ICANN79 | CF – GAC Capacity Development Workshop (1 of 3)
Saturday, March 2, 2024 – 10:30 to 12:00 SJU

GULTEN TEPE: Hello, and welcome to the ICANN79 GAC Capacity Development Workshop on IANA PTI's role, ccTLD's transfer and IP addresses allocation session on Saturday, 2nd of March at 14:30 UTC. Please note that this session is being recorded and is governed by the ICANN Expect Standards of Behavior. During this session, questions or comments submitted in the chat will be read aloud if put it in the proper form.

Remember to state your name and the language you will speak in case you will be speaking a language other than English. Please speak clearly and at a reasonable pace to allow for accurate interpretation, and please make sure to mute all other devices when you're speaking. You may access all available features for this session in the Zoom toolbar. With that, I will hand the floor over to GAC chair, Nicholas Caballero. Over to you, Nico.

NICOLAS CABALLERO: Thank you, Gulten. Give me just one second. So sorry about this. We're having an issue with the microphones. But in any case, yeah, go ahead. Let me give the floor to Karel Douglas. He will walk us through the whole process. Karel, please go ahead.

Note: The following is the output resulting from transcribing an audio file into a word/text document. Although the transcription is largely accurate, in some cases may be incomplete or inaccurate due to inaudible passages and grammatical corrections. It is posted as an aid to the original audio file, but should not be treated as an authoritative record.

KAREL DOUGLAS: Thank you, Nico. Thank you, Gulten. And good morning, everybody. My name is Karel Douglas, one of the GAC representatives from Trinidad and Tobago.   And welcome again to the capacity building work workshop. We have a very exciting day for you today. As usual, we hope to bring knowledge and inspiration, especially given the fact that we heard this morning that there are 30 new members of the GAC since 78. I'm not going to steal Nico's speech, but that is a huge reason why we have this workshop. It's really to assist people, persons, members who are new to the GAC so they could understand not just some of the issues, but some of the very basic issues.

I have with me today Tracy Hackshaw and some of their support staff as well, Susan Chalmers from the US, Owen and others who are all part here to assist us. So, without any further ado, but I must say, today, we're going to discuss some important topics. This evening, we're going to have a breakout which will allow groups to discuss amongst themselves some of the issues in their own languages that they feel are important coming out of today's, session. So, without any further ado, I want to pass the mic to Nico who will do the welcome. Niko?

NICOLAS CABALLERO: So, welcome again. Very pleased to welcome to the GAC ICANN79 Capacity Building Workshop. As Karel mentioned before, we have many new GAC members, 28, if I recall correctly, from Hamburg, and like 130, believe it or not, 130 new GAC representatives since ICANN74 in The Hague, about a year and a half ago. Yeah. The Hague was ICANN74, which was the first hybrid meeting right after the pandemic.

The GAC representatives have clearly expressed the value of face-to-face interactions. As a matter of fact, it's in my case, in my humble opinion, the best way to develop this kind of technical skills. Technical and not so technical because you will be covering many different aspects, not only technical issues, but, again, the face-to-face interaction is highly appreciated after two and a half years of pandemic. I got sick of Zoom and Zoom rooms and everything else. So, this is like a blessing for our souls to be able to share things face to face, the old-fashioned way.

So, consequently, committee members thought that a workshop would provide an excellent opportunity to share information with new and longer tenured GAC participants, which is exactly the case as of today. I'm very hopeful that this workshop will provide background and context for various GAC priorities, and we'll talk about that, and we'll get into detail a little bit later. Priorities and areas of interest, some basics for ongoing issues, and facilitate useful discussions among all of you to help us plan and prioritize the work of the committee for the future, and I mean it. Plan and prioritize.

Just to give you an example, we'll be talking about strategic planning. I don't want to get ahead of myself, but that's an important component that, again, in my humble opinion, was missing. So, in order to have an annual plan, an annual operating plan, so to say, we need to have a five-year strategic plan. So, that's what I mean by prioritizing the work of the committee for the future.

So, I just want to specifically ask you to participate actively, share your views, and ask as many questions as you can about all the topics. There

are no wrong questions, so feel free to take the floor in your own language if you're not comfortable with English, or if you're more comfortable with your native tongue, that's absolutely perfectly acceptable. We have a fantastic team of translators, the five official languages of the United Nations plus Portuguese. And what was the other official-- Sorry. Sorry about my ignorant comments. But, anyway, six official languages and Portuguese. I'm sorry. I'm sorry. We have English, French, Spanish, Chinese, Russian, Arabic, and Portuguese. So very excited. I wish you the best for this workshop.

Unfortunately, as usual, I can't stay with you, which is also a little bit frustrating for me because I always get to do the introductions, to plan the session, to talk about the different details, but I can never stay. But, again, that's something that we might need to change as well with the GOPE, which is the GAC Operating Principles Evolution Working Group, way too long for me to remember. But in any case, that's something I would like to change in the future as well. I would like to be able to stay here with you and to do the technical, the programming and everything else with you. Unfortunately, I've got to go and participate in the Board sessions. I'm very sorry. I apologize for that, but it's just the way it is for the GAC chair. Thank you so much and enjoy.

KAREL DOUGLAS: Thank you, Nico, and a round of applause for Nico for taking the time and effort and energy to be here. And we do thank you, and have a great day. Of course, I just want to remind everybody, just in case you're a person, there is an obstacle here, and we've already seen a couple people have some unfortunate incidences. So, by all means, just be

careful. Back to the meeting. So, we do have a pack meeting, I did say. We already have our first two persons waiting, and Tracy is going to introduce them.

But one of the things I really want to encourage you as much as you can, have your headsets with you. Interact as much as you can. This is an opportunity for you to be a part of the things and the discussions that are happening here. So, a lot of the discussions, as I did mention, as Nico mentioned, are maybe technical. There are things that you may not understand but this is an opportunity to ask. Feel free to ask. So, I wouldn't say anything more than that, and I'll leave it to you. So, Tracy, over to you to introduce our first two speakers for this morning's session. Thank you.

TRACY HACKSHAW: Thank you very much, Karel, and welcome as well. It's my welcome to you. Just as a reminder that the headsets that Karel mentioned-- So, the headsets are to my left. So, if you do not speak native English, my suggestion is that if you are trying to hear the sessions in your language, grab the headsets. Otherwise, you may not get all the information. I want to encourage you to do that. So, if you want to do that now, maybe you can get up and do that in the meantime.

So, starting now, we're going to have our first actual session. Some of you may have heard of these terms, PTI, IANA, and so on. What's going on? What is this thing? PTI, IANA, ccTLD, RIR, all these weird acronyms that we keep talking about. So especially for the new members who are here today, and for those who may have been too afraid to ask or may find chance remembering what they are, we have a team of people here

to help you with that today, explain what the acronyms mean. But not just that, what they actually do, the functions, how they work, and how important they are to the overall Internet governance ecosystem, especially to the domain name system.

