
BARCELONA – HLG: The Internet Technological Evolution and the Role and Impact of ICANN

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MANAL ISMAIL: So ladies and gentlemen, welcome back. If you can please start taking your seats, we'll be starting in a minute.

Thank you.

And may I also invite the panel, the speakers and the invited discussants and the moderator to the panel, please.

Thank you.

So, please, if you can take your seats. We're starting immediately. So welcome.

Welcome back, everyone. I hope you had enjoyed your lunch. And please allow me to introduce the chair of this session, Mr. David Cierco, Director General of red.es.

Over to you, Mr. Chairman.

DAVID CIERCO: Good afternoon. First of all, I would like to thank you all for staying with us, especially due to time of the day. It has been a very intense day, and I'm sure it has been very enriching for everyone.

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.

I would like to apologize on behalf of the Secretary of State, Francisco Polo, who, due to other commitments, has had to leave and will not be able to join us for this final session.

We are going to begin the afternoon session with a piece de resistance. During the next hour and a quarter, we will address the technological revolution and its impact on Internet and society. The emergence of new technology such as blockchain, the Internet of Things, 5G, and artificial intelligence are factors that are changing the global architecture of the Internet and society in a transcendental way. "The Internet Technological Evolution and the Role and Impact of ICANN." I would like to give way to the moderator of this system, David Redl, Assistant Secretary for Communication and Information, and Administrator National Telecommunication and Information Administration, U.S. Department of Commerce.

David.

DAVID REDL:

Thank you, Director General Cierco, and -- for the introduction, and I'm honored to be here as the moderator of today's panel.

Today our session will explore the impact of the technological evolution on ICANN and the Domain Name System. We'll hear from distinguished colleagues in government as well as subject matter experts and an invited discussant.

To start the discussion I'd like to talk about how the United States sees the future of the Internet. For us, it all starts with security. To put it

simply, if the Internet is going to continue to grow and thrive around the world, users need to be able to trust that the devices and networks they use will be secure. Technology is becoming more complex and more integrated into our daily lives, and that raises the stakes for the work that we do to ensure that building in security measures is priority number one for all Internet-related companies.

At NTIA, the agency I lead, our work on cybersecurity and privacy initiatives seeks to give companies and consumers confidence in our connected future. We have convened stakeholders to improve the processes around disclosing vulnerabilities in software as well as patching Internet of Things devices just to name two examples. Right now we're in the middle of a process that is working through the potential of software component transparency so that companies that are looking to integrate Internet of Things devices can better track and fix vulnerabilities.

All of our cybersecurity work is aimed at getting the incentives right so there is a market for secure devices. If the least expensive option is also the least secure, consumers need to know what that means for their security and safety.

Our security-focused mind-set is also a big reason why the U.S. is adamant that ICANN and the community develop a universal mechanism that permits lawful access to WHOIS information. WHOIS is a vital tool for cybersecurity, law enforcement, consumer protection, and the enforcement of intellectual property rights. You can draw a straight line between allowing lawful access to WHOIS information for

these purposes and ICANN's bylaw commitment to preserving and enhancing the operational stability, reliability and security of the Internet.

Security will also be a major factor in the expansion of the Internet in the developing world. Increases in connectivity, technology, and digital commerce shouldn't mean that you have to accept greatly increased risks. That would only incentivize staying in the 20th century.

Our digital inclusion work in the developing world will be an essential test of our ability to establish trust in networks and technologies. Equally important, people around the world must be able to trust institutions, like ICANN, that make decisions about the Internet's future. People need to feel confidence that participating in ICANN is solely about our working toward our shared goal to expand connectivity and preserve a culture of digital innovation that benefits all.

While the community has greatly improved ICANN's accountability through the IANA stewardship transition process, there are still improvements to be made. As one example, we need safeguards to ensure that ICANN staff and leadership are not only grounded ethically in their professional actions at ICANN but also in their actions when they see clear opportunities outside of ICANN. One potential fix could be cooling-off periods for ICANN employees that accept employment with companies involved in ICANN activities and programs. This is an ethical way to ensure that conflicts of interest or appearances of unethical behavior are minimized.

With all that in mind, I'm excited to be in our discussion today on the role that ICANN and other DNS organizations play in creating more security, stability, and resiliency as the Internet continues its remarkable evolution. Thank you for having me here today and with that I would like to take this opportunity to introduce David Conrad, the Chief Technology Officer of ICANN.

DAVID CONRAD:

Thank you, David.

[Applause]

So I have prepared a set of slides, if those can be brought up. Hopefully.

And I'll try to avoid making a computer nerd joke about aggregating all the Davids together.

So this is a perspective on the topic of Internet technological evolution and the role and impact of ICANN from the Office of the CTO that I head up at ICANN.

