BUENOS AIRES – Let's Talk About IPv6 in Latin America
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GONZALO CAMARROTA: Good afternoon to you all. Welcome to this talk on -- let's talk about IPv6. I'm going to talk about this, that we're saying this is the hashtag that you can use to connect with the panelists that we're going to have in this talk so that you can all participate. If you have any question or comment, you can do it via Twitter, and we're going to include them on the conversation.

Very briefly, I'm going to give you some background about me. My name is Gonzalo Camarrota, I'm from Uruguay. I'm a communicator. I was brought to moderate this. I'm not coming from Montevideo today. I am actually coming from Villa la Angostura. I have been running in the mountains. Why is this related, you probably wonder. Well, I will talk about that later on. I left Montevideo on Thursday. I had to mix -- to prepare my suitcase by mixing clothes to run in Villa la Angostura where there are mountains, I had to include my sneakers, my running clothes, energy gel drinks, and I also had to include what's necessary to be here, that is, appropriate shoes and shirts and indeed there's dichotomy, something always fails. So that is why I have these socks. These horrible socks are good for running in the mountain, but when I sit down here and you see a Salomon socks on my feet

and it has nothing to do. I just wanted to say that because I just don't want to say that I have horrible socks.

So as it is, let's just meet the panelists. You probably know them. I'm going to introduce them. Starting here on my right, Mr. Federico Ghiglione from BT, an internet supplier in Argentina. Then there's Carlos Martinez from LACNIC Uruguay. Jorge Villa from ASO Cuba. And finally, Leon Felipe from the end users LACRALO in Mexico.

We agreed to begin this talk that we will follow these alphabetically and each of them will talk for a few minutes on their position regarding the IPv6 protocol. So let's start with our friend Federico.

FEDERICO GHIGLIONE: Good afternoon to you all. I am Federico Ghiglione. I am a member of BT global services. I am a regional manager for all of Latin America and all of the connectivity issues including Internet.

It is very interesting to be here, so I would like to thank ICANN for being able to participate in this event. I wanted also to say that the position that an ISP has when offering IPv6 services, obviously we all know this is a priority for us as a company and we believe we have an opportunity to reach out with innovation to offer very high quality services and to attempt to provide benefits for

everybody in the IPv6 change. Services for the operator and also from the point of view of the user. This is valuable when it comes to offering this service infrastructure where we can all be benefited in this synergy. Because the IPv -- IPv4 addresses will end very soon and soon we need to start the transformation very soon to IPv6.

CARLOS MARTINEZ: This is Carlos speaking. Good afternoon to you all. Just following what Federico said, I would like to thank ICANN for the possibility to being here in this activity. I don't want to call this a panel so that it becomes more entertaining because panels are usually very boring.

I am very glad to be here today with you to share this opportunity with people from different organizations and different fields. As Gonzalo said, I am from LACNIC. As he said, LACNIC is a Latin American registry for addresses, and as you know, we have been administering the addresses that have been left. This is just to tell you that you should be afraid by the end of the week. Not really right now. So if something -- if we can get something positive from this address, then you should go to the organizations where you work and to try to convey these urgency feeling.

Even though in LACNIC and other organizations we have been talking about the end of IPv4, well, it actually has arrived, or it will arrive very soon. So this is the right time to start acting.

LEON FELIPE SANCHEZ AMBIA: I am Felipe Sanchez. I come from Mexico. I participate in LACRALO very actively, and I would like to address the IPv6 issues from the point of view of users, how it affects us, what we can do to drive it, and how can we contribute with institutions such as LACNIC where we have seen an important effort to boost migration to IPv6 and also with ISPs to press them as users and to force them to provide us with this service.

JORGE VILLA: It is my turn now. Good afternoon to you all. I would like to thank ICANN for having invited me to be part of this activity, as Carlos was saying. Though this should also have music and beverages, we don't really have this here. So we're going to take -- to talk about IPv6 and then on another activity where we can see food and beverages, we will continue to talk about IP version 6 and this will help us all.

I am from Cuba. I am representing the Latin America and Caribbean regions within ASO which is a committee within ICANN that deals with global policies for addresses on the Internet. Our

work is coordinated. It goes from final users, end users to suppliers to regional registries, and we need to give these a more general character. And so the main idea is to try to convey ideas, experiences, motivations, so that these IP version 6 issues that we have been dealing with for a very long time within the regions and in other areas as well, well, we are trying to see that the transitions to IP version 6 or actually the integrations to IPv6 in the current Internet infrastructure can be a less traumatic procedure and to try to make it as smooth as possible so that the Internet users can benefit from this process to allow the network to continue growing and to have more business opportunities, more contents, and to have the option here in Latin America to be more involved in an infrastructure change at the regional level. IPv4, well, we were a bit late to IPv4, but in IPv6 we will have the option from the very beginning to start participating at the level of the rest of the regions. I think this is a great advantage, and this is something we should not underlook.

GONZALO CAMARROTA: This is Gonzalo Camarrota speaking. When I came to this issue, one of the first questions I had when I talked to these people here, well, one of the main doubts I had was, what is the secret, what is the problem? Why wasn't this done before? I even read some articles in Wikipedia. My girlfriend is also a systems

engineer, and she couldn't really explain this to me. And nobody can really tell me well, IPv4 is better or there is this or that problem with IPv6 to switch to that protocol. So I would like our panelists here to enlighten me a little bit on this.

