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UNIDENTIFIED MALE: ICANN 60 Abu Dhabi on October 30, 2017 in Capital Suite 3.

DEBORA ESCALERA: Okay, everybody, we're going to go ahead and start the session. I want to welcome everybody to the ICANN 60 Next Gen Presentations. Welcome to our community members who are joining us and those online. I want to particularly thank my ambassadors, [Awal], Jackie, Mateas, Olga, and Daniel for joining me again for ICANN 60 and lending me your support. We're going to get started with our first presenter today, Ali Hussain, from Pakistan. Ali, do you want to come and get the clicker, so you can advance your slides? Please introduce yourself prior to beginning. Thank you.

ALI HUSSAIN: Hello, everyone. My name is Ali Hussain, and basically I'm from Pakistan. Currently I'm pursuing my masters at the University of Malaya Kuala Lumpur Malaysia. Today I'm going to talk about cloud-based digital rights management. That's basically my

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topic of research as well, and I'm going to highlight a few problems and [inaudible] technology.

Today, the cloud-based technology has enabled business customers and the users to store their data in the cloud and then share it for the collaboration purposes. In this scenario, the client side encryption is very important because the data, when it leaves the user's premises, and it reaches the cloud storage, and after that you share it with someone, you lose your control over the data.

That's why this is a great problem, which you lose your data and control over the data, who has access to it, who is sharing it, who is viewing it. This leads to some privacy related problem. The DRM technology is there to help innovate that whenever you implement the generally, it encrypts your data and then it assigns some excess right based on your own set of configurations. Then you can track your document after you share it with some third party. This is in case of a critical [corporate] file sharing. This is a very big concern that whenever you want to share as a part of your collaboration with some third-party company, you want to share documentations or some business logics, this idea became very important that you want more control over your documents.

In this presentation, we will briefly cover that and the role of private sector and the privacy need of corporate and the users, of course, and why it is a useful effort exploring this area and the [inaudible] model and some legal and governance aspects associated with this technology, how it helps [inaudible] the challenges and the popular DRM solution exists today. Let's continue. One slide back. Yeah.

Basically, this is the privacy need of any individual or the corporates because the data, if it is leaked to some unauthorized person, it is a threat on the data and the integrity of the organization and the reputation, of course. It's also tied to the flexibility, so there should be a flexible mechanism to address this problem. It's also a threat to the innovation, as your data is in the hands of some unauthorized third-party.

The most important is that, at that moment, because today not only one cloud storage provider you rely on, but they are interdependent, so one cloud storage provider also shares database some other cloud storage and it's a very complex scenario. So movement should also be taken into considerations, the data flow. Interoperability is also a valid point to take into consideration.

The DRM defines a new level of security for protecting your documents. Because the traditional solutions which are already

protecting your network infrastructures are prone to [inaudible] and legacy attacks, we had in the recent seen many of the breeches happen this year and the last year that leads to the data breach. That's because if we are more focusing on the infrastructure level of security and we treat very less about the data, the security of the data itself, and we are putting much effort on the network, securing the network and infrastructure, but this technology focuses on the protection of data itself.

There is an interesting stat that PwC studies shows 37% of the current employees and 27% of the previous employees account for the data breach. That doesn't mean that they are responsible, but due to lack of awareness, due to these, this is a gap because after breach the data is unencrypted. So, [another] infrastructure, that's the reason after the breach [inaudible] is exposed to the unauthorized person. Next slide.

So, in the DRM cloud-based DRM, when you let's say upload some file to this service, it transforms that particular file to a propriety format and it [inaudible] and then it's easy to assign any particular rights you want to assign into the file. Even if the file is leaked, then it is unable to decrypt. This way, this distributed rights you can enforce.

Some of the permissions, you can apply, use in industries, it's a complex metrics. You can define your own, who has the data,

who has what level of access to the data. So owner, manager, [inaudible] can have different access permissions for viewing, editing, deleting content.

Here is a brief of the service delivery model. In it, when the content producers producing some content, it is published on the licensing server and the distribution server [board] and whenever users want to access it, it has to have some valid license, and if it does not have, it cannot access the file. When you share the file, those access parameters are being shared with particular users. So, in the cloud, this is the most common engineering model being followed. The content server and the license server board are responsible for managing the license and make sure that the user is authorized to access.

As this technology has enabled to enforce – and make sure enforce the security of the data itself and make sure the integrity of the data as well. So it is supporting, in legal, it's supporting the [inaudible] perspective and it's helping the [inaudible] respective to protect the data.

It is also important to take the security, and [inaudible] of the security law enforcements because they are also concerned about how they're going to [inaudible] but if everything is encrypted, it is hard to trace the evidence in the legal cases. This is a challenge. When it comes to multiple data storage, cloud

based storage providers, working together then the scenario is very complex and there has to be some [standardization] on these DRM services.

Here are some of the industry used DRM solutions. First three are mostly related to the audio and video content, so Microsoft, PlayReady, Google Widevine, and Apple Airplay are some of the initiatives of these big companies which enforce DRM rights to your video or audio contents. But, there is some interesting project named SkyDRM from NextLabs. This is specific to the file, any independent file you can share it, and then the file shouldn't necessarily be an independent file, but you can also connect your other cloud repositories like Dropbox, Google Drive, and OneDrive. You can just import your repositories and then enforce excess rights [inaudible]. So whenever you want to share any document from any of these repositories, you can have a dashboard. You can get to know where your data is and who is viewing it, who is editing it, who is authorized to print it and all that.

This is some of the statistics for its market. In 2015, the DRM market is around 1,100 million USD and it is expected to go to around 2,900 million US by 2020. So I think it's very huge.

So, in the summary, this is a valid need of corporate and the end user to try to protect this privacy and to know the integrity of the

data. So this is a very crucial point and when it comes to sharing some data with some third party, it is very important.

As it is a client side, client side technology, so user implementing this doesn't require any hardware sort of things. So you just need some software to enforce additional things. It is a cost-effective thing as well because we are [dealing] the application layer and this gives more flexibility to the businesses to track down their data and monitor it.

There should be, there is a need of international consensus between the role of private sector and the role of governments in defining and standardizing these parameters so that – because the data volume is increasing very rapidly. So the future computations who might not be of very efficient, so there is need of standardization of some protocols or something to build trust between private sector and government sectors and to have efficient implementation of this technology to have privacy and security of the data.

That's it. Thank you. If you have any questions ...

DEBORAH ESCALERA:

Thank you, Ali. Do we have any questions from our audience members?

BARRY [LEIBER]: Hi, I'm Barry [Leiber]. We talked briefly at the social last night. So, usually when we think of DRM, we think about content delivery networks and that kind of thing. I gather that what you are proposing here is, for instance, if I store my spreadsheets in the cloud they can be protected by DRM so that I can be sure that other people can't see them. Do I have that right?

ALI HUSSAIN: Yeah.

BARRY [LEIBER]: With this system, would the cloud provider have access to my data as well? Because typically with a DRM system, the cloud provider can override that and have access to it.

ALI HUSSAIN: Yes, the cloud provider do have access, but that access will be delegated to your DRM service. Your DRM service is just representative of you managing all that. So your hosting provider and the cloud storage provider do have access, but it's the same. You work on the Google Drive spreadsheet and this is the same way that software will be working for you.

BARRY [LEIBER]: Thank you.

DEBORAH ESCALERA: Any other questions from the audience? Okay.

MOHAMMED ABDUL AWAL: Very quick question. My name is Awal. I'm an [inaudible]. Is the data encrypted in the DRM system or not?

ALI HUSSAIN: Yeah. That's basically its point that data is being encrypted. And in fact, some propriety [formats] are introduced, so whatever extension you upload, it is in the standard extension [format], which [inaudible] that has to be propriety file format.

DEBORAH ESCALERA: Okay. Thank you, Ali, for your presentation.

ALI HUSSAIN: Thank you.

DEBORAH ESCALERA: Okay, our next presenter is Ali Rahmanpour from Iran. Ali, we're just going to be loading up your slides. Ali, one minute. We have a special guest. President and CEO, Göran Marby. Can you hand him the microphone please? Thank you for being with us today. Ali, can you hand Göran the microphone? Thank you.

GORAN MARBY: Can I sit down?

DEBORAH ESCALERA: Sure.

GORAN MARBY: So, how are you doing? Learned all the acronyms? I don't know them either. What have you been doing? Anyone? What has been the most interesting thing for you so far? Anyone? I'm asking you a question. I'm not giving a speech.

