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>> IZUMI OKUTANI: Good morning, everyone. Welcome to the
session on national policies and business strategies on IPv6.
Please start taking your seats and getting settled.
I really appreciate everyone for attending this session from
early in the morning. And while it might sound a bit more
technical than other sessions and for taking an interest on this
topic.
My name is Izumi Okutani from JPNIC. I'm also serving as
executive Council member of APNIC. I'm co-moderating this
session with Aftab Siddiqui, a member from ISOC. You might feel
that the topic is more technical than some of the other sessions
covered during APrIGF. You don't have to worry about having a
technical expertise on IPv6 because the focus of our session is
on policies and strategies.
And so we would like to have discussions in three parts. The
first part is more like scene setting and sharing the basic
environment, the current situation around IPv6 deployment. The
second part we will hear from our panelists here, their
perspectives and observations about IPv6 and what might be the
helpful way forward in encouraging deployment. And the last

part we'll have discussions together with you. So we want to make this session very interactive.
So I already see like quite a number of familiar faces. But I would like to see how many of you are familiar with what IPv6 is. Can you raise your hands if you know? Okay, it seems that most people know. So I don't have to cover too much into the details. Just in short, for the record, so IP address is like a technical identifier to put the devices to be connected to the global Internet.
Like phone numbers for telephones and the version of IP address that we have been using since the start of the Internet is called IP version 4. However, this has run out of newly available stocks to be distributed since 2011. We still have this new version called IP Version 6 we don't have to worry about the exhaustion, but there are actions needed for the devices or the services to be IPv6 supported to make sure you are able to connect to the Internet using IPv6 address or access to a website using IPv6 address. That is what the issue is about.
And so why is this relevant to Internet Governance is that it is related to the issue of access and accommodating growth of the Internet.
So making sure that we are accommodating new users, new players to the Internet.
Who may not be able to receive IPv4 address, but be able to be connected using IPv6 just the same ways that users of IPv4 address is able to do. And then keep on accommodating the growth of the Internet.
That is what the context of this topic on the Internet Governance.
And so I would like to start sharing what are the work that has been done in the global IGF.
Okay, great. So I would like to start sharing the slides. And all of this work in the global IGF is started since 2015. We started the Best Practices Forum on IPv6 there exactly under the context that I described earlier. And then what is interesting is that we have had then had a session on IPv6 last year at APrIGF and then we brought the feedback that was discussed there again back to the global IGF. Now we are back here. It's like global feedback shared in the AP Best Practices Forum provided back to the IGF. Good global discussions an the regional discussions.
And I would like to share some of the key points that were some highlighted in the work that was done in the global IGF in this presentation.
I can't remember where I put the ... oh.

Thank you. So this is the session that we had in Guadalajara, Mexico, and Global IGF in December last year. If you're interested to observe the discussions, there should be a video available. Take a look from the link over here. Why IPv6 at IGF? I think I explained a little bit. To encourage deployment of IPv6 you can't do it by a single organisation. You can do it on your own. To make it truly effective and raise the deployment rate worldwide, you really need a collaborative effort within your country by different players in industry, as well as make sure that different economies, countries in the world deploy IPv6.

So at the point in December last year of v6 work at IGF, the overall deployment rate of IPv6 was a little less than 8 percent. This has really grown since then. It is now 15 percent. So it is almost double within half a year, which is quite impressive pace but still overall, 15 percent is not necessarily really high. So there is still room for doing more work.

So what work did we do in the Best Practices Forum? So myself and also Simon from Bangladesh, we have served as the co-coordinators on this topic.

And this was very much open community effort, everyone was able to join the mailing list for discussions, regular telephone conversations and as a result of that, we have compiled a document on best practices on IPv6, which is available on the IGF website. It's on the UN IGF website, the output of this document. You can take a look if you are inned to look into it in further details.

And one of the things that we did was, we collected case studies, 20 case studies from different parts of the world. Also the U.S. government, NTIA, an agency within the U.S. government helped us compile the cases from the U.S. as well, from Microsoft, AT&T and a few others.

And some of the examples categorized per industry players is, for example, for content, a talk from Korea, and also from Brazil, TM Net from Malaysia. FTP from Vietnam helped us share the cases in the area of telecom. T-Mobile from the U.S. I won't go into the whole list. You can see that there are various industry players contributing in sharing their cases from different parts of the world. I do want to highlight, it is not just Internet companies who have shared these cases, but banking and security. Wells Fargo and other banks shared their cases and Sony has shared their cases as well. Again this is all published. You can take a look and see what they've done and what are the incentives they've seen if you're interested. And then what is notable about these, the top 20 countries at the point in December last year of the IPv6 deployment rate. It