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So just to sort of level set. ICANN's role in the context of Internet technology, ICANN is a body that helps coordinate the topmost level of the Internet's system of unique identifiers, domain names, which you're all familiar with which is what people use, IP addresses, the Internet addresses IPv4 and IPv6 which are primarily used by computers, and then protocol parameters, which are used within the protocols that connect the communications among those computers.

ICANN's policies aim to ensure the security and stability of the identifier systems. That's the number one item in our mission, and we do that via contractually mandating conformance to Internet standards and helping to ensure uniqueness of the identifiers that we help coordinate.

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The impact that ICANN has in the context of Internet technology. Most of the impact we have is through the policy investment, contracts, and agreements that we enter into. We have a Contractual Compliance Department that ensures that contractual obligations are met. Many of those obligations are related to security and stability.

We provide services in a reliable and secure fashion to our customers. Folks like the domain name registries, including VeriSign, who handles com, net, and a few others. ccTLD registries like .JP, JPRS and a whole bunch of others. There are now about 1500 registries -- 1500 top-level domains that we provide services to.

We also provide some services to the Internet -- the Regional Internet Registries. These are the bodies that hand out Internet addresses, typically to Internet service providers, that are then handed out to their customers to allow connection to the Internet. Those are AfriNIC, APNIC, ARIN, LACNIC and RIPE NCC.

We also provide services to the standards development organizations, like the IETF. We primarily work with the IETF to record the parameters that are used within protocols that allow people to interconnect their computers on the Internet.

These contracts and agreements will continue to evolve with the technology. The best example of that right now is the requirements that -- the contractual obligations that we have with the generic top-level domains to move from WHOIS to a new protocol known as RDAP which stands for Registration Data Access Protocol. RDAP is a much better rollout protocol in almost every way but in particular it allows for something known as differentiated access so that people can specify credentials, identifying who they are and gain different access to the registration data. This, if properly implemented, could help alleviate some of the concerns that have been associated with GDPR.

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ICANN's role in terms of technological evolution. I've sort of broken Ken this into two parts. There's a near term and a long term.

In the near term, in the context of names, ICANN will continue to support the continued evolution of the underlying technical protocols. There are minor changes that are being made to improve the performance of the Domain Name System, to improve its security, to provide additional functionality.

We're also improving the infrastructure that ICANN is directly responsible for. ICANN runs one of the 13 root servers, and we're continuing to work with the root server community to make sure that the root servers are able to withstand the increasing risk of attack that is being found on the Internet these days.

We have a role with the implementation of RDAP, the Registration Data Access Protocol I mentioned earlier, and we're providing some infrastructure to allow for that to be rolled out.

We work with the IETF, the Internet Engineering Task Force, and the Internet Architecture Board in a particular area within the DNS known as the address and routing parameter area that's used by protocols to share information. And we will continue to provide the IANA, the Internet Assigned Numbers Authority functions, to those communities to enable the continued growth and functioning of the single global -- globally interoperable Internet.

On the addressing side, our primary role is to support the Regional Internet Registries. We are trying to do what we can to support the promotion, deployment of IPv6, and we will, as appropriate or necessary, facilitate the deployment of routing system security. Right now, the routing system is relatively insecure, but the Regional Internet Registries and Internet service providers are working to actually improve that.

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Looking towards long term. ICANN is community driven. The organization is responsive to the community. That's actually enforced by the empowered community that was a result of the transition.

We will do what we can to facilitate changes in the underlying technologies, including things like decentralization of services, happened privacy, security improvements. In this area there are a

whole bunch of buzzwords that come and go with the seasons. The ones that are most popular these days are things like blockchain, 5G, AI, IoT, big data. There are a whole bunch of others. My team within the Office of the CTO is continuing to research all of these technologies, aiming to provide information to the community as to the implications and uses of those technologies within the ICANN sphere of operations.

But ultimately, the DNS and Internet addresses are only tools. They facilitate the communication. If new tools come that are better or are more able to meet the requirements of the community, then we will work towards evolving towards those new tools.

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The guiding factors in that evolution from OCTO, ICANN's Office of the CTO's, perspective are, number one, to be reactive to the community, but also keep in mind the concept of the network effect. And the network effect is easily described as when a network effect is present, the value of a product or service increases according to the number of others using it. This implies that a single interconnected network is better than multiple discrete networks.

So in ICANN's mission of providing a secure and stable -- secure, stable, single, interoperable global Internet, security and stability take precedence, but the single, interoperable and global aspect facilitates the greatest value for the users of the network. And with that, next slide. I will hand it back to David.

DAVID REDL:

Thank you, David. We appreciate the value of your extensive expertise in this area and some clarity on the role of ICANN's processes, their contracts, and the relative players in the ICANN community with respect to the development of the Internet and the protocols that underlie it.

With that I'd like to introduce Tripti Sinha who is the Chief Technology Officer at the University of multistakeholder where she also leads the advanced cyber infrastructure and Internet global services work.