CARLOS MARTINEZ: Where should I begin with? IPv4 is like a soft drug. It's something we have been accustomed to and the technical community and operators have gotten used to IPv4, and it is very difficult to think of using something different. IPv4 and IPv6 are not strictly compatible on cable, and so this implies that we will be needing to operate two networks in parallel. And so this will have cost impacts. It will also have operational impacts.

Up to five or six years ago this was reasonably okay for the deployment of IPv6, but the Internet is now at a point where its nature will change. And so it's as if I am standing on the railway tracks and the train is coming. I don't want the train to come, but it will crash me anyways. So this is no longer a valid excuse, and we will need to face an Internet that will be rather different than the Internet we are used to now. In senses that could be better, but they will be what they are. So we will need to operate two networks, and one of those networks will probably be a network with certain characteristics that will make it more difficult to

operate. We will have devices in the middle that will make it more difficult to operate.

>>   This difficult part touches me as an operator. So now there are things we need to solve that the network is allowing. We have a certain number of users on the network, and that's why the network will not be able to support this. So we now have difficulties in terms of the end of IPv4. There are resources that we need to operate with such as using NAT which is a translation of addresses within IPv4, and to continue using IPv4 is something that will no longer allow us to escalate this. There are certain applications that are no longer working, and so what's natural is to go to something that will open our mind and to offer IPv6 as something native, though this is something that started to grow and perhaps not as fast as we wanted it to grow. We believe this is part of an evolution.

Honestly, in BT, when we started to work on this issue, we asked ourself well, where are we going to do? Are we going to offer IPv6 or will we wait to see who is going to give the first step. And so this was something we considered in 2006 as a question. And our question was, where are we going to. By the end of 2007, we started the migration process. It was ended actually in 2007 and this we can offer now is IPv6 as part of the solution that the

company is giving for the Internet. It is a dual stack mode to allow for a better transition to a more flexible change for clients. And so we expect to have a lot of clients, and this has not really happened.   We promote development of the IPv6 protocol because this will bring a lot of benefits and we see these in many fields. We see these in many parts of the process, that it becomes easier. But at the same time, it has complexities to administer. And so we need to give clients facilities, we need to provide them with elements to continue growing and to continue maintaining that infrastructure.

And so the IPv6 power is almost endless, and we want to support these as another step towards evolution of networks towards being able to maintain and to provide more connectivity and to have a more intelligent connectivity than we can offer nowadays.

JORGE VILLA: We don't need to speak stereo. It's important to know something with this issue. The future is designed from the present, not from the future itself.   So if we are trying to see what is going to happen with the Internet in the next few years, then we will simply have to start developing it or to start preparing it with sufficient time. What Carlos says is true, we will need to work with two protocols simultaneously as if it were two networks in parallel running in the same infrastructure. But what's true is that

even though we have gotten used to using the IPv6 -- IPv4 protocol, people are still investing on the network. And so it doesn't really make sense to invest in the network constantly and not to incorporate the IPv6 protocol, which is a new protocol where everything is supposed to be evolving. So that's the cost excuse. That is, the cost excuse is not really valid. People continue to purchase devices, they continue to purchase the version 4 devices that they know, and so they are saving money in training. That is important. What's important is that -- that whether your devices are version 4 or 6, they should be working. You'll need to continue training developers to -- so that we can have better applications. And so the financial issue is no longer an excuse as a first barrier. The main barrier there is how we perceive the problem from the different levels in the chain.

We were having a discussion some time ago and I was recalling -- many of you here are a bit older than us would probably remember an issue that I recall all the time. It was the 2 -- the year 2000 problem, that is, the millennium change problem, the Y2K problem, which was when we changed to the following century and we started to use the date with the four years -- four digits in the year, et cetera. So this change started to be prepared many years before, and it was okay. It really did work. We used a lot of patches in many of the softwares that were about to be affected, and many people were concerned that money was in the

banks and all those issues were at play. And so this really did work, and we still don't know if the catastrophe that everybody expected would actually happen. And we had a deadline, and this is an issue with IPv6. The year 2000 was about to arrive, and so we had to have everything solved before the year 2000. And so we knew that we had to do that. And so it -- in the end I -- we are not fixing things now. If you don't have something that will press you now to solve it, then the other issues that are left at the will of people are not always getting the best results.

GONZALO CAMARROTA: Felipe, I'm going to read one of the tweets. Perhaps we should consider the user, especially when there are paradigm changes, these important changes that may be left in a way. So someone is saying we are in a migration process and some people may be left aside with IPv6. Can this happen?

JORGE VILLA: Well, I am not a technician, but I understand what we by here as final users, these devices are prepared for us to use the new IPv6 protocol. This should be transparent, that is, migration should be transparent, because we should not really know if we are using a protocol -- a v6 or a v4 protocol. So we may become isolated if our devices did not have the capacity to communicate in an IPv6

protocol after completion of the migration. So from the technical point of view we are driving on two different roads that are in parallel. One is IPv6 and the other is IPv4, and at a certain point they get at a crossroads and this is where a translation of these two protocols occur.