is not just the Developed Countries that has high deployment
rate. There is no correlation with GDP. So the countries
highlighted in red, Greece, Peru, Ecuador, Trinidad and Tobago.
They have high deployment rates. This ranking and percentage is
a bit old. It was six months ago at the point of IGF work. Now
India is within the top ten with, I think, almost 50 percent
deployment rate. It's very, very impressive. Please, take a
look at the actual link that is shown here for the latest
figures.
But as I said, the key is that you don't have to feel hey, I'm
not a developed country and we can't do v6 deployment. This is
not the case.
Then another notable development since last year is that in the
area of software development and equipment vendors, there has
been two notable announcements. One by Apple that they've
required all the AP software developers that want to put their
applications in the AP store, they are required to support v6
native since June last year. So that they all have to make sure
that any of the software that is developed for mobile to put
into Apple should support v6 natively.
Another thing is IAB. It is a body within a standardisation
community called the IETF. They have announced that it is no
longer a must for vendors to support IPv4 which they consider is
more of a legacy technology. And then still continue to make it
a requirement for any of the protocols to be developed to
support IPv6.
In short, there is more focus on vendors and software developers
to support v6 than before.
In the area of mobile, there is rapid growth observed. It is
quite amazing. I think Apple's announcement must have made some
influence. So large scale native IPv6 deployment in the U.S.
such as T-Mobile, Verizon wireless which is over 70 percent of
their traffic in IPv6.
If we look at the Asia-Pacific Region, Reliance Jio, over 70
percent and they boosted the deployment rate in India. SK
Telecom in Korea, they are supporting IPv6 mobile service.
Another development within Japan is that our Ministry has
published a report setting milestones for Japanese mobile
operators to provide IPv6 service by default by 2017. We
actually have a speaker from Softbank here today who will be
sharing his experience.
So then with all these developments, if you actually look at the
end user development environment, even without yourself as end
user being conscious, the environment is getting very ready.
So, for example, look at major global contents. Google,
YouTube, Facebook, Wikipedia, LinkedIn, all these are v6
supported. Major cloud or CGN players, CDN players support

IPv6. They make sure that the contents can be viewed very
smoothly. Akamai, Microsoft Azure, Amazon, AWS, they all
support IPv6 and Akamai has observed that 50 percent of their
mobile traffic is already accessed using IPv6. This is really
rising out.
Latest operation system is supporting v6, blah-blah-blah.
So if an ISP turns on v6 by default you can expect to see a
substantial volume of traffic using, accessing via IPv6.
And this is another like projection of IPv6 enabled web browsers
courtesy of Google, that today -- well, today like in December
last year it was 15 percent in total was expected to be about 20
percent by the end of 2017, by the end of this year.
But we have already reached 20 percent at this point. Then by
the end of 2019, expected to be around 35 percent. On the other
hand, there are still areas which needs more work. One is the
area of access line. Preparing ISPs infrastructure is not that
difficult, but then the last mile between ISPs infrastructure
and end user part, this might be an area that may be causing
some challenges. Content, top Alexia website, I think it's
already 22 percent, 20 percent is v6 reachable. The rest of
IPv6 is not. More work needed in making local content available
and support IPv6. There is sporadic support in data centres and
Internet exchange point which are the core of providing
infrastructure. And so this part also needs more support.
Common deployment challenges. I won't go too much into details
here, but these are also like listed. A lot of it was actually
a part of the input by APR IGF last year. Thanks to you.
So take-aways for policymakers. What are the actions that they
can do? I think one of the things that they can do is request
vendors to support IPv6. This was one thing which was strongly
recommended by Microsoft in their inputs that governments should
require vendors to, as I part of their -- to require vendors to
support IPv6. Awareness raising to consumers that they make
sure they buy equipment that is IPv6 supported especially when
they buy home routers. Outreach to key decision makers in the
industry and things like that. There are things that
policymakers can do.
And then take-away for business decision makers is that whenever
you upgrade your equipment or buy a new equipment, make sure
that out of different choices, choose the product that supports
IPv6. By doing that without making additional investment, just
for IPv6, as a part of your equipment upgrade, actually your
network will start getting IPv6 ready. So this is very cost
efficient.
And when you deploy IPv6 commercially, turn it on by default.
Some of the ISPs make it optional that customers have to request
for IPv6 service, but end users are not going to say I want IPv6

service especially. Make sure you don't make it Optional. Make
it provider service by default. Vendors have your products
support IPv6.
Key message of our best practices document is that consider IPv6
for long-term business strategy. I mean, IPv4 is not
sustainable. It is already run out of new stocks. And so make
sure that you have your network and service ready for this
coming protocol, IPv version 6 and then in a couple of years ago
IPv6 was more like, I mean theoretically it might happen, but it
is more like theory and not happening so much in reality. It
was more like an insurance, just in case.
But as you can see from my updates, it is really happening
rapidly especially in the area of mobile. So you really want to
adjust to the reality today, not for hypothetical situations.
Let's each do our part to prepare for the situation. So that's
a key message of our document on IPv6 in the Global IGF. Thank
you very much.
(Applause.)
>> IZUMI OKUTANI: So should we move to the second part? So you
will be moderating, right?
>> AFTAB SIDDIQUI: Sure. Hi. Thank you, Izumi, for the great
insight in what is happening and what we are looking at. I am
from the Internet Society. So we have the panel here with me.
Here is Billy Cheon from KISA. Can you introduce yourself on
the mic as well, please?
>> BILLY CHEON: Hello. My name is Billy Cheon, KISA, from
Korea.
>> AFTAB SIDDIQUI: And then we have Koji from Softbank and we
are missing two panelists. Hopefully they will be here in a
short while. So it is more of an open discussion. We will try
to get as much information as we can, but if you think you want
to ask some questions, please feel free to ask any question.
There are two mics here.
So well, we have ... yes. We haven't decided yet and we have a
question on the floor.
>> AUDIENCE: No, go ahead!
>> AFTAB SIDDIQUI: Thank you so much. Gearing up for the
question. Well, that is the spirit! That's the spirit, yeah.
No shouting today. Well, yeah.
So let's start from the, I would say from the regular
perspective. We have KISA. And let me get some brief overview
what is happening. And as Izumi shared the slide which says
that in Asia-Pacific specifically India is on top at the moment
just because of an operator. And the rest of the top ten only
have less than 10 percent deployment. And India is on top with
40-odd percent deployment. And the difference is huge. So let
me ask Billy, what's happening? What is not working from the

