
ICANN84 | AGM – How it Works: The RIRs
Tuesday, October 28, 2025 – 15:00 to 16:00 IST

ADIEL AKPLOGAN

Welcome, everyone, to this How It Works session. This session is specifically around the original Internet registry system. As you know and you have listened to the chair of the NRO at the opening, the RIRs are one of the ICANN stakeholder groups that majority conduct their business at a regional level, where each of them have their own community and exchange with them. So we have this How It Works session to bring the RIRs to the ICANN community and give them as well the opportunity to explain a little bit how they work, how all this ties back to ICANN. So we are going to listen to German and Ulka today, who are going to take us through the RIR system and also who will have the opportunity to exchange with them a little bit as well about what is new in that arena. So I will let you take it up. But before that, yeah, the remote participation information.

CHAMPIKA WIJAYATUNGA

Hello, everyone, and welcome to this session, How It Works: The RIRs. And my name is Champika Wijayatunga, and I'm a participation manager for this session. Please note that this session is being recorded and is governed by the ICANN Community Participant Code of Conduct, ICANN Expected Standards of Behavior, and the ICANN Community Anti-Harassment Policy.

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.

Please observe the following guidelines to participate in this session. I will also post them in the chat for your reference. If you would like to speak during the session, please raise your hand in Zoom. When called upon, virtual participants will be given permission to unmute the Zoom. On-site participants will use a physical microphone to speak. Only questions posted in the Q&A pod will be read during the session as the time permits and when directed by the facilitator of this session. Please state your name for the record and speak clearly at the moderate pace. I will now hand it over to Adiel. Thank you.

ADIEL AKPLOGAN

Thank you, Champika. Thank you very much. And I will hand it over to Uke.

ULKA ATHALE

Hi. Good afternoon, everyone, and thank you for joining us at this session. My name is Ulka Athale, and I work for the RIPE NCC, one of the five regional Internet registries, and we'll be telling you all about them. We are trying to make this session a little interactive, so please humor me a little bit. Yeah? So let's get started. So everyone in this room is an Internet expert. So we start off with a very easy warm-up question. True or false: the World Wide Web and the Internet are the same thing. True or false? If you think it's true, please raise your hand. Ooh, no hands going up. We have a room full of experts, and this is really helpful because then we know how many details we can go into. All right, if you think it's false, please

raise your hand. All right, all right. So for the people who raised your hands, I have small prizes for participation. So the person at the end of the table, if someone could please pass the chocolate along with you. RIR staff, Board members, and ASO AC council members, you will not get chocolate. All right, great, so now you know how the system works. There's two more questions through the course of the presentation, and let's see who gets the next two. Next slide, please. So just, yeah, the correct answer is false. The internet and the web are two very different things. The web is one of many applications that run on the foundational network of networks that is the internet. Many other things run on the internet. Think about weather satellites, ATM systems, train signaling systems. So when we talk about the Internet, we're talking about a bigger system. We're not just talking about the web. Next slide, please. The Internet is a network of networks, and every device that is directly connected to the Internet requires a unique IP address. If you were in the opening session, you might have heard the address by Hans Petter Holen, the Managing Director of RIPE NCC, who joked that the second N in ICANN is silent, but that N stands for numbers. So when we talk about numbers, we're referring to IP addresses and autonomous system numbers. I'm first going to give you a broader overview of the system, and then German will go into the technical details a bit later on. But to put it very simply (and you can tell that I'm not an engineer), data travels in packets between these IP addresses, and that's basically how the internet runs. That's the extremely simplified version of it. Next slide please. So there are some core principles that underlie the operation of the