So, Tripti, the floor is yours.

TRIPTI SINHA:

Thank you. I need a slide deck. Yes, next slide, please.

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So could you expand that?

So I'm going to tell you, very quickly talk about how current Internet technological evolutions will impact ICANN. And I like to tell the story in the context of yesterday, today and tomorrow. And the one thing that's been said repeatedly, and you probably heard that in the morning, is that it's amazing how quickly this innovation cycle has been moving through humankind. And when history is written and we write about this duration in history of the Internet innovation and revolution, you will realize that yesterday, today and tomorrow is, indeed, very small.

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And as has been said all morning, the growth of the Internet has been absolutely staggering. And when you look at it a while back, which was, believe it or not, in the 1950s and '60s, there really was no network. And as you know from the '60s down to the '90s when things were beginning to get commercialized and today where we have roughly 4 billion connected hosts, and we're looking to grow at a tremendous pace. And the number that I show you on the screen here is rather small, and it's going to be hockey stick, and we know that. And so this is absolutely staggering. When you look back at just innovations in human life, when the printing press was invented in the 1400s and you look at the steam engine that powered the industrial revolution, nothing was as impactful as the Internet has been to all of humankind, and today we are up close to 7 billion.

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So this is how ICANN and Internet came to be. I think most of you know the story, but the Internet was commercialized. DNS gets monetized, lo and behold, what do you need? You need something to be coordinated, and that is the DNS system, the addresses and IP addresses, and hence ICANN was born in 1998. And this was all because of this development of what we call the Internet.

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So what's on the horizon? David just said there are lots of but words and I'm going to tell you a little bit more about those buzzwords and I'll start at the very top. So this is what's on the horizon and it is, indeed,

in my opinion an inflection point in the innovation cycle. So I'll start at the 12:00 arm at the top of the circle and I'll go clockwise.

So the Internet of Things as you know are just devices that are designed for certain purpose, and they can be enterprise driven or can become consumer devices. And in the effort to rush to market, the one thing that is forgotten is security. So that introduces an entirely new attack vector into this thing we call the Internet today. And it is enhancing, enabling our day-to-day life, but that is something that's happening quickly. 5G mobile, as most of you know, is the next generation in mobile communications, and it is the power of 5G will spur the growth of Internet of Things devices that are scattered around the world and around the Internet, and that leads to sensor networks which are purpose-built ad hoc networks that do various and sundry things like monitor the environment and pressure and temperatures and so forth. And this leads you to blockchain, yet another emerging technology. It is what I call representation access technology which is how do we represent data digitally? And one way we do it in our world, in the DNS world, is the way DNS is represented. There's some hope that blockchain could potentially be applied to DNS so we need to keep our finger on the pulse of that technology.

And with all of this comes big data. You've heard of the instrumentation of science. Just about all kinds of disciplines today have instruments that do the science for them and they're all Internet enabled. And what do they do? They bring down lots and lots of data.

For example, the astronomers are scanning the skies. You know, the geneticists, the DNA sequencers. They're all Internet enabled. They're all bringing down lots of data, and data comes in two forms. We have what's called big data, dense data, elephant flows and we've got big data in the form of tiny packets but in many, many numbers. Things that happen at point of sale where they're capturing credit card data and they're doing studies and analytics on consumer behavior. So there's all kind of data that's coming down as the Internet grows, and with data, as has been said numerous times, is the issue of privacy and security and so forth.

And then the other big thing is artificial intelligence and machine learning. This is not something new. This is talked about 30 years ago. I took classes in neural networks and artificial intelligence. At the time, the time was not right. The technology surrounding it couldn't enable it, but today GPUs and CPUs are so sophisticated. Input technologies. Voice activation is very advanced. The power of the Internet where it's bringing all kinds of data. So if you look all the data that's brought in, fed into these very powerful machines that now think like humans and they can make decisions based on the data that they're provided. So this is actually the perfect storm of innovation that's occurring, and we will see a highly complex, more connected Internet, with all kinds of intelligent behavior. And in the future who knows what's going to happen? And I will put one word out there. It could potentially be a buzzword, but keep your finger on the pulse of quantum computing and quantum networking. I believe that's probably a decade away, but that

could potentially completely change the landscape. So this is what's on our horizon.

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So the stuff that I just talked about, at the application layer, the user interface layer is very exciting for the user, but what's happening at a very fundamental layer of the Internet with packets are flowing. It's a single event that happens there which is packets say get me from point A to point B. That's it. And there are and trillions and trillions and trillions of such packets that are traveling a fiberoptics and wireless spectrum. So that needs to be -- The integrity of that transmission needs to be maintained.