regulator side and what is not working from the operator side?
How is the situation in Korea?
>> BILLY CHEON: Thank you, Aftab.
Well, I don't know all the case in the other countries, but I
would like to share my KISA observation and government strategy
for the IPv6 deployment. You know, I am with KISA, that is a
quasi government organisation. IPv6 has been quite important
topic. With the post industrial revolution, as infrastructure
to develop local Internet industry in Korea, and also globally
also it is important to be connected. Everyone knows that. And
for this KISA with the Korean government set a plan for IPv6
deployment. We actually studied the global IPv6 deployment
trend from the multi perspective. First network perspective.
Second, service perspective. And third, user perspective.
And we studied these perspectives from the these perspectives,
global IPv6 deployment trends. And the major finding in the
network perspective was according to the data from Akamai, the
top ten countries with the high IPv6 deployment rate are
Belgium, Greece, Germany and the states. These countries we
noted that major ISPs possess 70 percent of traffic and they
support IPv6 end-to-end networking.
From a service perspective, 16 out of 100 world popular websites
supports IPv6. For example, Google, LinkedIn, YouTube,
Facebook, Amazon. These support IPv6. Especially in mobile
apps, Apple also mandated to support IPv6 in registering and
updating apps on ISO platform in the App Store as of June 1,
2016.
From a user perspective, according to Google data, global IPv6
use percentage was just 0.27 percent in 2011, which was IPv6
user period, but this increased to 15.14 percent in 2016. This
is 56 in five years. In comparison with this global trend, we
also looked at local status of IPv6, same again. In network
perspective, IPv6 in Korea, IPv6 adoption was very slow,
especially in PICs line and communication was very poor between
the ISPs. But one thing notable is that the mobile carrier
while very active in IPv6 deployment, because I think many, many
reasons for why we adopt IPv6, but I think the main reason is
that they just need more IP addresses to indicator new
customers.
So as Izumi just mentioned, as KTLGU plus deployed IPv6 in their
LTE networks two years later.
And also service perspective, about 1,000 out of 3.4 million
domains in Korea, which is equivalent to 0.03 percent domains in
Korea support IPv6.
And content providers also, I mean, such as DOM and neighbor,
these content providers also support IPv6 in part of their
services.

And so with this, our take, our major observation is that from global, overseas case in network and user perspective, as pace setter, multinational companies including major telecos and mobile carriers are driving IPv6 deployment. And service perspective, global service providers such as Google, Facebook, and also platform service providers are driving IPv6 deployment through App Store and content delivery networks.
So local status, after looking at local status mobile carriers are driving IPv6 deployment. And the deployment in fixed line networks was so slow. So we reached the conclusion that probably we need to focus on mobile area first. So preferential IPv6 deployment for mobile area is needed first, possibly leveraging the platform service providers.
So we actually set up this IPv6 deployment strategy with the Korean government in the first half of this year and the major target in the strategy is to raise IPv6 usage to 10.4 percent, which is the average figure of 35OCD countries and enter into 20 countries with the high IPv6 adoption rate by Google measure.
The will second target we set up is to put IPv6 traffic exchange between local backbone ISPs and the poster. This is to poster IPv6 ready environment with mobile services.
So should I stop here? Okay.
>> AFTAB SIDDIQUI: Thanks for the update from KISA.
(Lost English translation.)
>> AFTAB SIDDIQUI: This is what is happening in Korea. If you check the stats, one of the biggest telecom operators is providing the IPv6 services and making an impact in Korea as well.
So now we have Koji from Softbank. Again, they are one of the top five IPv6 providers in Japan. The Japan percentage is very, very good in the region.
So let's hear from him, what encouraged his company to deploy IPv6 and where are they heading now.
>> KOJI YASUKAGAWA: Thank you so much. Good morning, everyone. So my name is Koji Yasukagawa from Softbank. We are one of the two or three telecommunications companies in Japan. I would like to talk to you about IPv6 deployment experience in the mobile network in Japan. I am in charge of the conducting for the IPv6 in the mobile network. Thank you.
So I prepared a few slides. I would like to talk based on the decks.
So firstly, I would like to talk about the mobile situation in Japan. So in Japan, sorry, I have to talk about one thing that is very important. Softbank is the name of the bank, but we are not a financial bank. So this is just a telecom company.
So I talked about the mobile situation in Japan. So in Japan, there are three major telecom carriers. It is one of the NTT