I think this is not really feasible. Perhaps our technician friends can help us deepen on this, but I see some problems on the networks and I insist at the level of users and these problems need to be linked to the technical issues. This is the case of Mexico, for example. If you have a mobile device and it is linked to a network -- I, for example -- I'm a Telcel user, and many times my device tells me you have a data connection. However, that data is not really flowing upwards or downwards in my phone, and so when you conduct a very basic analysis, what happens is your device is not linked to an IP address. It doesn't have an IP assigned to it. And so this can be attributable both to routers as well as to availability of IP addresses on the supplier. And so to the extent that we ask for a migration to IPv6, we will have less connectivity issues and evidently we will be able to receive a better service quality, both for mobiles and for fixed devices. I have seen this not only in mobile networks but also in fixed networks.

Sometimes connections is made through systems where your address is placed in a sub-network and so you get connected to a public IP that is used for many addresses. And so there are strong problems in terms of the implementation for these ISPs which have no availability of addresses to assign to the different users being connected.

GONZALO CAMARROTA: I also read something you Twittered, you mentioned Telmex and several other companies which are the ones that provide a service, and I understand that what you're saying is well, they charge for a service. Maybe the quality of service is offered is not so important and this is what is happening with IPv4 today. Now Jorge will say that today the economic aspect would not necessarily be a problem. They all say keep investing in IPv4 technology. So what's happening there with those companies that you've just mentioned, for example, is a real economic issue there in the background.

LEON FELIPE SANCHEZ AMBIA: There may be economic issues. As far as I know, in the concrete case of Telmex in Mexico, they have everything ready to deploy IPv6. So when you go to them and ask them about availability of IPv6 services, their answer is that the user has not

requested it and they do not have everything ready for content provider sites to be connected to this protocol.

And I think the issue is what comes first, the egg or the hen. I need it. But, if I don't ask for it, you will not provide it to me. So, as Jorge was saying, we need to set a deadline, a time when maybe not naturally but in a forced manner, we will forced to the next protocol, so that we will be able to enjoy those benefits.

GONZALO CAMARROTA: This is Gonzalo Camarrota. I wanted to ask the others whether you think we need a deadline.

FEDERICO GHIGLIONE: This is Federico. I think it would be perfect. It would be great to have some point where we'll use IPv4 up to here, up to this point. Because sometimes you really expect this to happen in a more accelerated manner. So I think it would be great to have a deadline just like what happened with a Y2K issue. That was forced issue.

GONZALO CAMARROTA: This is Gonzalo Camarrota. The Christians set the date, the year 2000.

FEDERICO GHIGLIONE: This is Federico. Let's not talk about religious matters. We may be creating more problems. Looks like there are questions. What are the questions? Will you bring the mic here?

CARLOS MARTINEZ: I'd like to say -- this is Carlos talking -- that it would be great to have a date. But I don't think it's possible because Internet is too centralized to do that. Now, there are some dates that, if you look at them, they're already there. We're estimating that there will be a depletion or the first stages of IPv4 depletion will happen in July next year, approximately. You have a date there. Some things will happen by then, because IP addresses are assigned according to LACNIC policy. The way in which those addresses are assigned will change dramatically. At best you'll be able to get is * slice 22 which, as you know, is too small. Within that framework, the way in which a network operators will operate the networks will have to change. It's not a hard deadline; but it clearly marks a before and an after, a separation between two stages. I think our readers should look at that. And this is something we can all do. We should communicate that estimated date as any forecast. Well, forecasting is really difficult. You may move the date a little bit to the past or to the future, but I don't think it will change dramatically.

GONZALO CAMARROTA: There's a question.   Somebody from the floor.   There's two questions, and there's one question from the audience.

REMOTE PARTICIPATION: I had a question in the chatroom.   Remote participation.   One question is: What should be done for mass users of cable modem to drive IPv6 to end users?   And the other is: Which are the security considerations deploy to IPv6, for example, in the case of university campus with dual stack.   You can answer those questions yourself.

GONZALO CAMARROTA: Well, now, let's answer the first question first.   Jorge, do you want to say something?

JORGE VILLA: No. Let's go with your first question which was -- otherwise, we'll end up answering any question.   Because there are two networks running simultaneously here.   So what's missing? What do we need?

FEDERICO GHIGLIONE: Well, initially, the operator needs to have the capacity to operate IPv6.   What they have to do first is manage addresses.   One thing is managing IPv6.   And a different thing is managing IPv4.   With

IPv4 may be enough to have an Excel sheet in order to use -- in order to manage IPv6 addresses, you need to have IPAM tools, which are more sophisticated. And they allow the operator to manage a large number of addresses, maybe millions of addresses and to know exactly what address is linked to what user. I think this is the first step. These tools are already available. And it's not that they are extremely expensive. I think today it's not only a matter of having the infrastructure ready, but having the resources trained and ready to face IPv6. This is one step that has to be taken by the company. In the case of BT, in particular, we took a step in 2007. And we hoped we would get a more accelerated response, which did not happen. But today we are ready to offer IPv4, IPv6, in dual stack. And this is a transition. It's a simple transition to make this easier.

However, I think the best thing is to go to IPv6 resolutely because the benefits will end up to be good throughout the value chain, even all the way up to the end users.

CARLOS MARTINEZ: I'd like to add something regarding the first question. Something is true. DSL and cable modem operators have made a great investment in their facilities and in SPS.

Now, I'm going back to dark future. In the future I used to work to communication operator. I apologize for that. Thank you for sharing that with us.