UNIDENTIFIED FEMALE: [inaudible]

GORAN MARBY: I'm not that frightening. I promise you. I'm quite nice. Some people don't say that about me, but I think I am. Should I share you my story about ICANN, what ICANN is? Do you want to know?

First of all, I have not been around that long. I became the CEO 18 months ago. I usually say 18 months. I never calculated it. But, before that, I worked for the government, but I come from the IT sector, so I've been around.

Actually, I got my first Internet access in 1992. How many of you were born in 1992? No, don't answer that question, please. My kids still think I'm very old.

The thing about ICANN is that – I've said this many times. ICANN is not the Internet. One of the reasons is because Internet is all individual. Your Internet is different from mine. I bet that we use different things. And yours is probably different as well. The Internet is a very unique thing because it's very personal, and it should be that. We can use this fantastic system and really pinpoint what we're interested in.

For instance, I don't use social media that much. That's not my thing. Only when I communicate with my youngest daughter who uses things like Instagram and Snapchat. She doesn't want to speak to me. She's 14. That's really the trick of the so-called Internet.

But, together with some of our partners, the numbering community, the technical community, or the standard protocols community, we do provide a service. And we provide that service to the world. We're not here to make money. We're not here to do anything else. The fundamental belief that Internet is a system and two people are connected, something magical happens.

So, most of us who you meet here have that inclination that we do this for the better good. We truly believe that Internet can change things in a very, very positive way.

So, for me coming into ICANN, and to describe a little bit more of ICANN, what is so unique with this whole thing we do is at the end of the day all these discussions out there, there is a machine somewhere and that machine is where we hit that button ... There is no button; I just want to tell you that. But when we actually [update this], the interface, the domain name system, changes for all users and the world at the same time.

So, what many people think as [national resource] is also a machine, and ICANN is a technical organization in that sense, but in the end, with the IANA functions, through the root server systems and all the other abbreviations we're using, something actually happens on the other side. And it's been successful so far with 3.5 to 4 billion users around the world.

But, the other thing with that is that we're not done. When I got my first Internet access back in 1992, what was the speed? 9.6-something and then we upgraded to 19.2. There was no mobile phones. There was no ... I was 30 years old before I had the first mobile phone you could text message on. Yes, I'm really old. I have to say that. Yeah, thank you.

Move there? Why is it better there? I don't want a camera. No, I don't want a camera. I want to talk. Thank you. I'm sitting there because there's no camera there. You're doing a great job, by the way. Good look.

Where was I? 1992. The thing with Internet is it's not done and that's something you should remember. You are here to help us to shape the next generation of Internet domain name systems and you have the right to ask any question, make any proposal, to do anything in this [inaudible] what we do because it's the next generation of users who are sitting here, and you represent something that's going to be your obligation in a couple of years. And believe me, you get older much faster than you think. They didn't believe me.

So, come into this, and you will meet a lot of old-timers like me. You will meet a lot of people who talk in acronyms. You'll meet a lot of people who talk about the processes and the multi-stakeholder model and all of this.

But, always remember, at the end of this day, we do something. We do a service for the world. We're not alone in this service. We are together with our other partners. We are not unique in that sense, but we actually do something that I think is very important. And just because you're young or you come from a certain country or you don't have the language skills, where you

don't feel ... This is an intimidating environment with thousands of people from 140 countries coming together here. You have the right and the obligation to help us make the domain name systems and the interface of the Internet user world a little bit better. But you are the ones who are going to decide what is good. Thank you.

Question now? I got [inaudible] from an old-timer. If you really want to know how this works, listen to that guy.

UNIDENTIFIED MALE: There must always be an old elephant in the room.

GORAN MARBY: Please?

[PIERRE]: Pierre. I was just wondering what you would consider to be the most interesting aspect of ICANN in terms of the policy making decisions.

GORAN MARBY: There was actually two questions and I will explain to it. You asked me what I think is the most interesting. No one has done Internet before and no one has done ICANN and that's one of the things I spend a lot of time trying to tell people. What is ICANN?

Because you want to put it into a box. And no one has created an organization such as ICANN before. There is nothing like us.

So, I happen to think that's fascinating as itself. The reason why the multi-stakeholder [method] for me is so important personally is because Internet hits so many parts of your life today – school, book your doctor, social life, love life. Every aspect of your life if you're connected is now affected.

So, for us, the multi-stakeholder model is really to make sure that all those things could be discussed here so we don't forget about something. Multi-stakeholder, that's the guarantee I see, to make sure that everybody can have this voice here.

But, it was a personal question, which you don't know. What fascinates me is the ability for people to come together. You can go into a room and people could be, depending on culture, depending on ... People could be really tough. People could argue for stuff. People could have fantastically different opinions and throw acronyms on each other and talk about what happened in 1752, and then in the end, after all of this, they come together.

We had a transition last year, which is a word we use, and that was when the US government relinquished [inaudible] clerical supervision of the IANA functions. We had participants from 140-150 countries, thousands of people, with every background you

could think about actually coming together, setting up a system that was able to convince the US government this works. I don't think that's ever happened in world history, any international movement like that before.

So, for me, the fascination lies is that in all of this, people come together and it just happens. And when that happens, after all the discussions, it's actually quite beautiful. It is. That's the thing that fascinates me the most. And I'm also a technical nerd, so I also like anything with technology, and if I [inaudible], I would start drawing something here on the board and lose myself in technical acronyms for a while and you could go to sleep. But, according to my speech, I'm not allowed to do that. Anyone?

UNIDENTIFIED MALE:

This is [inaudible] from South Korea. I think everybody knows that Internet is going to be changed very repeatedly. So, in your opinion, can you tell me how Internet will be changed about after ten years.

GORAN MARBY:

Are you going to tell me? There's different – if this is a cake, there are different parts of this cake. The cake, the top layer, the cream of the cake, are the applications you meet. I think it's going to be ... How many years has Facebook been around or

Snapchat or Instagram or all the other things I don't really use? Or Twitter? It's actually a very short period of time, and I bet somewhere around the world – which is one of the unique things with this system – someone [inaudible] to come out with something.

One of my favorite stories – I'm Swedish. There was a guy who was sitting at home. He loved Lego, so he started doing a gaming thing that is really Lego to [build a house]. The company is now called Minecraft. It's one of the world's most used games right now. He sold it to Microsoft I think. It's just that someone comes up with an [idea] and it all changes.

So, on that layer, I think a lot of things are going to change in a high speed. Who knows what comes tomorrow?

The next part of the cake is the sort of infrastructure, and there we see trends. The next billion users. I said this morning and I said it repeatedly. I think I said it this morning. So far, we have 3.5 to 4 billion users around the world. I claim that most of them comes from very good backgrounds. They can afford excess. They have English as a concept to a language. They often come from cities, rather than rural areas. Often, what I understand, with an education. The next billion users will not be that. They will be very different. They will be primarily mobile. They will not have English as a concept, read from one side to another with a

dot in the middle. Strange thing. They will have less affordability for the access.

So, I think that puts a demand on our side. That's why we talk so much about universal acceptance, IDNs, local scripts because we have to provide that.

It's also an interesting thing that I hope you can solve for me, and that is we always said that Internet is networks on networks connected together, but it's local and global at the same time. And the more people on the local scale that comes on board, has the right to have its own Internet with its own history with its own culture values, with its own perspective of doing things and how do you combine that in a global network with the local needs? We haven't figured that out yet. So, there, I think it's going to be changes that are slower.

Then you have what we do and we are not part of an infrastructure. We come in when two users on two different networks wants to communicate with each other and we provide the telephone book for that. We provide the protocol, the language for them to communicate in between together with our partners.

And because now there are 3.5 to 4 billion users, I don't even know – I don't know how they calculate. I get those numbers from my staff all the time. I don't think we have people around

[inaudible]. We don't know how many Internet users there are. That's the beauty in that.

I happen to think that the underlying discussions about how the technology from [that side] works, we should have more discussions about. But that's been around for a long time.

To give you an example, a couple of weeks ago, we were – there is a security system that we supply to about 750 million users around the world – small numbers – called the DNSSEC and we were supposed to upgrade that. But we realized that we probably would've blocked 40-50 million users out of Internet. We decided that was not a good idea. But the implications of when something goes wrong in the system is quite good – the implications could be quite big.

Now I'm going to say something. There is no central point of the Internet. There are only mechanics. No one owns and controls the whole Internet. That's one of the beauties of it. But it also creates its own problem.