internet, the first being open standards. And that's why participation with regional internet registries and bodies like the IETF is so important. Open standards ensure that devices can communicate. It guarantees interoperability. And the second principle is uniqueness. Without accurate registration of global Internet identifiers, names, numbers and ports, we do not have global uniqueness. And the combination of these principles makes the Internet what it is the way we know it. Next slide, please. Could I have the next slide, please? So how did this system come about? ICANN came quite late into this process compared to the development of the Internet. The Internet started off as a project in the United States between the Department of Defense and universities. It was called ARPANET back then. The Department of Defense contracted the administration of names to the University of California's School on Information Systems, run by Jon Postel. So Jon Postel was the person who ran the first process to register IP addresses. He called this the IANA function, the Internet Assigned Numbers Authority, but basically he gave out IP addresses to people who requested them. Keep in mind, the personal computer hadn't been invented yet, right? So the main use case was universities' physics departments research networks who were trying to figure out what it is that we can do with this IP-based thing. So John Postel originally started handing out IP addresses. These were chiefly universities and research networks requesting them. But as this started to grow, it all became a bit much. The Internet was starting to grow. And in order to facilitate the allocation of addresses, the RIR system was formed. So RIPE NCC

was formed in 1992; APNIC in '93; ARIN in '97; and ICANN was actually established in 1999. And following the establishment of ICANN, the document ICP-2 was written in 2001. You might have heard a lot about ICP-2 this week. LACNIC and AFRINIC were established after that in 2003 and 2005 respectively. But back then in the '90s, again, the Internet Number Resource Administration was also separated from the domain name system. If you look at the ICP document series, ICP-1 is actually about the domain names, and ICP-2 is about the regional Internet registries. Next slide, please. So the IP address space handed out before the regional Internet registry system came into existence is referred to today as legacy space. It means the people who received addresses then, or the organizations, received larger blocks. It was more convenient. There was no shortage of IPv4 addresses like we see today. Nobody could foresee that at that point. The technology used was different and they did not have contracts. Obviously, the RIRs didn't exist yet, so they didn't have agreements with the RIRs. But in the long run, as distribution could not be managed this way, the RIR system came into being. Next slide, please. The regional Internet registries actually do many different things, but one of the main functions is the allocation, administration, and registration of Internet number resources in a specific region. And as I mentioned earlier, the main goal is to ensure the accurate registration of IP address allocations and to ensure the uniqueness of IP addresses. Next slide. Let's see where everyone's from. We have five regional Internet registries today and we are in Ireland which falls under the RIPE NCC service region. So if you live in the RIPE NCC service region, let's wake up

and stretch the arms a bit please. How many people do we have here from the RIPE NCC service region? Cool, cool. Oh, I see a reluctant hand go up in the back there. What about APNIC? Right. AFRINIC? ARIN? Three. And LACNIC. Back. Great. All five regions represented. Check. All right, next slide please. So now you know at least which RIR to go to if you have questions about your Internet number resources. So as I mentioned, the functions of an RIR include managing and distributing Internet number resources, IPv4 and IPv6 addresses, autonomous system numbers, maintaining directory services (so whois. And I've also now heard that we have a historical lookup service called whoWas. I'm wondering when AI will help us have whoWillBe. That'll be fun. But we also mentioned we also keep routing registries and reverse DNS. But the RIRs do more than just IP addresses. We do a lot of technical coordination. We have community-driven policy processes. And each RIR carries out training and capacity building. I should have really had a slide on this, but many RIRs have online e-learning resources, which you can find in different languages. LACNIC offers resources in Portuguese and Spanish; RIPE NCC in English; AFRINIC in English and French; APNIC in English; ARIN in English as well. So if you go online, you will find a lot of resources. They are available for free. You chiefly have to make an account. Part of the RIR's mission is to support the scalability, security, and resilience of the internet. And by scalability, German will talk more about the limitations with IPv4 addresses. So we promote the use of IPv6 to help the internet scale. We provide and educate people on RPKI. That's a routing security technology to protect against route hijacks and

misconfigurations. Each RIR has its own policy development process, which is bottom-up and multi-stakeholder. And I've already mentioned the capacity building. Many RIRs also do in-person training courses. I say many, but all RIRs do in-person training courses and have webinars and online training. Next slide, please. It's also important to know how the RIRs are structured. The RIRs are independent. They are not government bodies. They are membership organizations open to Internet number resource holders. Members chiefly tend to be Internet service providers, national research and education networks, universities. Any company basically, any organization, that runs its own internet network and wants to receive IP addresses directly from the RIR is a member. Many governments are members of RIRs. It's also important to know that. Each RIR is not for profit. They're funded by membership fees, and the RIRs are community driven. Policies are set by the RIR communities. It's also important to note the framework within which RIRs operate. They are independent, non-governmental entities, but that doesn't mean it's a free-for-all and we can just do whatever we like. Each RIR is established within a jurisdiction. We have to follow the law of whichever country we're established in. The community actually sets the policies. And then we fulfill a very specific technical function. So it's important that we do our jobs of maintaining accurate data correctly. Next slide, please. Now we come to a whole bunch of very complicated acronyms. We've had RIR, but we're going to talk a little bit about how this works within the context of ICANN. When the five RIRs work together, we coordinate through a body called the Number