GONZALO CAMARROTA: This was Gonzalo Camarrota.

CARLOS MARTINEZ: This is again Carlos. It's been starting. SPS has a definite period, three to five years. Every three to five years they have to replace the SPSs. Now, the secret is to change -- to change them. But changing them all together is impossible. Now, as I replace them, I have to replace them with devices that will support IPv6. Unfortunately, we have recently heard some terror stories about huge investments made in huge devices that do not support IPv6s. This is the cycle we have to break. And an analogy is IPv4 and drugs. Is this also related to your dark future? No, it's not. It's a cycle we have to break.

Afterwards, I'd like to make a comment about the second question. Let's hear the question from the audience, and then we can answer the second question. I'm going to stand up, so that you cannot see my socks.

This summary from the audience -- actually, this is not a question but a comment about setting a deadline. This has already been done. Sometimes it is not met because there is still some IPv4 issues. The IPv6 task force in Europe many years ago discussed the possibility of -- for example, I used to work for SITA, which builds very big applications for air carriers, airports. These companies may also be banks or other industries. Sometimes these applications cannot be improved any longer. No upgradings can be made. What should be done is to do more awareness, awareness among the big companies, so that they will know that those applications should go to IPv6. Because we're speaking of costs and these are applications that will be used in the next 20 years. So I think that the industry should get a better support.

JORGE VILLA: This is Jorge. I'll go back to what I said about the fact that people keep investing. The issue is that today any application, any large scale application is a modular application. And, as such, if we do not make certain mistakes, you can use the corresponding libraries that will help us talk to IPv4, IPv6, and who knows. In some time we may even have IPv8 or 10. But what happens is this is related to how we develop applications.

Every day we add a new feature to something.

Well, that same concept is the one we should follow when it comes to developing applications. Does it happen to you that you get into Yahoo!, Facebook, and suddenly everything has changed? And they say we have a new profile and what you are using is no longer there. Somewhere else. They have made an improvement, according to them, in the user interface but trying to take users to another point in trying to find certain flexibility.

This is given by the modular development, modular software. And this is a very extended practice in big companies. This is why it's important for the academic sector, for universities where many programmers and developers are educated should learn about these technology. They should leave the university knowing this is the knowledge, this is the future. I think this brings benefits for all of us if we do it in time. Otherwise, even if we do not have a deadline -- this forecast made by Carlos -- I disagree with you. Some people does very well in the forecast business. Some people do very well in the forecast business. I'm sorry. I think that what should happen is that people should start deploying IPv6 once they know all of this rather than having them complicate the network. Eventually, when you use any technology, you're making the network more complicated. And this brings about a cost. Devices, planning, management, everything that was in theory complicating IPv6 is also generating

complications with these solutions. This is what should happen in our region.

GONZALO CAMARROTA: This is Gonzalo Camarrota. There's a question over there. There's somebody reading the questions. There's a previous question and a new question. I'm going to read the previous question first. Which are the security considerations to deploy IPv6 in the case of a university campus with dual stack?

CARLOS MARTINEZ: Well, security considerations -- this is Carlos talking -- are those. Well, seriously, though, same considerations you would have with IPv4. If you already have security policies in IPv4, you should use the same ones with IPv6. It's the same thing in some cases, and in some cases it isn't. Depending on your firewalls and so on, you may have an additional work delta. The devices we're using in our data centers for LACNIC, likely to define the same policies and replicate them in IPv4 and IPv6. By just working a little bit more, you just had to say that this device will not only have a v4 address but a v6 address.

There's some considerations which are specific to IPv6 just like -- just as there's some security considerations which are related to

IPv4. But I don't think we should go into the technical stuff. Maybe that person can write to us.

I'd like to say something about the applications and the comment made by Rosa. Rosa has a good point. The software industry and other industries, the financial industry and the airline industry, they've made huge investment in software. They have invested in software that nobody dares touching or people touch it very respectfully because any change may have a huge impact. There are some techniques maybe applied to expose that contact in IPv6 without having to act on the applications themselves. Just that.

JORGE VILLA: I just wanted to say something about security.

It is no secret that all operating systems that are being used today -- all operating systems, whether they are from Microsoft, Apple, Google, Android, they all support IPv6. And the nice thing is that it's enabled by default. So those of you who are concerned with what will happen when IPv6 is deployed, you'll probably not even notice that there is IPv6 traffic in your network. And this traffic may even be traffic among devices that may be violating the policy that's defined for the campus. Very frequently we do not update management tools; and, consequently, we're not able to say that there is traffic out there. A different traffic. We're just

seeing what's going in IPv4, and what's going in IPv6 is seamless. So I think we should have worked on this a long time ago, even if we were thinking of deploying it now. But today all users have devices with IPv6 features.

GONZALO CAMARROTA: There is a question here. End users, should we have an additional rate if we have IPv6 rate?

JORGE VILLA: Well, this is Jorge. I don't know what network operators are going to do. Because, when you pay your rate, this includes a cost associated to the use of IP addresses. I don't know how this may vary for suppliers. But, from the point of view of users, the device, no matter what device you buy to date, we support both things. Or you may do a software upgrade that will imply a larger investment.