So, a long answer to a very good question. The basic answer is I don't know. If I knew, I would be much richer than I am and I'm not at all. Because for every Facebook, for every Google, for everyone has been 10,000 failures.

The funny thing is, someone in this room, you sit together tonight and come up with something, and next week you are on the Fortune 500 list.

Who moderates this?

ROZOANA MOSLAM:

I'm Rozoana. I'm from Bangladesh. I just have a quick question. What is your opinion about the Internet security and how ICANN is really working about the privacy rights and how these rights can be protected? What's your opinion about that.

GORAN MARBY:

My opinion? Oh, I have loads of opinions. That's not the same as ICANN's opinions. But this is my [road] at the ICANN [inaudible] is to facilitate that discussion when it comes to privacy within the community. It's you who's going to have an opinion, not me. That's one of the fantastic things with this model. I'm here to serve you, so you can have that discussion and have your own opinions, and together the community will form an opinion which I will be told and I will go and execute. Remember that. You have that right. There's no voting system. You don't have to be elected into the system. You can walk up to the microphone, and I bet they told you that when you go to open sessions, you

should up to your microphone, present who you are, where you come from, and then ask your question. Take that right.

When it comes to security, everybody uses the word security, cybersecurity. It's actually a lot of different parts. What we do is security and stability for the domain name system. That's where we make our focus, that the system we have is secure. That's important. Together with the DNSSEC, which is another acronym which is really about making sure that when you come to a webpage, you know that's the webpage and not a fake. And unfortunately not everybody in the world are using it. It's your ISPs who does that for you. You don't have to worry about it.

But, with that said, because of the technical knowledge that we have in the community and in the organization, we do spend a lot talking to different parties about how we can evolve this system because there are some central functions as well. So, we participate in the standardization bodies.

But, as I always say when someone asks me, "Have you upgraded your mobile phone and your PC? Do you have a firewall on there? Make sure you have the latest [inaudible]," because if you don't do that, the Internet will not be secure.

ROZOANA MOSLAM: Thank you.

GORAN MARBY: You moderate it. Who's next?

FRANCIS NWOKELO: My name is Francis Nwokelo from Nigeria. My question is I don't know if it's really important, but it's really important for me. The question is does ICANN provide any platform for the next gen to make the Internet better?

Okay, what I'm trying to say is currently I'm working on a project in Nigeria, because actually the Internet actually a very good thing and it's a fantastic thing, but you see, right now in Nigeria if you say you want to come up with an e-commerce or anything else to do with technology that's connected to the Internet, then you have to accept payment online, you are definitely going to fail in Nigeria or probably in Africa as a whole.

So, actually, I want to see how to improve people's businesses in Nigeria using the Internet and of the above. You see people start telling you that they are not going to make any payment online, like there's a payment [inaudible] Nigeria. Very popular online. So, people more [inaudible]. We also have Jumia.com. But these guys are really having a very big challenge because people don't want to use their credit card or their debit card to make payments online, so you have to [inaudible] pay on delivery, so

they have to call, you bring the goods, they check it out and stuff like that, because nobody feels like people are going to have them, take their money.

So, what I'm [inaudible] working on right now is that I'm trying to – not trying to, I'm actually educating people on Internet and also things that has to do with security because I actually believed that no matter how good a company is regarding security, the [inaudible] always wants ahead of them no matter what.

GORAN MARBY:

Let me pause because you have many questions and I have to leave and there were some other questions. But let me pause for a second because you're underlying questions were interesting.

One of the things that we more and more have to do is to work together with other ones. Africa is a good example in that sense that we tried now to do a new strategy on how we engage in Africa.

The next billion users will come from places Africa, parts of Asia, and South America. We won't get more users in [Stockholm] because already everybody on there.

To be able to get Internet, and [inaudible] say we should have more users, but it's many things that have to come into play. You

have to have people who can afford to buy Internet access. You have to have someone who pays and invests in Internet access. Then you have to have local knowledge about how to build those things. Then you have to have a government which is supportive of building a digital society. Then you have to have local competence, how to build webpages, and therefore you need to have local content development. You need to have a good structure for domain name systems.

More and more we realize that. Because it was easy for us in the beginning. Everybody has a telephone system, now we're going to build Internet on it. But we're actually talking about people that doesn't even have a telephone. How do you get energy to a bay station in the middle of somewhere where there's no electricity?

We are more and more engaging and talking to governments and regions [inaudible], for instance, in Africa with Africa Union, to try to work together where we call can come together and talk about all of those things. Because it's been very – I would not say anything about your country. In many places, they are a little bit unstructured. All of those things has to come together for someone to be able to connect and get the information there.

Without going into how you do things in your country, the realization is coming to many of us we need to cooperate with

different ones. Because if the underlying belief we have is that the Internet is good then we have to work with other ones who provides functionality to make that happen.

I think I have time for one more question. I think I have time for three more questions. This is my boss, and I know when she's texting things it's because I'm late. I should be somewhere else and she's telling me that.

DEBORA ESALERA: Just one more question [inaudible].

GORAN MARBY: Okay, you want to get rid of me. Welcome to ICANN.

UNIDENTIFIED FEMALE: I'm [inaudible] from Iran. As you said, ICANN is trying to make one world, one Internet. But as you know, we have many problems because of sanction and Iranian users are suffering because they don't have one Internet like others. What can ICANN do to make that better?

GORAN MARBY: ICANN's mission and what we do has nothing to do how countries choose to do things. We are not a political organization and shouldn't be. We are in the core of what we do

a technical organization who provides a service to the world. But it's like I said: it's up to you what you do with it.

I know there are countries with different perspectives and different ways of doing it. Now I'm going to say something. It's nothing to do with your country. I happen to believe that the more people that gets connected the world is going to be better by increased communication and increased understanding. That's going to be positive.

ICANN doesn't involve itself in that, but I hope you can see that you have the opportunity here to create another world. That's why I'm here.

And I can leave you with this. [inaudible] when I talk. This is sort of a bad joke, but it's also what I actually mean. That I have this job and this firm belief that the Internet makes the world better, so my job is fantastic enough to try to make a little bit better place to live in. That's what I do for work. That's what I do. So, hopefully it will be good in the end. Thank you very much.

DEBORAH ESCALERA:

Thank you so much for being here. Thank you [Casia]. Okay, we're going to continue on with our presentations. Next up is Ali Rahmanpour. Ali? Did we get the microphone back? [inaudible] I didn't get it on time so I can't change it now. Thank you.

ALI RAHMANPOUR:

Hello, everybody. I am Ali Rahmanpour a NextGen from Iran and my presentation is about the need to protect Internet values in the IoT era and why this is more important than ever to protect Internet fundamentals and values.

I have studied communications engineering, both bachelor and master, at the Iran University of Science and Technology. I've also cofounded a startup which is working in IoT. This is [inaudible] development platform for IoT and market for presentation of IT solutions. You can find more information on the website, linkap.net.

I should say I'm so honored to be here as a NextGenner.

As you probably know, the Internet of Things era is coming. Several things around is connecting to the Internet. The personal gadgets, smart gadgets, smart homes, smart buildings, smart cities, and smart industries, these all are the consequence of connecting things to the Internet.

The Internet before has been connected people to each other, now is connecting things to each other. Can you please go to the next slide? Thanks.

This will change your industry and even lifestyle fundamentally. It has a huge economic effect, too. Based off some predictions,

such as McKinsey till 2025 around \$11 trillion of economy affected with IoT and this is about 10% of the whole economy of that time.

Another important point in IoT is that this time developing countries are in the game, too, besides developed ones and will benefit from IoT values.

But, many IoT solutions need new technologies to be realized. For example, sensors and actuators, there are new technologies needed to make them efficient and [inaudible], and there are new technologies needed in wireless communications, technologies that let the communication to be cheaper and to be [applicable] with less power consumption. Also, there is needed [apps] for some new software infrastructure that makes management and [inaudible] of this huge amount of gathered data possible. So, this is the technical aspects of IoT and until now most of the focus was on these aspects of IoT. Can you please next slide?

But, the reality is that IoT is not just technical aspects, and to be useful and to be penetrated in every aspect of life, IoT needs other aspects than technical ones.

For example, there are issues in stability and security and privacy [inaudible] other aspects are more important than technical aspect. For example, in these, education is more

important, regulation, policies. These all affect these issues and we should have enough notice on them.