Resource Organization. The NRO is the coordinating body for the five regional Internet registries. But because we all love acronyms, the NRO serves as the address supporting organization, the ASO, at ICANN. The ASO has been a part of the ICANN supporting organizations since 1999, and it is charged with reviewing and developing recommendations on IP address policy and on advising the ICANN Board on issues relating to the operation, assignment and management of IP addresses. So NRO and ASO are used quite interchangeably. There are some slight differences. We have some lawyers in the room. You could ask them if you would like to know the precise differences between the NRO and the ASO. But broadly speaking, whether you hear NRO or ASO, we're speaking about the same group of people. It's just that when it's in the ICANN context, it's called ASO. When you hear about them at RIR meetings, we call it the NRO. The mission of the NRO is to contribute to an open, stable and secure internet by providing and promoting a coordinated internet number registry system. So the five RIRs are distributed but ultimately it's one internet. We are operating a joint system. The NRO aims to be an authoritative voice on the multi-stakeholder model and the bottom-up policy process in the internet governments. And it provides a mechanism for the RIRs to coordinate on certain activities. One of our activities right now is reviewing ICP-2, so that's happening with the support of the NRO. But there's also other technical coordination programs like the RPKI program that German will talk about. Next slide, please. I'm sorry, the formatting's a bit mangled, but this diagram is just to show you the role the ASO plays within the ICANN framework if that

is more familiar to you. So it's one of the supporting organizations. And perhaps what's more familiar is you have the ASO AC, the address council, which serves as the NRO NC. And this consists of representatives from each RIR region. There are three representatives from each region. Two are elected, and one is appointed by the RIR Board. All right, next slide. All right, we have the next prize up for grabs. True or false: you can participate in policy development in a regional Internet registry. If you think it's true, raise your hand please. You bring it? If you raised your hand, you got the answer right, and I think [Dinwade] gets the chocolate.

UNIDENTIFIED MALE

[inaudible]

UNIDENTIFIED MALE

[inaudible]

UNIDENTIFIED MALE

We need a policy for that.

ULKA ATHALE

Next slide, please. Indeed. And if you wanted to propose a policy, each RIR has a multi-stakeholder approach. And we tend not to use the word “multi-stakeholder” as much as it's heard in ICANN because it was always done this way. We do not have separate stakeholder groups within RIR communities, but rather we invite everyone into one room to talk about a topic of interest like

chocolate distribution or more likely IP address policy. So whether you're a part of the technical community, academia, civil society, governments, or the private sector, anyone can participate in the RIR policy development process. So to reiterate, typically policy development takes place through a combination of mailing list discussions and RIR meetings. Anyone can participate, and you participate simply by signing up for the mailing list that is of interest to you, following the discussions. Anyone can attend RIR meetings. Some of the meetings have fees to attend in person, but at least for the RIPE meetings, if you participate online, it's free. There is online participation, so you can follow along the discussions. The policies are drafted by the community. They're discussed by the community. The RIRs advise on how they should be implemented and assess whether or not they're actually executable. But everything that happens takes place in an open and transparent manner. So if you are interested, please look up the policies under discussion in your RIR, your region, and consider participating. And when a policy needs to span the whole world, if it needs to be accepted by all RIRs, there is a similar process, the Global Policy Development process, in which a policy proposal goes to each RIR community and back to the ASO and to ICANN and gets adopted globally. Do you want to add anything to that, German?

GERMAN VALDEZ

No.

ULKA ATHALE

Great. And with that, I can stop talking and hand over the responsibility for the last chocolate to German. Thank you.