FEDERICO GHIGLIONE: This is Federico. From the point of view of operators, what you should see is, basically, whether you need to make the investment for IPv6 to be active for all users. You need to do this. You need changes in the network. And these changes will bring about benefits. And, on the other hand, it will also bring about more

users. So I think we should look at this as a change in scale, as a change in the number of users you may have when you go to IPv6.

GONZALO CAMARROTA: This is Gonzalo. So the business will grow.

FEDERICO GHIGLIONE: This is Federico again.   Yes, this is why it's so important. Remember, that the penetration, the business penetration at Latin America is above 30-40% year after year, depending on the different countries. But this is huge growth. So, if we have this growth, which we are already suffering in IPv4 in a way with IPv6, this will be easier from the point of view of operation and will help us grow so that Internet penetration will be even higher so there will be more users, so that applications will be used more efficiently in IPv6. These are all very positive issues, which, by the end of the way, makes the investment worthwhile.

GONZALO CAMARROTA: Gonzalo Camarrota speaking. There is someone who wants to ask a question. I totally agree with what the chairman said. I'm sorry, there's someone else speaking.

>>   It is true that certain devices can have an additional cost? Now, it is also true that operators cannot continue functioning as they have so far. And they say, well, we don't want to use IPv6. And they need to invest in another technique in order to allow their business to keep growing. So this cost will be transferred to the users, at least a part of it. So the tragedy of this situation is that, irrespective of what is going to happen or what each operator will decide, there will be an additional cost that somebody will have to absorb.

Typically, the users.

Now, as users and as operators, we all need to question and ask ourselves if this is going to have a future or if this is going to be a dead-end street. This is our dilemma.

>>   Madam, I'm a service provider. Please don't kill me. I'm also -- I'm not to blame here. And so I wanted to make a comment.   I have only one question.

Do you, at the official international level, have a plan to end with manufacturing end user hardware that only supports IPv4? Because the decision is very simple.

Now, if I go out to Florida Street here and I can purchase -- for $35 I can purchase a Wi-Fi repeater, because the Wi-Fi signal here at the meeting is not very good. So I can plug it in. I can configure it in two minutes, and it is up and working. So, if I need to start thinking as a final user -- and, of course, I am a final user. So, if I have the possibility, I will continue to use it.

So, from the point of view of the supplier that has just spoken, deployment is a lot more difficult. You may have technical options to define a transition path to IPv6. But, actually, you have only one, which is dual stack. Because, as a company, you cannot force your clients to change devices that they have already purchased. And so suppliers such as group -- well, my company is Gigared. I don't know if you know it. Actually, it's a small company.

Well, I see someone here does know it. We are getting ready for this. We have approximately -- well, our backbone supports IPv6. We need to make the final deployment for that backbone. We have played with IPv6. We have published sites with non-public DNS because we are a friend of security issues.

But what we're missing is some support from the outside so that we can say either we will have a deadline and say from this or that date, which here it could be -- you know, it could be done by any organization, regulating communications that can said the

Argentine network from this or that deadline will set a date for the end of IPv4. It should not necessarily be June next year where everybody should be ready. I actually have my home ready for IPv6 and this is the repeater that I take when I go on vacation. But then the rest of what I have is all IPv6. But that's me.

In the same way that all analog TV sets will stop working, which you also have a deadline for all of the IPv4 devices, and if you want to transition to IPv6 and you want to have dual stack, then as a final user you need to purchase hardware that will support an IPv4 network that can use IPv6 as well because what I'm also seeing is that the big problem is a problem for the supplier, that is, there is no official initiative for this that somebody obviously knows.

FEDERICO GHIGLIONE: There is an interesting idea here. We need to shut down certain solutions in IPv4. That's a good measure. My recommendation perhaps is more for people administering the rest of the addresses. We need to speed up the process, and this could imply that there are no more addresses. As a user, not as an operator, that's what I would propose.

On the other hand, another important thing is, we need to set a date and to say, from now on we will talk about IPv6. From this

moment on, the network will evolve and we will need to propose manufacturers to set a shutdown date so that we will say from this deadline we will no longer manufacture IPv4 devices. This is the best policy for me.

CARLOS MARTINEZ: I have a comment. Many of you here know about this. What do we do with addresses? We apply the policies that the community decides. Now, this scenario where somebody will tell you there will be no more addresses will actually happen. It's not going to happen immediately. There will not be a fixed date for this, but it will be actually phases that will lead us to that. And this will probably happen a few years from now. But we will have a period of a lot of restrictions with access to addresses because irrespective of the size of the suppliers, they will have access to very small blocks.

I don't really agree with specific dates. I think as an industry we should be able to self-regulate ourselves. And so we do know there are certain deadlines in existence that have to do with the phases, changes, but there's something very valid here. In the case of ISPs there are two or three scenarios where the suppliers will purchase the SP -- purchase the CP and the case where the CP is purchased by the user itself.

So in your scenario, in a scenario where the user will purchase its CP, your duty as a supplier is to give the user the possibility to purchase a more expensive CP to have IPv6. And so your help desk will need to inform that if this or that is not working properly, then that's because you're not using IPv6. Thank you for letting me this now.

GONZALO CAMARROTA: As a user, many times you don't know about those issues, and so when you purchase something you have this and you have that, and so it is easier to purchase this or to purchase that. It is also important to give end users some information.