So, based on what has been said, in the next years and by IoT, every aspect of life, even fundamental ones, will be dependent on the Internet. This is the normal consequence of this event that Internet becomes more vital than ever in our daily life. So, activities of organizations such as ICANN which are dealing with Internet governance become more vital too.

One of the questions was about Iran, too. We in Iran have sensed this importance about two years ago when based on comment of court in United States, the plaintiff has the right to seize all Iranian dot-IR domains. In that time, fortunately, ICANN has defended and tried to stop this procedure, and fortunately it was successful. But all this terrible event was a warning for us, I think for all of us, that shows how important it is to be aware of the fundamental values that make and shape [our great] Internet, how important it is to [inaudible] to protect those values and fundamentals by engagement, by developing the processes, and even if needed by modifying them in all technical, legal, and policy and other aspects that is possible.

Thanks for listening.

DEBORAH ESCALERA: Thank you, Ali. Are there any questions from the audience?

ALI RAHMANPOUR: Thank you, again.

DEBORAH ESCALERA: How about from the NextGen? Okay, thank you. Okay, we're going to move on to our next presenter, Ani Mkrtyan. Now, don't forget to introduce yourself and tell us where you're from.

ANI MKRTCHYAN: Hello, everyone. I am Ani Mkrtyan. I am from Armenia. I am working at Internet Society Armenian Chapter, and as the majority of you, this is my first ICANN meeting, for what I would like to thank to Deborah and the organizers and the committee who selected us.

My presentation is [converting]. Well, the name of my presentation is Users' Trust. Yeah, back to the first page.

Well, Internet is the revolution of our millennial [inaudible], and over the past three decades, it has come to facilitate our lives and our way of thinking and living. But today, along with the positive impacts it may have on our life, we are also dealing with negative impacts. So we are dealing with data breaches,

malware, malicious activities, and as a result of this, various Internet users do not trust the Internet.

What is dangerous that those connected to the Internet may not only lose their trust on the Internet, they will disconnect themselves. And what is more dangerous is those that are not connected yet, they will not connect to the Internet just finding various reasons for that. And what is the reason, is to see how the community feels about these problems and to find solutions on it. Please, yes, the next one.

So, I think that we have a collective responsibility to protect one global Internet that we all depend on. This is the idea of my presentation.

So, in Armenia, we have decided to conduct a survey which was called Users' Trust and to see how Armenian peoples perceive all these online trends, how they just protect themselves online. This a question, like a kind of philosophical question – do users trust the Internet? And we can say that some of them don't because of these negative impacts the Internet has on our life.

In my presentation, there are numbers as well, but as you have converted it, we cannot see the numbers but I will tell you.

So, we have decided to conduct a survey. The aim of the survey is to see how people perceive the Internet to ask them very

simple questions, and [inaudible] to discover their real intentions and their opinion.

So, we asked people what are their major concerns related to online privacy and security risks, but it cannot be seen here. Their answers were loss of control over personally identifiable information. Other major concerns were financial and credit card fraud. We had other variants as well, which unfortunately cannot be seen. Can we just turn it to the PowerPoint for me so the answers can be seen for people? Otherwise it has no meaning. I have it in my laptop. Okay, then I will take my paper and I will just read the answers, because without them, it has no meaning.

We can see here three main answers. The yellow one, red one, and the green one, which are loss of control over personal data. The second place took credit card or bank fraud, and the third one was threats to personal safety. We see that the users, the respondents, are much concerned about such kind of risks. And you can turn the next slide.

So, the next question was are you willing to provide personal information to websites so that online advertisements can be targeted to their taste and interest? The first one is not willing. We know that we leave [inaudible] of digital footprints, and whatever we are doing, the Internet can be just followed and

there are companies who are just targeting based on our taste and interest, and we see that our respondents are also much aware about this threat and they are not willing to be just managed. Their behavior is managed subconsciously, [inaudible] and they are not willing to that.

In the next slide, we can see that they are also not willing to do business with a company where financial and sensitive information was stolen. It means this is the kind of a message to companies to invest much in security because if they are having data breaches, financial or sensitive information breaches, they are losing not only their financial means but also something which is very expensive and very important in our era. This is their customers loyalty because we see that for our respondents – in the next slide that the reputation of the company in their decision to give personal identifiable information to them over the Internet is really very important.

The next question is have they ever been a victim of online threat or crime? The second option is that they say no, but a question is are they really aware of whether they have been a victim or not? Because we know that there are various techniques that can be installed on our devices and they may follow us and we may have no information about it.

So, these questions were aimed at discovering whether users know about these threats and we can see in their answers they are much aware of all this.

The next section concerned passwords because passwords are security protected tools and they are giving us opportunity to have access to our accounts. And the way we just make our passwords is very important, whether they are simple words or they are a combination of letters or numbers.

I have a question to the audience. Do you forget your passwords frequently? Me too. This is because we have multiple accounts and it's quite humanistic and logical, and we see that our participants, too, 59% of them sometimes forget their passwords.

In the next slide we have asked them how often do they have their browser remember passwords for them, and we can see that the first answer is never. We can see that people today even do not trust their browser.

So, the next question is about do they have the same password for multiple accounts. I have this question for you, too. Do you use the same password for multiple accounts? So, in this point I would like to remind you about a notorious event related to the name of Facebook CEO Mark Zuckerberg who used the same password, dadada, for his LinkedIn, Pinterest, and Twitter

accounts. Once when hackers were succeeded in breaking his LinkedIn account, they were also succeeded in breaking his Twitter and Pinterest account because he used the same passwords. By the way, dadada was the word of his baby. It was his baby's first word. So, he was not being such famous people, he was not much concerned about his security, so hackers were succeeded in doing so. So, I will ask you not to do so, not to use the same password for multiple accounts because this is really very dangerous.

So, the next question is about what kind of techniques they use to remember their passwords. The first answer is using combination of letters and numbers, which is letters [inaudible] is a little bit better than using the same password for multiple accounts. Some of them use password remembering techniques, password manager techniques. But they also cannot guarantee 100% security. None of them use sequential numbers. This is the third option. Some cafes and restaurants, they use sequential numbers, which is very easy to guess, and luckily none of our participants does it.

So, we see that our respondents are, let me say, aware about how to protect themselves concerning their passwords. And the third and the last part of our survey was about social sites because social sites are part of our identity. Some of us were sharing much information on social sites. Some of us not and it

depends how we just think about our privacy, how we appreciate our privacy.

Do you share much information about you on social networks or you are privacy oriented? No?

The first question is how do you present yourself on social sites? Do you use your real name or you just present yourself anonymously? Thank you. The same the majority of our participants.

In the next question, we can see in the next slide is do you have a fake account? Do you have it? No one? This is a huge problem in Armenia. Our users have fake accounts and they are using it, like making comments, writing some abusing words and using their fake account.

But we see that in the next question when we asked them do you use your fake account? The first option is never. I don't know why they have created their fake account that they do not use. You can turn the next slide.

So, we asked them what they do to control your personal information. Some of them just escape doing financial transactions online. Some of them escape doing online purchases. Some of them just does not provide personally identifiable information over the Internet.

But, in the next question, which was more important for us was to ask them to estimate their knowledge on online security and the majority of them said that they need to gain more knowledge, which was our aim. You can turn the next slide.

We do like to participate to online security workshops and we see that the majority of our participants, of our respondents were quite willing, and whatever we did after this survey was more valuable.

This was before organizing our first Internet governance schools for students, which was in summer. So after this survey, we saw that people were much concerned about their online security, so we have decided to incorporate such course an Internet governance school for children and to organize workshops for our members for people. We even have very famous social media expert who is Internet Society Armenian member and he is sharing information about breeches, malware and some information. So the aim of this survey was to reveal people's attitude, then to initiate activities according to that.

Something I presented here to advise you to do the same in your communities because this is really very valuable. This is [inaudible]. If you have any questions, you can reach me on Twitter like this and you have my e-mail.

DEBORA ESCALERA: Let's start with questions from the audience first. Are there any?

MOHAMMED [ANSUI]: Good evening.

ANI MKRTCHYAN: Good evening.

MOHAMMED [ANSUI]: Good evening. My name is Mohammed Ansui. I am from Kuwait [inaudible]. The people that you choose for your survey, do you have any statistic of their ages and their gender?

ANI MKRTCHYAN: Yes. I decided not to incorporate this to my presentation but we have 600 participants all from social sides and they're aged from 17-50 years old and they all have high education. So 600 of course is not that much enough to have idea how the society feels, how the society thinks, but I think it's pretty enough to have some understanding about their interests.