GERMAN VALDEZ

It's a big responsibility. My name is German Valdes. I'm the Executive Secretary for the Number Resource Organization. And while Ulka gave us the introduction, a little bit of history of the RIRs, who we are, what we do, now we will be talking a little more technical aspects of the resources that we administer. We'll talk about how the Internet works, how those resources fit in the routing system, a bit of network development, and some of the services that the RIRs provides. This session is meant to be an introductory session, so I won't go into details. I'll keep it in a general aspect. And with that, I'll start with a true or false question. This is the last chocolate. This is a tricky one. There are more IP addresses than grains of sand on the Earth. True? All right. Or false? Okay. The answer is true. And the gentleman in the back—I saw that he raised the hand. Sorry, I [inaudible].

UNIDENTIFIED MALE

Who was it?

GERMAN VALDEZ

The gentleman in the back. And the answer is true. One of the two resources, number of resources, that the RIR administers are IPv4 and IPv6. There is roughly 4.2 billion unique addresses in the IPv4

space. And there is another amount of addresses that I won't be able to name, given the huge quantity that represents, but it is considered that there are more IPv6 addresses than grains of sand on the earth. So that was a good introduction to mention that, well, part of the number of resources that the RIR manages are the IPv4 and the IPv6. IPv4 is the original numerical address that started with the Internet. And eventually IPv6 standard was developed. The IPv4 is 32-bit addresses, while the IPv6 is 128-bit addresses; different protocols but with great relevance in the routing and internet. So one important reminder is that IP addresses are not domain names. We, the RIRs, focus on the IP address work. It's what the computers use to recognize and what they use to connect to the Internet. Sorry, next slide. The numbers are what they use it for routing. The DNS is used for people to recognize websites or mail addresses. And they do the mapping from a hostname to/from an IP address. It's easier to remember NRO.net than a group of eight hexadecimal numbers. So that's where we focus is: the numbers, in the numbers world. Next slide, please. So we have IPv4 and IPv6. The other resources that we manage for the Internet community is the autonomous system numbers. Those are unique numbers that are used for exchange routing, identifying a group of IP networks. This is important for different organizations to exchange traffic and change routing. And it's used by network operators to control the router in their own organizations. And as mentioned before, it must be unique, and these resources are assigned by the RIRs. So, that's basically the three resources that the RIRs manages and distribute on behalf of the Internet community. Next slide. And the way that

we manages these in collaboration with IANA is that IANA manages the global unallocated IP address pool. Regarding numbers resources, IANA only has five customers, and those are the five RIRs. They cannot allocate number resources to any other organizations. We are the exclusive customers. Once the RIRs receives the resources, according to the policies established by each RIR community and follow those rules, those resources are distributed in the region. I think there is more in the graphic that needs to be displayed. So the RIRs can allocate resources to an ISP or end users. Eventually, those resources or those spaces can be suballocated to a customer for the ISP. Next, please. Could be another ISP, so it could be end users. And all this process continues. And that's the way that this distribution is, always following the policy that has been established by the policy development process. We are just executing what the community establishes for the management of these resources. All right. Talking about routing, next slide. There are two core functions in the Internet, and here in ICANN you will see a lot about DNS, which translates domain names to IP address. And also they have the reverse process. But also we have the routing process, the routing technology. That is how do we bring a packet from point A to point B. And the RIRs are working to improve the routing technology, trying to bring a secure infrastructure to it, as for the original technology that was defined around in the 80s, they didn't consider security aspects in the infrastructure. Next slide please. So, I'll talk more about how the RIRs are supporting the security and routing, but in a general aspect, the Internet is a cloud. Different devices can

