ICANN85 Mumbai | CF – How it Works: The IETF
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JENNIFER BRYCE

Thank you so much. Hello, everybody. My name is Jennifer, and I am the Remote Participation Manager for this session. This is How It Works: The IETF. Please note that the session is being recorded and is governed by the ICANN Community Participant Code of Conduct, ICANN Expected Standard of Behavior, and the ICANN Community Anti-Harassment Policy.

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DHRUV DHODY

Hello, everyone. This is How It Works: The IETF. I will be presenting the first half, and then we have Warren. We have kept a bunch of time for questions. We want this to be interactive, so let's have discussions and questions. Moving to the next slide.

First thing, why do we even do standards? What is the reason for this? Every time we go to conferences, we have to figure out the plug point and the voltage. We have to ask if we are carrying the right adapter. We have all been there, right? If there was a global standard for that, things would have been super easy, wouldn't they? Luckily, for the most complex system that we know, the internet, we have global open standards, and that has allowed us to work seamlessly.

Every email, every website that we go to, and every Zoom meeting that we join are on different devices and servers located in different jurisdictions, yet they just interoperate. They work because we have global standards. That is where the IETF comes in. What do we do? We develop protocols, we build consensus across communities, and then we publish our standards, which are our RFCs.

As far as protocols are concerned, these are basically the technical rules by which any independent network and system get to interoperate. Different vendors and different services just interoperate because we agree on those technical rules. We implement those technical rules in the right way. That is how we interoperate.

What are some examples of these standards? Since we are in ICANN, DNS comes to mind first, but then there is everything from email to HTTP to TLS to security protocols. We will go over a bunch of things that the IETF does. We do it with a process that is bottom-

up. It is all about building consensus. It is about a community where we need to get the right set of voices in the room: engineers, operators, vendors, researchers, academia, civil society, and end users. We get everyone in the room together and build what we call rough consensus.

The focus here is always on the technical merit, not so much on whether someone is speaking for a company or a government. It is about the technical argument that you put in front of the room. That is how we judge consensus. The final output is our RFCs. RFC stands for Request for Comments. These are public, freely available documents that define our internet standards. Not just standards, we also have informational documents, best current practices, and even documents on how the IETF functions and our processes. These are also in the same RFC series. These are basically the shared technical foundation over which we built this internet.

The summary is basically that the IETF is a technical community, and we all come together to agree on those technical rules, which we call protocols. Those are the protocols that make the internet work. One thing that is often asked, especially by folks from the Internet Architecture Board, is: "Where is the blueprint for the internet? Where is the grand architecture that you have? You call yourself an Internet Architecture Board, but we don't really see how these things fit together. We come to the IETF, we look at all these documents, but we don't really know how things fit

together." Actually, that is not a bug; that is a feature. We do not do that.

What we do is basically building blocks, like Lego blocks. We solve a very specific problem. We define how it works and how it interfaces, but we let other people decide how to build on top of that. That has led to what we call permissionless innovation. Things were developed for a totally different environment when the internet looked very different, but the same protocol continued to work in new environments and new deployments because we did not have a grand design of how the internet is supposed to look. It just continues to evolve and interoperate.

Our mission is a very good way to learn about the organization. Our mission statement is very clear and focused. Our motto is: "Make the internet work better." That is the aim towards which we are going, but we do this with a very small mandate. Our mandate is producing high-quality technical specifications, and those specifications influence how people design, use, and manage the internet. The mandate is not about operations of the internet or compliance. It is not about making sure how things are running. Our focus is to write the documents and the rules that we can all agree on, and then we let the industry and the other stakeholders in the process take over. This is the way in which the IETF contributes. The technical specification itself, the rules, and the RFCs are the most fundamental foundation over which we build the rest of the internet ecosystem.

Regarding our ethos and the way the IETF community and organization work: first, everyone participates as an individual. This is very different from what you would see in other organizations where you might formally represent a government. For example, in ICANN at a GAC meeting, you are representing a government. In an ALAC meeting, you are representing a particular region. Here in the IETF, you represent yourself. That doesn't mean people don't state their affiliation. They go to the mic and state their affiliation because that signals where their biases might come from so people can understand their perspective. One thing we see in the IETF is people from the same affiliation going to the mic and arguing, which shows that you are representing an individual opinion. Our aim is to come to the best technical discussion and the best technical answer.