>>   We are talking about dual stack here, so please slow down. Please allow interpreters to work better, and there is a question here by Luis Espinoza from Costa Rica. And it is, what happens if final users are actually asking for the IPv6 service instead of waiting for the operators to offer IPv6? We cannot shut down IPv4. Dual stack will continue there for a long time and forcing the situation will be imprudent. So what applies here is to encourage the use of IPv6 and to not disencourage the use of IPv4.

GONZALO CAMARROTA: I was taught as a unionist that we should not talk about the base and to refer to a pyramid. So should the user be the one pressuring or should the supplier providing certain software be the one doing this or doing -- the one taking the initiative?

JORGE VILLA: The fact that the user will press is a fallacy, that is, we are not going to shut down IPv4. When the user has a device that costs a lot of dollars and that day they cannot use it because this is an IPv6 device, this is when the user will actually be concerned because they made an investment that is not good for them. So that's not the reality that we are having here. We just -- we as users will start claiming to have IPv6 connectivity when there's something that they need to access to that is only offered on IPv6. And so people from Promotion Concept in Japan, when they were there for many years and they had to introduce IPv6, they had some strategies. And one of those strategies seemed like a joke but people actually liked it. It was the Geisha of the month, and they had a Web site. It was a girl that was just appear there, and this could only be seen by using an IPv6 version or connection. And so that was a motivator to determine as a unit that you could tell people well, I saw this or you saw that and this gave me a certain ranking. That's the kind of thing that will -- well, it's not exactly that, but this will actually cause users to ask the supplier

to provide access via IPv6. For example, if Google were accessible only via IPv6 tomorrow, there will be long lines with lots of operators because this is a tool that we have gotten used to that is good for us and we cannot access this because the operator could not deploy the protocol properly.

GONZALO CAMARROTA: Is there anybody who would like to say anything else?

RAUL ECHEBERRIA: I'm Raul Echeberria from LACNIC. In many meetings there is a similarity with the shutdown -- the analog shutdown process. Even though these are two different realities, the emitters of users in analog TVs are very limited and they are service provided -- providers with licenses and they are regulated by states in all countries. So it is very easy to work with them, to coordinate, and even to force them to stop emitting those analog signals on a certain date. But the Internet architecture is completely different. It's not an architecture where everybody is against everybody. So it is impossible to regulate and many times content generators are just users, home users. So it is impossible to force everybody to work on IPv6 in a situation that is similar to it.

I think we will continue to see networks that will continue to work on IPv4 for many years, and even if we see a successful adoption

of IPv6 in the next two or three years, we will still see networks that will have no need to migrate for a long time. And when one of the countries in our regions had regulation projects prohibiting importation of devices -- well, actually they didn't prohibit importation of devices, but one of the demands for communication devices was that they were IPv6 compatible, then manufacturers got in touch with the government and showed them, or at least tried to show that there will still be a need to continue importing IPv4 devices for a long time, even in closed networks or in networks -- IP networks that are not connected to the Internet or many other examples. And there was no reason to make these devices more expensive to users if those users were not actually going to demand IPv6.

These issues are a lot more complex and these manufacturers were very, very concerned, even though they were manufacturers that we know are very committed to -- in this specific case, to adoption of IPv6. So they were really concerned that a measure like this could affect their business unnecessarily. That's all. I just wanted to comment on that.

JULIO DUNSAVAGE: I am Julio Dunsavage (phonetic). Since the 1990s we have heard about IPv6 as something different, aside from the IP addresses depletion. We were talking about service, quality, broadband.

We heard that it was a network that would provide different things. And also in advanced networks, it is like a parallel network to the Internet. The same is being said but still in advanced networks we continue to see a lot of users of IPv4 even though it is a dual stack full network. We still need -- aside from the IPv -- IP addresses depletion, we still need to implement applications that can use this type of facilities where the user -- and I'm not talking about the end user at home but actually I'm talking about corporations, organizations, universities, et cetera -- can see the advantage of using IPv6. I think this is one of the main elements to generate this change. For example, being able to work with dynamic broadband and many issues that can be implemented and nowadays no provider can provide this because they cannot implement it through IPv4. However, it would be something different with IPv6.

>>   I am from the interior of the interior. I am from the province of Cordoba. This is the first time I come here. I belong to a cooperative that provides Internet to many communities, and it is interesting for us to come here so that we can understand where we are heading to. And by listening to all of you, my concern, and perhaps my need, is to ask, I heard that it would be interesting to encourage the use of IPv6 and for us, small ISPs, I'm talking about

10,000 subscribers, we cover needs that big operators cannot cover. So my question is this, has LACNIC or any other organization thought of including these ISPs in the provinces in the country to reach migration under the implementation of IPv6 without really suffering big costs. For us in the provinces, assuming costs, not only economic costs but also service malfunctioning, just leaves us in a bad position. And so my concern is, perhaps we need to leverage these actions by providing success stories, by providing professionals who have participated in the migration or implementation of IPv6 to people or entities in the provinces of Argentina. Thank you for listening to me.

GONZALO CAMARROTA: Carlos, by LACNIC or somebody else, can you answer to that?

CARLOS MARTINEZ: We have a very training -- many training initiatives in IPv6. Next year we will have a big offer of online training IPv6 and other issues as well. And with respect to a more active support, I can tell you that you can email us and we will see how we can help you. Perhaps by putting you in contact with some other professionals or perhaps we ourselves can provide you with some support.