MOHAMMED [ANSUI]: But just to be specific, the people who chose to put the same password for all accounts, what were their ages, the age ranges? Were they the young or the old ones?

ANI MKRTCHYAN: You mean those people who used the same password for multiple accounts?

MOHAMMED [ANSUI]: Yes.

ANI MKRTCHYAN: Frankly speaking, I don't have statistics for that special question because we just tried to find out the situation in general, not who are they.

MOHAMMED [ANSUI]: Because I think your survey is good, but if you see which people are using, for example – this is a problem, using the same password for multiple accounts. It's a big problem. My mom's account was hacked maybe three months ago. I struggled to get it back. The problem was she used the same password for all her accounts. So, we have to educate people not to do that.

ANI MKRTCHYAN: I think the reason is not their age. We can have statistics. We have this data, but I don't think that the reason is their age because all they have high education, so it means they are

reasonable people. I think just they are not aware that it may be dangerous.

MOHAMMED [ANSUI]: Exactly. Thank you very much.

ANI MKRTCHYAN: Thank you for your question.

ADEEL SADIQ: Adeel Sadiq from Pakistan. Thank you for your beautiful presentation. So now you have the answers to your survey questions, right? So what's the way forward? Are you going to involve the government of Armenia as well, or is it only going to be private sector or civil society?

ANI MKRTCHYAN: This survey was for all people. We just spread it on social sites. But concerning what we organize after this survey was for students. It was Internet governance school. Initially, it was for students, but we are also aimed at organizing something for civil workers, so their ages, they are not students. So I think this survey is useful from this point as well, so we will organize online security workshops for them as well. So, to incorporate other people and other parts of the society as well. And irrespective of

their – they are from academia, from civil society, or any other background. But this is a process that cannot be done at once. I think it should be done step by step.

ADEEL SADIQ: Best of luck with that.

ANI MKRTCHYAN: Thank you for your question.

PIERRE DORDHAIN: Thank you for the presentation. Pierre from Australia. You might have covered this, but one slide you discussed Facebook or social media and the transparency of what information is available on there. My understanding was that there's not a lot of information that's provided on Facebook that would be detrimental in terms of like, say, bank account details, etc. So, having that availability from a security perspective, how is that damaging at all if you are [inaudible]?

ANI MKRTCHYAN: If I get your question, you ask how the information spread on social like Facebook?

PIERRE DORDHAIN: I was just – the answer might just be it's not, but I was just wondering whether there's any risk in having your accurate information about yourself on social media websites, from a security perspective.

ANI MKRTCHYAN: I think there are risks because whatever we are sharing online can be useful for some companies and they can just base their advertisements on our tastes, on our photos, on our – they may look at our social sites and they may understand who we are, what kind of tastes we are from our photos, from our posts, so that they can target their advertisements on us. And after [inaudible] they will manage our behavior.

PIERRE DORDHAIN: Okay. So, using myself as an example, I have a different name on Facebook, so people won't find me if they Google my name on Facebook. Is that a good thing or is that going to make no difference to security?

ANI MKRTCHYAN: That's a good example. I can just add something from my own example. I would like to say the good things of all this, of Facebook and something like this. You can just think that it's not secure to share much about you on Facebook or on social sites

and using your real name, like it's dangerous. But it can be also good from the point that you may become famous in your community by sharing photos, posts, and some information about you. So I just suggest considering this from the positive, this part.

So, it's up to you to decide based on your personality, but about the risks, we should be aware.

FRANCIS NWOKELO: My name is Francis Nwokelo from Nigeria.

ANI MKRTCHYAN: Yeah, I know you.

DEBORAH ESCALERA: We need everybody's name.

ANI MKRTCHYAN: I know. I'm just kidding.

DEBORA ESCALERA: It is being recorded, so go ahead.

FRANCIS NWOKELO: Actually, I have a question, but let me help you answer his question. Actually, Pierre, it's actually a good thing in a bad thing anyway. It depends on what you are using your social account for. So, if you are very conscious about security, things like financial security and stuff like that, it's actually a bad thing.

Also, for you to have your name on, you are talking about having your name on social media. I don't think having your full name, it will have anything to do with security issues. It depends on what you post and stuff like that.

So, somebody who really wants to hack you will definitely hack you. I don't know if you know about [inaudible] engineering and stuff like that. If somebody really wants to hack you, [inaudible].

Now, the question I want to ask is you talked about using one password for different social accounts is not cool, right?

ANI MKRTCHYAN: Yeah.

FRANCIS NWOKELO: Okay. So is there any suggestion you are coming up with? Let's say for somebody who has up to five social different accounts or probably ten social different accounts including not just social

accounts but Internet accounts, like let's say bank accounts and stuff like that. What's your advice?

ANI MKRTCHYAN: What kinds of passwords to choose for multiple accounts?

FRANCIS NWOKELO: Yes. If you are going to, say, to use a password manager like 1Password, I'm not going to agree with you. If you hack one password, then the account definitely gets [inaudible].

ANI MKRTCHYAN: Yeah, so it doesn't guarantee 100% security. I can share my experience with you. I'm using the same word, adding some letters and some roots to that word. It's so easy for me to remember passwords. I am not trusting password manager techniques because they are not secure. I'm not trusting my browser. I don't know why, because I think it's not secure. I like using a combination of letters and numbers. It's more you can protect yourself in this way.

But my personal example I think is a good one. You can use the same word. For example, the name of your country for one password and then some letters, and then in another one you can use the name of your country, these letters, adding some

other word. For the third account, something like this, adding some other symbols. This can be secure for you and you don't have to write it down somewhere because even if you write it in your notebook, even it can be not secure, so we cannot trust any technique...

FRANCIS NWOKELO:

Okay, this is actually not a question. Let me actually help you. One advice actually I want to give is using the word is actually not a good thing. I think one of the best ways to actually secure your account is if you have a native language, you can just come up with probably a sentence and take the first character from all of them – something like [inaudible] language. I love my wife so much, we went to a party, they now begin to pick the first character. So, when you are typing, you already know. You just say I love my wife. You already know I love my. You see, ILM. I love my wife so much because ... Then if you are going to use something like Facebook or Google, you can just say I love my wife so much. The last word is going to be F, you know this one is for Facebook. [inaudible] put are too close. I love my wife so much, then G. This one is for Google. Now I [inaudible] hack you. Thank you very much.

DEBORAH ESCALERA:

Thank you, Francis, for your suggestion.

ANI MKRTCHYAN: This is a good ... I will use it.

DEBORAH ESCALERA: Okay, Ani, thank you for your presentation. Wonderful.

ANI MKRTCHYAN: Thank You, too.

DEBORAH ESCALERA: Okay, Francis, can you shut your microphone off? Okay, our next presenter is Anum Janjua from Pakistan.

ANUM JANJUA: Can you hear me? So, I'm Anum from Pakistan and I'm working in the safety department for [inaudible]. I chose my topic to be Internet Ecosystem because this is the term I first got introduced to just two months back when I was attending [inaudible]. But I am going to focus on Internet ecosystem from just Pakistan perspective. That is my country.

I'm sure every one of you would be aware of or most of you would be aware of the term ecosystem itself, but just for clarity, I'll define it. That the Internet ecosystem encompasses all the

organizations were involved in the evolution or the development of the Internet in one way or another.

So, the most famous model, which we study is the sector model of ISOC, but I'm going to take a different stream and a broader perspective of it, which is I'm going to split the ecosystem into two. One, the service providers and the users.

So, for the users, we have the market. Basically, the end users who actually are the part of ecosystem, as using the services or as end users themselves. And then there are the providers, which cover the ccTLDs and IDNs.

So, for the user [inaudible], in Pakistan, although Pakistan is a growing market itself, but there are different technologies that are currently we use in Pakistan. Some of the few would be DSL. HFC is new, but Fiber to Home is spreading recently. Then we have WiMax and 3G/4G/LTE is also new to Pakistan but it has spread, like anything, like fire. So majorly, we have WiMax and 3G in Pakistan.

So there's some stats. Although [inaudible] a little old data, but this is authenticated data for me, so I'm just going to [inaudible]. So, you can here see the subscriber base in Pakistan and the 3G/4G penetration. 4G is a very small number for our country, and considering this is 2015 [inaudible] data, so 4G was a new concept back then. It is still a new concept because not a lot of

users are still accustomed to it, but 3G is like 93% penetration in Pakistan by now.

