ICANN78 | AGM – GAC Capacity Dev Workshop (6 of 10)
Sunday, October 22, 2023 – 9:00 to 10:00 HAM

GULTEN TEPE: Hello, and welcome to the ICANN78 GAC Capacity Development Workshop: Introduction to the Namespace and Case Study being held on Sunday, 22nd of October at 07:00 UTC. My name is Gulten Tepe Oksuzoglu, and I'm the remote participation manager for this session. Please note that this session is being recorded and is governed by the ICANN Expected Standards of Behavior.

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ICANN's multi-stakeholder model, we ask you to sign into Zoom sessions using your full name. With that, I will hand the floor over to Tracy Hawkshaw. Tracy.

TRACY HACKSHAW: Thank you, Gulten. Good morning, good evening, good afternoon, wherever you are. Welcome back to day two of our capacity development weekend. Today, we are calling it Tech Day. So for many of you who are technically minded, this is for you. Hope you had a good night's sleep, hope you had a good rest, and you're gonna go right into it today with some really interesting technical engagement activities. As you remember yesterday, we sort of went over the ICANN process, and then we dealt with some policy topics, and we had really good interactions, so we wanna keep that up today. So make sure wake you up, let's get in, everybody's saying yes.

Let's do this today. Yes, you ready? Yeah, right. Excellent. I wanna hear all of you talk, and again, if I don't hear you, I will make you talk, so that's good. Joining me on the hosting duties today is Alisa from Netherlands. This actually was pretty much her idea today, so she's going to really drive this process to a large extent along with Owen from the US government. Yes, there he is. So you'll see some different faces today, so give them your love. And I'm gonna toss to Alisa now who will do some introductions and take us through the rest of the morning session. Alisa.

ALISA HEAVER: Yes. Thank you, David. Thank you, Tracy. I'm so eager to announce David, so I'm just gonna call everyone David today, and Alan, obviously. Well, welcome everyone. So we're having Tech Say here, but on the other hand, it's also maybe basic day because we're gonna start with how does DNS resolving work? And we were saying yesterday to each other that we thought that the DNS is the fundamental part of the internet. I think it's really important for us to understand how that works. I'm really happy that we have David Huberman from OCTO here with us, and he'll be presenting that, and later on a few other things on DNS and all these topics.

And after that, we have Alain Durand, I read Principle Technologist from OCTO. I expect you can answer all our technical questions. And he'll be guiding us through the alternative naming spaces. And yeah, we'll come back to you after this and introduce the next sections of the day, but in the afternoon at least-- I'm going too fast, sorry. A little bit.

TRACY HACKSHAW: Hello, Alyssa. Isabel was asking me, what is OCTO? So perhaps as we have many newcomers, you could explain.

ALISA HEAVER: Yes. I know the abbreviation, but I can't. Yes, that was it. It's the Office of the CTO, so the Chief Technical Officer. Still abbreviation. And in the afternoon, we'll have a panel discussion. And then after that we'll have a few breakout sessions. So without further ado, here is David.

DAVID HUBERMAN: All right. Hello everybody. My name is David Huberman. I'm with ICANN's Office of the CTO. Today we're going to be talking about the DNS, but we're mostly going to be talking about the DNS that other folks want to sell to other people. In order for us to understand the implications of this and in order to understand the strengths and weaknesses of these other arguments, I want to spend just a few minutes setting the table to help us understand in context the system that we have today and why it is so good and why it is so effective.

So you have an idea, you have an app you wanna build, or you have a site you wanna build because you think it's gonna offer value to people around the world, and they're gonna use it, whatever your idea is. And so you build it, somebody does some programming and they create a site or an app, and you do the app development and the web development, and you turn on this service or this platform, okay? And if you're lucky, you're right. And people start using it, and that's really cool.

You get a hundred users, you get a thousand users, you get 10,000 users, and that's when it starts to get interesting, because when you start getting a hundred thousand users of your service, or a million users of your service, or you are the next Facebook and you've got half a billion people around the world or a billion people around the world using your service, you've got a problem.

In computer science, if you study it over the last 50 years, the hardest problem to solve in computer science is scale, okay? If you want a computer to do math, the computer will do math. You just have to tell

it how. If you want the computer to solve problems, the computers will solve problems. All you have to do is be smart enough to tell it how. But if you want your computer to do something, to offer a service, a site, and you want it to be accessible to millions or billions of people, you have a problem because it's really, really hard.

Have you ever gone to Facebook and it didn't work? Have you ever gone to Twitter and the tweet didn't load, or the pictures, the images or the video didn't load? If you've ever gone to any popular service and it didn't work, it's because of scaling. And the people who build these things, the people who run these things, they're not dumb. Some of these platforms have thousands of highly intelligent engineers building and running their service, and yet, it's still down.