be connected to it. Next slide. If we go a little bit deeper, we will see that there are different networks. It's a network of networks. An organization or ISP might manage their own networks. Could be a mobile, could be a traditional ISP with residential customers that are connected to copper or fiber network or as a [telecom] company that provide connectivity through satellite wavelength. And all these (next slide please) will require specific identifiers, number identifiers, to identify a particular network. They would require an autonomous system number, and each device would require an IP address. It could be an IPv4 or an IPv6 in order to connect to the Internet. That's in general aspects how the RIRs provide these important identifiers to the Internet market. Next slide. Next one. So regarding the IPv4, the last space that IANA manages were depleted back in 2011. This is a picture that marked the event of the last /8, which the minimum space that could be allocated to an RIR. They were finally allocated to the RIRs back in 2011. So, next slide. Eventually, on those spaces that were allocated, that IPv4 space that were allocated to the RIRs, in case of three of them (ARIN, LACNIC and RIPE NCC), they are completely used. And there is a small space still in the pool in AFRINIC and APNIC. But that's why we have been also working in supporting the deployment of IPv6, and I will talk more about that. Next slide. So talking about IPv6 deployment, there are different way to measure how the IPv6 is being adopted across the world. ISOC, for example, has mentioned that around 50% of the IPv6 deployment has been adopted worldwide. And while Google has an estimation of 47, the calculations are around 47 on the global. IPv6 traffic is around that

figure. And that's on statistics of this month. And these numbers increase every day. As per how the RIRs distribute IPv6 space to their members, [there's] another way to measure how the distribution of IPv6 space is gaining momentum across the globe. Around 75% of RIPE NCC customers, for example, have IPv6 space allocated to them. So they are in the position to use those spaces to start to provide services based on our IPv6. In the case of LACNIC, it's almost 100%, and this has to do with a particular policy in LACNIC that any new customer that receives a space, even if they apply for IPv4, receives automatically an IPv6 space. And the distribution of these resources, as mentioned before, depends on how the criteria, the policy, establishes this. But you will have these numbers in these slides that that will be part of the record of this meeting if you want to check it later on. Next. So the IPv6 is gaining momentum. The [IPv6] is rolling out every day. RIR has been involved in capacity building and training to help the deployment and adoption of IPv6. And we have been watching a steady increase in IPv6 traffic and all also IPv6 requests to our registration services offices. But still we have a demand for IPv4. We still have been receiving some IPv4 requests. And for that we started to watch a phenomenon that has to do with transfers. Next slide. We started to see that some companies, in order to get access to IPv4 addresses, started to make deals and negotiation directly with other companies looking for a transfer of those resources. We as RIRs were concerned that all these processes were outside the compliance of the policy. So we worked with the community to establish policies that allow this transfer. Our main concern was to

keep the information in the database accurate. As part of the platform that was developed for this policy of transfer of IPv4 addresses, the RIRs are not privy of the financial information regarding the transactions. We just facilitate the transaction. We just have concerns to keep the records accurate as one of the core businesses and core commitment to the community. Next slide. There is some information in the—we'll leave the questions to the end. Yeah. Thank you. We keep some statistics about IPv4 transfers on the NRO website. We keep information about the amount of transfer, the quantity of transfer and the size of the transfer that has happened. Transfers can be internal within the region and also between RIRs. With exception of AFRINIC, APNIC, ARIN, LACNIC and RIPE NCC can transfer IPv4 resources among them. So of some of the services that the RIR provides, one of the most important is the whois, which is the database I was mentioning that we were concerned to keep accurate with the IPv4 transfer processes. The whois is a public directory service. It was designed in the early '80s. It provides information about Internet resources. It can be domain names, could be numbers, can be routing information. In the particular case of the RIRs, we keep information about number resources. And one important characteristic (next slide please) is that the information of this database of the whois public, is public-accessible. And when you go and check information, a particular number resource, you will find information about the organization that are located in and were assigned [to], with content including contact information. We also keep information from what we label as legacy space. That's this information of the space that was

allocated before the creation of the RIR. We have some timestamp information about when the original record was created, when the location was made, when was the last update. And also we include reassignment information if an ISP makes a sub-allocation, a particular space of their resources. That information would also be included, so re-delegation will include information of what organization and what component context. And that's the information that we provide to the Internet community. Next slide. Now moving to the routing, the RIRs have been working in the deployment of technologies to help to secure the Internet routing. One of the resources is public infrastructure. I will expand more on this. The acronym is RPKI. And this is a security framework. It's based in cryptography, and it helps to improve security of the Internet. That is the main purpose of this technology. Basically, it verifies that a particular set of resources correspond to resource holders. The other technology is Internet Routing Registry. This is a collection of distributed databases that include information about routing announcements. Our concern there is that any update to that database be done by the authorized network. One is based in certification, but the other is more about manual changes. But they work. The ISPs use both technologies, and so we are concerned about the security in both cases. We are also in development of a third technology called ASPA (I won't go in detail on that), which is autonomous system provider authorization. We said it's still in evolution and is the next step in how we help to secure the routing system. Next slide. So the RPKI is a public infrastructure framework. The main purpose of this is to secure the internet