For cellular subscribers, back from 2011-2013, we saw good growth in the market, especially in 2013 because of the infestation of cellular use and because Pakistan started manufacturing cellphones and providing services locally. So we see a big rise there.

But then the market has started stabilizing now. And there are other factors as well, which decrease the cellular subscribers numbers in Pakistan, like we have better regulations now, and biometric verifications and stuff, which has eliminated the non-authentic and non-regulated [inaudible] use for [inaudible] cellphones. So that is how we have stabilized and are going towards that trend now.

Also, the mobile penetration in Pakistan for two years back or [inaudible] is 61% which is still comparatively shorter compared to other markets, but relatively we are a growing market in this.

Likewise, in broadband, like I mentioned earlier, 3G and DSL are the major usage from end user's point of view. Fiber is very little, like you can see 1% of the broadband is comprised by fiber usage.

So, Teledensity shows the exact same trend, like the cellular base subscriber base trend. The numbers might be different, but for clarity, [Televis] is the telephone usage for 100 people in the population. So, this has also stabilized, as our market is being stabilized with time.

So, this is also a comparison for [APAC] in general, but for Pakistan, we can see that we are going, although the trend shows that we have – there's little progress compared to other big markets like Sri Lanka or India, which still Pakistan is showing some progress in this domain because there are different factors to that as well, like the lack of infrastructure and other – Pakistan as an [inaudible] market faces a lot of social cultural issues as well. People do not really trust using Internet and there a lot of, I would say, stigmatized. The use of Internet is stigmatized in Pakistan to now, to date, which is not the case for other countries I guess, or to little extent. But for that particular reason, the trend is Pakistan is relatively slower.

From the other stream, which is the providers. So, Pakistan has the country code, dot-pk, but not a lot of Internet users. It's still very limited. The numbers and stats show exactly this, that compared to other big markets, even if you see the state and the penetration as well, Pakistan is lagging behind, but I still think that we've come a long way from 10 years back maybe. I'll just move on with this.

The other thing is the IDN, which is increasing the accessibility of Internet because we have IDN local languages, like Pakistan has an Urdu transcript, dot-pakistan, just like other countries, which has increased the accessibility and I would say comfort for people who are not very used to the language, other languages, majorly English. This has also increased the number of users in Pakistan.

This is just the timeline, ICANN's timeline. The font is very small, so I'll just read it out from here. Back in 2003 when they started the IDN guidelines and when they first tested the [inaudible], from that compared to Pakistan's progress, it kicked off in Pakistan in 2013.

So, Pakistan is relatively going behind the threshold or the bar. We're just going forward. And especially for thinking that these forums where Pakistan is getting equal chances and there a lot of people where although Pakistan is smaller fish in the sea, but still they're getting chances here and they're getting to know about things and we have our own PK [inaudible] and we're going to have PK [IGF] as well there. These are just Internet governance forums, but they're contributing to the progress that we're having in the recent years.

That's about it for me. Any questions on that? Thank you.

DEBORAH ESCALER: Okay, do we have questions for Anum?

ANI MKRTCHYAN: Thank you for the presentation. I am interested in IDNs and in Armenian I don't know developments. So I would like to know how popular is Pakistan's IDN in your country and do you have any statistics how many registrations you have?

ANUM JANJUA: Since it's not directly my field, I don't have the statistics to quote, but as an end user I would say that it's not as popular as probably ... I've seen the statistics for India, for instance, because I was starting something earlier. It is relatively less popular, but still, like I said, there are other barriers as well which hinder Pakistan's growth in these domains.

I can share the statistics with you later probably offline, but I don't have them right now. But still, from user point of view, I know that it is very less popular.

ANI MKRTCHYAN: The situation is the same in Armenia. It's less popular than the ccTLD and we're just trying to develop it and that's why I would like to know your experience. Thank you much.

ANUM JANJUA: Thank you.

DEBORAH ESCALERA: Yes.

JACKIE EGGENSCHWILER: Hi, this is Jackie Eggenschwiler speaking for the record. Thank you very much for your presentation. Very interesting. The question I have for you is if you were a policy maker in that sense, what would be your first steps that you would take in order to, let's say, increase access or increase, for example, the use of the internationalized domain names. What would be your policy steps?

ANUM JANJUA: From policy, I would say the first step would be digital education considering our country situation. I think that to build the trust to user facility, the first, as in the starting point, should be educating people about the pros as well as the cons about it because when people have insecurities, just like the survey that Ani shared, when people have insecurities with it, with [inaudible], the usage declines exponentially. So I would say that digital education would be my first step towards it.

DEBORA ESCALERA: Okay, we'll have one last question. Go ahead.

[BATMA]: [Batma] from India. I just had a question with regard to access and use of all these different types of technologies. Do you have any idea about the demographics in terms of gender at least? Especially concerning – I mean, considering – Pakistan and India is [inaudible] problems. Do you have any idea how accessible it is to women and other minorities?

ANUM JANJUA: Right. I don't think we have any such thing, although I came across the – just like I was mentioning earlier – I attended [ABSEC] where we came across that India has diverse [inaudible] numbers as well. I doubt that we have – [inaudible] would probably be able to help if he has some numbers related to gender usage.

UNIDENTIFIED MALE: I am [inaudible] and I work for [inaudible]. So we collect data on ICT and telecom. We don't have gender based statistics so far, but we do have statistics on regular basis and on the basis of a number of subscribers. All of that data is available publicly on the website of [inaudible]. If you just Google telecom India [inaudible] Pakistan, it will take you directly to that website and you can see what data you want to have. If you want some

more data, you can always e-mail me, talk to me. I can provide you.

ANUM JANJUA: [inaudible] for the age groups and rural, urban if I'm not wrong. We don't have the genders [inaudible].

DEBORAH ESCALERA: Okay, thank you for your presentation. Okay, we're right on schedule. We have 30 minutes left with three speakers left. Our next speaker is Melchizedek Alipio from The Philippines.

MELCHIZEDEK ALIPIO: Hello, good afternoon. So, I'm Mel Alipio from The Philippines. I was the NextGen who came late in this event. So I think my presentation will be a little break from the previous presentation because I am not directly working with the application layer. When it comes to [TCPIP] [inaudible] I am more on the transport layer component, but I am of course interested on the security part of the IoT, per se.

My presentation is entitled Cache-Aware, Congestion Control In Wireless Sensor Networks. Before I proceed to the main part of my presentation, let me first give you an introduction on the

framework of IoT and the role of wireless sensor network and its framework. Next slide, please.

I think a lot has been said of Internet of Things, so I will not give you more information about it. I think it's already enough. But what is the role of wireless sensor network in the field of IoT? Basically, IoT has three main processes. The first one is data gathering and the next one is data processing, which involves data analytics. The last one is for visualization.

The idea of wireless sensor network is to collect the data from the physical environment – let's say, for example, a scale or quantity such as temperature, humidity, weather, or anything about the environment. It can actually be collected from the sensors.

So, the main issue with the sensors is that they are being deployed in a wide geographical area. So, the problem is that if you deploy the sensors in a wide range, meaning the transmission will be hub by hub. So from the source, the destination, it will take a long time for that packet to be transmitted to the destination.

So, these types of networks are actually considered to be constrained. Constrained in terms of bandwidth and energy. Therefore, there is always a high probability of [inaudible] loss in these networks. It is important that if we are going to design the

transport protocol for these types of networks, it should be something reliable.

I think although we always talk about security threats, I think it's also important to consider the reliability issues when it comes to transmitting the data itself. Next slide, please.

There are actually mechanisms to improve the reliability in terms of transmission of data in such networks. The first one is local retransmission, so mainly the idea is that if there are packet losses during transmission, the source will have to ask the – I mean the destination will have to ask the source to transmit that missing packet. One example of that is through data caching. It's the same caching that was discussed during the DNSSEC session.

The other one is the congestion control mechanism. Later on I'll discuss how congestion is happening in a wireless sensor network. So those are actually two mechanisms that can improve the reliability of transfer protocols. And some [excess] things, state of the art protocols, combine these two to further improve the performance. Next slide, please.

So, let me give you an example or a use case scenario here. Let's say for a smart agriculture. Smart agriculture promises us an automated way to control, let's say, the water level or the Ph

level of the plants, or it can also control let's say the mechanism in terms of farming.

So, here, let's say we have the source node, which collects the data from the soil. Let's say [inaudible]. Then it will be transmitted all the way to the sink node. So these intermediate nodes here, the responsibility of them is to forward data.