That's because scaling is really, really hard. Amazon Web Services, Microsoft Azure, Google Cloud, Alibaba, Alisoft Cloud, it doesn't matter where you are in the world, these gigantic clouds that we've put all this information in, they've hired the best in the brightest engineers in the world, and these sites still are regularly down because scale is hard.

In the 1970s and in the 1980s, scaling was a problem on the early internet. You were a professor at a university and you had a machine. You gave the machine a name. Alisa had a machine, she called it Prometheus. She was really into the Titans. And Owen had a machine, and he called it Homer Simpson because he really liked The Simpsons. This is what you did. You had a machine and you gave it what was called a host name.

But here's the thing, when Alisa and Owen want to talk to each other, an email or an instant message of the early days of these computers, the computers don't talk to each other via their host names. Instead, they talk to each other via their IP addresses. An internet address is what it was originally called. Now we call them internet protocol addresses, IP addresses. But regardless, for two machines to talk to each other, they have to use their IP addresses.

And in the earliest days of the internet, you had to register your host name with a central authority at Stanford University in California, and every day Stanford would produce a file, it was called hosts. text. And this file had all of the host names on the entire internet, everybody's computer, and it mapped the computer name, the host's name, to an IP address. This didn't scale. This didn't scale at all because everyone and every network had to download this file every night, and these files would get out of sync, and you wouldn't actually be able to contact everybody on the internet because everyone's host file was out of sync.

Forty years ago next month, November, 1983, we solved this problem. A gentleman named Paul Mockapetris, at the University of Southern California, created the DNS. The DNS is 40 years old next month. And what Paul did, is to me as a lifelong technologist, remarkable. When he created the DNS in 1983, he solved the scaling problem. The DNS that we run in 2023 isn't materially different than the DNS that Paul created in 1983. It's still the same system because that system scales. It scales as large as the internet is, its scales as large as the internet probably will be. It doesn't scale infinitely, but it scales, okay?

It does this because it's decentralized. He set up a system where different parts of the DNS, different components, which I'm going to show you, only need to know as much information as they need to know, but not everything. There are a billion names in the DNS. Nothing needs to know a billion names. All right. If you could please bring up the first slide for me, please. And I don't actually have a clicker. I don't know if we have one.

Oh, just say next slide. Okay. Ah, there's my slides. So we have this thing called the name space. This is the space, the location, the place where we've put all these domain names, these names, these labels. And what Paul did is he built it like a tree, turn the tree upside down. And at the very top of this tree is this thing that I've represented down here as a dot. And the dot is the root of the tree.

The root of the tree doesn't know all of the branches and all of the leaves on the tree. It doesn't know everything about the DNS. It doesn't know your website. It doesn't know my website. The only thing it knows are the top-level domains, .com, .net, .asia, .hk, .il. There's 1300 top level domains, 1300, the number shifts from here to there, but they're on 1300 names that the root server knows, the root zone knows. I've represented those on the second level, .asia, .com, .de. And the ASCI on the left, xn-j6w193g is the ASCI representation of .hk for Hong Kong.

The root servers only know 1300 names. It's 1300 pieces of data. It's nothing. It's a few kilobytes, it's nothing. And that's the brilliant of the model because the root of the tree, that's the most important thing, only knows 1300 pieces of data. So you move down the tree a little bit

and you go to .com. The only thing .com knows are all of the domain names in .com, google.com, x.com, example.com. Now the .com zone is big, you all know that, .com zone has a couple hundred, like 300 plus million things.

But Verisign does a very good job running it, and it's the largest one. But every other TLD doesn't have 300 million names. Some of them only have a couple of hundred names or a couple thousand names. This isn't a lot of data. Each branch of the tree only knows what's underneath it. So we have example. com, what's underneath that? Well, www. example. com, mail. example. com, and whatever else may exist. So let me show you how this works in reality. Next slide, please.

Your phone, when you pick up your phone and you go to www.icann.org, I'm gonna show you exactly what happens, and it's very straightforward. Your phone is on the bottom left on this image. I've represented an iPhone, and I'm representing the Safari web browser. But it doesn't matter whether it's Google Chrome or DuckDuckGo or Safari, it doesn't matter, it all works the same.

What happens is your phone sees that you wanna go to www.icann.org and your phone service or your laptop or your desktop or any computing device you're using that's connected to the internet wherever you are, it's configured by the provider of your internet service, whether it's your phone provider or Raj or Deutsche Telecom, whether it's your home ISP, whether it's the government department that is providing internet access to all of your ministries and all of your

buildings, it configures your devices to use what's called a recursive name server or recursive resolver.