Docomo. The other is KDDI. That is the next Softbank. Japan
has three mobile company and we are providing the customers,
providing for the others also.
In Japan, the diffusion rate, currently we have, 128 percent.
So this is the only the cellular mobile phone. This is, except
wireless broad. So this is focused on only the mobile server
network.
Why I'm here. So we talk about the three mobile operators. One
of the two operators launched the IPv6 as a default service.
One other telecom company will provide IPv6 as a default.
So firstly, until 2016, so three mobile operators provided IPv4
service only as a default. So some people, some customers
wanted to use the IPv6. So those customers had to order to use
IPv6 in that situation.
But so actually, we discussed in the government Committee,
actually the Japanese government has an administration of the
information and communications, and we mainly encouraged using
the IPv6 installment of IPv6. And so another aspect, actually
the mobile operator aspect, the point of view, we provide LTE.
And we provide the ULT. It is a voice service on the LTE.
Actually, this is based on the IPv6 network. So this situation
makes us the occasion to join the IPv6 world.
So right now Softbank provides IPv6 as a default. So the
customers use IPv6 with a contract.
Next we are talking about the timeline for launching. Actually,
the Softbank provided the IPv6 as a default since 2016 in June.
And right now last month NTT Docomo has provided IPv6 as well.
Another one, KDDI will provide IPv6 as a default by 2018.
So we addressed the commitment in the government Committee and
announcement for the Internet world. So actually, currently the
Softbank has launched mobile handset, a mobile handset over 20
models. This is based on the IPv6.
So I direct you to talk about the differences of the IP address
assignment. IPv4, the handset of customer, of customers used
IPv4. This is only the private IPv4, not global. So every
handset has to show to change the IPv4 global, IPv4 address.
Currently IPv6, as you know, the IPv6 is no need, sorry, the
IPv6 have lots of address range. So we don't need to change the
between the private and the global. So we provide global IPv6
address for the hand set.
Actually, this is two roads from the customer's point of view
where customers reach the website by IPv4. This is through NAT.
But if it is even Google or YouTube or Facebook like that, so if
customers reached IPv6 website, it can be reached directly with
it or not. This is a totally different from mobile carriers
point of view.

We need to talk about IP addresses. Actually, the private IP address is protected from global Internet network, naturally because is it not?

But IPv6 network is a global network until the handset. So I think this is one of the risks. We cannot describe the size of the risk, but it is actually the risk.

And this is a sticking point for the launch IPv6. Actually we need a change of network. Why we cannot, we couldn't change the IPv6 network from IPv4 network until last year. So actually we need to change our network and we need an investment doubled because we need a provider IPv4 network and IPv6 network also. And we need to develop, we need to change our way of the handset information system, and the education for the staff and the call centre also. Sometimes the customer might ask them about the IPv6 access.

So this is or was one of the big issues. When you are roaming out, we need to assure the reliability when customers go overseas. Actually, this is a benefit. I am talking about the benefit of the IPv6. IPv4, you know that IPv4 has the limitation of the address size, range. We need to sprint the network actually. But on the IPv6, IPv6 has lots of big, huge address range. So we can have only one network. This is a good point for the cost efficiency.

This is the last slide. Our goals. Currently, a customer accesses IPv4 and IPv6 as well in parity. But the mobile operator, the Japanese mobile operators thinks about we want to access via only IPv6 finally, because we told you about the network speed and the double investment. We have two networks currently. So only in the IPv6 world. So we have only one network. This is a good point for the mobile carrier and the customer as well. Because it is simple. So migration of the contents to IPv6 is important to increase IPv6 usage and efficient cost management.

This is what I want to say today. Thank you.

(Applause.)

>> AFTAB SIDDIQUI: Well, thank you, Koji. And this is what we were, this is the most important point which he shared in the last slide. If you hang between v4 and v6, the user experience is not going to be a very good one. So if you make a decision that okay, fine, let's go with v6, you can actually measure the actual user experience, right?

So there are multiple measurements people have done. Even Jeff from AP NIC. He shows when v6 is faster than v4 and when it is not. The problem is the deployment is in silos. Sometimes it breaks the Internet just because everybody else is using it. So it is just like a chicken and egg situation. Sometimes the contents are available and the connectivity is not. So right

now, Izumi initially shared in her slide, like content is
available on v6. So the chicken is there. It is only the egg.
So it is your, if it is not connectivity, if the connectivity is
not there, that's your problem. And so again, I would like to
hear from Billy, from a regulator's perspective how they are
encouraging the service provider and the telecom operators to
deploy more and more v6.
>> BILLY CHEON: Regulator's perspective. I think IPv6
deployment should be driven by private sector, but in case of
Korea, the government was the main body to drive IPv6. But I
think it didn't work well. So we changed it, actually. Our
strategy to encourage people, encourage the industry to adopt
IPv6. We have been using push strategy with direct incentives,
such as tax redemption providing IPv6 at cheaper cost.
But it didn't work out well. So the strategy that I just
mentioned, we, this time we are using pull strategy, leveraging
with platform service providers and label most of the parts in
private sector and government is going to support IPv6
deployment at the minimum level.
That is what we are doing. Thank you.
>> AFTAB SIDDIQUI:
>> This is -- this is not the right way at all. I think for the
people in the Asia-Pacific, I think Izumi or Billy, you know
that. For a long time in the Asia-Pacific, we have so-called
IPv6 summit. IPv6 summit. What is IPv6 summit? All the money
actually from the government. No matter Korea, Taiwan. Even in
Japan they are running it. They have all the money from the
government and what are they doing? They are not solving the
IPv6. They are looking for a killer AP. They spend all the
money into the killer AP.
How long? I have no idea. They have done nothing. They really
actually made the IPv6 fine. It is two major situations or
scenarios that happens. I think for the people in this area,
you know that. First of all, because the IPv6 day is launched.
It is back to maybe 2009 or 2010. Who launched that? Basically
it is the content provider. You know, the major content
provider put IPv6 available. Successful.
I think the second bowl you have to be happy about that, sir.
The IPv6 did the not come from the computer. It is from mobile.
We are still living in the computer age. I think the IPv6, we
need to wait even longer. And mobile really made IPv6 happen
because everybody has a mobile. Mobile is, the number of the
mobile phone is much more than all of the computer or notebook
that we have.
And particularly we know that all the mobile system, no matter
if it is Android or Microsoft, they pull IPv6 much earlier is
workable in your mobile. So for these two issues, I think IPv6