So, we have Kim Davies from the PTI, and Amy Creamer, also from the PTI to discuss PTI/IANA. And I'll leave it to you to go through that discussion with us, and how IP addresses work and what's going on with that whole part of the technical part of the Internet that some of us may be asking about. Over to you guys. Thank you.

KIM DAVIES: Let's see. It's on. Perfect. All right. Good morning everyone. My name is Kim Davies, as you just heard. I have a very long title, vice president, IANA Services for ICANN, president of PTI. But the short version is I have the pleasure to lead the team that is the Internet Assigned Numbers Authority, which we will explain what that is and what it does over the course of the next, hour or so. As mentioned, Amy Creamer is here from my team. She is IANA's operations director, and she is responsible for overseeing one of the teams that does all the work we're about to describe.

I don't have a clicker, so I guess I'll just say next slide, please. All right. So, this is my objective for the next hour. I'll try and hit on four things. Firstly, introduce you to what unique identifiers are. Petty fundamental concept as you'll come to learn in a moment, and what the role of IANA is when it comes to unique identifiers. I'll then talk about how IANA relates to ICANN, and also you heard the word, the acronym PTI. If that is not clear to you, I will hopefully make that a little clearer during this

presentation. And then I wanted to focus on two specific areas. One is a discussion about number resources and the role of RIRs. And then secondly, a specific discussion about ccTLDs and how they're managed, how they're transferred, and some key points about IANA's involvement and also some key points about government's involvement in ccTLDs.

All right. Next slide. So, to start this presentation, really going back to a basic core concept that underpins everything really that we do in IANA, and I would argue everything that is done in ICANN, which is unique identifiers. Unique identifiers as a concept is at the heart of everything IANA does. It is the reason why ICANN exists, but the notion of what is a unique identifier might be a little elusive to you. So, let me walk through a scenario that I think will be illuminating to the concept.

Next slide, please. So, for the purposes of our discussion today, I'm going to talk about something that all of us probably do once, tens, hundreds of times a day, which is visit a webpage. It's something that we do. I takes a second or two to type in an address and to get back the web page we're viewing. But underpinning that simple transaction is a whole world of interactions that aren't necessarily visible to the end user. They just type in an address, hit enter, boom, a web page appears, and it's just there. But how that works is really critical to understanding unique identifiers and really critical to understanding our role here at this ICANN conference.

So, I'm going to use this example. We're looking at a web page called indentifiernews.com. Maybe that's something we look at the first day of an ICANN meeting to find out what's going on, to inform our day. So next slide, please. So, we'll start with the address bar at the top of your

web browser or in your mobile phone. Here you type in a web address. We call these URLs. And this is the first place you're going to see a unique identifier. In fact, it's probably the unique identifier you're most commonly used to which is a domain name. Here, the domain name is indentifiernews.com.

Next slide, please. So, a domain name is a human readable unique identifier that is designed to be memorable.   It's a way of communicating easily to another person somewhere you want to go on the Internet. It forms a component of a larger string, a larger piece of text called a URL. A URL is a uniform resource locator, and URLs is the way you describe a location on the World Wide Web. We use domain names everywhere. We use them obviously for websites. In this example, we use them in email addresses. They're not specifically tied to a particular application. They're a general-purpose identifier that are used in most kinds of interactions we do on the Internet.

So, I think you're all probably familiar with domain names given that you're here, but we're going to go down the rabbit hole a little bit to look at some more. Next slide, please. So, in a URL, there's other information there as well. And the first piece of information that is important is how should I transmit this information to your computer? And the way that that is shared is in a different kind of identifier that is at the start and is highlighted in orange on the slide. This is referred to as a URI scheme. When we visit a web page, very common to use HTTPS, that is today the default URI scheme, but there are many others as well. By changing that first part of the URL, it completely changes the way the information is transmitted from your device to the server and back.

Some examples of some different URI schemes, FTP, file transfer protocol. If you're someone that's downloading bulk files, directories of files, that would be typically something you would use. RTSP, real time streaming protocol, when you're on, let's say, a Zoom call, this could be what's behind the scenes sending real time video back and forth, things like that. So, this is another kind of unique identifier. It's not the domain name. It's a unique identifier that is used as part of transmitting information over the Internet. And overall, there's over a 100 of these URI schemes. So, it's not just one or two. There are quite a few used in normal day to day Internet communications.

Next slide, please. All right, so we're in a web browser. We typed in indentifiernews.com or HTTP:/indentifiernews.com. Our laptop needs to do something with that address that you just typed in. How does it work out where indentifiernews.com even is? There is a service somewhere out in the world that has all the hottest identifying news information that you want to know, but your laptop doesn't necessarily know where that is. How do we find out which server contains that website?

Next slide, please. So, you might have thought that, well, you go to the domain name. Right? Well, not exactly. The way Internet communication works is through a set of unique numerical identifiers. Each device that is connected to the Internet that has a public facing service has a unique one of these. These identifiers are called IP addresses. And so, every server that you might access has one of these numbers and they need to be uniquely assigned. Domain names are just a middle way to get there. The domain names are actually converted into IP addresses to make the connection. I'm not actually

going to get into the specifics of how that conversion works, but your computer needs to take that indentifiernews.com and turn it into an IP address before it can get to that web server to give you the information you're looking for.

Next slide, please. Now there's billions and billions and billions of devices on the Internet. It is not practical for your mobile phone or your laptop to know where every server is in the world. That wouldn't scale. It just wouldn't work. So, the Internet, and this is something that you wouldn't necessarily see as an end user, the Internet is divided into what I'm calling here as neighborhoods where different groups of servers are grouped together in big collections, and this makes it a lot simpler to work out where servers are. A neighborhood in this instance could be an ISP. It could be a corporate network or a company office. It could be a data center, but these neighborhoods have a formal name. They're called autonomous systems.

And what network operators really need to do is not know where every device is on the internet. All they need to know is which autonomous system is a server located in, and what is the most efficient way to get to that autonomous system over the network. So, when network operators, and remember the internet is a network of networks, each individual network operator only has to know an efficient path to get their internet traffic from where they are now to the autonomous system, not the individual server. And then the assumption is the autonomous system will work out the very specific path to the individual server.

Next slide, please. Now any individual server on the Internet might perform multiple functions. So, the question then becomes, well, how do I know that this connection coming to a server is wanting a website as opposed to something else? Maybe it wants to deliver an email to this server. Maybe it wants to do a remote connection to this server for administration, all sorts of things. Maybe it's a VPN connection. Who knows? So, the way that servers distinguish between the kind of transaction is coming to the server is through another concept called port numbers. Every service, a public facing service essentially, is allocated a unique port number. Associated with a port number is also something called a service name.