And what this thing does is it takes all of your queries and says, let me find an answer for you because you've asked it to go to www.icann.org. But as I've already shown you, the computers don't talk to each other as icann.org. They talk to each other via their IP addresses. Your phone has an IP address, that's how traffic gets to your phone, and www.icann.org also has an IP address. But your phone has to find that IP address because there's 4.2 billion IP addresses in one system and an essentially an infinite number of IP addresses in the newer system of IP addressing, IPV6, and your phone can't store all that information.

That's what the DNS is for, right? So you use a recursive resolver. And the recursive resolver is simply a box that fetches answers to the questions you're asking. And it does so by querying a set on the right of what are called authoritative name servers. And these are the different boxes around the world that have the various discreet bits of information about the question you've asked. What do I mean by that? Let me show you. Next slide, please.

So you have a phone, you've made a query, you're going to make a query, your phone has been told to use this recursive resolver. This recursive resolver has an IP address of 4.2.2.2. Your phone has been configured to know that piece of information. Next slide, please. You type in www. example. com into Safari, and Safari will make a call to the stub resolver to get the information it needs of what is the IP

address for www.example.com, because It's the IP address that it needs to communicate with the web server.

Next slide, please. So the phone sends a query. This is a DNS query, and you see next to the line, next to the arrow, the question it asks is, can you please tell me the IP address of www. example. com? Next slide, please. The first thing a resolver does is it asks the root, it goes to one of the 13 root zone servers and says, can you please tell me the IP address of www.example.com?

Next slide, please. It doesn't know the answer. It doesn't know where www example. com is, that's not what a root server does. It only knows where .com is. It only knows 1300 pieces of data, each of the top-level domains. So it says, oh, I don't know the answer to your question, but I know some of the answer and I know where you can go find more information. So here are the name servers, the authoritative name servers for .com. And it gives the resolver that information. Next slide, please. And so the resolver goes to the authoritative name servers for .com, and it says, Hey, can you please tell me what is the IP address of www.example.com?

Next slide, please. And it says, I don't know, but I know where example.com is, example.com is within my zone, maybe go ask them. So here are the name servers for example.com.

Next slide, please. And so the recursive resolver goes to the authoritative name server for example. com and says, hi, can you please tell me the IP address of www.example.com?

Next slide. And it says, yes, I know this information. So it gives the answer to the recursive resolver.

Next slide, please. And the recursive resolver sends the answer to your phone and your phone is then able to go to the proper IP address and say, Hey, give me everything you got for www.example.com. All of this happens in milliseconds. All of this happens without you knowing about it. Anyone in this room and online listening to me who's just learned how this works, well, you've done this thousands or tens of thousands or hundreds of thousands of time, and you don't have to know how it works.

And it takes milliseconds because it scales. It takes milliseconds because the first name server only knew 1300 pieces of data and the second name server knew more, but it knew exactly what you wanted when you wanted example.com, and the example.com name server knew everything that was in it, which wasn't a whole lot. It's really, really, really, really small pieces of data that fit in a very small packet, which means they're able to go very, very fast.

And when you ask for a website on your browser, it just works. This is beautiful. We've been using this for 40 years and it just works. Do you have any other piece of technology in your life that you've been using for 40 years that just works? That's not how technology is. And yet, the whole internet is built partly on a protocol, DNS that's 40 years old and materially unchanged. This is the genius of DNS.

Next slide, please. Next slide, please. I've changed the title of the same slide that you saw at the beginning. I'm now calling this slide the IANA namespace. The internet works because we all choose to use the

same protocols. What do I mean by that? Well, if you are here this week in Germany and you're not from Europe, what did you bring with you? A power adapter because you wanna charge your devices and your plugs don't fit in the plugs here in Germany. It's just power, right?

It's just power that goes to your phone, yet we have standardized the shape and the voltage of plugs many different times. We have one standard in Europe, we've got one standard in Japan, we have one standard in South Africa, we have different standard in other countries. It's the same thing, right? But we standardize multiple different times. If I take my wallet out right now, I have euros, I have US dollars, and I happen to have Japanese yuan in my wallet. Why?

It's 2023. The only purpose of money is you wanna sell something, I wanna buy something. It's the same thing, it's not particularly interesting or complex. But for reasons, we have different forms of money-- money takes different forms because we have different standards. We're here in Germany and if you get in a car, if you get in a taxi today, we drive on the right side of the road, which means our steering wheels are on the left side of our car.

But if you just go across the sea there to the UK, we drive on the left side of the road and the steering wheels are on the right side of the car. And that's actually a problem. It's a safety issue if you're not used to it. It's also a problem for the manufacturers because they've gotta figure out how to do different phones.