routing infrastructure. It's a system of certificates based on cryptography and basically certifies that a specific set of resources, like numbers and IP addresses, and route announcements as well, belong to a particular resource holder, but also that autonomous system numbers can make announcements of those particular sets of numbers. And this is a strong certification. Next slide. So why is it important? RPKI is still a new level of trust. On one hand, it allows the network operator to have confirmation of that the resource holder actually manages the resources they are going to announce, and it also brings certainty about the announcement they are going to do, of course. And at the same time, it has an impact to limit the misconfiguration mistakes in the routing. It could be by accident or could be also intentional attacks by a bad actor. So that's one of the relevant aspects of the RPKI to help to limit source damage. Next slide. In the NRO website, we keep track of the adoption of the RPKI in different regions. We have this highlighted by Internet Protocol, IPv4 and IPv6. Different regions have different levels of adoption. On the website, also you can find more granular information. You can find adoption rates by economies. So you can find this information in the NRO website. And we update this information on a daily basis. Given the importance of the RPKI, the NRO established a global RPKI program called the NRO RPKI program. The main purpose is to provide a more consistent and uniformly secure, resilient, and reliable RPKI service. This program has provided an infrastructure space for collaboration and coordination among the five RIRs. Before this program, each RIR was working in their own regions in the implementation of the

RPKI. So the program brings a little bit of consistency to the RIR efforts in implementation on a global level and also allows them to address concerns and challenges in an aligned way. Next slide. Talking more specific objectives, the NRO program is helping to improve transparency, robustness and security of the RPKI system. And also it's helping to increase consistency in the user experience in implementation of the different RPKI system and the different RIRs. It provides also information to the technical community regarding the implementation and the advance on implementation of this technology. And just to finalize, we keep some publications on the NRO website. We keep some statistics about the distribution of number resources on the global level. We have a report that is updated quarterly and also some global stats that are updated daily about the distribution of IPv4, IPv6 and ASN. I already mentioned about the adoption report that could be seen by Internet protocol. IPv4 and IPv6 can be seen also by economy, and that information is updated daily. We have a comparative policy overview. You can see in a document how the different policies compare in each RIR, and it has to do with the membership policies and also how the delegation registration services works in each RIR. Finally is an invitation to stay informed. Next slide. You have much more information on each of the RIR websites. As Ulka mentioned, you don't need to be a member in order to participate in our policy discussions. If you have an interest to get involved in how the IP resources and number resources need to be distributed, you can participate on an equal footing with any other organization. Policy discussions are open, regardless of if you are a

member or not. RIR meetings also are open for anyone to participate in if they wish. And that's it. Now we move to the question part.

ADIEL AKPLOGAN

Thank you, German. Thank you, Ulka. We'll take a few questions. I already see hands up in the room. We'll start in the room. [Antoine]?

[ANTOINE]

Thank you. I have three questions, but I'm going to try and make it short. I'm not a technical expert. I work for an international organization. I'm not a lawyer. I'm a political scientist by background, but I immediately see a problem when you mentioned that the RIRs are under national law. In many continents, the law systems are quite diverse. So why should RIRs be submitted to one state of law and not another one? Then the choice of the place where the office will be is of great importance. Has it been thought beforehand? I doubt it. So that's my first question. My second question: I see that the security is ensured by cryptography. Is ICANN dealing with the quantum revolution that is coming soon? I'm based in Geneva, and we had a workshop a week ago for diplomats where the CERN explained to us that the quantum revolution will be into business in five to six years' time. How is ICANN going to ensure the security of the cryptography once the quantum is there? Third question quickly: I understood that ICANN was making policies to allow the transfer of IPv4 addresses from one company

to another. But does the second company have to buy the IPv4 from the first one? And in this case, is it not breaching the rule of a common good? That's it. That's my three questions.