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So in this potential horizon, what happens? The Internet grows. Clearly it's going to grow. The address space grows. The identifiers grow. Policy coordination doesn't go away. It needs to continue to be enhanced. And security. We introduce very interesting things with security. The risk of attacks. And oftentimes, security is an afterthought. It has to become a forethought. And as you've heard numerous times today, privacy is an issue.

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So what are the underlying principles that need to be preserved in the future? So to support this key transportation, which is get me from point A to point B, identifiers have to be unique. You absolutely have to preserve that. And the integrity of the event is preserved only by using

a single unique namespace. So it's absolutely critical, no matter what evolution occurs, we have a single namespace. And the coordination will continue, and of course security is ever-growing.

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So the impact on ICANN is essentially that the integrity of resolution coming from domain name to IP addresses, they need to march lockstep with the scale and increased complexity of the Internet. It's going to be bigger, it's going to be more complex, and there are going to be more attack vectors. We just need to ensure that that integrity remains.

DNS root services, which is part of the DNS resolution, needs to scale and evolve potentially. And one thing I believe needs to happen is you bring the resolution closer and closer to the client. And if I can use a metaphor, today when you make a phone call on your cell phone, your address book lives on your cell phone. So even in the Internet world, we probably have to bring it closer and closer to the client.

And of course as I said, you know, the new -- the security profile and risk profile, it's shifting. We need to keep our fingers on that landscape.

And as David just said, the delivery of ICANN's mission in this multistakeholder model is going to grow in scale. So ICANN itself will need to adjust and adapt to this growing, changing Internet.

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I believe that might be my last. And yes, thank you.

DAVID REDL:

Thank you, Tripti. Appreciate that. We appreciate your experience on -

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[Applause]

-- what's next for the technologies that are enabled by the Internet and what those technologies mean for the Internet itself as well as the principles that should guide us as we look to the Internet and ICANN's collective futures. So thank you very much.

At this point we'll move to the portion where high-level officials will be begin their interventions. At this point I'd like to recognize Director General Yoshida from Japan who will be recognized for an eight-minute intervention.

MR. YOSHIDA:

Thank you, Mr. Chairman and distinguished (indiscernible), ladies and gentlemen. It's my great pleasure being here today to make remarks on the development of the Internet. So I'm from the Ministry of Internet Affairs and Communications of Japan, MIC. And we are living in a world where major changes. As economic growth advances, our lives become more enriched. At the same time, energy consumption and food demands are increasing, and the human lifespan is increasing.

On the other hand, our economic growth, it's getting more complicated to address social changes such as environmental issues, food issues, aging population, rural disadvantages and so on.

These issues would be a byproduct of the growth since industrial revolution. With the current social system changes, it's quite difficult to satisfy both the economic growth and the solution of social challenges at the same time.

I would like to emphasize the new human-centric society called Society of 5.0 in Japan where cyberspace and (indiscernible) space are (indiscernible) integrated and converged. Japan intends to solve various social challenges that have not been solved ever before by integrating the digital innovation such as big data, AI, and (indiscernible) economy (indiscernible) into social lives.

In Society 5.0, as AI becomes more popular, one AI system will be connected to other AI systems over the Internet. Then networked AI systems will be imagined torrent in the near future. The Internet remains quite important there.

The DNS system, one of the themes of this session, is transparent for its users, but it is a very fundamental core of the Internet and its role is of considerable significance.

It has been more than 30 years since the DNS system was designed. Thereafter, the DNS system has been working consistently all over the world and its security function has improved.

We also expect the stable operation and development of DNS in the future.

We think emerging technologies and innovations to be derived from them will change the world address query. Most of them depends on

the stable Internet and its enduring freedom and they will interact with both cyberspace and future space.

From this viewpoint, the importance of ICANN will definitely increase where multistakeholders have developed policy and the core of the Internet.

We believe the multistakeholder approach will continue under the circumstances, though it should (indiscernible) and getting complicated.

The next ICANN meeting in March will be held in Kobe, Japan for the first time in 18 years. Kobe is also known as the place where INET '92 was held. INET '92 was a historical conference where the commercialization of the Internet was discussed. It's our great pleasure to invite guests to such a place.

Thank you for your kind attention.

[Applause]

DAVID REDL:

Thank you, Japan, for sharing your vision of Society 5.0 as a consumer-focused era in human development, particularly your vision on interconnected AI.

With that I'd like to recognize next Undersecretary of Development from the Ministry of Modernization in Argentina, Mr. Hugo Miguel is recognized for the next intervention.

HUGO MIGUEL:

Argentina speaking. Thank you. Let me begin by thanking ICANN and Spanish Government for opportunity to hold this meeting here.

Argentina, in terms of interconnection and network development, has been working heavily on taking technology to the last mile after completing a national program with more than 30,000 kilometers of extension. So we are trying to connect all citizens. In parallel on the infrastructure side, looking forward into the future of Internet, we are coming up with an initiative to support the migration to IPv6, and we are also assessing the impact of this routing for going into the Internet of Things. That of course is going to result in a new way of dealing with domain names, and we need to assess the impact that this will have on future networks.