We don't have membership. In the IETF, you have an email address, you join one of our mailing lists for any of the working groups you are interested in, and you are an IETFer. There are no membership dues or renewals. You are an IETFer just by joining us.

We talked about the building blocks aspect. Our specifications are the building blocks; they are not grand designs. The most important thing we do at the IETF is ensure all our output, not just the final RFCs which are available for free, is transparent. You can see how those RFCs came to be. You can see how they evolved over time, how the discussion went, who discussed what, and who said what in the meeting. Everything is available and completely free

and open. That gives people openness, trust, and transparency in the system regarding how decisions are being made.

We judge contributions by technical merit. There is no voting. Everything is via rough consensus and open mailing lists. Finally, we determine success by voluntary deployment. There is a saying in the IETF that the IETF doesn't have a protocol police. We don't tell people what to do. We write the specification, and it is our industry, the vendors, and the open-source communities who decide if it is worth implementing. Then a service provider decides if they want to buy and enable that service. Then the user gets to decide if they want to use it. Our focus is only on producing high-quality technical specifications, and it is the industry that decides whether to deploy them.

For any organization, the most important thing is the community. The IETF community is defined by who comes to our meetings, but more importantly, who joins our mailing lists, who is posting, and who is discussing. These numbers are mostly about who is part of the broad IETF community, not just meeting attendance. We get a lot of participants from the technical industry, but we also have participation from academia, civil society, and government-affiliated organizations. At one of our plenary meetings, we had participants from seventy-seven countries, so we get a good spread, even if it is not evenly distributed. The key thing is everyone participates as an individual. All communities have an equal standing in the process.

At the same time, the IETF realizes we need tailored engagement. When we go to operators, Warren runs a program called IEPG where operators discuss the operational issues they face when deploying these protocols. We run a program called SISTERS for women and non-binary participants to interact and discuss how they can improve their experiences at the IETF. We do hackathons more towards the open-source community. ISOC runs a policymakers program to make it easier to distill how the IETF works for policymakers. We have tailored programs, but when it comes to the actual specification and the standard process, everybody participates as an individual with the same standing.

How do we run our meetings? This is something the IETF is really proud of. We take our hybrid meetings and remote participation very seriously. At any of our meetings, we have a huge chunk of people participating remotely, and this participation is not passive. We have folks chairing meetings remotely. There are multiple working group chairs who could not make it to the meeting but run the whole meeting remotely. People join the same queue, and irrespective of whether you are in the room or remote, you use the same tool and join the same queue. Your order for raising questions is exactly the same. People present remotely all the time. Nobody is given special preference just because they are there in person.

That doesn't mean being in person is not an advantage. Networking and hallway conversations also matter. But the IETF tries to make remote participation a first-class experience. Multiple working groups just do work remotely and never meet at the

plenary meeting. They decide for themselves what time works, and they meet and do the work. IETF meetings are actually working meetings. There are fewer presentations because people are here to move the documents and the technical specifications forward. They are only discussing open issues. All our material is on the Data Tracker. That is the tool we use to find our RFCs, drafts, and all other documents.

These building blocks are basically RFCs. As I mentioned, these are free and developed by a fair and open process. They are stable; once they are published, they don't change. They are widely respected and known. People might not have heard of the IETF, but they have definitely heard of an RFC. Some examples include DNS, HTTP, TCP, IP, IPv6, and BGP. All these key protocols are defined in the RFC series.

This is how we organize our work. Different protocols are clubbed into areas. We look at the internet in terms of how IP packets move over different link layers and how we connect and find paths, whether within a domain or across domains. Web and internet transport includes protocols like TCP, UDP, QUIC, and HTTP. Applications include things like email and calendars. These things work because they are well specified in these different areas. The two pillars you see are operations and security because irrespective of which layer you are in, you need to operate the protocol, manage it, and make it secure. On the next slide, you will see some examples. Warren.