ULKA ATHALE

Thank you. That's—

GERMAN VALDEZ

[We] will answer them and then we will take less because there are three questions.

ULKA ATHALE

Yeah, that's many different questions rolled into one. So let me start with the last one. ICANN doesn't facilitate any IP address transfers. Any IP address transfers take place between private parties. The RIRs only ensure the accurate registration of any IP addresses transferred. IP addresses are not necessarily always in a financial transaction. They could be transferred because of a merger or an acquisition, or a return to the RIR because of a bankruptcy, and so forth. So there are many different situations in which a transfer could take place; and it's not ICANN; it's the regional Internet registry. That was the easier question to answer. Regarding the post-quantum cryptography readiness of RPKI, I think that's something the engineering teams will be looking into. I think they will have to look into this. I see Wout in the room, who presented a report on the EU working on quantum readiness for

cryptographic services. If you want to comment on that, I'm going to let the experts speak.

ADIEL AKPLOGAN

And you can ask your question as well.

WOUT DE NATRIS

Yes, thank you, Adiel. I'll go [inaudible]. Don't take it personally. I'm Wout from [van der Borcht], and I represent the dynamic coalition at the IGF called Internet Standard Security and Safety. And yes, we presented a report in Lillestrom in June on the topic of post-quantum cryptography. And we noticed that there's a lot, lot, lot, lot to do in very, very, very many different areas of the Internet and everything around the Internet. I will be talking hopefully to you later, German, on what we plan to do—sorry—so I'll leave that for now. I have a very different question that (I'm always looking at things from a very practical angle) may not be as easy as it seems. But what about introducing an IPv6 Day on 31 December 2028, and we sort of shut down the IPv4? I know that it's probably much harder than I propose, but it gives you three years to do that. And in all sorts of other parts around the Internet, it's possible to do. So what is stopping ICANN or the RIRs probably from organizing something like that and preparing everybody for this transition step that at some point we have to make anyway? Thanks.

ULKA ATHALE

Wout, that would be great on a T-shirt, but it's the network operators that need to move, right? We don't control the Internet. We manage the registration of the addresses. So if you are a network operator or you run an enterprise network, please listen to Waut.

GERMAN VALDEZ

Yes, my answer is around those lines. It's like an addiction. So network operators are very comfortable with the old protocol. It has been taking a while even for some of them to deploy a IPv6. And it's an important part of the infrastructure in order to maintain the stability of the internet system. IPv4, I think, will still be around for many, many years. Now, regarding the one question, I don't want to miss the first question about why we are submitted to a national jurisdiction. The truth is that the original three RIRs (the APNIC, RIPE NCC, and ARIN) by historical reasons were established in a particular country. It was already operating in those countries. And in those days, the ecosystem of the Internet was not in the mind of the founders of those organizations. They were purely technical community. It was pre-ICANN. It was pre-many of the Internet governance processes they were living in and the complexities of these days. I can talk a bit about the experience of LACNIC because I was part of the establishment of LACNIC, and there was more a pragmatic reasoning behind founding LACNIC in Montevideo. And it has to do with economical reasons because it facilitated the transfer of money from different Latin American countries to the Uruguayan bank system. It was easy to operate in

that sense and manage the membership of the members of LACNIC. It was going to be difficult to have that social facility in another country. And that was one of the main reasons. And also they have laws that allow international organizations to establish in Uruguay. So it also attracted the decision to establish that. But yeah, it has to do with historical reasons that they're in the city that they actually are, to be honest, but as I said, they were different times.

ADIEL AKPLOGAN

Thank you. And I think that is valid for the other RIRs as well. I think, the moment they were being created, the situation at that time were favorable to the choice that made it. But this is a dynamic environment, and things are evolving. But I think the best choice was made looking at the situation at the time, I guess. But it is a discussion that keeps recurring about under which umbrella all those global internet governance entities they should operate. That's different. On quantum computing as well, I think there is a lot of work and thinking that is happening right now. Even the IETF is looking at the post-quantum cryptography. And once those are mature, I'm sure that that is going to be implemented at the RPKI level, at the DNSSEC level, or other cryptographic implementation level. But I think it's a little premature to start looking at the real implementation, looking at the impact, operational impact. And there is still plenty work being done all around to make sure that it

doesn't impact the infrastructure globally. There is another question?