And this pairing of service name and port numbers is how to distinguish between multiple connections to the same server and to tell which one of these is an email being delivered versus which one of these is a request for a web page, and any number of the other kinds of things that could be going to the same server. So, in this specific example, port 80, I don't know if many of you might have heard that, port 80 is the common port for websites. Port 25, on the other hand would be the typical port that you would deliver email over.

Next slide, please. All right. So, we've connected to a web server, indentifiernews.com based on a combination of things, an IP address, a port number. We've said we wanted this web page. Now we've gotten back all this information that's filled in our web browser. However, web pages are pretty complicated. They're not just text. There's often embedded movies, graphics, interactive elements, things like that. How does the web browser kind of discern between all the different types of data you might be getting back from a web server to work out

what to do with all that information to present it to you? Well, there are other kinds of unique identifiers that support that process.

Next slide, please. So, each piece of the transmission from a web server is coded with a different kind of unique identifier called a media type. What a media type does is sort of label this piece of the transmission is of a certain type and in a common way that web browsers know what to do with that information. So, in this example, maybe there is a logo at the top of the website that's encoded in one way, image/SVG. Here there's a picture of a horse, so image/jpeg. There's a movie at the bottom that might be encoded as video/h264. The text itself is HTML that would be encoded with text/HTML. And then maybe there's some interactive elements on the website, some animation or something that is dynamic, and that would be done with application set/JavaScript. So, each one of these tags, these types is encoded as a media type.

Next slide, please. So, when requesting the web page, web browsers try to accommodate language preferences. So, how does it do that? Well, in conjunction with asking for a web page, it sends some extra data with that, which we sort of refer to as headers or header fields. One such field is called accept language, and accept language is how your web browser signals to the web server I speak French, if there's a French version of this web page, please give me the French version. And then the web server can then work out what kinds of languages it supports. Maybe it doesn't support French, and it'll just send back the original website language. But if it does support it, it can send back the preferred language. So, this is done with head of fields, and this is just one of many kinds of negotiations that happen in the perimeter of a website transaction.

Next slide, please. All right. So, this is the end of my example, my worked example of requesting a single web page. And let's think about all the different unique identifiers that were required to get that web page. Firstly, there was the domain name. This is the human readable friendly version of the website location. There's the URI scheme. This tells your computer what kind of connection to make to the remote server to get that information. There's the IP address. This is the numerical location of the individual server on the network. There is the AS number. This is sort of the numerical identifier for the network neighborhood, if you will, where the server is located.

There is both the service name and the port number. These are essentially telling you which door do you knock on once you get to the server to let me in and give me what I'm after. There is the media type that helps when the information is sent back, helps your web browser decode it and do the right thing with that information, so it doesn't, for example, confuse an image with something else. There is the header field, which has extra data that goes along with the request and the response to inform how that information is sent. And there is the language tag, which I skipped over a bit in the last slide, but the language tag is the formal way of representing language choice with a two-letter code.

Next slide, please. So, all of these are unique identifiers. Every single thing I went through just now is a requirement to just get a single web page. You might have only typed in a domain name, but behind the scenes, all those different unique identifiers were required to get that single web page downloaded. And for the Internet to work, everyone needs to use these in the same way. It's no use if HTTP means one thing

here in Puerto Rico and has a completely different meaning in Europe. It makes no sense that an image file actually means a spreadsheet in another country, things like that. So, for the Internet to work to be interoperable, we need all these identifiers to be used in the same way everywhere around the world in a consistent manner, and that is at the heart of what we do.

The IANA functions, and more broadly, ICANN, is here to make sure unique identifiers are applied in a consistent way across the world. And incidentally, I've walked through nine identifier types here today. IANA manages around 3500 identifier types. So, our bread and butter is a lot of different identifiers, most of which you've never heard of, most of which you don't need to know of, but are essential in ensuring Internet communications are successful.

Next slide, please. So, the IANA functions, it's effectively a record keeper. We're kind of like the official record keeper of the internet. We keep records of unique identifier assignments, often based on internet standards, and we keep the records that this has been assigned for this purpose, and that is really essentially what our role is. The functions predate ICANN. They kind of grew organically out of the original creation of the Internet, but it got formalized over time, and certainly most notably with the creation of ICANN. ICANN's original remit, the purpose ICANN was established, was to be a home of the IANA functions.

So, we manage these unique identifiers. I'm going to break it down a little bit more in a moment. We typically divide them into three areas though, protocol parameters, Internet number resources, and domain

names. And the IANA team, my team is responsible for maintaining these records, but in compliance with policies that this community sets. And part of what we'll talk about this week is setting policies that will ultimately dictate how IANA does its day-to-day administrative role.

Next slide, please. So, I mentioned we typically divide this into three areas, and I'll explain why in the following slides. Next slide. So first I'm going to talk about protocol parameters. Now protocol parameters is just a different way of saying unique identifiers. But in this context, protocol parameters is used to mean everything except number resources and domain names, because each of those have very unique management constructs. But for the vast majority protocol parameters, the things I talked about before, media types, language tags, things like that, we do that more or less directly in conjunction with the IETF.

The IETF is the Internet Engineering Task Force, and they set standards on how protocols on the Internet should be implemented. Our job is to basically issue these codes directly to software implementers. So, if you're writing a piece of software like a web browser, you're our direct customer at the Iona functions. Typically, people don't come and register them as an end user. It's people that are creating the underlying technologies that interact directly with IANA.

Next slide, please. As I mentioned, the IETF, the Internet Engineering Task Force, is the standards body that develops these underlying technical standards. And in those standards documents, there's always a section called IANA considerations, and that is the predominant way

that the specifications that relate to how IANA does its job are located. I see a question over there, please.

SUSAN CHALMER: Thanks, Kim. And I'm sorry to inter interrupt the flow. I just had a question that occurred to me. Well, I had no idea that all of those unique identifiers were involved in the protocol parameters and that protocol parameters is shorthand. I was just wondering if we could go back a slide.

KIM DAVIES: Certainly.

SUSAN CHALMERS: Okay. Could you repeat the second bullet point that most protocol parameters visibility is limited to software implementers? So, software implementers turn to these protocols. We understand that universal acceptance is kind of a software issue, and some of those technical specifications relate to software.   Is there any way to incorporate universal acceptance unique identifiers into this to help further that? Or am I just way off?

KIM DAVIES: No. No. I think it's an interesting question. So, from my perspective, what IANA does and IETF to a certain extent, it says if you are going to do this kind of communication, here is the very specific way the communication must be conducted. It's a technical standard. So, you

must use this number. You must do it in this way. And these technical standards are often 100 of pages of very prescriptive information about how to do this.   And there's definitely a nexus with universal acceptance. But what I see universal acceptance is more convincing the market to implement standards in the first place.