In the field of 5G, we are assessing the frequencies that are going to be used or can be feasibly used for the adoption of the future networks and especially we are concerned in the area of blockchain to standardize access times in order to provide time stamp in the proper manner. So we need to integrate the national time zone service with the network timing system. These are priority elements to provide the necessary infrastructure for the system to work on interconnection.

In terms of interconnections, we are also working on the development of new rules for signaling, given the migration from legacy networks from R2 or SS7 in order to take them to the IP signally in a comprehensive manner. That is basically a summary of what Argentina is considering to do in the field of infrastructure, and we need

interaction at the global level to make sure that the network can be interconnected.

Thank you.

[Applause]

DAVID REDL:

Thank you, Argentina, for that discussion of the challenges we have in addressing and in routing, and particularly your vision of how we can see that moving forward.

At this point, I would like to recognize Mr. Pearse O'Donohue from the European Commission, director of future networks at DG CONNECT.

So, Mr. O'Donohue, you are recognized.

PEARSE O'DONOHUE:

Thank you, Mr. Redl. Thank you, ladies and gentlemen.

I think it's essential when we're looking at how new technologies -- as said, either blockchain or AI or other things -- or changes in Internet use, such as IoT, will impact on the DNS. And we must also look at the wider ecosystem surrounding the DNS.

I think Ms. Sinha gave us the full list of technologies already, so I'm certainly not going to pretend to be able to repeat that, but we should be aware of work being carried out that will use, for example, use blockchain to depart from or at least build a wider environment around the DNS base system or work that's being done on data registries as an

alternative way, perhaps an alternative to IP addressing. And those are certainly challenges being put forward by technologists with regard to what is the DNS system but I think we need to look at, actually, the drivers coming from the use of Internet itself and from society.

The Internet grew organically and started thanks to the work of some brilliant visionaries, and they were actually referred to in the opening session of this meeting, of the ICANN meeting this morning. But despite its huge contribution to economy and society, it has given rise to increasing concerns. You said yourself -- David said that the United States policy was predicated largely on security. Security and privacy are now huge issues and the lack of trust that has developed in certain segments of the Internet, with also then problems to do with the concentration of economic or technical power, silos, lack of interoperability.

And then elements of society or elements of the world who appear to be losing out on the positive socioeconomic transformation that the Internet can bring.

So we have the risk of a digital divide, and that is really which the -- the elements which should look and instruct us as to how we will deal with these new technologies, the new technological evolutions, and, if and where necessary, depart from the market-based approach. And as I say, if and where necessary in order to ensure that those concerns do not actually bear fruition.

In European Union we are looking at a policy called Next Generation Internet. Now, we're not going to win any prizes for original branding

with that name, but hopefully we will eventually win some applause for our efforts to tackle the issues underlying this policy. It's how we respond to the challenges to the drivers that I just listed very briefly, with a goal to achieve a human-centric Internet. That is to say, an Internet where the user is very clearly in control of his or her environment. And this brings us back, then, to the technologies. What are the technologies that, certainly they're there, which may be challenging the current environment, but how can we actually, through cooperation, through technological research but also through standardization perhaps, shape to a certain extent the growth of these technologies in order to achieve our goal for the human-centric Internet.

They don't necessarily require changes to the basic architecture and certainly we're not proposing or saying that that should be the case. That should be a natural evolution from technology in the market. But we should be much more aware of the implications of any of those technologies.

So that we use artificial intelligence, we use the Internet of Things, we use interactive technologies to create an Internet which is much more inclusive -- including, by the way, even in the European Union very important for us that it be much more multilingual -- that retains the best elements of the Internet, and we all know that there are a lot; that it be open and transparent, to create a global, social sphere.

So while we don't pretend to have the answers to the questions that are put, nor are we in control of the technological evolution,

particularly I think it is relevant for the GAC in this environment to be considering how can policy, where we collaborate very closely with industry and with the other stakeholders in this community, how can that inflect on and shape technological evolution.

Thank you.

[Applause]

DAVID REDL:

Thank you, Mr. O'Donohue. We appreciate you're elucidating for us the EU's vision of an Internet where security, trust, privacy and new technologies are all consumer focused and focused on the end user.

All right. Next on our interventions, the Honorable Peter Shanel Agovaka, the Minister of Communications and Aviation from the Solomon Islands. Mr. Agovaka, you're recognized.

PETER SHANEL AGOVAKA:

Thank you very much, Mr. Chairman. Since this is my first time to attend and speak on an ICANN meeting, may I first of all acknowledge the traditional owners on whose land we are privileged to hold this meeting.

Secretary of State of Spain, Francisco Polo is not here. I acknowledge your earlier presence. The ICANN CEO, government ministers, government officials, ladies and gentlemen, I bring warm greetings to all of you from the government and people of Solomon Islands.