What's interesting here is LACNIC has created a rich community such as a Network Operators community, and we have the capacity to help each other. So if you subscribe to (saying name) you will be able to take advantage of the richness of the community as such.

FEDERICO GHIGLIONE: One important issue is what you have just said regarding generating obligations or generating demand within IPv6. I think this has many faces. You probably want to show these benefits, and I think we need to drive this with what people are looking for, what users are looking for. They are looking for an application that develops properly, and sometimes we don't really realize there are many issues in the middle, that then users do what they do because of applications. So applications have to be targeted to operating in IPv6, and this will be an important driver for everything in the middle.

On the other hand, I would like to be in contact with you and to comment a bit more about what we can do. BT is an operator and it has tools to deploy IPv6 since 2007, as I said before, and these need be to transferred so that an operator in one of the provinces can have the capacity to operate IPv6 directly with dual stack or with a smaller implementation. And we need to gradually take these. Because IPv6 is a very strong change sometimes. If you

put it in contrast that once you have given that step, everything becomes easier. Okay?

JORGE VILLA: I wanted to say something which Julio reminded me of. I'm seeing Internet in two stages. Up to now the growth and the number of users is one. We're thinking of that in terms of people. However, the Internet is no longer network for people. Increasingly we'll be seeing a greater presence of objects that are connected to the network, and this generates a series of parallel markets, car, appliances, industry, entertainment, and so on and so forth and they start using IPv technology and join the network and suddenly the Internet becomes a network of people and object and data, of course, because there are also applications which are handled differently. And thinking of the network from this point of view implies there is a change of paradigm which is quite significant. And this is precisely what happens when you understand where this technology is going. You have to say well, IPv6 is something that will be useful to me, that new technology will be able to leverage it.

So we cannot refuse to deploy IPv6 if we're aware of that environment that is changing. It would mean suicide, if you did. So maybe we could look at it from this point of view.

LEON FELIPE SANCHEZ AMBIA: The saturation of the network from a point of view of personal devices and other objects such as TVs, fridges, et cetera, any kind of object that may be connected -- six months ago I remember my Internet service was canceled. I called my service provider and I said hey, what's going on? I have no Internet connection. And they said, we've just detected that you have hired a domestic service but you have 20 IP addresses. This means that you're reselling the service. I said, no, I'm not reselling anything. But I'm connected -- I have connected my fridge, my TV, I gave them the list of applications, and they said well, you're not a regular user.

GONZALO CAMARROTA: The fridge, come on.

LEON FELIPE SANCHEZ AMBIA: The issue is that this is a reality. As users we're saturating the network. Not intentionally, but this is our natural way of life-style is leading us to do that. So I think it is important for providers to take this into account.

There was a question about the setup of the -- somebody asked whether configuring the switch for IPv6 -- 4 is similar to configurating it for IPv6. Maybe your friends can answer the question.

GONZALO CAMARROTA: Would you like to talk about switches or should we switch this question?

CARLOS MARTINEZ: As you wish.

GONZALO CAMARROTA: Do we have to sum up? We still have 15 minutes. Great. There's a question from the audience.

MARIA: I am Maria. I am part of the Argentina University Interconnection Network. This is a comment rather than a question. And it's related to suppliers. You made a comment about a supplier in the provinces was trying to deploy to start and you know what to do. There is a portal that LACNIC has -- Carlos has more information than I do -- a portal called portal IPv6 LACNIC.net. It has lots of information to have deployment, different environments, academic, end users, and so on and so forth. There's an interesting part which is a list that is updated gradually that involves different suppliers and organizations in the region which are deploying IPv6. And there you can see not only who is deploying IPv6 in his or her country but also who has already done it and how because there's a section called Details. In there they

explain to what point they got with their deployment. How they deployed -- how cable operators deployed IPv6. There is a brief summary but there's also contact information so a list of regional providers may be useful for somebody who's already starting.

GONZALO CAMARROTA: Carlos, would you like to say something?

CARLOS MARTINEZ: The address is portal IPv6.LACNIC.net.

GONZALO CAMARROTA: This is Gonzalo Camarrota speaking. I was saying that I have a hard time in understanding all of this. And now I've seen there are lots of aspects to it rather than certainties. I have lots of questions now. Listening to our discussion today, I see it's quite complicated. We don't know where to start. On the one hand, you say, well, end users and users. And I agree with Jorge. Until the end user does not realize that he or she has a problem and when something is not working because I do not have IPv6, end users will not complain. Those companies that provide services say, well, I'm offering this service; but, when I buy software, as somebody said, it's still manufactured based on IPv4. So I cannot lose my business. I cannot tell my customers, if you do not have

this, I cannot offer anything to you. On the other hand, software companies provide advice to government and tell them this is complicated. We'll need to continue with IPv4. Then government said we want to have IPv4, and IPv6 steps back. So who has to take the first step? At some point in time, somebody will have to make a decision. Otherwise, we will need to have a fictitious Y2K. When something will happen, something will crash and that will be the day when we'll have to start working. Do you think we'll need that? Or do you think at some point in time one of somebody in the chain will decide to start acting?