actually happened this day and what I say is that you don't need
a national policy. The reason I'm saying that, if any teleco,
any ISP, they don't implement IPv6, just like Izumi presents, by
the end of the year the IPv6 traffic is up to 35 percent. For
those people now moving to the IPv6 ISP or teleco, bye-bye.
You are losing your customer. You are losing your user. Who
wants to access the Internet with only 65 percent? Once you go
to the 35 percent, you will see much faster the IPv6 go to the
45, 50, 60 and eventually nobody wants to buy the IPv4 address
anymore. Right now IPv4 address is a top dollar per address.
So if you have IPv4 address, you should sell it as soon as
possible to cash out. You know, so I don't think we have to
spend a lot of time to convince the government to do anything,
you know. The teleco or the ISP, they have to be surviving.
I think one of the, a couple of the questions is more important.
I think one of them is Softbank raised it. I think some of the
ISPs and telecos, they don't know how to implement IPv6. The
problem is, just like you say, a lot of people because they are
using the NAT to provide the private address to the user. When
they move to the IPv6, they don't know how to take care of the
NAT. So they keep asking one simple question: Should I still
put NAT in front of IPv6? I think that maybe we need to more
explore the new ISP teleco people want to go into IPv6. Don't
put NAT in between the Internet and the user.
>> IZUMI OKUTANI: Thank you very much, Kuo-Wei. I think you
made a very realistic observation on the reason and the factors
which pushed IPv6 deployment. It is basically the pushing
factor was the private sector. Actually went ahead with the
deployment and then another point that he highlighted, don't use
NAT.
I think I really agree with both. I also agree that based on my
observation that a particular like legislation or something as
strong as policy may be really difficult to implement it in an
effective way.
At the same time I think the situation, for example in the U.S.,
Europe, and Asia-Pacific, may be slightly different. So I just
want to share a situation in Japan. What was the extent of
government involvement there? So compared to the U.S. companies
or maybe some of the European companies who are genuinely
motivated on private sector level, hey, we have to get this
going. I don't know, the motivation was not as high on private
sector initiative.
So the engineers knew that this was needed, but it was really
difficult to make business case. And convince the top level
people. So what happened was two things: One was very much a
community-based initiative. We set up a task force among

different key Internet groups within Japan. What shall we do?
Let's set a milestone as industry.
Another thing is MIC has gathered a Study Group inviting
academics and the key business decision makers in discussing
what to do.
So MIC, it wasn't MIC who actually told the industry what to do,
but through the industry players themselves discussing what
should be done and because the business executives were there,
they thought okay, we have to do something about it. It was
published as a report as well. So it was like helpful as a
pushing factor.
Another thing is that the part that you mentioned about the NAT,
you know, you should try to encourage ISPs not to use NAT so
much, especially with additional costs. It is really difficult
to reverse it once implemented.
Again, I think there is a role that government can play in
sharing information. And it is not like regulating or anything.
Share the information. This could be the implications and leave
the decision up to the ISPs. I don't know if Koji has anything
to add from the perspective of mobile, because this is exactly
what the MIC did in the area of mobile. Do you have anything to
add? If you want, maybe you can speak in Japanese and I'm happy
to translate as well. But you can also speak in English,
whatever works for you.
>> KOJI YASUKAGAWA: This is not my opinion, but actually, the
government encouraged us to introduce the IPv6, actually. But
so on the network and IPv6 already, because the, it is a voice
calling service on the LTE. We need to prepare the IPv6 because
based on the standardisation standard.
So actually, when they make, when they held a Committee, a Study
Group, so we already have the IPv6 network as a portion. Not
completely here. Well, the government encouraged us to
introduce the IPv6 because the government was looking for the
IoT. It is like one of the buzz words right now.
(Laughter.)
>> KOJI YASUKAGAWA: Actually, the government is looking for the
IoT network. What is the network to be used efficiently? One
answer is IPv6. So the government encouraged that.
These are the circumstances that made us introduce IPv6.
>> IZUMI OKUTANI: Thank you. I guess in short it's like
private sector was motivated but also government encouraged and
pushed?
>> AUDIENCE: Let me try to put into the small circle. IoT is
not an issue, okay?
>> KOJI YASUKAGAWA: Sorry.
>> AUDIENCE: First of all, what is the government can do, you
know? We are all in Asia, we know that. The government is