It is both an honor and pleasure to be here at this High-Level Government Meeting, and I would like to convey my sincere gratitude to the government of Spain for extending an invitation to my country to attend and participate in this very important meeting in your beautiful country.

Solomon Islands have experienced challenges in our telecommunication development, but at the same time we appreciate the benefits and opportunities that Internet has provided in terms of social and economical developments.

Despite the challenge and implications of Internet technology evolutions, Solomon Islands will continue to pursue and embrace this phenomena, in collaboration with private sectors like ICANN, to ensure development now will continue to harness and maximize Internet connectivity and services for all our citizens in the future.

I am optimistic. I'm optimistic that technical support and advice will continue to be provided by ICANN. The cooperation between ICANN and my government is important to look at the challenge of policies and what role my government play in the Internet governance. The role and impact of Internet technological evolution on ICANN are important consideration, as has been described by one of the panelists. The evolution effects -- also effects my country, and my government must put in place effective policies and legislation to ensure security.

ICANN support is not new in my region, and I'm pleased to acknowledge that the deployment of the Domain Name System

security extension for my country was an outcome of the DNS workshop delivered by ICANN and other international organization.

I believe my ministerial colleagues for my region will support my call to ICANN to keep its outreach program and assistance available and to continue effectively to provide tangible benefits to curb some of the challenges that we in small island states in the Pacific region faces with regard to Internet technology. I'm also aware that public-policy discussions are taking place and are ongoing during this ICANN meeting and at Governmental Advisory Committee, GAC level of ICANN.

On the release of the country's top-level code at the second-level aspect, I commend the work of -- the work progress and led by Brazil and ICANN. I'm grateful that this has provide clarification for my country in order to reduce the opposition to ICANN to GAC.

Ladies and gentlemen, I look forward to the outcome report that will come out of this meeting, and I thank you one and all.

DAVID REDL:

Thank you, Solomon Islands for that balanced vision of the risks and opportunities we face as the Internet progresses and your optimism in the structures, including ICANN, that have brought us to this point. I'm particularly pleased to hear of your adoption of DNSSEC as a result of your engagement in the multistakeholder process. So thank you for that intervention.

Our next speaker is Dr. Daniela Bronstrup who is the Deputy Digital Director -- I'm going to get this wrong. Deputy Director General for

Digital Policy, Postal Policy, International Affairs and Media for the Ministry of Economic Affairs and Energy in Germany.

Dr. Bronstrup, you have a title that is even longer than mine, so I appreciate that. You're recognized.

DANIELA BRONSTRUP:

Thank you, Chair. Indeed, yes, it's long.

Excellencies, ladies and gentlemen, first of all let me stress that Germany strongly supports the multistakeholder approach. The multistakeholder approach is a driving force for innovation and for stability of the Internet. And having in mind new technologies -- for example, IoT -- with much more devices connected than today, it is even more important to guarantee an open, secure, reliable and truly global Internet.

The dynamic technological developments show once more how important it is that ICANN provides the platform for the different stakeholders to work together. And as Tripti said, the model will have to grow.

For this reason, and to further support this multistakeholder approach, Germany applied to host the United Nations Internet Governance Forum 2019. We are proud and delighted that it will be taking place in Berlin in November 2019.

The significance of the multistakeholder approach and the IGF was recently flagged up by U.N. Secretary-General Antonio Guterres when

he established the U.N. High-Level Panel on Digital Cooperation. The work of the new U.N. digital panel goes hand in hand with the Internet Governance Forum and will feed into the preparations for IGF 2019.

I'm sure that technical issues like blockchain and AI will be discussed during the preparations and also in IGF sessions as they are discussed and will be discussed by ICANN.

In addition, let me say that the City of Hamburg together with the German Internet Industry Association will host ICANN 69 in autumn 2020.

I very much hope to see many of you at those multistakeholder events in Germany, and we will work very hard to provide the same hospitality as our Spanish colleagues do here. Many thanks to Spain for organizing this event.

Thank you.

[Applause]

DAVID REDL:

Thank you, Dr. Bronstrup, for your strong support of the multistakeholder process, and of course for hosting IGF in 2019 and ICANN in 2020. We look forward to joining you at those events.

Our next speaker is Deputy Minister Amir Nazemi from the -- he is the Deputy Minister of ICT and the head of the Information Technology Organization of Iran.

Deputy Minister, you're recognized.

AMIR NAZEMI:

I would like to extend my high regards and thanks to the government of Spain for kindly hosting the ICANN and all meeting. Unilateral sanction known as or Unilateral Coercive Measures, or UCM, are clear examples of violation against fundamental rights of the most vulnerable people. Sanctions target infrastructure of the country under sanction and violate the right to life, health, peace, and development, all of whom are considered as civil rights of the people. Sanctions are also contrary to the economic, social, and cultural rights. UCMs violate the right to development in general, and the development of ICT in specific. In 2017, Amazon was under potential investigation for selling \$300 worth of consumer goods to an Iranian.