Because I think whilst the technical standards, and I'll use IDNs as an example, the technical standard for IDNs was invented in 2003. It was updated in 2008. So 2008, the technical standard has now existed for, doing the math, 16 years in its current form, and we see that there's a lot of software out there that still doesn't support IDNs. So, it's more of a convincing the market that this is a good idea as opposed to the implementation of the technical standard per se. So hopefully, that clarifies. So, they're complementary roles. And there another question back here. Please.

ABDALMONEM GALILA: Yeah. This is Abdalmonem Galila for the record. Actually, my colleague was talking about a valid point that how come I could use the protocol HTTP or HTTPS in English language at the time, I am Arabic people, for example. So, this HTTP should be, for example, maybe it's an Arabic word instead of English one, similar for French, similar for other languages. So, it through to call, it's affected by universal acceptance as well as domain name itself. Thank you.

KIM DAVIES: So, the notion of internationalizing other parts of the Internet communications that are user facing is definitely something to

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consider. And that's something that would be working the IETF to create a new technical standard that allowed for to take that example, forward and-- Sorry. Go ahead.

ABDALMONEM GALILA: Yeah. Actually, I think that you will write Arabic words that have right to left context. At the same time, it's HTTP, left to right context.

KIM DAVIES: Understood. No. I understand the problem very well. I think what web browsers have done, as a consequence of that, in large part is that today, when we use a web browser, we don't actually type in HTTP:/. You can just type in the domain name by itself, and it'll figure the rest out. So rather than solving it the way you've proposed, and that might be an alternate solution as well, is the affordance that's being made by web browser creators like Safari, Chrome, etcetera, is sometime, I'd say 10 years ago, they stopped making it mandatory to type in the whole URL. Instead, just type in the domain by itself, at which point you type in Arabic string dot Arabic string, enter, and then that's it. Hopefully, don't run into as many left to right bidirectional sort of challenges as you mentioned.

ABDALMONEM GALILA: Yeah. Last thing. Actually, we are talking about most of the world that is underserved, that have mobile phones that are out of age, that doesn't understand HTTPS, only answer HTTP. Most of the websites

now are going for HTTPS rather than HTTP, so it would not be understood by the browser.

KIM DAVIES: Without getting to specifics, there's actually protocols about automatically upgrading from HTTP to HTTPS. So even if you type in HTTP, it will convert it to HTTPS in the background. So, it is a problem as well. I agree. But I think it's something there are good technical solutions for right now. So, that particular piece, I think, has been well addressed. Any other questions? And to be clear, feel free if you want me to clarify points as I go. Please, please put up your hand. Please.

ASHWIN SASONGKO SASTROSUBROTO: I have a question. And I can't help but observe that when I open a web page, at the bottom of the page, there's a lot of action taking place. Handshake, that's one of the things I see. Maybe you could just explain what that handshake and so forth is.

KIM DAVIES: Sure. I mean, in brief, we've typed in a domain name, indentifiernews.com in the example I gave. The first thing it needs to do is convert that into an IP address. So, the first handshake is a DNS transaction. And again, a bit beyond the scope of what I'm talking about today, but you can imagine it possibly going to the root servers and the root servers connect to somewhere else. So, there's a bunch of DNS traffic going back and forth to convert that domain name into an IP address.

Now the next handshake would be your web browser does what's called a TCP connection to the web server itself on port 80 or port 443 and says, I want this web page. And then what the web server is typically going to do is send back the basic framework of the web page, typically HTML. And that's just like the text and nothing else. But embedded in the text is a bunch of tags that say, insert this image here, insert this ad here, insert this here, insert that there. Every single tag with an embedded content is going to trigger more and more requests. And I think in a typical web page transaction, it's going to have to pull 20, 30, 100 different resources to build that web page from its component pieces.

So, when you see that activity bar, you'll see the spinning dialogue and it takes a few seconds or even longer sometimes. It's all those transactions happening back and forth. So, any one web page could be hundreds of different transactions. Yes, please.

ASHWIN SASONGKO SASTROSUBROTO: Sorry. I also put my question on the Zoom. My question is about two things. One is, what is the main reason for NTIA to change IANA, which was it was part of US DOC, to PTI, which is a nonprofit organization, something like that? I did ask this during the meeting in Singapore to NTIA, but that time, it was many, many years ago. I a bit forget about that. And secondly, how about the root zone file? Because as far as I remember, that time it was discussed also in Singapore whether the root zone file will be will still be kept at the US DOC or not? And finally, I learned that it is still in the US DOC but run by private

company, Verisign. Is there any reason why it is still there, or is it better to be to be like that or what? Thank you.

KIM DAVIES: So just to briefly respond because I'm going to talk about the governance a bit later in my presentation, but the US DOC is not involved in production of their root zone anymore. So, that's not correct. The US government had a very strong oversight role up until 2016, but in 2016, well, culminated in 2016. There was a lot of activity in this community to develop a new multi-stakeholder global governance model for the IANA, and that resulted in a bunch of changes that happened in 2016. And I will talk to those later in the presentation. Thanks.

Okay. Let me move forward. Next slide please. Okay. So, the next piece of the pie if you will is Number Resources. So, number resources is really two key things. IP addresses, we talked about those already. These are the unique numbers given to every device connected to the Internet.   And autonomous systems, and these group networks together under a single identifier. So, number resources are allocated hierarchically. IANA doesn't allocate every individual device with its own IP address. Instead, there is a hierarchy of allocation, and I'll get to this in more detail a bit later on. But the predominant party here are what we call regional Internet registries, or RIRs. And like I said, I have more of this later, so I'm going to skip past this.

Next slide. Then the third piece of the pie is domain names. This is what most of you are most familiar with. Domain names are these unique identifiers that can describe any number of different services on the

Internet. These are also hierarchically delegated, but in a different manner to IP addresses. IANA is responsible for the uppermost level of the domain name system, what we call the root of the domain name system.

Next slide, please. So, when it comes to the root zone management function in particular, we're responsible for receiving and evaluating any changes to the root of the DNS. This includes requirements such as assigning and transferring of top-level domains, routine maintenance of the various different name servers and technical elements of those top-level domains, changing points of contact. And then when those changes are deemed to be in compliance with policy, we then coordinate those changes to be implemented through updates to the root zone and then promulgating those through the root servers. We also operate .INT, a top-level domain for intergovernmental treaty organizations. And we also have some other functions called IDN table or LGR repository maintenance, which I don't think I have time to get into too much detail there today.

Next slide. Another key part of root zone administration is something that is relatively new in the lifespan of the root zone. We started doing this in 2010. In 2010, a new layer of cryptography was added to the root zone to add an additional layer of security to how the DNS operates. And the way this works is that, essentially, IANA needs to maintain a cryptographic key, and it's extremely important this key is kept very secure. Arguably way more secure than almost any other cryptographic key out there.