quite bureaucratic and the government usually is, they don't
know the market trend. Maybe in the private sector. And they
don't know what is the difficulty of the private sector. I
think that Softbank is very true for every teleco. It's a real
problem.
I am a board member from a telecom. I know the problem, too.
If you run them to run IPv6, IPv4, extra charge, extra cost, but
no extra income. I think Softbank understands very well.
What I say, why the government should not get in. If they lose
the money, are you going to pay them? So let the decision be
made by the private sector itself. I agree, the government,
well, I don't think government can share that information. I
think it is much better for APNIC or the successful story from
Verizon or T-Mobile or Softbank, sharing through the mobile
company or teleco company or ISP company.
Because if they trust them, they know them, they know, they will
ask, for example, they will ask Softbank and say there will be
an extra charge, extra cost. What can you do?
And they talk. The government cannot talk in that way because
the government doesn't know the financial status and the expense
issues. And they don't know, they don't get the extra income.
And such as I just talking about it, it is the same thing. If
they heard from the Softbank and said you don't need NAT in
IPv6, they trust them. And the government told them, they don't
trust. Even if they told them you don't need NAT in there for
the IPv6, they don't believe you because you are not an
operator. You are not in my business.
So I will say how can we make the IPv6 really successful in
Asia, bring more successful stories like Softbank, something
like that. And of course, the slides of the data showing at
least right now in Asia in IPv6 we are not as good as in Europe.
So there is something we can share with them. But remember,
share the good example in their industry, not from the outsider.
Because the outsider you don't know the financial structure and
operation issues inside the teleco.
The Softbank just said one of the stories because they are a
mobile company. They don't have any idea, or it might be small.
If you want to change to IPv6, you have to change the box.
Change the box is money. Again, you know. So I would suggest
we are going to do sharing that information from APNIC, from
everywhere, from Akamai and from Google. All the ISPs need to
look at Google, share the story from Softbank, Verizon. T-
Mobile. I think the telecos will listen and they will move
faster.
Of course, the government can play a neutral position to do
that. Thanks.

>> AFTAB SIDDIQUI: Two supporting comments on what Kuo-Wei
said. We always heard there is no business case for the service
provider to deploy IPv6. Well, you have a business case now,
right? So rather than investing in CGN or big boxes and use
legacy IPv4, rather than just use IPv6 it is a very good
business case. The cost of IPv6 makes sense for a telecom
operator. As Kuo-Wei said again, if you want to change the
wired broadband subscriber, you have to change the box. It is
still very expensive. Let's try from where you can do at the
moment right now.
And the second supporting comment I would give is LinkedIn two
weeks back published their report from the U.S. that the mobile
traffic in the U.S. hitting LinkedIn has crossed 50 percent and
that is IPv6 only.
So it is a big difference. Just because of AT&T. And one
operator has changed the status text for the country. I would
say India, one operator. Again, telecom. It is easy for them
to take a step forward and we can learn from the telecom
operator in this region and hear the story that, well, it is not
that difficult. And it makes sense in terms of economics now.
So yeah, that is supporting comment. Please, go ahead.
>> AUDIENCE: Thank you for your presentations. I'm from
Pakistan. You mentioned some where about the ISPs. Correct me
if I'm wrong, the main purpose of ISPs is to keep the traffic
local and reduce the latency. How exactly establishing more
data centres and ISPs are going to help IPv6 when in my
government, my government are not supporting IPv6 in the first
place?
>> IZUMI OKUTANI: So I think that both have to support it. I
am not saying that ISPs don't have to support IPv6. So this is,
of course, needed. But also for the Internet exchange points to
support IPv6 as well as data centre, not just ISP. That is my
major point. I am not saying that data centres don't have to --
ISPs don't have to support IPv6.
Would that clarify your question?
>> AUDIENCE: I'm Leonid, from Russia. I have a very kind of
special question. We always discuss this and other issues
basing on the assumption that governments like businesses are
driven by some rational expectations. And considerations of,
you know, maximizing benefit for the community and the nation.
Yet just to give you an example of some kind of controversial
trend, it was just recently that RIPE NCC signed a memorandum of
understanding with the Russian government on the issue of IP
addresses location. The very next day, after that memorandum,
the Russian government put forward a very strong statement that
the IP allocation, matters pertaining to IP allocation, IP
addresses allocation should be an exclusive mandate of the

government and should be decided within the country and by the
government of a given country.
I think that that was quite a strong signal which, of course,
would be sent throughout a huge post-Soviet space and
governments, most governments in that area would follow that
example and that lead.
Another point about exchange points, the Russian government also
made a strong statement that all exchange points should be, of
course, located in the country and should be owned by the
government.
So in other words, my question is: When we talk about all those
market incentives and about some best examples, it might be
probably lost on some governments and some big players in
certain countries because either they are government-owned or
they have to obey certain rules.
What are you going to do with that? How would you be convincing
or trying to engage in meaningful dialogue with, under such
unconducive circumstances? Thank you.
>> AFTAB SIDDIQUI: Thank you so much, Leonid, for pointing out
a very important thing. I would really appreciate RIPE NCC's
initiative to support governments for the deployment of IPv6.
I'm not sure how they are going to do it. I'm still quite
skeptical about it. It is the same thing what IPv6 task force
was trying to do.
>> AUDIENCE: Just a minor correction. The memorandum of
understanding held that RIPE NCC is responsible for IP addresses
allocation and the Russian government recognised that.
On the very next day, that's what I'm saying.
>> AFTAB SIDDIQUI: Okay. Thanks for the correction. I didn't
get your point initially. Well, that is my skepticism still
remains, can't change it.
It's tricky. I'm not sure how it is going to work in Asia
specifically and probably APNIC can respond to that.
(Laughter.)
>> AFTAB SIDDIQUI: If they are trying to do something similar
and which may or may not encourage thinking about it.
(Laughter.)
>> AUDIENCE: I don't have a right answer. I'm Sonny from
APNIC. I would like to cover three points that the previous
speakers raised. And the presentations as well. So my daily
job at APNIC is to go around the region and talk to the
operators, the government, the regulators in making sure they
understand what is IPv6, creating awareness and talking about
deployments, right?
So we are in a diverse region here. In some governments, in
some economies, yes, the operators are taking initiatives on