Unilateral interventions of countries such as United States have stopped not only the flow of money and exchange of goods by other countries but also the fully flow of data and information. U.S. sanctions on technology export to Iran prohibited the exportation, re-exportation, sale or supply, directly or indirectly, from the United States or by a U.S. person, wherever located, of any goods, technology or services of Iran. This even included a prohibition on the provision of Internet access by U.S. persons to Iranians.

Iranian software developers cannot supply their products on app stores or Google Play. Also, no Iranian individual can access any of the products of the Adobe, AMD, (indiscernible), McAfee, et cetera, and

some Google, Microsoft, (indiscernible) or ICANN services or web services from an IP address from Iranian origin.

Even the software necessary for medical equipment are not exempted from the sanction.

In the last couple of month, various Iranian startups applications have been removed from app stores and Google Play. Such restrictions have faced Iranian startups with new challenges and barriers in promoting the life quality of Iranian citizens. Restriction to people, access to knowledge unilaterally by country violates the right of free access to information.

In the real world, ETNO sanctions target peoples, not government; such, these sanctions get the fair opportunity for all citizens and enforce the digital gap in the international society. We have to make sure that all people, including the Iranian people, get their fair chance for development and utilizing from fundamental services. Fairness in allocation of unique Internet identifier is a natural path that must be provided without discrimination.

We hereby support a force by several GAC members to ensure that ICANN would expand immunity from U.S. jurisdiction and raise ability to resist all such sanctions against other nations and countries. Nothing would be more harmful to the functionality of ICANN than putting arbitrary limitation to the free access to Internet, data, and information by certain countries for illegitimate political purposes.

Thank you for your attention.

[Applause]

DAVID REDL:

Thank you, Iran.

Our next speaker is Mr. Edmunds Belskis, the Deputy Secretary of State of the Ministry of Environmental Protection and Regional Development in Latvia.

Deputy Secretary, you're recognized.

EDMUNDS BELSKIS:

Yes.

Excellencies, ladies and gentlemen, at first, I'd like to thank Spanish government and ICANN for leadership and excellent organization of ICANN 63.

We believe that primarily technological development must serve needs of citizens including all needs of society. That will promote not only the classical use of Internet but enable the oral Internet of Things environment development. With that we also see challenges to the classical HTTP and DNS protocols, as we all have many more millions, if not billions, of services.

Another point we believe that ccTLDs will continue to play a crucial role in the future, especially in shaping local communities identities. For example by providing domain names, registration in local languages or by raising awareness of DNS-related issues. The question is how ccTLDs

should be governed to maximize their positive impact. In our opinion, it should be done. We as active involvement of all stakeholders. When it comes to blockchain-based DNS-systems, we could potentially see an added value when it comes to issue like censor and DDOS attacks. However, more experiments and tests are required.

Also further discussions are needed on whatever. We should be ready to more decentralize solution as blockchain is in essence peer-to-peer system. What would be the role of ICANN in such model?

We are facing another challenge. Browser windows and large corporations take over DNS resolutions, there is a risk that only a handful of companies will provide DNS resolution services.

That will inevitably lead to centralization and concentration of important data in hands of those few players.

In Latvia we strongly believe no matters in which direction technological evolution goes, we expect the Internet will keep working and ICANN is a guardian of security, stability, and resilience of the DNS. It can't be done in isolation. Multistakeholder engagement needs to be sustained, nurtured, and enhanced. Thank you very much.

[Applause]

DAVID REDL:

Thank you, Latvia, for your discussion of the challenges those protocols will face as we expand the number of devices on the Internet and your faith in the multistakeholder process and ICANN itself.

Our next speaker, Ms. Claudine Kariger, is the senior policy advisor at the prime minister's office in Luxembourg. Ms. Kariger, you're recognized.

CLAUDINE KARIGER:

Dear heads of delegation and colleagues and I also want to thank the Spanish colleagues for hosting and for organizing the ICANN meetings and the meeting today.

We all know the most promising technologies and consumer trends on the horizon, like already mentioned before -- Internet of things, augmented reality, artificial intelligence, enabled devices and services.

We also know that they point to scenario with a massive increase of DNS demand because of the quantities of new devices and because of the amounts of data traffic generated.

A complex -- an already complex system will get more complex. In Luxembourg, where we are trying to build up a smart nation as many other countries do, we support a number of emerging technologies, primarily among them blockchain and 5G. We finance and support projects that increase our collective knowledge in these technologies so that we can find out where they can help us most.

I would propose the same approach in the realm of ICANN, and I'm certain they do.

There is a lot of talk and some new projects involving blockchain architectures that could apparently present alternatives to the legacy DNS system.