And I can go on and on and on. But the whole world, this world we live in, and we don't even sometimes think about it, is we don't use the same standards. On the internet, we do. All of the standards that we

use to commute for our devices to communicate, we've chosen the same standards. They all come from the same place.

They all come from a bunch of engineers who develop these things. And what we've done in the DNS is we've all used the same dot at the very top called the root zone. And it's the root zone that's managed by ICANN. It's managed by a Department of ICANN called the IANA, the Internet Assigned Numbers Authority.

This is what the new round of gTLDs is. All we talk about at ICANN meetings are the new round. When is it happening? What's it gonna be? This is what the next round is. It's filling up this row underneath it with new labels. I want to go register .david, go make lots of money selling to all the Davids around the world. All I'm doing is adding one little piece of data to the root zone. This thing works. This root zone has been managed for 40 years. It's been managed by the same, essentially organization, this thing called the IANA. It's managed by consensus-based policy that you develop, that the ICANN community develops, that the engineering community develops.

Changes to the root zone only happen via those policies. You can't just say, Hey, I'm a country now, country of David. I've succeeded from where I live, I'm now the country of David, give me ccTLD, give me .dv. Can't do that. Why? Because we have policies in place that tell the IANA exactly when and when not they're allowed to. In the case of a country code, it's very simple. The IANA follows what the United Nations says in ISO 3166-1. If you don't have a country code in ISO 3166-1, which comes from the United Nations, you don't get a country code TLD. That's it.

Because that's the policy that was developed here. That was the policy that makes sense. The internet, when you pick up your device and you go somewhere and it works, it's because of this system. It's because the root zone is the top of this tree. It's because the root zone starts off the query of how to get somewhere. And it works because the DNS protocol is scalable, the scalability makes it fast, and we've all adopted the same protocol so it works the same anywhere you are on any device you use.

Okay, that is the table setting for today. Now let's talk about other things. To do so, I would very much like to introduce my colleague Alain Durand. Alain is a distinguished technologist in the office of the CTO at ICANN. Alain is also my friend. Alain is also brilliant. So as Alain is talking to you and you have questions, please take advantage of the fact that Alain is here and he wants to answer your questions. Any question is welcome. So Alain, please join me.

ALAIN DURAND: Thank you, David. So my name is Alain Durand, and it's my pleasure to be here today. I'm going to talk to you about some variations of naming. I want to dovetail on what David said. Many of you come from different countries, when you are home and you type in something in your browser, it works. When you come here in Hamburg, Germany today, you type the same thing, it still works.

For example, if I want to go to my favorite newspaper in France, I type www.lefigaro.fr, it works at home. I do the same thing here, I get exactly the same webpage. If I go to Vietnam as I were just several

weeks ago, I type the same thing and I get exact same information. That's this idea of one world, one internet.

So let me kickstart this session by asking you something, a hypothetical question in a hypothetical future. Let's say we have a metaverse and your avatar goes into the metaverse, you find a meta computer and a meta browser, and your avatar types in www.lefigaro.fr, is it going to see the same webpage as if you are in the real world? Well, if you don't know the answer to this question, don't worry because I don't know either because this system has not been built. But this is something maybe that we should think about before building this system.

Is it a property that we want to keep to make sure that wherever you are, in Vietnam, in France, in Germany, or in this Metaverse, you get the same thing. I happen to believe this is a good property, but maybe people have a different opinion about this. So today I'm going to talk about what happen when you create different naming systems than the DNS. And I wrote a paper about this, technical paper, that's one of the things we do in the office of the CTO, about some of the challenges when we are deploying those technologies. I'm not going to talk about the technologies themself.

This is going to be part of the next session. I'm simply going to talk about what happen when you start to deploy something alternative to the DNS. So this paper is called OCTO-034, and there's a URL there, you can go and read it. I've run into a number of people since I arrived here in Hamburg Germany that have actually read my paper and I

want to say thank you to all of them. It's a pleasure for me to meet people who actually read what I write.

Next slide, please. So this idea of alternative naming system is not new. We had the very same conversation about 20 something years ago at the very beginning of ICANN. At the time we were talking about alternate route. I like the word alternative better than alternate because alternate means you go one, you go to the other, you go back to the first one, you go to the other, you oscillate. Alternative is you have one choice or you have another choice. I think more descriptive of this. Back then, it was seen as a problem, and there was an ICANN document that was published called ICP3 in 2001, so 22 years ago. I will mention this document a little bit later, but it provides some guidance on how to think about a different naming system, a different namespace.

Why are we talking about this again in 2022, 2023? It's because the popularity of blockchain in general has brought some attention to the blockchain based naming systems, and we are positioned, some are by some people, as an alternative to the DNS. And we'll talk about this some more in the next session. There is not one blockchain. There's not like the blockchain. There are a number of them. So there are a number of them that have developed their own naming system. I'm going to mention three here, Handshake, ENS, and Unstoppable domains.