WARREN KUMARI Just a quick note. If anybody has any questions, please interrupt us. We are more than happy to stop. We don't want to spend too much time and then have you wondering what we were talking about on slide four.

DHRUV DHODY Yes.

SANTHOSH VISHNU BHADALE Sure. I am Santhosh Vishnu Bhadale from Zensar, and we work on the technical side of ICANN. I am asking this question because we regularly read the IETF Data Tracker and develop our technical models. I am trying to understand how the process works. Do you first create the IETF documentation and then implement it? What is the flow? First, you create the documentation, and then you implement it through this process?

WARREN KUMARI Actually, luckily, we have some slides further on regarding that. I think we will answer that in a little bit.

SANTHOSH VISHNU BHADALE Yes.

WARREN KUMARI But definitely come back to it.

DHRUV DHODY If the question still exists, come back.

WARREN KUMARI Yeah, if we haven't answered that further on. Anyone else? I will jump in if there is anything interesting.

DHRUV DHODY Oh, yeah, we kind of knew that. These are just some examples of the protocols and the working groups in each of these areas to give you a flavor. The IETF does a lot of different work; it is very diverse. We love acronyms, and there are a lot of them. This sometimes makes things harder for folks.

When I joined the IETF, I was implementing a protocol and just went to that working group. I found the protocol defined there, joined the mailing list, and became an IETFer. I didn't care about the rest of the organization for a long time because I was focused. That is the experience of most IETFers. We are focused on the key protocols we care about. If you are in the DNS world, you go to DNSOP and the DNS working groups. We want technical expertise from those folks. Once you go into leadership, then you see the big picture of how diverse and varied the IETF is. No one in the IETF knows everything; it is impossible. There are 125 working groups.

There are eight parallel sessions at any time. It is impossible to figure out everything happening at the IETF.

Let's look at our organization structure. We have understood the technology and the community part. We saw how we run the meetings. Now for the boring things: how everything in the IETF comes together and what the different organizations are. On the left is the IETF as a standards body. That is where we have our Area Directors, or ADs. Together they create the IESG, which is our engineering steering group. On the other side are two organizations I want to cover: the IAB, which focuses on architecture and outreach, and the IRTF, which focuses on research.

Both Warren and I are on the IAB. We are a body that provides long-term technical direction for internet development. We organize workshops and look at things that are not yet ready for standardization. We want to get the community together to focus on a problem that might lead to future work in the IETF. We are sort of like the foreign office. We do liaison coordination, talking to other bodies including ICANN and other SDOs in the space, making sure we have good working relationships and reaching out to all communities.

The research arm of the IETF is called the IRTF. It focuses on things that are not yet ready for engineering. They have a much more long-term focus. There are still research questions that are currently unanswered, so we want them to explore those. There are

around sixteen research groups. We also have the administrative part, which is our LLC, and the IETF Trust that manages our rights to the IETF contributions.

The final output was the RFCs, but you also have Internet drafts, which you will see in the Data Tracker. Internet drafts are just working documents. These are not standards yet and are not finalized or stable. They change all the time. Anyone can submit an Internet draft. The IETF process starts when the draft is adopted by a particular working group, and at that time you would see the name change to something like draft-ietf-dnsop. That means the working group has decided to work on it as part of their charter and scope. RFCs, on the other hand, are published and do not change. Note that not all RFCs are standards because we produce many informational documents and experiments. Also, not all RFCs come from the IETF; some come from the IAB, IRTF, or the independent stream.

The next thing we want to talk about is running code. The IETF holds hackathons on the weekend before the IETF meeting. This is where we get folks who want to implement the standards that are in the making. Running code actually helps the standard process. During the process, when we can say a specification is implemented, interoperable, and tested, it gives us a lot of confidence that these things work and are not just looking good on paper. We have feedback from the implementer. Hackathons are completely open. This is not like a competition; it is about getting people from the standards and open-source communities in the

room to work on interoperability and testing. You can find more information on our website. Looking at the time, let me...

UNIDENTIFIED SPEAKER Just a bit.