TINUADE OGUNTUYI

Thank you, everyone. My name is Tinuade Oguntuyi from Nigeria, an ICANN Fellow. Okay, while you were sharing the slides, I took note of the [place] you said. All of the registries, the regional registries got the last slash-eight. So I'm curious because I work in an ISP in Nigeria, and many years ago we were even getting our public IP address through RIPE NCC, meaning AFRINIC was not even in the picture at all. I understood through one of the sessions before now that these IP addresses were not evenly distributed. I'm just curious to know, for knowledge update, why. That's one. Secondly, you said, for the transfers, AFRINIC is not allowed to transfer. Is there any reason for that? Thank you.

GERMAN VALDEZ

For that last question, it has been the decision of the AFRINIC community not to allow transfer outside AFRINIC. It's part of the policy development process.

TINUADE OGUNTUYI

But it does happen, right?

GERMAN VALDEZ

It's a policy.

TINUADE OGUNTUYI

But it happens.

GERMAN VALDEZ

Yeah. To avoid it, yeah.

TINUADE OGUNTUYI

No, I mean, it happens even though it's not allowed.

GERMAN VALDEZ

It's not allowed.

TINUADE OGUNTUYI

But it's happening.

GERMAN VALDEZ

Well ...

TINUADE OGUNTUYI

So that's why I said it's just for knowledge update. When these IPs were not evenly distributed, is there any reason? Because, you know, we were even late adopters when it comes to ... because I know then we were doing that not until Interpol came because we got just slash-23 from RIPE NCC, and we're [not in] for all the customers. But when there was an infringement, Interpol came, we were forced to now go to AFRINIC properly and get our own /20 block. And I know most developed countries ... We even have

maybe the likes of 18 larger blocks. Why was AFRINIC given maybe lesser? You get what I mean. Thank you.

ULKA ATHALE

I don't have the answer to that.

GERMAN VALDEZ

Me neither. Yeah, I think it's a question for AFRINIC. Thank you very much.

UNIDENTIFIED MALE

As already mentioned by German, we have developed some policies in the AFRINIC region to restrict the transfer of IP addresses out of the continent. We have to consider some local reality, as already mentioned by some presenters at the beginning. AFRINIC received only less than 3% of IPv4 block addresses. And we are observing expansion of digital infrastructure in Africa that still required IPv4. So it is a common decision to give the opportunity to the continent to develop its digital infrastructures, but it's on pace. But the community members are fully aware that we have to shift to IPv6, but that should be done according to the local realities. So this is what I can tell you. And so far, the community developed some policies. And this question is already on the table. And all Africans are aware of that. But we have to move at our own pace and then shift to the IPv6. I heard somebody telling me that we need to close down all the IPv4 infrastructure and move within three years. Okay, IPv6. I'm not the community. We as AFRINIC are

the secretariat, so what will decide the community will be implemented by AFRINIC. But so far, we are taking in consideration the reality of the continent. So we have to give opportunity to the newcomers to benefit from IPv4 to develop the digital services. This is what I would like to [offer].

ADIEL AKPLOGAN

I'll add something as well, maybe a clarification. Although it looks like it's not evenly distributed, as German mentioned, IP addresses are distributed on a need basis, right? So need goes and plays a role in the distribution itself. But he also shows something which is critical: the fact that each region has an RIR. At the end of the [exertion], at the IANA level, the last slash-eights were evenly distributed across the five RIRs, including AFRINIC. So that's another level of ... although on the usage basis it's not evenly distributed, on the global policy level there are a lot of mechanisms that allow the distribution [to the RIRs]. Question from online, Champika? No question. Okay, good. Thank you very much, German. Thank you, Ulka. Thank you for that. And also, thank you for making it interactive at the beginning with the chocolate. That was very interesting. Thank you very much. We really like this session at ICANN. It gives the opportunity to interact and talk about the RIRs when it's not always talked about. So thank you, and we'll look forward to more sessions like this. Thanks.

[END OF TRANSCRIPTION]