So, when ICANN contemplated how to do this, usually cryptographic key management is a sort of a mystical science where it's done in secret, it's done in closed rooms, not much is known about it, it's done by private companies, it's not something you get to see. ICANN took the opposite approach. ICANN decided to make it a very public spectacle, if you will. And the reason ICANN decided to do this is firstly, it's in ICANN's DNA to do everything in the open. Hence, ICANN meetings and conferences.

But also, it was felt that if security researchers around the world saw exactly how we did every step of key management, that would engender trust in how we did it. That everyone would have much more confidence that we were operating these cryptographic keys in a suitable manner if security experts around the world could look at it and vouch for it and say, yes, I'm watching it, and I can see it. And IANA's doing a great job, as opposed to IANA doing it in secret and just telling the world, we've done it. Don't worry. It's secure. So, this is sort of security through transparency, I guess you could say. So, we have these key ceremonies we do every three months where we invite a bunch of security experts, and we do these ceremonies to administer the cryptographic key.

Next slide, please. So, together, everything I just described protocol parameters, of which there are thousands of different types and millions of actual registrations number resources, and domain names, these three areas comprise the IANA functions. And they also represent the three primary areas of accountability for how those functions are performed. Next slide, please. So, this is where I'll first mention PTI, and this comes back to the question I received a few minutes ago. PTI

stands for Public Technical Identifiers. It is a nonprofit organization that performs the IANA functions. Note, it is not ICANN, and there's a good reason for this.

So, I'm the president of PTI, part of my job. here was this discussion that happened eight years ago now, it feels like it hasn't been that long, that I mentioned a moment ago that there was general consensus, the accountability model for the IANA functions needed to evolve. For the first couple of decades of ICANN's existence, the US government played a very important role in overseeing ICANN and overseeing the IANA functions. And this manifested in the that the IANA functions were actually performed under contract by ICANN for the US government.

But culminating in 2016, as I mentioned a moment ago, this moved to an entirely different oversight model, still within the ICANN community, but structured quite differently. And part of the structural change was that the IANA functions stopped being performed by ICANN directly and instead a new nonprofit organization was created called PTI, and PTI performs the IANA functions. I actually don't work for ICANN. I work for PTI, and PTI is a nonprofit organization that hires all the IANA staff. But it is closely related to ICANN. So, to be very clear, ICANN provides 100% of IANA's funding. We work out of ICANN's offices. We're not quite a subsidiary of ICANN, but you can kind of think of it that way. Under US law, it's referred to as an affiliate relationship.

Next slide, please. I'll just give you a sense of the scope of the IANA staff. We currently have 20 people in our team. I won't list them all off, but there's their smiling faces. Briefly, we tend to divide the work we do into a few different operational areas. Firstly, there's the operations

team led by Amy on the stage. They do the core transactional work of IANA, receiving requests, checking them against the policies, actually implementing them. We also have a strategic programs team that does things like ensuring the ongoing evolution of our service delivery is taken care of, project management, auditing, risk management, business excellence, strategic and operational planning, all the stuff we need to do to continue to meet the requirements of the community.

Technical services. We are a very technical operation. We do technical things, and that means we need to have technical systems in place. We need to have technical experts as well. So, we have a team of them. And then lastly, myself as sort of departmental leadership and the PTI board, which I'll get to in the next slide.

Next slide, please. So PTI has its own board. It's a small board compared to the ICANN board. It's just five people. Three of them are Org staff. There is myself as the president. There are two other staff appointees. At the moment, it is Xavier Calvez, ICANN's CFO, and Jia-Rong Low, ICANN's VP of the Asia Pacific region. And then there are two nominating committee appointees. At the moment, it's Tobias Sattler. He is our chair. And Anupam Agrawal, he was recently appointed in the second NomCom seat.

Next slide, please. So now you know a bit more about PTI. So, what then is ICANN's role in this new structure? Well, ICANN is ultimately responsible for the IANA functions. It's still the IANA functions are in ICANN's remit. It needs to make sure they're done correctly, and it does it by overseeing PTI. ICANN contracts PTI to do the work, but it oversees PTI's performance. It also provides a lot of the resources PTI needs.

What I didn't mention in a couple of slides ago is we have no legal staff, we have no HR staff, but we leverage shared services with ICANN. So, a lot of the sort of back-office functions, we don't duplicate. We instead leverage those in the broader ICANN organization. I mentioned ICANN funds PTI, and ICANN also operates the accountability mechanisms. One example of that is the customer standing committee. This is operated by ICANN to make sure IANA's customers can provide input into the IANA functions.

Next slide please. So, each of these three legs of the IANA functions, if you will, has a different accountability model with their individual communities as well. In the case of the protocol parameters, there is a memorandum of understanding that exists between IETF and ICANN. In the case of the number resources, there is a service level agreement between the five RARs, and ICANN. And then domain name, I mentioned the customer standing committee. There's also a naming contract there as well.

Next slide, please. All right. I'm going to take a brief moment to grab some water, but if there's any questions at this point before I start going specifically into number resources and then into ccTLDs. Please.

DR. SHAMSUZZOHA: Thank you. I think it's a very interesting presentation. This is Shamsuzzoha from Bangladesh. I have a couple of questions, very short questions. In the protocol parameters, you mentioned that it is primarily developed by IETF. So, is there any instances that any of the protocol parameter developed any other way than IETF? That's the first thing. The second thing is that, is there any instances where IETF

recommended something to be adopted but it was not accepted by either ICANN or PTI? And just should I go question by question or should I mention all the questions together?

KIM DAVIES: Let me respond to that one first. There are a few registries, IANA registries that are not set by the IETF directly. Some originate from the World Wide Web Consortium, for example, the IEEE, but they're relatively rare. Usually, it's through the IETF. And then for the question about, is there any standards we've rejected? I think was the question. I don't think so. But that said, we're an active participant in the standards process. So, before a standard is finalized, if we have concerns that it's not implementable, we are actively involved and we can ask them to change the standard before it's finalized. So, that does happen. That we will have a dialogue with the standards body and result in amendments to the standard before it is finalized.

DR. SHAMSUZZOHA: Thank you. The next question is that, for the protocol parameters for the domain names and internal registry, we know that it needs subscriptions. For example, the addresses, you have the subscriptions to the RIRs for domain name. The registry need to get it from the ICANN. But for the software implementers that you mentioned that they normally utilize the protocol parameters. Does it need any subscription or is it a free open source?

KIM DAVIES: Yes. Everything IANA does is free, even domain names and number resources. So, for example, RIRs don't pay IANA for IP addresses and top-level domains operators don't pay IANA for domains. We get our funding from ICANN broadly. So, yes, they pay indirectly, and we do get funds from those organizations, but it's not a pay for service where you have to pay IANA to get something. So, everything IANA does is free, open, transparent, and you can download all of our data. It's in the public domain, so there's no monetary exchange. I see a question behind you, so I'm just going to switch to him for a moment.