DHRUV DHODY Yes. Let's take a fun break and have a bit of trivia. First question: what came first? The IETF, an RFC, or did they all come at the same time? Does anybody want to take a guess? Yes.

UNIDENTIFIED SPEAKER RFC.

DHRUV DHODY Okay.

UNIDENTIFIED SPEAKER No.

DHRUV DHODY Okay. We have one for IETF and a couple for RFCs. Second question: how many RFCs are there out there? Around one thousand, five thousand, or ten thousand? Fifteen thousand? Uncountable?

UNIDENTIFIED SPEAKER Uncountable.

DHRUV DHODY Less than ten thousand? Okay. And this is something you should know if you were paying attention: how does the IETF make decisions? Majority vote, board resolutions, or rough consensus?

UNIDENTIFIED SPEAKER Rough consensus.

DHRUV DHODY Yay, we have a winner for that. Good. So these are your answers.

UNIDENTIFIED SPEAKER Dhruv, that's humming.

DHRUV DHODY Hmm?

UNIDENTIFIED SPEAKER Humming.

DHRUV DHODY I have a slide on that. Let's wait on the humming thing, but it is still rough consensus. Humming is not a replacement for rough consensus. So these are the answers. Who was surprised? Okay, let's talk about it. Why were you surprised?

The IETF was formed in 1986 by what was then called the Internet Activities Board, which was a precursor to the IAB. The first meeting had around twenty-one folks, mostly from US federal government-funded projects, on 16 January 1986. We are lucky that some of those people who were in that meeting are still around and still come to the IETF. But the RFC series itself, RFC 1, goes way back and was published in 1969. Now we are approaching ten thousand RFCs. We haven't reached it yet, but it is coming. For the longest initial period, it was managed by Jon Postel, the internet pioneer, and later we had the RFC Editor and the RPC, which is the RFC Production Center, where a whole team does the job.

The second question was about the rough consensus part. I covered this during the hackathon, but here is the full quote: "We reject kings, presidents, and voting, and we believe in rough consensus and running code." This is a famous saying and our unofficial motto, said by David Clark. Why is this important? It is important because of rough consensus. Pete, I'm going to put you on the spot. Why don't you talk about this? You wrote the RFC on it.

PETE

I swear the RFC I wrote on this is not a standard; it is an informational document. The trick here is that you don't want voting for obvious reasons. If you can vote, people could stuff the ballot. Since we have no membership, we don't know who counts. I could bring all of my sales representatives, my mother, my father,

and my children, and we can all vote for a particular protocol. But that doesn't end up with the best outcome.

What we do is say we're not going to count noses or people; we're going to count issues. When the issues that everybody raises have been addressed, then we will move on. It doesn't necessarily mean we will accommodate all of them. We might say we understand what you said, and the vast majority of us believe we have it covered. I always say lack of disagreement is more important than agreement. The question is really: can you live with this?

Regarding the humming thing, back when we didn't have remote participation, we all knew that we were going to do rough consensus. But every so often, the chair needed to figure out what the room wanted to do and which direction we were going. They didn't want to show hands because that would make it seem like we were voting. So the chair would instead say, "Who is in favor of proposal A?" and the room would go, "Hmm." Then, "Who is in favor of proposal B?" and the room would go, "Hmm." The chair would say it sounds like proposal B has more people who feel strongly about it. Proposal B might get fewer people humming, but they hum very loudly.

We don't do this anymore because doing it over microphones in remote meetings is terrible. It never works out, and you can't figure out who's humming loudly or softly. It is a mess. We don't do that much anymore. We do go around the room and ask for objections. Technical reasons matter, not counting people saying they agree.

We want to know what the issues are. So yes, many years ago we wrote this document on consensus and humming because back then we were still doing it a bit. It describes all of the ins and outs. I am very proud of this document and would love for you to read it. Yes, sir?

ANUP KUMAR PRASHAD Since you said that RFCs don't have a membership, who decides and how do you make a decision?