There are good ideas in the blockchain naming services. It is certainly worth to experiment certain use cases more closely, for example, by monitoring closely one or two projects in order to collect information on the problems and on the benefits.

But, speaking from a public policy side, the blockchain naming system as an identifier service is anonymous, distributed, and decentralized and virtually working without rules. This, again, hampers the public interest duty of governments like GDPR compliance, combating crime or consumer protection.

I mentioned before 5G. In Luxembourg we are currently planning the rollout of the first 5G pilot projects.

5G, as you know, will rely massively on network slicing and tailormade network architectures.

Finally, we think that the Internet of things world is bringing its share of opportunities as well as challenges to the DNS ecosystem. Also here more reflection is needed to see the possible consequences for ICANN.

Thank you.

[Applause]

DAVID REDL:

Thank you, Luxembourg, for sharing your vision of blockchain as a technology that can enhance the DNS as well as your prudence in advocating that we better understand these new technologies and their consequences as we go forward.

Our next speaker, Ms. Ana Cristina Amoroso das Neves, is Director of Department for Information Society and Ministry of Science, Technology and Higher Education in Portugal. Director, you're recognized.

ANA CRISTINA AMOROSO DAS NEVES: Thank you.

First of all, Ana Neves is speaking. First of all, I would like to speak about the promotion of the Portuguese government in digital issues through the implementation of a program known INCodDe.2030 so as to take the best of what the digital transformation has brought.

The development of technology is there are (indiscernible) just as machine learning, artificial intelligence, distributed (indiscernible) technologies such as blockchain, Internet of things, cloud computing, artificial intelligence, advanced computing, and data analytics.

Put special attention on a specialist and governments on how we may -- we think the Internet architecture, the design of the Internet architecture and changing the currently models of centralized governance as well as Internet protocols.

So we have to bet on digital competencies so as to find new solutions for different issues or issues of a different nature.

The report of future of Davos 2018 published by the World Economic Forum in September shows the challenges we are facing in the future so as to perceive better the future of jobs. And in this case, the Internet regulation and architecture.

So we have to unconditionally bet on digital skills for all stakeholders at all ages because this digital transformation will have an impact on the way people use this Internet and on the architecture of the global network. Thank you very much.

[Applause]

DAVID REDL:

Thank you, Portugal, for that focus on the understanding of new technologies, digital competencies, and the skills needed in our societies to cope with new technologies.

I thank all the high-level officials who made interventions from the floor.

At this point, I'd like to recognize Katrina Sasaki, who is the chair of ICANN's ccNSO, the country code name supporting organization, who is our invited discussant to give her expert remarks. Thank you.

KATRINA SATAKI:

Thank you very much. Good afternoon, ladies and gentlemen. First of all, ccNSO is the body within ICANN structure created by and for country code top-level domain registries or ccTLDs.

And, when we speak about ccTLDs, you should understand that we see ourselves as the trustee for the nation's Internet resources.

At the same time, in terms of policies, culture, technological advancement, we are all as different and distinct as are all the different countries and territories throughout the world. That's why we always stress one size does not fit all. But many of us have been thinking ahead and for many years now putting significant resources in the research and development.

However, for all ccTLDs security and stability of their ccTLD is their number one priority. That is why in this area our appetite for risk is very, very low. A ccTLD manager must make sure that the ccTLD under their supervision is always available. That means that they prefer evolution over revolution.

The ccTLD can be viewed as a stabilizing factor in promoting cultural values and identity, for example, by encouraging the use of Internationalized Domain Names.

But, as long as local Internet community will need their ccTLDs, rest assured ccTLDs will be there to serve. Thank you very much.

DAVID REDL:

Thank you very much, Katrina --- for governments to play a more active role in shaping the future of the Internet and growth for the need to have trust in the institutions that help bring the Internet to each of our respective constituencies.

We also heard that that growth comes with particular challenges. And a number of those technologies that were brought up today present challenges to the Internet -- the growth of those devices, 5G, the Internet of things. But some of them also present potential solutions. And I was glad to hear a number of those that were intervening today bring up not only the need for us to take a hard look at technologies like blockchain and AI and alternative addressing and what they could mean for the growth of the Internet, but also to make sure that, as we take a hard look at them, we look at the potential downsides of them as well and do so in a concerted and prudent method as well in the multistakeholder system.

I want to thank all of those who intervened and who are experts here on the panel for their interventions today as well. Thank you for attending this session.

With that, Dr. David Cierco, I'll give you the floor back.

DAVID CIERCO:

Thank you, David. Many thanks to the speakers and the moderator. It was a very interesting discussion and will undoubtedly lead to much more extensive debate. But, unfortunately, we have run out of time.

Let's all have a coffee and take a 15-minute break before the last session of the afternoon. Thank you very much.

[Coffee break]