DJIKOLMBAIBET KENNEDY: This is Kennedy from Chad. I wanted to know, what is the relationship between the consortium, the WC Consortium, and the PTI. How do they collaborate? So, I will repeat my question. Yes, I was saying, what is the relationship of collaboration that you have with the WC Consortium, PTI and WC Consortium?

KIM DAVIES: We don't have a direct relationship with the W3C. Generally speaking, the people in the W3C that have a relationship with IANA come through the IETF. So, it's sort of trilateral relationship. There's no direct relationship with the W3C.

GULTEN TEPE: We have a remote participant raised hand. Wang Lang from China.

WANG LANG: Hello, Davis. I have a-- Hello?

KIM DAVIES: Yes. Please go ahead.

WANG LANG: I have a question. [inaudible 00:57:05] Bangladesh GAC representatives about the protocol parameters. As we know, the protocol parameters are defined in the RFCs in IETF. So, why do you say they are issued by AINA? And what does the word "issued" mean here? Thank you.

KIM DAVIES: So, the way it works is that, yes, some RFCs specify the protocol parameters, but that is because they've, in the drafting process, come to IANA and we've already made the allocation.   And then that allocation is put in the RFC. That said, most of the allocations made are not specified by RFCs. The RFC creates the technology but then users of the technology come directly to IANA afterward to register the technology. So, I'll use port numbers as an example.

So, the concept of port numbers is baked into the underlying technical standard for TCP on the Internet. But when you create your own new application built on top of that, you don't necessarily have to go back to the IETF and create a new RFC. Let's use Skype as an example. So, I create Skype as an application. Skype would come to IANA directly to get a port number for Skype, and we would issue it directly to Skype, and then they can use that port number for Skype transmission. The individual allocation is beyond the underlying standard. You don't have

to be products of the IETF. So hopefully, that clarifies. I am told we're short on time.

KAREL DOUGLAS: Yeah. I mean, to be fair to Amy, because Amy also has-- Oh, yeah. All right. So, what I'm going to do, Amy, I know you have a presentation.

KIM DAVIES: I'm presenting the whole thing.

KAREL DOUGLAS: So, that's fantastic. Okay. So, what we could do is proceed. Let me just do a check and see if we're okay for the-- So, you'll do the ccTLD component as well. Okay. Fantastic. All right. And we have some more questions. Gulten has a couple more. And over to you, Gulten.

GULTEN TEPE: Thank you, Karel. We have a question in the chat from Indonesia delegation. What is the main reason for NTIA to change IANA, which was part of US Department of Commerce to PTI? How about the roots zone file? Is it transferred also by US Department of Commerce to other or still run by VeriSign. Thank you, Ashwin.

KIM DAVIES: In brief, the US government issued notice to the international community to develop a new governance model for the IANA, and that resulted in 2016 switching to the current model we have today. Today,

the US government has no role in root zone production. It is a government at the same level of standing as any other government in the world. Obviously, it has an interest in its own territories' ccTLDs just as every other government does. VeriSign still has a role today, but it is under direct contract from ICANN, and it only acts on instruction from IANA. So, it's a direct relationship between IANA, ICANN, and VeriSign in terms of production of the root zone.

Okay. And if we run out of time for questions, I'm very happy to take them via email or whatever works, but I want everyone to feel their questions are answered. But I do want to make sure we get time to talk about number resources and ccTLDs. So next slide, please. So, we've already covered this for the most part. We talked about IP addresses, and we talked about autonomous system numbers, but one thing we haven't talked about yet is there's two different kinds of IP addresses. There's what's called version 4 or V4 and version 6. V4 is the numbering type you're most likely to be familiar with. It's been around since 1980. It's in widespread adoption. V6 I think was deployed in 1998. Less broader adoption but, rapidly growing.

Next slide please. So, I mentioned the regional internet registries. For those not familiar with who they are, here they are. ARIN assigns numbers in North America, LACNIC in South America and the Caribbean, AfriNIC for Africa, RIPE NCC for Europe and APNIC for the Asia Pacific region. Next slide please. So, I mentioned that IANA does not directly allocate IP addresses to end users or even to network operators. All we do when it comes to sort of the general-purpose IP addresses that we use for general purpose applications is we allocate very large blocks to the regional Internet registries. The regional

internet registries in turn split those up into smaller blocks, who then assign them to network operators, and then the network operators will then individually assign individual IP addresses to devices on their network.

The way we make the allocations to the RIRs is highly deterministic. There are policies that set out all these kinds of formulas we need to follow and so in our application of the policy, we look at allocation rates by RIRs to their customers, and there's certain thresholds of exhaustion that once they pass a threshold, we will give them another block of a particular number resource.

Next slide please. You know what? I'm going to skip through this. IPv4, we've given out our entire supply. If you haven't heard the news, IPv4 is basically exhausted. There's very little supply of new IPv4 addresses out there. Next slide. IPv6, opposite story. There is a lot of them, they're readily available. We've used less than 0.1% of all the available address space in IPv6 today. Next slide. AS Numbers. Similarly, there's plenty of AS numbers available. Anyone that wants to create a new network on the Internet will have no problem getting AS numbers.

Next slide. And so, if you're a network operator and want to establish a network, what do you do? Well, you go to the regional internet registry that services your country. Each of the five RIRs have very comparable websites where you can apply for IP address allocation, or AS number allocation. It is a fee-based service, so you do pay for those allocations, but that is where you go to get your allocations as an end user or as a network operator.

Next slide. Any questions on number resources? And I will note that I know in the next session after lunch, there will be an RIR presentation. So, I'm sure they'll get into this in more detail then as well. Yes.

KAREL DOUGLAS: Yes. What do you think is the most challenge of for less adoption of IPv6?

KIM DAVIES: That could be a very long answer. I think the short version is that, initially, the value proposition to any network operator was not there. You could still get IPv4 addresses. Ipv4 addresses are what everyone used. So, why would I invest in V6 when very few people used it at that point, and it just was extra money to spend? But the situation has changed a lot since then. That it's very difficult to get IPv4 addresses now for new networks. I think it's resulting in a natural requirement to move to IPv6. So, to support continued growth of the Internet, the dynamics have changed a lot, and that sort of balance is shifting.

And I will note that IPv6 is supported in practically every kind of device or technology out there today. So, unlike before where maybe your operating system didn't support IPv6 if you were talking 10, 15 years ago, that's not the case today. Yes.

SUSAN CHALMERS: Are all devices also-- I mean to say, so IPv6 is supported in basically every device as is IPv4, I would imagine. I'm just wondering if we'll ever get to a point where IPv6 is the only address that is supported by the

device. Or some people have started making that type of hardware already?