By far, those are not the only ones, but there're some a lot of people are talking about this week and I've been talking about over the last 12 to 18 months. Next slide, please. So why naming and blockchains?

Well, in a blockchain, and we talk about this some more again in the next session, they have objects. Example, they have a wallet in the blockchain. In the early days, blockchains, when we were talking about your wallet where you have your cryptocurrency, you need to give the address of your wallet, and the address was an hexadecimal string.

Very long strings with a bunch of numbers and digits, impossible to remember. That's the exact same problem that David mentioned earlier when you had the computer, if you have to remember the IP address of the computer is a really hard problem because this is not human friendly. People like to have names. It's a lot easier to remember a name than to remember a long string of digits.

So there was a desire to use a human readable name to refer to those objects, typically those wallets. So extension to the DNS could be developed for that, and actually they have been developed for that. However, the blockchain communities decided to not use this, not go this way, but they decided to create their own environment, their own naming system within their own blockchain.

That was a conscious choice they made, because as I mentioned, there are many different blockchains. Well, first, there are many different blockchain based naming system. It's not like you have a DNS and you have blockchain. You have a DNS and you have many different blockchains.

Next slide, please. Another reason why we are talking about this is that some ICANN accredited registrars have been selling for a while now, some of us blockchain based names alongside traditional DNS

domain names. And that has created some confusion and that has raised questions. I wrote a blog a while ago about this. It's called Buyer beware. Make sure what you're buying. Important point here is that those blockchain based names, by definition, because they're not part of the ICANN ecosystem, they are not bound by ICANN policies, but they're bound by their own independent policies. So they do essentially what they want.

Next slide, please. So this is about background. Now let's go into what happened when you try to deploy this alongside the DNS. The point that my friend David made early about scaling is really, really important. This is what the internet is about. If I want to do a few things with my friends, we can make it work. We go in the lab, we write some code, it'll work, not a problem. Back in 1992 with some colleagues of mine, we wrote some very first implementation of a network stack that became known as IPV6. In 1992, we got it to work. Fast forward 2023, IPV6 works, but it's not available everywhere. Scaling from the lab environment to universal deployment across the planet is a huge problem.

So, when you have those alternative naming system, how do you use it? I'm not talking, how do you build it? That's the easy part. How do people, regular people, use it? Well, if they use their normal applications, they cannot use it. So they have to use specific applications. So new applications need to be built. So, typically people will say, oh, if you want to use this naming system, you need to use this specific browser. If you want to use that over naming system, you need to use that other browser. It's different.

Or maybe you can use this generic browser, but you need to get my plugin. What does this mean? It means that a user needs to have skills to understand this, need to have the skills to actually go and do this, install this software or plugin into his phone, computer, whatever it is, and he need to make sure he doesn't break the rest. This is not something simple to do.

I can do this, I'm sure you can do this. My father was 90-year-old, he cannot do it. But more importantly, when you communicate to somebody and you ask them to reach you, whatever reach means, for this particular name, up to now, you just have to tell them, this is my name. Send me an email or go to my website. Now you need to tell them, go to my website or go to this specific thing, but you are not allowed to use any browser you want. You have to use the very specific browser I'm telling you to use. This is more complex.

Next slide, please. So, because this is not something that regular users can do, the obvious fault for a technologist is to say, let's do it on user's behalf. David earlier talked about those recursive resolvers that go and ask questions to the root, to the operative named servers for the TLDs and all of that, we can ask those recursive resolvers to also go and look in a blockchain. But that's problematic because it can create some instability, because one particular resolver may decide to do this, another resolver may decide to not do this. So depending on which one you use, you may get the answer you want or not.

Let me give you a very concrete example of how this could become easily a quickly a problem. So I'm really, really lucky, I live in a small village in the French house, and I mean wonderful scenery, even more

lucky. I do have fiber at home, love it. However, my house is built in wood and the wood absorbs the wifi signal in the house. So if I'm relatively close to the access point, I have fabulous wifi connectivity to a fiber network. Wonderful. If I'm in a far corner of a house, the wifi signal gets weak and I end up using the cellular network, and that's fine because my phone can go from cellular to wifi and back, not a problem. Where it becomes interesting to this conversation is my wifi and fiber provider actually is not the same as my cellular provider. It's by choice, by design, that's what I wanted in my house. So if one fails, I can have another one.

When you live in the mountain, failover is important. So if there's this bridging system, and let's say that my fiber provider does this bridging system, but my cellular provider does not, I put ethical, right? So if I'm in a part of a house where I have good wifi connectivity, I will have this bridging system available for me and it'll work.