Let's say if I am only using a traditional transfer protocol, what will happen is that if a packet is [dropped between] nodes 4 and node 5 it will be detected by the sink node that the end, and it will have two requests [inaudible] transmission all the way back to the source node.

So, in that case, it will actually consume a lot of energy. So, if the transfer protocol performs caching what will happen is that these intermediate nodes will cache all the packets they are actually receiving. So if in case that packet is dropped between node 4 and node 6, what will happen is that when sink node detects this missing packet, it will [inaudible] have two requests [inaudible] transmission all the way back to the source node. But actually, node number 4 can perform as the new source node. Therefore, it will lessen your retransmission and also the energy consumption will be lessened. That's one use case.

Another one is, next slide, for smart cities. So nowadays intelligent transport system is future of the smart cities. Let's

say, for example, in this case, the type of the [inaudible] more demanding in terms of pay load. Let's say in a smart city wherein it can predict possible route decisions in case of vehicle congestion. It means that the data is something in multimedia type. It's a higher payload.

So, the same idea. Those packets will be dropped due to maybe wireless problem during congestion of traffic. If the transfer protocol is performing caching, again it will lessen the number of retransmission as well as the energy consumption. Next slide, please.

Where in wireless sensor network congestion normally happens. There are two possible locations. The first one is at the buffer. I think you are familiar with [inaudible] computers. That's also buffers. Those buffers are actually limited in terms of size, so therefore the [inaudible] time that they will be full. So, if these buffers reach their corresponding or respective threshold, it will overflow. It will further cause congestion.

Another one is that during wireless transmission, these nodes can actually contend for the channel and it will also cause collision between these transmissions. We call that buffer overflow and link contention as causes of congestion in wireless internetworks. Next slide, please. Previous slide.

These are actually just mechanisms in terms of congestion control. There are three phases. We have detection, notification, and avoidance. I will not go into these mechanisms because they are too technical. Next slide.

In my analysis, these two mechanisms can of course contribute to the improvement in terms of reliable transport. However, as of today, no study has been developed or had developed a relationship between these two mechanisms. That can actually result in non-optimal use of intermediate caching as well as inappropriate congestion window and energy consumption of intermediate nodes. In short, none of these existing congestion control are actually cache aware. Next slide, please.

The hypothesis is that it will provide us an underlying support in terms of developing a new congestion control mechanism, which is cache aware and at the same time can guarantee us to maximize the use of cache. In effect, the result will be a more reliable end-to-end transmission with better cache facilitation, improved network efficiency, and reduction in energy consumption. Basically, that's all for my presentation. I hope you were able to at least connect some of the terms. Thank you.

DEBORAH ESCALERA: Thank you. Very fascinating. Are there any questions from the audience? Go ahead.

DANIEL WOODS: For the record, Daniel Woods. You said that you use the caching to overcome the connectivity issues. Are there performance problems in terms of having enough memory size to manage the cache?

MELCHIZEDEK ALIPIO: Ah yes, that's a good question. Because sensory networks are also limited in terms of [this] memory, that's why we have to develop a protocol that can maximize this cache memory. But that will be again another constraint and it should be considered in terms of designing these types of protocols. That would be another concern, yes.

DEBORAH ESCALERA: Any other questions?

MELCHIZADEK ALIPIO: Sorry if it's not more of the ...

DEBORAH ESCALERA: Thank you, very nice.

MELCHIZADEK ALIPIO: Thank you.

DEBORAH ESCALERA: Okay, next we have Benjz Sevilla also from The Philippines.

BENJZ SEVILLA: Hello. Good afternoon, ladies and gentleman. My name is Benjz Sevilla. I come from The Philippines. I actually work for the government, and as the ICANN CEO earlier said, government that is supportive of building a digital society. I work for the Department of Information and Communications Technology. It is barely a year old, a new ministry in The Philippines.

On top of this, I also serve as the senior vice president of Internet Society Philippines and the co-chair of Philippines Network Operators Group.

While waiting for this presentation, this afternoon I'll be talking about Internet governance in the Philippines and especially the different multi-stakeholder engagements that drive these discussions forward. I think you can load the PDF. It's less of a file. Alright, so we can go to the next slide now.

I have divided the presentation today into about four parts that I'll be going through one by one. Basically this will be starting with the context of how the Internet governance landscape in The Philippines is and it will be followed by a simplistic take on how the department currently operates in building a policy, or in

the policy formulation process. It will then be concretized in the local community engagements that we have undergone in The Philippines in the past few years. Next slide.

This slide basically paints us a picture of how the Philippines Internet fares with [inaudible] neighbors, and of course in reference with global Internet standards. As you might realize, the Internet in the Philippines is not so really fast and it's very expensive.

With this, the department or the government has earlier this year released the National Broadband plan that hopes to accelerate actually the investments in the telecommunications industry in the country as well as engaging the public and private sector into a holistic take, setting up new Internet connections in the Philippines.

We actually see from the government that putting up free WiFi access points is a good way to stimulate demand and greater connectivity in the Philippines. This enhanced connectivity actually enables more people to have social mobility that is moving from one social class to another and it also provides opportunities for economic progress. Next slide.

Related to this trend, the government firmly believes as well that we are getting connected sooner or later, and realize the need to

transform processes and mechanisms so that we are able to embrace a digital economy in the Philippines.

As you may be aware, digital economy, usually it's the data that is the new currency and this data, because we have a lot of data in the government, will have reached this data in order for us to be able to create new investment opportunities using the information available.

What we wanted to do is to build out new infrastructure that will be able to deliver new services or the services of the government to the 100 million Filipinos on our part of the world. And in doing this, we also maintain a level of trust for us to be able to maintain and secure the activities online of these constituents. Next slide.

As we are cognizant of the role of policy with the same accord as ICANN process that elevates policy discussion into a multi-stakeholder process, we realize this virtual cycle of ICT formulation. We can start with the ICT innovation framework, and in order for us to be able to establish infrastructures that are not only integrated but also interoperable, we have to realize that this policy should also be industry supported for it to be very effective.

After doing so, we also realized that there is a need for a complementing role of the policy making and the regulation and

the regulators solidified with a bottom-up approach as concretized by a multi-stakeholder engagement. Alright, next slide.

So, we move on to the different strategies that the department is employing to answering the needs of society. In the lens of Internet governance, we actually use the first step as mapping or understanding the ICT landscape. It is very important because we don't really need to reinvent the wheel. We have to look for the solutions that are already available. We could look at the global best practices, and with that, we are able to build technical capacity and more constituents. And like the same as here in ICANN, we are able to magnify cross-sectoral opportunities. These are opportunities brought about by new friends, new networks, and new contacts. By this we hit two birds in one shot. We build the capacity and of course we magnify the opportunities. Next.

With the different strategies in paving the way for universal access and surveys, it is important to realize that all of Internet governance discussions in all of this. We are building the national broadband plan. We also have e-governance on the table and we are stimulating demand, and of course we are doing digital literacy programs. But let us not get into the different technical details and let me now focus on the different

events that we did in order to address these Internet governance discussions. Next slide, please.

We can actually skip this slide, but in summary this just fleshes out the different strategies that we have employed in the Philippines. As you can see, we are focusing mainly on the technical issues, policy formulation, as well as development of work for this. Alright, next.

We now turn on to the different activities that we held over the past few years. Let me center on three organizations. That is the Department of Information and Communications Technology, the Internet Society Philippines, and the Philippines Network Operators Group.

This set of pictures was from last year. This event was led by Internet Society Philippines. We did outreach activities for IETF as well as engaging the community outside of imperial Manilla. So we travelled way beyond the capital to bring them on board in the community discussions. This was held in Cebu. This was around two hours from Manilla. This was supported – again, led by ISOC, supported by DICTN PH. This was actually the very first event of the ministry. We see that the ministry puts on high regard on Internet governance. Next slide.

Following this, we held very first ever PhNOG conference early this year. It's a two-day event with the theme of Philippines

Internet. This is now supported DCIT and ISOC. So you see that there's this dynamic that if it's technical events, it's led by PhNOG and its developmental work, it's led by ISOC.

It was also the very first [inaudible] forum, for those guys operating networks. We actually thank ICANN the Asia-Pacific regional office for flying in and supporting this event. Next.

Very fresh, before flying to ICANN, the DICT or the government has also conducted the very first Internet governance colloquium in the Philippines. This was just last October 18th. It was very well attended with a lot of esteemed attendees. This format is mirroring the real Internet governance forum. I was a product of ICANN's as Asia-Pacific Internet Governance Academy which made me comfortable leading these kinds of activities in the government.