PETE This is where trusting the leadership is always tricky. In a working group, the chairs—we usually have two or three so not everyone is responsible for everything—make the decision as to whether the working group has come to rough consensus. There might be some outliers, but this is the direction. Any of those outliers can always appeal the decision. If you feel the chair made the wrong decision or didn't understand what you were saying, first you talk to the chair. If that doesn't work, you go to the Area Director. If you disagree with the Area Director, you can go to the entire IESG and file a formal appeal. If that fails, you are allowed to go to the IAB, and whatever the IAB says on the technical matter is the end of the road. There are many layers. Hopefully, with all of those people involved, you're satisfied that everybody has looked at it.

ANUP KUMAR PRASHAD What is the full form of IAB?

PETE

The IAB is the Internet Architecture Board. Warren and Dhruv are both on the IAB.

ANUP KUMAR PRASHAD

A trailing question: what if whoever is making a decision is compromised? Do you provide a prevention mechanism for this on the website?

WARREN KUMARI

One of the things that makes the IETF very different from most other standards organizations is we don't have very strict rules. We instead rely more on our culture and ethos. If a chair is conflicted, the expectation is the chair will say, "I'm conflicted. I'm not going to involve myself in this discussion." As noted, there's always the appeal process because sometimes a chair will think he's not conflicted, but everybody else will. Our culture encourages people to say, "Your company is deeply involved in this; you shouldn't really have a view here." A lot of our success is the expectation that the chair will do the right thing. If the person doesn't say that, our culture encourages others to point it out. That makes the IETF different because many other standards organizations have voting, which as Pete pointed out, often leads to bad outcomes.

ANUP KUMAR PRASHAD Do we have the website for the appeal mechanism in the presentation?

WARREN KUMARI I think we can cover that afterwards, but let's look at the bigger picture.

ANUP KUMAR PRASHAD Okay, great.

WARREN KUMARI One thing to quickly add is that since everything is done in the open, all our discussions in the working groups and in the IESG are minuted. There are observers everywhere. Because there are eyes on you at all times and no closed-door discussions, that gives us trust and transparency. We also have a different way of electing people to the organization. We have a NomCom. Here in ICANN, you must have heard there is a NomCom. Our NomCom is different in the sense that there are ten randomly selected members from the community who get feedback from the whole IETF and put people up or take them down. If somebody is conflicted, they can be taken off the organization.

PETE Quickly, the other bit here is that because everybody participates as individuals and NomCom picks people from the community for leadership positions, capturing the chair and every member or

even a majority of the IESG and the IAB is nearly inconceivable. The number of years of effort it would take to capture all of those people and have them remain there at the same time would be quite impressive.

WARREN KUMARI

Yeah, that is actually another really clever part of the process. The way the NomCom is chosen is a purely random selection of people from the community who have participated for a bit. They have to have attended a few meetings, virtually or in person. If the random selection chooses more than a certain number of people from one company, you don't choose any more from that company. So even if a company like Cisco sent a million people to the IETF and there were only a hundred other people, Cisco still wouldn't be able to stack the board because they can only have one or two people on the NomCom. Again, a reasonable amount of this is driven through ethos and culture. But I think I've said that, so we'll let Dhruv...

PETE

And we always say the best chair or IAB member is the one who can say, "I really don't like the decision you made, but it is a reasonable decision. And so I am in the rough part of the rough consensus." I've done it myself many times.

ABDULRAHMAN ABULTALB

Thank you so much. My name is Abdulrahman Abultalb. I am a journalist from Yemen and an IETF fellow. I have always been

confused about the IETF. I had this idea of a technical community with nerd guys working in the basement of the internet.

WARREN KUMARI: It is kind of true.

ABDULRAHMAN ABULTALB: Yes, and sorry to say this because I came from an ICT background, so I worked in this role one day. As I understand it now, your work focuses on the future of the internet to enhance things and make standards or protocols. I want to make sure: do you code anything or develop software, or just make standards? That is the first question. The second question: in case you don't get consensus, are you going to vote, or ignore the whole topic entirely? Thank you so much.