Now I walk to this other part of the house where wifi signal is weak, I still have internet connectivity because I switched cellular, but now all of a sudden it doesn't work. This is a situation that is impossible to understand and to debug for normal users, they expect things to work everywhere, especially within your house, right? So those consistency issues are really, really difficult to debug. And that's what could happen if we talk about bridging.

Next, please. In the previous slide, I was talking about simply bridging to one alternative system. Now, I mentioned earlier there's no such thing as the blockchain or there's no such thing as the alternative naming system. There are multiple of them. I mentioned three of

them, but that is there like at least five, 10, or maybe more, every couple months there's a new one.

Now, if I do some kind of gluing of all those systems together, I need to explain which order I'm going to use to try to resolve things. Am I going first to the DNS and then to unstoppable domain and then to ENS and then to something else, or the other round, or yet another order?

Because there is no coordination in between any of those namespaces, any of those naming systems between themself or between any of those naming system and the DNS, there's going to be overlap. Example of an overlap, .wallet is already in different blockchain naming system. So if I go to alaindurand.wallet, am I going to go to this blockchain or to that blockchain? And the answer is, I don't know because it depends on which one I'm going to look first, and it may be on some places else computer configuration. I just do not know.

So those things, when we have a name that exists in different places, essentially called name collisions, and you hear a lot about this this week. When you have no coordination whatsoever between different systems, you're bound to have those collisions, and not just one or two, but you're bound to have a lot of them. It's unavoidable, and I will even claim it's unfixable. So yeah, I'll skip that.

Next slide, please. One naive approach is to say, oh, this naming system is only good for this application. If you go to my big app that is very, very popular, you use this naming system, you use this other alternate universe or another app, you use another naming system,

and kind of life is fine. The reality is things always intertwine, they always mix. So you will have names that go from one space to the other, or you will have people who want to behave, to behave is not the correct word. They want to live in both world and they want to use both application at the same time, and then the names don't work.

So this idea of creating separate ecosystem, one for each naming system, is an idea that for somebody like me who has been observing this technologies for a long, long time, is really head scratching. Next. At the beginning of this talk, I mentioned a document that was written back in 2001 called ICP-3. So couple page long document, put some excerpt in here. I don't expect you to read the text on the slide, it's there only for reference. But back in 2001, the document said, “This document reaffirms ICANN's commitment to a single authoritative public root,” meaning essentially a single namespace.

The other key point is as mentioned in this documents, alternative roots substitute insular concerns in place of the community-based processes. Essentially, this is about the good of everybody as opposed to the good of only a few. I'm not claiming that this document actually applies a hundred percent to the current situation. What I'm saying is, a very similar situation occurred 20 something years ago, and that was a resolution that was taken back then by the community and we can get inspired by it.

Next slide. So, everything I've said is a little bit abstract and I'm going to try to make it somewhat easier to understand. And this is Sunday morning, we can be a little bit lighthearted. I'm going to use a cartoon to show you exactly what can happen.

Next slide, please. It's a cartoon that involve three people. One character is John. John, he's a techie. He likes to try new technologies, always on the cutting edge. Sometimes I will say on the bleeding edge. He has a girlfriend, his girlfriend is Sally. She is more of a calm side, she doesn't want to be taking too many risk, but she's very effective in what she does. And there's a third character called Market. Market is a guy that will sell you anything you want.

So this guy, John, says, oh, I want to try some new things. I want a new domain name and I'm going to get a blockchain name, why not. Market, can you sell me something cool? Of course, Market says, I will sell you john. cryptonite.

Next, please. So John goes to his girlfriend, he says, Sally, connect with me at john. cryptonite. So as you will see in next session, blockchain are not directly used immediately to map names to emails or IP addresses, but it could be done like this in the future, or yeah, we can talk about simply changing some wallets and exchanging some money. So my example is a bit of the scratch and forward looking.

But the point here, John wants Sally to connect with him using this name john. cryptonite. So Sally tries, doesn't work on the computer. Next. Then John says, well, I forgot to tell you, you need to use this cool web browser first in order to use this name because on your normal browser, it won't work. Sally says, have never heard of that browser. Is it safe? Remember, Sally is calm girl, she's wants to be efficient.

Next, please. Few days later, John read some news article, and oh, this talks about this other blockchain, some cool stuff there, I want to try

this. Let's ask Market if he can sell me something there. Goes to Market, Market says, of course, I can sell you something. I'm going to sell you john. superblockchain. Next, please. John is very happy with his new name, goes to Sally, his girlfriend again, said, yeah, yeah, I have some new stuff. Try this, john. superblockchain. And Sally says, John, I did what you told me last time. I went and installed this new cool browser you gave me.