This one is supported by ISOC and PhNOG. You see again the dynamics, the different organizations that the community is working towards Internet governance. And of course we thank also, if you know [Gyro], we also thank ICANN's Asia-Pacific regional office for supporting these kinds of activities. Next slide.

So, now I [inaudible] if you ever find yourself in the Internet governance space, I would like to echo what the ICANN CEO said earlier, that we have to engage governments. We have to make them more supportive of building a digital society. If you

actually follow PH Internet and hashtag [#netgovph] one hashtag is for all the complaints that the Internet is slow, blah, blah, blah. Internet is very expensive. The other one is the more diplomatic discourse, #netgovph. With that, I think I end my presentation, and if there are questions, please. Thank you.

DEBORAH ESCALERO: Thank you, Benjz. Are there any questions for Benjz? Yes, please.

ADEEL SADIQ: Thank you. I actually show a lot of similarity between what you just presented and what we have in Pakistan. One difference is that we are 200 million people and you are 100 million people. All of the things [inaudible] was the same.

So, my question to you is that the numbers that you presented and the [inaudible] ranking that you mentioned, how do you capture data? How do capture the ongoing data for all of the numbers that you presented? Do you take it from the operators? Because this is what we do. Or do you connect independent service and activities like I do, find out the [inaudible] of the ICT situation in your country.

BENJZ SEVILLA:

Thank you for that question. For clarification, the sources of the data are on this slide. But however, I would like to point out that I think we are fortunate in that side of the world in the Asia-Pacific that ITU has presence there as well as the Asia-Pacific telecommunity which were very helpful in validating this data.

There was this instance in the past few years basically between the transition from 2011 and 2012 that there was a jump of statistics. Let me give you this example. For example, in 2011, they said that the Internet penetration in the Philippines is about 10%, and then in 2012 it suddenly became 25% or something like that. In that one year, there was a handover of data from one agency to another, which made [inaudible] how could in one year the Internet penetration suddenly change 15%? That's very hard. That translates to 15 million subscribers already in a 100 million population.

So, basically, your question is very much important because we have to understand that the sources of the data should be an authoritative one. Why? Because for many of us in developing countries, statistics will make money. What do I mean by this? If we say that in the Philippines we have 50% penetration, we don't have any more reason why we will get a loan from other countries to beef up our communications. So yeah, to get this data, we get it from the operators but we are lucky because we ITU is there to validate.

Yes?

UNIDENTIFIED FEMALE: Hi, [inaudible] speaking for the record. Thank you very much for the presentation. In terms of multi-stakeholder governance, do you see any stumbling blocks in the Philippines?

BENJZ SEVILLA: Thank you for that question. Actually, the biggest problem in the Philippines in terms of Internet governance, the reason why we did not call the Internet governance colloquium a Philippines Internet governance forum is that we are unable to really fly in participants into a central meeting place or to set up remote participation, mainly because we have 7,641 islands in the Philippines.

UNIDENTIFIED FEMALE: Let me ask you a follow-up question. In terms of equal participation let's say from civil society, businesses, as well as governments, is that on an equal footing in your opinion?

BENJZ SEVILLA: Alright. As my presentation earlier highlighted, I think we have employed the government, the DICT, as well as the civil society as ISOC and Philippines network operators as a part of the

technical community and as well as the business. So, suffice to say that I think it is [inaudible] for a real multi-stakeholder one, but our main contention one is for the participation from the different parts of the region. Thank you.

DEBORA ESCALERA: Okay, we're going to stop there because we are very close to 3:00 and we have one final speaker. Thank you very much. Doggi Lee from Korea.

DONGGI LEE: Hi, everyone. This is Donggi Lee from South Korea. Due to limited time, I just want to point out the most important thing that I want to share with you, so let's get started.

I'm from South Korea and I'm online eight-plus hours a day. It means I'm really familiar with the Internet. I'm the first Internet generation. It means I grew up with the Internet from when I was young and I was a little bit older and right now, and maybe [inaudible] more. So, I'm a user from Windows 95 to the windows 10. So, here's where the Internet has been ranking. Could you go to the next slide?

Maybe [inaudible] Switzerland, Hong Kong. But South Korea has the fastest Internet connection in the world. However, it's not at [inaudible] for South Korea because there is a lot of personal

information leakage. Actually, there is 53 billion personal information leakage for the five [areas] in South Korea. And for your information, the population in South Korea is one million. So maybe like my information can be leaked multiple times.

I'm pretty sure guys already heard about [inaudible] that's strongest ransom ware, but the trend is going to be changing. The ransom ware is going to be translated in Korean. It means ransom ware or the [inaudible] is going to be something more. They select a target in specific countries. I think even hackers know that Korea is not that safety with that kinds of ransom ware.

And there's other [inaudible] phishings that Anonymous guy collected contact information from the Internet and they make a fake profile [inaudible] for the domain extensions, and they try to call to the company in Korea in local language. "Hi, we're ICANN Korean branch" or "We're one of the accredited registrars from ICANN and you need to extend your domain right now," but actually that is fake. So there's a lot of voice phishing, and in reality many of the companies in Korea, they got their voice phished. So I think the issue is going to be more serious and serious in South Korea.

This is a really horrible example in South Korea. They named company Nayana. Nayana is one of the web hosting companies

in South Korea and it's really the old and [inaudible] Korean local company used web hosting services at Nayana. But, the hackers hacked in Nayana web hosting host [inaudible] and the hacker said we need to get them BitCoin. But there's a lot of big companies, major companies, using Nayana so the stolen data was really critical. So the company Nayana they just spent money, over \$1 million US dollars. So the crime is going to be very serious in South Korea.

So this is my point that I want to share. Internet makes our life getting better and faster and even comfortable. Due to the IoT, the scope of the Internet is going to be wider and wider. In our lives, there's a lot of different kinds of the Internet in our [world]. However, it might be pros; however, it might be cons. So we need to think... Yeah, press one more button.

So I think the Internet might be like a double-edged sword. Even though Internet, the technology – move to the next one. The next one. Yeah, press it one more time. One more time.

So, this is what I want to say. Even though we have a lot of the really up-to-date technologies in South Korea, we have really fast Internet connections. However, I think the people aren't aware of the importance of the Internet governance.

That's why if we a little bit take care of the Internet governance or how ... If Koreans think, oh, technology is important, but we

need to think about Internet governance thing as well. If we did more, maybe we might prevent those critical crimes as well.

I just want to deliver the message that it's time to share the value, how Internet governance stuff is important and why Korean cities need to be aware of that. Thank you for listening.

DEOBORAH ESCALERO: Thank you Donggi Lee. Any questions from the audience? Okay, thank you so much for your presentation. Oh, there was one. I'm sorry. Sorry, I didn't see that.

UNIDENTIFIED MALE: I want to ask him because South Korea is the world's most premiered and most advanced country in terms of ICT development. I think you are also number one in the IT rankings this year. You're pretty much the model of where everybody would like to be in the end. We are way down in the hundreds or whatever.

The things that you just mentioned about the problems you are facing because of this Internet influx into your country, what is your government doing to overcome these issues, and since – if you overcome these issue in advance, are there countries that are going towards that path that they can learn from you and

probably tackle those issues on the way up? What is happening [inaudible] in South Korea?

DONGGI LEE:

I think that's very complicated situations. I think that it's [inaudible] government. Government always has a priority to develop new technologies. That's why if we have two options, like Option A for developing new technologies and Option B is setting up some infrastructure or setting the Internet security. But we always take the Option A first. Later on, then we're going to take Option B.

I think the human resource is not that enough about Internet governance in South Korea. That's why there's the one agency from the South Korea government named KISA, the Korea Internet and Security Agency. The human resource is limited but there are so many – the Internet websites and the companies, they need to cover. That's why due to the limited resources, I think the Korean government cannot handle everything.

I think that's why I just want to emphasize on the importance of Internet governance things because those crimes can be protected and we can prevent in other [inaudible] if we just put a little bit more effort on that issue.

I think we need to make more collaborations between governments and ICANN and other departments to make it better.

DEBORAH ESCALERA: Okay, thank you. Thank you for your presentation. Okay, we need to wrap it up because there's another session in this room afterwards. I want to thank tech support for their support today. I want to thank the audience members for being here today.

I remind you that we'll be here in this room tomorrow for the second half of the presentations from 1:00 to 3:00 p.m. Thank you.

[END OF TRANSCRIPTION]