WARREN KUMARI: I can probably answer both of those. The IETF itself doesn't really implement anything at all. We don't write software; we just write the specifications. However, we do have the hackathon where people come together and write their own implementations or open-source stuff. But that is not officially an IETF activity. That is just people who want to participate in the IETF and want to make sure the spec works. They show up two days before and write code. Generally, they have been writing code for months before, but they come together at the hackathon to ensure their code works with others or to get help if they don't understand a part. Many people

who participate in the IETF develop software that the standard uses as their day job. For example, router vendors have people at the meetings who are actually implementing the code on the device, so they are deep in the bowels of the code.

Regarding your other question about what we do when we don't come to consensus: generally, if you end up in a situation where nobody can figure out the right thing, you have probably gone off the rails and need to find different solutions. Sometimes you decide both options are acceptable and do both. Or sometimes, in extreme cases, you flip a coin. What usually happens then is you have two sets of people, some thinking A and some thinking B. You flip the coin and it comes up A, and everyone realizes that was a bad idea and decides to do B instead. Sometimes just making a decision and moving on is the important thing. There is also a question in the back. Come to the mic, please. I think it's more important we answer questions than get through the presentation. Is there anything else important in the presentation? You can start if you want to.

NIKHIL MATHUR

Hello, everyone. My name is Nikhil Mathur, and I am a fellow at NICSI. My question is related to DNS tunneling's abuse of port number fifty-three, which is a universal port, and the DNS abuse happening due to universal ports. Stealthy botnets, C2, and malware exfiltration have been frequently discussed topics related to DNS abuse. How is the DNS Operations Working Group exploring

protocol enhancements like embedded anomaly signals or rate hardening?

WARREN KUMARI A couple of different things. One, remember the slide that showed the building blocks? We do the building blocks that people then use. If you want to deal with some of the DNS tunneling things, in some cases that's not really something the IETF can do because there's no way of telling whether a DNS lookup is actually hiding information. For some things, you need firewalls, although putting a firewall in front of DNS is generally a bad idea.

NIKHIL MATHUR Bypass.

WARREN KUMARI Yep, they bypass it. There are also some things which potentially make the problem better or worse. One thing we have been talking about recently is encrypted DNS, such as DNS over TLS or DNS over HTTPS. Many of our technologies, like VPNs, TLS, and IPsec, end up being dual-use technologies. They can be used to keep journalists and dissidents safe in places where bad censorship happens, but they can also potentially be used by bad people to hide bad things. This is not a brilliant answer, especially in a policy world, but we decide it's more important to figure out how to keep users safe and protected globaly. Someone is going to slap me for that.

PETE

I think Warren is exactly right here. We provide tools to be able to do encryption over the channel or to protect the DNS. DNSSEC protects the chain so you know it is true and coming from the root of the DNS. People will do bad things, and if you decide those things are bad, we have provided the tools. Legislators might want to consult with technologists first, but at some point, they may say you may only use the tools in this way, and if you don't, we will fine you or arrest you. To a certain extent, the IETF steps away and says we can advise you on the use of our tools and what the implications are—usually the IAB does such things—but at the end of the day, we have provided hammers. If you hit people in the head with hammers, bad things happen, and maybe you have to make hitting people in the head with hammers illegal.

NIKHIL MATHUR

Sir, I just wanted to add something which I personally feel. When cybersecurity is talked about, the five pillars of DNS are not the core mechanism. The mechanism is tunneling. If we make policies on DNS tunneling rather than those five sections, I feel that malware would be automatically useless when the attacker is not able to create the tunnel. What are your views on that?

WARREN KUMARI

You can make a policy to say that DNS tunneling is not allowed. But you can also make a policy saying that speeding on the highway is

not allowed. How do you possibly enforce that you are not allowed to do tunneling? Good DNS tunneling hides the query in the DNS string, and so there's no real way to tell other than doing heuristics that the actual thing is secretly a message. If I look up a string at example.com, you don't know if that's a real lookup or if I am secretly hiding a message. But maybe we should finish this bit offline because I know there are more questions. Let's keep it on how the IETF works, and then we will figure out how DNS abuse works. Thank you.