their own without any support from the government that we can
see. It has been visible.
But in some economies when I talk to the operators and they say
the government is not asking us to do anything. Why should we
do it, okay? So it is a balance. It is a partnership. You
need to, in some economies you need that partnership to work
with the governments. Maybe the government should take the
lead. But in some others, they don't.
The other point I would like to raise here is, when we started
about this IPv6, discussing about IPv6, the deployments,
creating awareness, we have been focusing on the content. The
content is not on IPv6, so we had IPv6 launch day. We got the
Google, everyone on.
Now, the bottom line is the CPE, the users are using, right?
And that is why now we are discussing about reliance success,
but the reliance success is not about deploying IPv6 in the
network. The success is making those devices available to the
subscribers, hundreds of thousands of subscribers. You see the
reliance going up because of those CPEs. That is where we still
have to focus our interest in talking to the vendors, talking to
the operators, how we can actually change those CPEs so they can
support IPv6, right?
My third point is, we still have to go after economies where
there is low IPv6 deployment, create awareness among the
operators and regulators, try to bring them to one table to
discuss their issues, discuss whatever they require support from
the governments, to make it happen. Thank you.
>> AFTAB SIDDIQUI: Well, reaching out, it means reaching out to
the whole Asia-Pacific Region because the deployment is really
small. So yes, we have to make extra efforts now.
Please, go ahead.
>> AUDIENCE: I am from Singapore. In 1995 I have IPv6
published. Now we already have more than 20 years. So then
IPv6 has been in deployment more than 20 years, but now still
very, very low.
I don't know whether next 20 years is IPv6 will be deployed.
You also mentioned that the government should do this, or this
operator should do this, the companies should do this and the
customer should do this.
I think the problem is the government view, I think allow the
government to allow this in. For example, in China we have
devoted a lot of money to upgrade our infrastructure to support
IPv6. Russia, Korea, USA government. I think a lot of
government right now, but the user do not support it. For
example, I am a company. So I will be build a website. So a
website. So we, if I choose IPv6, maybe only 30 users can visit

my website. We will lose 70 persons, users. That means I will
lose 70 percent revenue of money, revenue.
So I am a businessman. So I should choose IPv6 or IPv4. So I
choose IPv6, I may lose. So my company will fail.
So give me a reason, why should I deploy IPv6? Thank you.
(Laughter.)
(Applause.)
>> IZUMI OKUTANI: May I briefly respond to the earlier
compensates made so far? Very good question about the content!
It is exactly the issue. The most strong challenges that we are
facing now is making content available in IPv6. What is the
incentive for that? I recently also experienced a case in Japan
where a particular mobile phone operator provided v6 access,
their user had an issue with a game like application provider.
Their users couldn't use this particular game.
So we reach out to this game application provider. Hey, you
know, people having issues accessing your website with IPv6.
But they didn't care. You know, it was exactly for the reason
which was highlighted. I mean, yeah, the majority of the users
are still using IPv4. Even if some users can't access by IPv6,
it wasn't their business. But at the same time I think we are
starting to see the figures that especially in mobile, if you
don't support IPv6, you will start losing like a substantial
number of the people who will be accessing your website. I
think this is an area that we have not been able to really reach
out to those content providers or like other higher layer
players in the industry. And I think talking to operators and
network operators groups, or at our meetings, it is helpful. I
agree with Kuo-Wei, sharing these business cases in the
communities are important.
At the same time there are groups of people who are not able to
reach out by simply going to these operator groups or ROI
meetings. This needs more of a comprehensive strategy rather
than leaving things on the efforts of individual private
companies. This may be an area, I'm not just pushing for
government. Maybe certain cases, maybe like a community like
joint community group or something. I mean, so you don't really
need to stick to government only, but a joint effort on more
like a broader basis is, I think, important.
I think the point that Sonny mentioned about CPE, that is
another area. In some cases maybe governments at least sharing
information to end users might be helpful. Then in other
economies maybe government is not the right place. And I don't
know, maybe it might be a consumer protection group or something
like that.
This needs to be identified per economies, but I think that my
point is that there are certain things that need to be done on

more integrated basis rather than just leaving everything to the motivation of private sector.

>> AUDIENCE: Sonny from APNIC again. On the content side, I think we need to differentiate between the global content and the local content. The global content, I think of the famous ones, Facebooks, YouTubes, they are all there, but the local content will be a challenge, a big challenge actually to get those guys to put the content on IPv6.

In regards to the CPEs, every economy, the regulators I spoke to, every piece of equipment that comes into the country has to pass through a certification. That is not economic. If they put guidelines saying every device that comes into every piece of equipment that comes into the country must have a tick for IPv6, that stops at least 80 percent of the devices coming into the country. I mean, some devices still come through the back doors, you know, from wherever they can, but at least they can make an effort in that first stage. Okay, this must meet. Whoever is buying that equipment must pass the certification. That will help with the change over of CPEs over time. Thank you.

>> AUDIENCE: I would be trying to be very short. Forget about the previous stuff. I am talking about what is potential risk for the IPv6 in the future.

And I don't know anybody of you thinking about that. I know some of the country want to use IPv6 as an E-identifier. That will be very interesting, though. Thinking about it. If the government puts a particular IPv6 address number to every citizen, that will be very interesting.

>> AFTAB SIDDIQUI: The sky is the limit, right?

Go ahead.

>> AUDIENCE: From Pakistan again. My question is to all the speakers, recently they released the latest technical specifications for IPv6. If anybody of you would like to comment on what has been coming from the previous RFC, especially in terms of security and the inspector general. What are the new things introduced in the new RFC that were not before.