KIM DAVIES: So, this isn't my area of specialty, but my understanding is that for a lot of mobile based communication, it is already a lot of it is V6 only. So, you might not know it, but your cell phone connecting to your wireless carrier might be doing all the transmission from your cell phone in V6. And then what's happening is your cell phone provider, if it needs to get to a site that is v4 only, will do that conversion in the network, as opposed to on your device. So, I think that's actually already starting to happen. All right. Question. Yes.

ABDALMONEM GALILA: Yeah. It is not a question rather than a comment. Yeah. This is Abdalmonem Galila for the record. If I am IPv3, I am happy with the equipment that I have and operated by IPv4. I don't want to invest more for my equipment to buy a new equipment and go for RIRs to buy uploads of IPv6. That's one of the issues. Other one that, is the IPVS also at same time want to lease IPv4 from other regions? That's one of the problems as well. The second one. The second one. Actually, it is a role of government now to have a long-term plan in order to go for the adoption of IPv6 and to prevent selling prevent IPVS from selling IPv4 at high prices. These are the businesses for IPVS at the moment. That is the role of the government. Thank you.

KIM DAVIES: Thank you. All right. So, we have 15 minutes left. So, let's start talking about country code top-level domains. Next slide, please. So just to set the stage for those not familiar with ccTLDs, when we talk about top-level domains, we typically divide them into two categories. One is domains with a global purpose where ICANN is responsible for policy making and oversight. We call these gTLDs. And then we have ccTLDs. ccTLDs are allocated for every country in the world, and they're allocated for a country level purpose. They're designed to have local policy making an oversight, that is to say within the country or territory.

And then there's sort of an automatic qualification or disqualification. So, if you are a country according to the standard I'll get to in a moment, you're eligible to have a ccTLD. It's that simple. Policy at a global level that applies to each of those is set by supporting organization in the ICANN community and both of these will be meeting this week. For gTLDs, it's the GNSO and for ccTLDs, it's the ccNSO.

And then lastly, a lot of the enduring principles I'm about to get to were established by Jon Postel. For those not familiar with John Postel, he's my predecessor and he invented a lot of the concepts that we've been talking about today in his role in the early creation of some of the fundamental concepts of the Internet. The most seminal principles that apply to ccTLDs are documented in a document that you'll hear time and time again called RFC 1591. This was actually an IANA procedural document that was published in 1994, but in turn has become sort of the bible, if you will, of what is a ccTLD and how ccTLD should be operated.

Next slide please. So, as the name implies for ccTLDs, they're derived not from countries but from country codes. Country codes are defined by an international standard called ISO 3166 part 1. And this is a standard that we use not just to define country codes, but it's actually used for a broad range of applications. If you look at your passport, at your identifier on your passport, it uses ISO 3166 codes. Currency codes, the three letter currency codes, the first two letters of the currency code are an ISO 3166 code. I mentioned before language negotiation for a web page, even that uses ISO codes. So, ISO codes are used all sorts of places, but this is probably the most obvious application of the standard. The standard provides different kinds of codings, but the only ones we actually use are the two letter ones, the alpha two codes.

And so, we use this standard for two different purposes. Obviously, interrelated. One is, what countries/territories are eligible? What is a country essentially is the question. And then secondly, we use the standard for deciding what that two-letter code should be. And the reason we use this independent standard was that Jon Postel felt as a technical body, the IANA staff were not equipped to make these decisions itself. So, we wanted something at arm's length, where there was experts in the field of country recognition, if you will, to make the decision about what is and is not a country, put it in that standard, and then we would leverage the standard to make these decisions.

Next slide, please. Probably it's an eye test to read this, but the green here are allocated two- letter codes for ccTLDs. The other colors are not. So, there's, I don't know, about half of the possible combinations are in production today. Next slide. I will mention internationalized

ccTLDs for a moment. The ISO standard only provides ASCII Latin codes, A-Z, but ICANN in the late 2000s introduced a new program called the IDN Fast Track, which allows countries who want representations in non-Latin codes to apply. So, you still need to be in the ISO standard to be eligible, but the actual string goes through a different selection process.

Next slide. So, this is where I think it gets interesting. How are ccTLDs managed? So, the first principle I want to share with you is that ccTLDs are intended to be managed within their respective jurisdiction. A trustee is appointed for every ccTLD. The lingua franca there is the ccTLD manager. And the ccTLD manager, you can think of is intended to be sort of like a mini-ICANN within the country, if you will. That they're ultimately responsible for the namespace in the country. But importantly, they're locally accountable. That they're in jurisdiction. Local laws apply to them. They're accountable to their local communities. Local remedies are available for people that want to address issues with the ccTLD.

IANA has a responsibility for ccTLDs, but it's fairly limited. As the manager of the root zone, we need to ultimately recognize who that manager is within the country, and we do so in accordance with a bunch of policies that I'll get to in a moment. But generally speaking, we evaluate any requests relating to management of the ccTLD against the policies. We make sure that they meet the relevant policies. And we need to maintain a day-to-day operational relationship with a ccTLD manager. TLDs are domains like any other, but even more critical. So, it's critical infrastructure. The ccTLD manager needs to have an active relationship with IANA to make sure that critical infrastructure

continues to function, and for that reason, we need to have a direct relationship with them.

To be clear, IANA is not involved in day-to-day administration at lower levels within the ccTLD. So how ccTLDs allocate sub domains, do registration, all that, credit registrars if they have registrars, not any of IANA's business.

Next slide please. So, when we get a request either to create a new ccTLD or to transfer a ccTLD from one organization to another, we need to do some due diligence. And we do this against a set of established criteria. And in brief, the established criteria are string eligibility. Is this ccTLD actually eligible to exist? Incumbent consent. When we're transferring ccTLD, does the current manager of the domain agree to hand it to the new manager? Public interest. Is this act the result of appropriate consensus building within the country, and will the manager perform in a fair and equitable manner?

Local presence. Is the manager actually in the country or territory? Is it in jurisdiction? Stability, and this is key. Will the domain continue to function? Does the new manager have the requisite plan in place to move operations from the current manager to the new manager such that the TLD will continue to function as you would expect? And then operational competency, and this is tied with the previous point. Is the new manager actually operationally competent? Do they have the necessary expertise to run critical internet infrastructure? So, these, at a high level, are the areas of assessment. I don't have time to get into the specifics today, but these are the areas that IANA does due diligence on.

Next slide. So, the evaluation process for any of these kinds of requests is that firstly, prospective applicants usually come to us first before they even submit any application. It is a complex process. It's often a lengthy process. So, applicants will typically want to understand the process better and how it applies to their unique situation. So often during the ICANN meetings, myself, Amy, and the rest of our team will often have private meetings, often with government representatives and others to have these kinds of discussions and we welcome that. So, if you are interested in such a discussion, please let us know.