JOYCE AKOSIK Hi, my name is Joyce Akosik for the record. Regarding the coding and the implementation part, is it also on an individual basis, or is there an opportunity to collaborate, such as a repository or a platform where coders can work together on protocols?

DHRUV DHODY We have a hackathon wiki page on which everybody puts their GitHub link, but it is not like the IETF controls it. It is for individuals. You talk to the individuals, build a community, and focus on that.

JOYCE AKOSIK Okay. Thank you so much.

DHRUV DHODY Are there more questions?

WARREN KUMARI Aniket has one.

ANIKET Hi, Aniket here, NIXI fellow, for the record. You said the IETF treats a remote participant as a first-class citizen and achieves rough consensus through open mailing lists. In such an open system, what mechanism does the IETF have in place to ensure that the comments and suggestions are coming from genuine participants and not from automated bots attempting to delay or manipulate the consensus process?

WARREN KUMARI One of the things that I generally tell people who want to start participating in the IETF is that before there is something you actually want to get done, you should first join the mailing lists and start participating in discussions. Especially for controversial topics, if four hundred people suddenly arrive with names you have never heard before and they all say the exact same thing or have the same typo, it is suspicious. We have very seldom had to say this looks like someone is astroturfing and we're not going to count those. If you're interested in doing work in the IETF, I suggest joining mailing lists and chatting with people. Start reviewing their documents. That way, when you have a document to review, people know you know what you're talking about and will help. It

is largely collaborative. Pete has a view, and we also have Andrew with a question, and then we should move on.

PETE

Quickly, this is why we don't count noses; we count issues. It doesn't matter how many people come and say something ridiculous. The chair at the end of the day is going to say we talked about this and decided it's ridiculous. It doesn't apply. No matter how many times you say it, it is not going to help your cause. The chair is welcome to say we are done discussing the issue. Even though ten thousand of you said you want choice B, we are going with choice A because the objections have been answered.

ANDREW CAMPLING

Hi, Andrew Campling, IETF enthusiast. Just going back to the question about tunneling as an example: if someone thinks there's a problem in a protocol, there's nothing stopping them from coming forward with their own Internet draft with a proposed solution. In the meeting in Shenzhen next week, there is an Internet draft being discussed on best practice for protective DNS, which could address some aspects of DNS abuse. It is up to people to put forward their own proposals. You don't have to wait for somebody else to solve the problem. You can take those building blocks and assemble them in your own unique way if you think it solves a useful problem and see if you get traction.

WARREN KUMARI	Exactly. We could talk about how the IETF fits into the rest of the internet governance ecosystem, or we could talk about upcoming work and new working groups being formed. What else do we have?
DHRUV DHODY	Those are the two choices. What do you guys want us to do?
WARREN KUMARI	Which do you want to see more? Are you more interested in how this all fits in?
ANIKET	Who wants to go with choice A?
WARREN KUMARI	Hum now.
DHRUV DHODY	Does this interest you? We have a meeting next week in Shenzhen. This is the new work that's happening and things to do to come and join. Which part is more interesting? The second part? The first one?
DHRUV DHODY	We can summarize the first part and then explain the second part.

WARREN KUMARI

Let's try to go fast. This is our internet ecosystem. There is no one body that controls everything. We all come together. ICANN is on top for naming and addressing. You have RIRs and other organizations and standards bodies on the sides. It is a bunch of us coming together. Names, numbers, and protocols are the key to the internet infrastructure. You had sessions on identifiers; we are the protocol part. That is the IETF.

IETF and ICANN both use the multi-stakeholder model, but in different ways. For example, participation is individual versus membership. In IETF, I speak for myself versus representing a community or region. We talked about how we have the NomCom, the IESG, and the appeal processes. We use rough consensus versus voting. Everything is open in the IETF. ICANN has a different way of doing things because they deal with policy, whereas the IETF is a technical organization. But both bodies follow multi-stakeholder principles.

What is our relationship between ICANN and IETF? This goes back to the start. The main thing is we have a long relationship. ICANN folks participate in the IETF. There are a bunch of RFCs written by ICANN staff. They are active in protocol development for DNS and registries. They participate as individuals and are viewed as individuals.