>> AFTAB SIDDIQUI: Well, I will take this one and I would say, I would like to do some self-promotion that I wrote a blog post on deploying that. Go read that. Nothing has changed. It is just an amalgamation of nine different RFCs which was published to define the IPv6 specification in the last 19, 20 years. And two erratas, which was just to update the initial RFC which was published in 1998.

So nothing has changed. This is what I mentioned in my blog post as well. It is the Internet Society's blog post. It is pretty clear that nothing has changed, nobody has to worry about

anything. What they have done is they said well, it's time.
The protocol has matured enough that it should become an
Internet standard. So IPv6 is an Internet standard that is -- a
proposed standard. That's how the idea works. Not getting into
details. Nothing has changed. Everything remains as it is. If
you have deployed IPv6, IETF has done nothing wrong with it.
Because we are running out of time we want to conclude this
discussion. And what we would like to do is leave this session
with some take aways, what is going to happen now. I would
start with Izumi if she would like to say something.
>> IZUMI OKUTANI: Thank you. I think we had quite good
discussions on the extent of the government involvement and
other players and I think it would be really nice if we can
start like a short listing. What would be the kind of things
that would be helpful to be done on a joint effort. It doesn't
have to be just government.
Sonny has listed very interesting example on certification to
import products. And maybe give it a tick for IPv6 supported
products. That's interesting.
Another couple of things happening in Japan which was helpful to
do it as a joint effort. One is that government has published a
list of equipment that is v6 supported in the security area so
that people can take consideration. This is a helpful way for
information sharing.
Third, this is not government. It is a joint community effort
that small to medium sized industries, they don't have the
capacity to train their engineers with IPv6 expertise. So we
are providing like a hands-on workshop to those companies as a
joint community effort for capacity building of the engineers
within Japan.
So these are a couple of things that we can do as a joint
effort. I think if anybody from the floor or other speakers can
list these things that you think might be helpful, I think it
would be really good to do it in the remaining five minutes.
>> AFTAB SIDDIQUI: Billy, would you like to say something as a
closing remark on that?
>> BILLY CHEON: Yes. So I said before I think the government
should not be the driving the IPv6 deployment. It should be
driven by the private sector. In could have I can't, government
should, but there are certain areas of the government that the,
like small and medium size enterprises. They don't have
capacity for the IPv6 training. So the government should
provide some help for those entities. So I think this is my
comments.
>> AFTAB SIDDIQUI: Thanks, Billy. Koji, would you like to add
something?

>> KOJI YASUKAGAWA: So I want to talk about two things. One of
the issues of the CPE, so actually we provide IPv6 for
smartphone users. But actually, we are providing it for some of
the smartphone users because who has changed the hand set. It
is the same programme. So if we provide the IPv6, the old
smartphone users, we need to change the hand set, everything.
It is impossible for us, actually.
So but fortunately the mobile phone industry, as you know,
everyone that changed the hand set and every two years, three
years, four years, it is a short time there. And the PIC lines.
So we guess that every, almost the usage changed within five
years, six years, seven years. So anyway, so we need to change
the customer's premises, the customer's equipment. But this is
an issue. But we think we have to launch it first.
Because we need time to complete the migration to the IPv6. So
we need it launched ASAP. We think so. I think so.
Another thing I would like to address about the global IP
addresses is risk under NAT. This is my opinion, but global IP
is adjusting because NAT has the function of the address
translation. The address is the most important thing in the
Internet because if you communicate with another thing, you use
the address. It is like your mouse and your house's address,
like very important as your equipment. So we provide using NAT,
meaning your address is changed by other things. So you cannot
control the addresses. Even the important things, important
issues, I think. So global address is very, very important for
the freedoms and the justice and say something about freedom.
So we need to keep, try to get global addresses. We need to
provide for the everyone's global IP address. I think this is
good because no one joined your communications. Thank you.
>> AFTAB SIDDIQUI: Thank you, Koji, for that. We are running
out of time. So just quickly to wrap up, some recommendation
from my end as well. And I would recommend to the APrIGF board
and the organising Committee that it should be made as part of
their checklist for the host that they will provide IPv6
connectivity to the participants. So people coming in here and
the regulators and the government and other advisory bodies
coming here, they will figure it out. Oh, it works! It's just,
you never asked for IPv4 when you asked for Internet. So why
are you asking for IPv6? It is just Internet. It works. Look
at your mobile, your laptop, everything works fine.
This is my recommendation to the IGF board and organising
Committee. Mandate it in your checklist, the host should
provide IPv6.
The second thing is the regulators has the role of facilitator.
And us, like the Internet Society, APNIC, any other NIR, JPNIC
or any other supporting person, we have the role of facilitator

to those regulators. We have to provide them the right
information. This is the business case. These are the numbers.
It makes sense.
So that they can facilitate within their own country. We can't
go to every country and encourage them. So we have to be sure
that what we are doing, what we are seeing and hit the nail at
the right time with the right force. That is my recommendation.
Please.
>> IZUMI OKUTANI: Excellent summary, Aftab, and very good
recommendations. Putting my halt, I'll take it back to MIC.
And the Global Best Practices Forum made exactly the same
recommendation to the UN. So now the UN website is v6
supported. We also requested the future IGF should support v6
networks.
So let's slowly get going.
Thank you very much, everyone, for participating. I would like
to thank our panelists, Aftab as co-moderator, and all the
participants in this session. Thank you.
(Applause.)
(The session concluded.)
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