2021, when will things open up and the first meeting will be hardest. We won't be sure how many people can get there and can it be held, and therefore we may be some risk of financial loss there. We'll try to manage that as best we can but it's unclear when the world will go back to some definition of normal and we'll do the best we can to manage and push out as far into the future as we can those decisions. Depending on the venue some of those decisions may have to be made sooner than later. It varies by location. It's a lot of uncertainty but everyone's facing it. Thank you.

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Rüdiger Volk: Let me start with the observation that Meetecho and probably none of the commercial off the shelf products would offer a way of giving Henrik the standing ovation that probably would have happened in a present meeting. Further comment from me is yes, the

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experience of unreliability of Meetecho this time has been a bad surprise to me after a very good experience in the previous meeting. Including more observation of the Meetecho team communicating with the ongoing conference. I was expecting that to continue and I haven't seen that in a similar fashion. The unreliability has been specifically surprising to me after I observed at the recent RIPE meeting that RIPE decided to switch from a commercial off the shelf service to Meetecho and it worked really well except that early on there was one failure and the causes were easily identified and fixed. There was a lot of praise for going to Meetecho there. A tiny additional observation there is that for questions about customization and plug in possibilities in Meetecho. RIPE meetings had a commercial off the shelf service plucked in instead of the humming tool or hands up tool. Actually I didn't feel very nice about that service but that's all stuff that's there. For this community I'm kind of also a little bit irritated about the way we are discussing this because in a community like this I would actually expect that people would be asking for, where do we get the report about what has happened? I observe that in this plenary session we did not have any slide as far as I recall giving information about the technical facilities and the usage that were applied to this meeting. Thanks.

Jason Livingood: Thank you very much.

Alissa: I had suggested to Henrik that we would recognize him at this plenary and he said he didn't want to do it, he wanted to wait for an in person meeting, and that's why we didn't do it at this meeting. Certainly he deserves a ton of recognition from the community and hopefully that can take place at a later date. Just wanted people to be aware that it wasn't an oversight, it was by design. Thanks.

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Tommy Pauly: I'll be brief. Jay, why don't you respond to a comment that you'd made earlier about the fact that there are people who do feel strongly about tools like Meetecho in both positive and negative ways? While I think it's fine to have community feedback for these long-term decisions about tooling, I disagree that it's a matter of opinion to weigh some people having good experiences with the very factual problems that we've been having this week with Meetecho. Again, those opinions are good for long term decision, but I'd consider the current situation when we're all forced to meet virtually and we don't have another option, it's kind of an emergency situation where it's not acceptable to just say we're going to use the status quo if it's actually harming peoples' ability to participate and we've been seeing that every day this week. So I think yes, let's start a long-term conversation with the whole community about tooling, let's figure out how to make sure that Meetecho and other tools like that are scaling well, but we can have a temporary solution like what we did last March to say we just need to put something in place to make sure we have a backup system, to ensure that IETF 110 will be successful. That should be our priority for now while we have these other discussions, but let's make sure that people are not being excluded or that our work is being harmed.

Jason Livingood: Thank you, Tommy. Next up is Rodney.

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Rodney Van Meter: To Toerless's comment and to speak up for the people in east Asia / Asia Pacific time zones, I'm in Japan so it's 8 pm now and it's really nice to have the IETF meeting not in the middle of the night. If we're going to be in a hybrid environment where lots of meetings take place year round I think it's entirely reasonable to continue to hold it in a fashion such that at least a reasonable fraction of the meetings are held in each of the major regions of the planet. Being in Japan I'm toward the eastern end of this, Bangkok is a couple of hours behind us and if you go two hours west from there you get to India, so in this four and a half hour time zone slot here we have more than half of the world's population. I realize it's substantially less than half of the total participation in the IETF, but if you don't have meetings that work for some of the people over here you're going to have trouble getting the actual participation you want from this half of the planet. That's it. By the way, I actually really like Meetecho. Thumbs up.

Jason Livingood: Thank you, Rodney. Next up we have Henrik.

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Henrik Levkowetz: As an illustration of a point that Jay made that these things are complex, I wanted to mention that my understanding is that Meetecho this time is running on a different cloud fabric than earlier and what I've seen in the tech support internal channel is that almost all the issues I've observed have been related to the different vendor of the virtual machines they're running on, not with the Meetecho software itself. It's very easy to perceive a problem and point at the front end of it but the actual cause of the problem is sometimes much more complex. I don't think that really is news to any of us. That's all.

Jason Livingood: Thank you, Henrik.

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Richard Barnes: I just wanted to briefly reemphasize a point Tommy made. There's a real asymmetry here. I was struck by the contrast between Tommy's point and Rod's point. Tommy's point being that "I can't participate because of something" and Rod's point being "I like this," and it strikes me that there's a real asymmetry there. It goes to this hierarchy of needs point from earlier. Yes, it's good to have tools that people like and people find pleasant to use, but it's much more important if we believe in the openness and open participation points that we espouse here to have tools that enable people to participate and provide reliability and accessibility to the communities we want to participate here.

Jason Livingood: Thank you, Richard, and I'll just note the board will have to have a think after this meeting in terms of our takeaways, but it's clear that a theme throughout has been pertaining to the reliability and need for productivity of the tooling to support online meetings so we'll need to circle back and sort out a way we can move forward.

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John Klensin: Two observations. The first is that I want to reinforce the support part of Henrik's point and ask that the LLC think about managing some systematic post mortems on the technology of these meetings so that those of us who are interested can actually understand what went wrong and what can be done to fix it for the next time rather than responding as almost everybody does in the internet in similar situations by blaming the front end application or whatever it is you're looking at. Since I have the floor, I will [clapping] add my applause to the previous general effort. Thanks very much.

Jason Livingood: Thanks John and an excellent point in terms of a retrospective or after-action report. Well-taken point to understand how was each tool or each system performing, what were the detailed issues, and have each team basically do root cause analysis. THat's really important to do and it can probably then inform any potential next steps.

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Spencer Dawkins: I just wanted to thank the people on the LLC for their service. I note that much of this discussion three years ago would have happened during the IESG open mic and that's gotta be more appreciated by the IESG not being on stage for this than anybody else.