It worked, but now with this new name, John. superblockchain, it doesn't work. Why? Sally's not too happy. Next. And John said, oh Sally, I forgot again. It's not the same blockchain, so you need to install this other browser, yet another one, and also this plugin. And Sally gets upset, go away, John. Go away, too much work, other things to do.

Next, please. Well, Sally's a good girlfriend, she wants to please a boyfriend, and at some point she tries his own, and she goes back to John. John, need to have a talk here. I followed all the steps you gave me. Now I can see your new profile on john. superblockchain, but when I go to the one you gave me yesterday, john.cryptonite, I don't see your profile, I see my ex-boyfriend profile. I don't want to see him, okay?

And John is like, I have done nothing, yesterday, it worked. Look, look, he shows his phone, it worked on my phone. But here's the point, it works on John's phone, it doesn't work on Sally's phone, right? And that's a problem. The two of them are fighting now.

Next. So John lose a fight, of course, and he goes back to Market and he says, well, Sally is very, very unhappy. How come we see different

things? How come she see an old boyfriend profile and not me? Market explains, well, this is called name collision, right? There are many different blockchains, many to choose from. Your computer, your phone and her phone are set up completely differently.

She's going to see something in one blockchain first, you in another. It doesn't work. That's normal. Next, please. But our canvas is not unique. Should be unique, right, john.cryptonite? Well, Market explained. Nobody guarantees those things are unique. There can be as many john.cryptonite in the universe as there can be.

Actually, yes, look John, it's available in another blockchain. Can I sell it to you? Or maybe I should sell it to Sally's ex-boyfriend. Market is kind of a bad guy. So John is really, really, really upset. Next, please. He said this is completely stupid. I want my old john dot ICANN TLD domain. This was guaranteed unique. And market laugh and said, no, no, no, no, no, you cannot escape name collision.

You see this, .icann TLD that you were using before is now available in five alternative name systems. Maybe you can create your own alternative name system if you want. And John said Market, you're just a monster, you just killed the internet.

So I think that's the last slide. Thank you for indulging me in this cartoon. Of course, all examples and characters in this cartoon are purely fictional. Things like that will never happen. There's no such thing as John and Sally fighting. There's no such thing as a Market selling any kind of random stuff. This somehow conclude my presentation. I want to go back to the first point I made.

Like if one day your avatar goes into virtual universe, metaverse, whatever you call this, and you type in something in this meta computer, meta browsers, do you expect to see the same thing as you see on earth or not? I'm not going to answer this question. I will let you ponder it. And if you have any question, now's the time.

ASHWIN SASTROSUBROTO: Can I ask you about this or can I ask the first speaker?

ALAIN DURAND: Any?

ASHWIN SASTROSUBROTO: All right. Okay. It's very interesting to know the data transfer internet operations. My name is Ashwin from Indonesia for the record. My question is when the activities of transferred from IANA to PTI, what is now PTI operate and what IANA is still operating, the two organization. That's number one.

Number two is while PTI is nonprofit corporation, what is the IANA legal status? Is it still under a USDC or it is also a nonprofit corporation? And number three, as mentioned, the roots file server is operated by Verisign. Now, Verisign looks after the data under the contract of USDOC or it is still under contract with ICANN? Thank you.

ALAIN DURAND: Thank you for your very good question. And I need to be very humble, I'm a technologist. I might have been watching that space for a long

time, but I'm a technologist, I'm not a lawyer, I'm not a policy person. And as such, I can answer any technology question, but I cannot answer policy questions. Any other question?

KAREL DOUGLAS: I have a question if it's okay. Karel Douglas. Over here, sorry. Karel Douglas, Trinidad and Tobago. Just in respect to a technical question, at the first presentation, it spoke to that each device has an IP address, however, well, of course, as I said, I'm from Trinidad and Tobago, but my phone is now here in Germany, and I noticed that when I browse, well, I'm assuming the IP address may have changed, but there is a difference in the language. So my searches are no longer in English, but they all appear in German. So I don't know if you could explain that in a nutshell. Thanks.

ALAIN DURAND: Thank you for a technical question. So when you are moving with a phone and you are roaming from one place to another, there are fundamentally two ways of doing it. One way is the operator where you are, in the country where you are, is simply taking whatever traffic comes to it through LTE or 5G, whatever transport you're using, and forwarding this back to your home ISP.

In that case, you are using the same IP address as you were using before or at least the same range, and everybody will think that you are home. This is expensive because you need to forward everything back to the home country. Let's say that you're here in Germany and you try to access your local website for local paper, then your traffic

will have to go all the way back to your home country, cross the ocean, and then cross the ocean again to come here in Germany.