CARLOS MARTINEZ: This is Carlos Martinez. I don't think this is the responsibility of a single group. Here we're proud of our multistakeholder model. We're all stakeholders here. And this is why we all play a role here. We're all responsibility. End users, operators, all of us -- we're all accountable here. The end user is the not guilty guy in this situation because they will only take concrete actions when they see things are not working. I'll sometimes think it's an excuse when operators say, well, nobody for asked for IPv6. It's true, but nobody asked for IPv4 either. People asked for other things -- Internet access, access to content, et cetera. I'm not saying you all do this. I'm not saying all operators do that. There was one proposal six or seven years ago, somebody suggested

seriously having a repository of hot video that could only be accessed through IPv6. And that was a serious proposal. It will have been a huge success. But, because of other non-technical reasons, it was not done.

I think we're all responsible here.

JORGE VILLA: This is Jorge Villa talking. Definitely, things will not happen as we thought originally. But we all have to do something; otherwise, we'll not be able to have anything. I think that governments play a role there, too.

In this case, the American government, for example, what has it been doing to lay some pressure? It has been developing an IPv6 introduction schedule in everything regarding its government infrastructure.

But who provides service to the government? All operators, manufacturers, software manufacturers, application developers. So, in a way, they said, well, if we manage to have IPv6 in our infrastructure, the country will be in a better condition to start using IPv6 even when there is no fixed date deadline for the transition. So we should find the best solution for all of us. The only thing we cannot do is do nothing and just look at the sun, the beach, and so on. Which is also nice.

GONZALO CAMARROTA: This is Gonzalo Camarrota speaking. This is easy for a Cuban to say. There is --

ROSE: This is Rose saying there is a question from Espinoza from the chatroom according to my experience, the granulated management of devices is easier with IPv6. What does the panel think about this? Is it easier to do or not? I'm talking about how complicated traceability with NAT is.

GONZALO CAMARROTA: I was just wondering about that. This is Gonzalo Camarrota speaking. I was just thinking about that. Who wants to answer this question?

CARLOS MARTINEZ: This is Carlos. The answer could be, yes, it's true. It's more difficult.

GONZALO CAMARROTA: Gonzalo Camarrota speaking. Thank you. We're going to a break.

CARLOS MARTINEZ: This is Carlos Martinez speaking. There is something -- there's a question which I found interesting that can really be a driver to

motivate migration to IPv6. A user suggested having Google migrate to IPv6. What would happen? That would be a great driver. It would be a strong change for all of us, but maybe showing a differentiating aspect of IPv6 as compared to IPv4. I think that's a good alternative.

JORGE VILLA: This is Jorge Villa. We've been talking about deadlines. Because, well, of course, we like deadlines, dates. We like those myths. But what happens? Some were, apparently, our enemies or our competitors -- Google, Yahoo! They are apparently competitors. But, at some point, they got to an agreement to deploy IPv6 in their infrastructure and have services working so that there would be no excuse so that people will not be able to say, oh, there is no content in IPv6. And, actually, we're here in our network -- the ICANN network we're using IPv6. And we can access Yahoo!, Google, everything. The only problem I see there is that there is no real differentiation from the visual point of view. That is, you're not able to tell when you're using IPv4 or IPv6. Even if it may seem silly, people will say, hey, I see things here in one way, things there in a different way. So maybe the IPv6 outlook or display should be more interesting. This may be a motivating factor. But IPv6 is being used.

CARLOS MARTINEZ: Going back to what Federico said, some months ago when Paul was reading about launching Nexus 5, somebody suggested to Google that in the first week the portal that received the (indiscernible) would be accessible only through IPv6. I think they eventually did not do it. I think those initiatives are very powerful. They're a very effective communication tool. It's much more effective than anything we may do. Actually, in Uruguay there was a very interesting experience. A soccer match, Uruguay versus the Netherlands, was played in 2011 in Montevideo. And the telecommunication operator in Uruguay agreed with broadcasting the match over the Internet in the following way. It was free in IPv6 and had a cost for IPv4. I can't tell you how many called because they had no idea of what IPv6 was. And, even people who had no idea what it was, eventually set up a tunnel to watch the match for free. So the communication effect of those initiatives is very powerful.

FEDERICO GHIGLIONE: Federico speaking. Maybe if famous artists -- Madonna, Lady Gaga -- has a show -- plays a show over IPv6, there would be great visibility for people to become aware of what this is about so that, eventually, we will take the right steps in the right direction.

GONZALO CAMARROTA: This is Gonzalo Camarrota. Leon, would you like to say some closing words?

LEON FELIPE SANCHEZ AMBIA: This is Leon speaking. I just want to say all stakeholders, managers, the ones who assign addresses, the ones who operate the networks, that this migration should happen a least painful way for users. This is my only conclusion. I'd like to make this request. I hope it will be as easy as possible for end users.

JORGE VILLA: This is Jorge. I'm just seeing that IPv6 is something that we will have to use. And all of us in the industry -- it's good for all of us in the industry. There will be more work for all of us. There will be more changes, more work. But, definitely, don't forget that the network we've known up to now will be different once we have all these new devices connected to the network. We're already talking of thousands of devices, but there are many initiatives. And there are real options for developers, even small companies, young developers who may create problems with a lot of innovation using these new technologies for Internet connection capacity.

GONZALO CAMARROTA: Gonzalo Camarrota speaking. Thank you very much. This is the end of this session about let's talk about IPv6. I'd like to thank all the members of the audience and those who followed our -- followed us remotely. Thank you, everyone.

[Applause]

[END OF TRANSCRIPT]