We as an IAB appoint a lot of folks. Peter is our appointment to the NomCom of ICANN. Similarly, we appoint Dave as our liaison to the board and other organizations throughout ICANN. The IETF is

represented there. The biggest area where we cooperate is on the IANA function itself. ICANN operates the IANA protocol registries for the IETF under the oversight of the IAB. You have likely gone through what IANA is and why it is important in other sessions. The key thing is we have a good overlap between folks active in both communities, which is why the relationship works well.

Key areas of our interaction include IDN, or internationalized domain names. We also deal with special-purpose domains, where the IAB gets involved. We have DNSOP, DNS security, and protocols used between registries and registrars. Note that the IETF is not a policymaking body, but our technologies can have policy implications, which is why we continue to work together. Take over now.

WARREN KUMARI

Sure. As Dhruv mentioned, there is an upcoming IETF meeting next week in Shenzhen. As we noted, our remote participation works really well. If you can't show up in person—and it's a little late to buy tickets—please participate remotely. Fee waivers are available for remote participants. All of these are links, so if you'd like to find more information about these working groups, please click on the link to go to the Data Tracker page and the charter for the group.

New work starts at the IETF through "birds of a feather," or BoFs. People interested in a topic get together to see if the work fits in the IETF. In Shenzhen, there are two BoFs. AI is a hot topic, so one BoF is an effort to discuss AI agent-to-agent communications. We want

to corral the work into one place so people aren't working in different directions. The other one is ONSEN. We spend a lot of time coming up with cool acronyms. This one is the output from an IAB workshop held at the end of 2024. The realization was that network operators want a way to configure a service on their network rather than configuring individual routers and switches. They want to be able to say, "I want the network to do X," and this provides that abstraction.

Next slide. Since this is ICANN, DNS is useful to talk about. There is a large effort underway called DELEG. Currently, in the DNS protocol, a parent domain can basically only say where the child name servers are. The DELEG work is redesigning the DNS so the parent can specify that name servers use DNS over TLS or that a domain is an alias for another domain. We are redesigning parts of the DNS in a safe way. DECON is a way to automate domain registration information. Instead of a user manually filling in web host or mail host information in a registrar interface, DECON automates that.

We have three minutes. AI is a hot topic. One working group is AI Pref. You may be familiar with robots.txt, which a web crawler uses to see which parts of a website to crawl. AI Pref expands that. Website operators can say a crawler can use data for training or not. There are now a lot of web crawlers, and some operators view this as too much traffic. Webbot Auth is a way for web crawlers to cryptographically prove who they are. We have seen crawlers pretending to be users. We are also addressing efficiency concerns.

"Green" is trying to expose energy metrics so people can lower their energy use.

The IAB also runs workshops. We had a virtual workshop on IP address geolocation in December. Originally, geolocation was designed to get users to the closest data center. Over time, it has been used for other purposes, like finding the nearest pizza shop or determining if an IP in the UK should access content in Singapore. We are trying to figure out if it is still fit for purpose and if there is a better way to signal information in a privacy-preserving manner.

Increasingly, regulation requires site operators to check the age of people accessing adult content or gambling. Many proposed solutions are privacy-invasive, requiring people to upload passports. This workshop was a joint effort with the W3C to find a privacy-preserving way to share only the minimum information needed, like age, rather than a photo or passport number.

The IETF is also doing new work on sustainability and how we take the IP protocol into space for missions to the Mars or the Moon. The implications for latency are very different. The IETF also does policy-related work like HRPC, Human Rights Protocol Considerations, ensuring human rights are considered when we build protocols. Global Internet Access for All is trying to get more people on the internet, especially in developing countries. We are also updating our protocols to make sure they are quantum-safe. Last slide. Wrap up.

Basically, why are we talking about this here? We would like more people to participate. The stability of the internet depends on technical standards. The internet doesn't work if we are all using different protocols and languages. The IETF develops protocols that underpin global interoperability. We want an end-to-end internet where anyone can communicate with anyone else. Even though the IETF and ICANN work in the same space, we have different roles but work closely together to ensure the internet is open and works for everyone.

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