So this is very inefficient. Technical local breakout has been developed quite a long time ago now, but enables this secret to be broken early, and essentially gives you an IP address locally even though you'll still be billed by your ISP. But your wireless connection, if you like, ends up locally here in Germany, and they give you a local IP address, which will be an address that belongs to the German ISP. So now when you go to sites like Google and others, they try to geolocate you, they try to think hard and try to figure out where you are.

To do that, they look at your IP address, and there are tables that are available in different places, services that some are free, some are for money, but try to map this IP address to a country. So they take your IP address, it belongs to German ISP, so they say you are in Germany. First, they are going to deliver you ads thinking that you are a German citizen.

They have no knowledge that actually, you are from a different country and roaming there. That's why you are seeing ads in German because they believe that you are a German person using the computer. There's another question over there.

GEORGIA OSBORNE: Hi, Georgia Osborne from the DNS Research Federation. Thank you for your presentation. I've got one question just around the name collisions. Are there any efforts to track name collisions currently? I

know that you showed it with a funny graphic around an ex-partner. How common is this? Is it that common?

ALAIN DURAND: I mentioned at some point that this example I was giving was a little bit futuristic because blockchain names are not used yet to do direct communication. However, they're used for things like wallets, and we already today have a collision with wallet. It's already in several blockchains. So this problem exists today but at a relatively small scale. The reason why we are talking about this is that we're worried that this is going to blow up and become a much more serious problem.

TRACY HACKSHAW: All right, I know a lot of questions are coming. We are due for break now. So can I just take all the questions, pass them to Alina, and get them answered in like two minutes? Is that possible?

ALAIN DURAND: We can try.

TRACY HACKSHAW: All right, so let's just see who has questions first. Who has questions? Hand up, who has questions? Raise your hand if you have questions. All right.

ALAIN DURAND: If you can limit yourself to a single question, more chance to answer it in two minutes.

TRACY HACKSHAW: So there are two questions, right? Go ahead. This one. I didn't see the-- okay, there are three questions. All right.

DJIKOLMBAIBET KENNEDY: Yes. Can I talk?

TRACY HACKSHAW: Go ahead.

DJIKOLMBAIBET KENNEDY: Yeah, my question is maybe aligned to the question my neighbor asking you. How does WhatsApp number, the local one number I have, and coming to Germany here, I can use it from these places when I'm connecting, it works like I'm in Chad, how does it work? I have my number.

TRACY HACKSHAW: May I ask for your name?

DJIKOLMBAIBET KENNEDY: I'm Kennedy from Chad.

ALAIN DURAND: Thank you.

TRACY HACKSHAW: Let's take the other question quickly.

KHALED ALTARHUNI: My name is Khaled, representative of Libya. Thank you for your presentation.

TRACY HACKSHAW: Keep the question short if you don't mind. Thank you.

KHALED ALTARHUNI: Okay. The blockcahin is not the rule of ICANN, and you mentioned that it's not bounded by ICANN. So in your opinion, who is the responsible for blockchain policy?

TRACY HACKSHAW: All right, that's one. And the last question quickly. Short question, please.

CHUKWUDI DIUGWU: Hello, good morning. Chukwudi Diugwu from Nigeria. I'm wondering is it possible to take an IP address that is allocated to Africa usage and they are used in other jurisdictions outside of Africa? Thank you.

ALAIN DURAND: Thank you for all those three questions. So very quickly, WhatsApp, your phone number is an identifier. It simply identifies you within the WhatsApp application. So wherever you are on the planet, you may have a different IP address, but when your app connects to the WhatsApp server, yes, it use the IP address to communicate, but once the communication is established, the identifier, it uses your phone number.

So that's why you can have different phone number physically on the device, but if you're registered to the application using your home country phone number, you still connect and get the messages. Now, quickly to the second question. I'm going to give you unfortunately the same answer I gave earlier. I can answer a technology question, this is not a technology question. I'm sorry, I have to apologize for that.

And to the question about IP addresses. So an IP address is an IP address. There are some of them that are specific, they're called for private use. So that's what you use inside of a house, what you have in that box. Other than that, any IP address can be on the internet anywhere.

So IANA allocates blocks of IP address to the different IRRs, some in Africa and some in Malaysia, Pacific, some in Latin America and Caribbeans, some in North America, some in Europe. But in the IP address itself, there is no construct that says it can only be used technically in one place. So an IP address can use actually technically anywhere. That's technical answer to your technical question. Thank you.

TRACY HACKSHAW: All right, thank you very much. I think that was a good introduction part one. There's more, part two after the break. So you have more questions, feel free, Alina will still be here. Let's take a short break. We're gonna be back here by 30 minutes past the hour for those who are online, and for those who are in the home country, please come back 30 minutes past the hour, that'll be in 22 minutes. Please come back precisely. Thank you.

[END OF TRANSCRIPTION]