Once an applicant is ready and feel that they meet the criteria, they will submit an application and supply materials that addresses all the different categories of assessment that I just mentioned. The process tends to be iterative. So don't expect to submit and it'll just be okay, done. Usually, there's some back-and-forth discussion, clarification and so forth in the process. Once IANA agrees to proceed, there is a procedural review done by the ICANN Board. And then basically, then we're ready to execute. And executing here means once IANA has approved it, that is the trigger to then start the management change in the country. Obviously, in accordance with the transfer plans and things like that, but once IANA has agreed that the transfer can go ahead, then activity starts happening in the country to actually transfer it to the new operator.

Next slide please. So, this is one thing I wanted to highlight because it comes up a lot, particularly in our discussions with government representatives. ccTLDs must have an active role in managing the ccTLD. It is not a hands-off duty where you're the ccTLD manager, but you actually are not involved in ccTLD management. You've just given

it out to a different company and then you're just not involved. All the policies, all the procedures are written in a way that requires active involvement by the ccTLD management in day-to-day operations of the domain.

Firstly, a lot of what we hear is that if this is a point of contention that, well, I need to be a ccTLD manager to have an oversight role over how the ccTLD management actually happens.   Oversight is a local responsibility.   It is something that should have enforcement mechanisms within the country, not indirectly via the IANA functions. So, this is often a point of confusion, but this is where local law, local regulation, local contracts, whatever they might be enforceable under local law, play an important role.   The assumption is all the accountability mechanisms that govern how ccTLD managers conduct themselves are located in your jurisdiction.

To be clear, the manager can use vendors. We're not saying that ccTLD manager must do a 100% of the work directly themselves. But they must have a tangible interest in day-to-day operations. It's not that they subsequently delegate wholesale all of their responsibilities to a separate entity. It's common to use a registry service provider. So, one of the big companies that you'll see advertising here today. So, it's common to use them for their technical expertise, but the ccTLD manager still sets the policy, still comes to ICANN meetings to represent the country, sets things like pricing, things like that. So, there is an active involvement in the ccTLD manager.

Next slide please. How does IANA resolve disputes over who runs a ccTLD? This is another really critical question that we hear a lot from

governments. We don't. It's kind of that simple. It is not IANA's responsibility to adjudicate between multiple conflicting parties within a country. In fact, Jon Postel stated very explicitly back in 1994, that we had to take no action in such situations. Like if we have feuding parties from within a country, we should tell them to go back and reach consensus and come back when it's resolved. So, that's the basic principle. Obviously every situation has unique circumstances and unique considerations, but one thing that ccNSO did do 10 years ago now is created a document called the Framework of Interpretation. And this document is very important in clarifying exactly where IANA should and should not step in, and the answer is not very often. But also, the kinds of processes that need to happen around this particular area and the definition of these particular concepts.

Next slide, please. So, I couldn't leave that last slide without just giving some commentary on some practical observations on some of the realities we have today, particularly relating to jurisdiction. It's true that before ICANN even existed, as the Internet was being bootstrapped, and remember in the 1980s when the DNS was created, the internet was not what we see today. It was an experimental research network, it had very little formality to it.

Part of the informality was that if a country was getting connected to the internet for the first time, sometimes the ccTLD was created before there was even a single connection to the country. Part of establishing that original connection was that there were some researchers perhaps working in the region that were rolling out access country to country, and sometimes the ccTLDs were delegated to parties outside the country as part of that capacity building effort. So, there's very few

cases where that's still the case, but that was actually pretty common in those first few years until everyone got kind of established.

We have seen cases on jurisdiction where the ccTLD manager has started in jurisdiction, but then taken steps later once they're already they established the ccTLD manager to then move out of jurisdiction. This is something where IANA is not empowered to do anything in particular about that. Oversight is a local matter, but it is challenging in those kinds of situations, and I have a solution to that at the bottom of the slide. Some situations we have the ccTLD manager is in the country, but their registry service provider is outside the country, by design. That's their choice. That's what they've decided to do.

But here's the critical part. ccTLD manager is responsible for the essential business data of running the ccTLD. And anytime you want to transfer a ccTLD from one entity to another, the consent of the current ccTLD manager as a practical matter is required because they need to hand that business data over to the new manager. So, this means that this incumbent consent notion is not just a policy requirement that is stated in the policies, but also a practical one. Even if IANA was to say, yes, we agree that we should move the ccTLD to this new manager against the wishes of the current manager, current manager is absolutely refusing to participate. The current manager still has all the business data, has the list of what domains are registered, who they're registered to, all that information which is essential for keeping your ccTLD running. So, there's an element of requiring the cooperation of the current manager to do any transition to a new manager.

One thing we do, at least for the last 10, 15 years, is we always counsel governments in particular, but interested stakeholders to consider the role of escrow. Those familiar with gTLDs, we have this e-bureau program. Every system registry is required to deposit their business data with a trusted third party, and in the event that they are not fulfilling their duties, we can restore operations relatively easy. There's no such program globally for ccTLDs, but in each individual country, you can establish programs like that for your ccTLD.

Next slide. I think this might be my last slide. So, I know this is a quick tour de force through a lot of ideas, but there are policy gaps. The ccTLDs policies don't cover every eventuality. What we have today was invented in the 1980s, refined in the 1990s. ICANN was established and sort of proceduralized a lot of this in the 2000s. The ccNSO started developing clarifying guidance in the 2010s. The ccNSO developed its first new policies in the 2020. So, that's kind of the arc of evolution here. But there is no single holistic policy document. There are practical situations largely unaddressed, and I think we've heard about the situation in Lebanon recently. But that's triggered a productive forward-looking discussion about what are the policy gaps here.

And I'll finish on saying that the ccNSO will be having some sessions on Tuesday to go through some scenarios where the policy is lacking to work out how the community might want to look forward in addressing some of these topics. So, apologies, I've run five minutes over and I don't know if we have time follow-up questions. But if not, I'm happy to take them via email and the next slide should have my email address. Thank you very much.

KAREL DOUGLAS: All right. So, thank you very much. And no, we don't have time. And I know they keep time strict here. We have interpreters and so on. So, for any questions, please do, use Kim's email address. Thank you very much for the questions we took during the session. And thank you very much to Kim and Amy for all the time. Jon and his team has been here. Thank you very much. And we break now for lunch for I think it's, how many minutes is it, Rob? Until 15 minutes past the hour for those who are not here in Puerto Rico. So, for those who are here, 1:15 or 13:15. Those who are online, 75 minutes from now. Thanks very much.

KIM DAVIES: I'll continue the conversations in respect to the country code top-level domain.

KAREL DOUGLAS: All right. And one more thing. Thiago said that there's some sweets from Colombia in the back by ICANN staff. Please check them out. Thanks. Bye. Thank you.

[END OF TRANSCRIPTION]