**2015 11 12 WS214 Internet Interconnection Under Regulatory Pressure Workshop Room 5**

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>> UTA MEIER-HAHN:  I want to talk about future scenarios.  The remote participants, time is short but I will nevertheless do my best to include your comments.  In the web cast interface, please look for the chat icon to commute with the remote moderator.

Before we start here on the panel, I would like to do a short introduction with the help of a survey which I conducted in the run-up to this event.

It was an open online survey among interconnection professionals around the globe, that is mostly network engineers, but also chief technology officers and in the survey the participants were presented with ten forms of public regulation.  These ranged from norms about mandatory peering over disclosure regulation for interconnection arrangements, to schemes of economic incentives for certain actors.

And one of the results is, I want to keep it brief here, one of the results is: for every one of these items more than one fifth of the 131 participants stated that the norm in question had influenced the interconnection practices.

What does this tell us?  Globally speaking, internet interconnection is not as unregulated as it seems. In several jurisdictions public regulations are enforced, and secondly there is a variety of public norms that impact connectivity.

Regulation is not binary.  So we would be oversimplifying to frame this topic in terms of “regulation yes or no”.  Details and context matter.  And that is what makes this topic so complex and this session here so challenging.

For all of us here on the panel I would like to do a small check and ask you, as the participants in the room: whom of you deal with interconnection on an occasional basis?

Please briefly raise your hand so we get an understanding of who is here.

Ok, thank you very much.  That is not so many people.

So one more thing to make the discussion a little bit more tangible.  Also for those who have become interested in this topic more recently and that is I've picked, four examples of public norm setting from the survey and I will depict how survey participants have assessed them.  Just to make it more tangible, this whole topic.

First: licensing requirements.  And I'm quoting here: “licensing requirements” one participant said “led us to a decision to pull out of India and serve India from Singapore rather than deal with the internet service provider licensing requirement in India as most of our business is a content provider.

So here we can see practically a mismatch between regulation and best engineering practices from the perspective of this participant.

And this example also highlights how categorizations of infrastructure actors are becoming more important these days.

Are CDNs Internet Service Providers? Are exchange points critical infrastructure? Is this the same everywhere?

As a second example, mandatory peering requirements.  Survey participants have expressed that such requirements may, and I am quoting again “prevent sensible engineering practices” and what they mean by this is, for instance, de-peering what they call “bad actors” who do not operate the networks well.  And they've pointed to negative secondary effects, that if the largest networks decide to stay away from those exchange points because they would be forced into open peering policies, it also may make those exchange points less attractive to connect to for small networks.

I could continue on this list, but I myself am already running out of time here.  So let me now welcome the panelists who will share more detailed analysis about this.

Catering for regional stakeholder diversity posted a positive challenge for this panel, that is why I'm particularly pleased to be joined by, actually, five experts who will present initial remarks before we start the discussion.  One is remotely, four you can see here.

I will start with to introduce Mike Jensen on the far right.  He is Internet Access Specialist for the Association of Progressive Communications, APC.  Mr. Jensen has worked on ICT infrastructure projects in about 45 developing countries and, at APC, he manages a global program to promote infrastructure sharing policies and regulations in Developing Countries.

Next, two seats to the right from me, is Mohamed El Bashir.  He is Director of Technical Affairs at the Communications Regulatory Authority of Qatar, and Mr. Bashir is also the vice chair of IANA Coordination Group, as some of you may also know.

To my right is Mr. Manoj Misra.  He is Head of Regulatory at Vodafone India, and also represents the Association of Competitive Telecom Operators, ACTO.  Mr. Misra is a specialist in financial analysis of telecommunications industry, and he has previously been with the Indian Telecom Regulatory Authority, and he will be able to share insights from this point of view, as well.

Second from the right is Mr. Bill Woodcock.  He is Executive Director of Packet Clearinghouse.  And, among other things, Packet Clearinghouse provides operational support to Internet Exchanges, as well as policy aid to governments.  Within the last 20 years, Mr. Bill Woodcock has helped established more than 200 internet exchange points around the world.

And, remotely with us is Dr. Laura DeNardis.  She is professor for Internet Architecture and Governance at American University in Washington.  In publications such as “Protocol Politics”, “The Geopolitics of Interconnection”, or most recently “The Global War for Internet Governance”, Laura DeNardis has carved out how struggles for economic and expressive liberties are increasingly carried out by Internet structure.

With this, I would like to ask our technicians to hand over to virtual microphone for the first round of remarks to Laura DeNardis.

Please, the floor is yours.

>> LAURA DENARDIS.  I'll ask the remote moderate type to me if I can be heard.

>> Yes, you can.

>> LAURA DENARDIS:  Okay, great.

Well, thank you very much for letting me participate remotely.  And I certainly would rather be there in Brazil.  I've been following this remotely, and it looks like a wonderful IGF.

I'm happy to be on this panel because of all areas of Internet Governance, interconnection arrangements are probably the most out of view from users, they're the most privatized, they're the least transparent in some ways, and they can be viewed as very technologically complex, but interconnection is not at all neutral, and what I would like to do is to explain why this area matters so much.

Now, as an engineer, it can be very tempting for me to view this whole area as a physical plumbing and engineering of the internet and not really what is called a high politics issue.  Indeed, there are so many engineering concerns including latency, improving routing efficiency and redundancy, keeping traffic local rather than inefficiently routing it through another country, but as a policy scholar I also view this area like other areas as political.

So what are some of the policy concerns?  I'll mention a few.  First, economic interests often trump issues of technical efficiency in this area.  There can be disincentives for incumbent networks to engage in peering and settlement free peering with newer entrants who instead could be viewed as potential customers.  So this is a paradox of interconnection where market decisions of companies do not necessarily translate into a collective picture of a technically optimized network.

Even governments we've seen, can be resistant to IXPs because of their relationship to incumbent telcos.

Now a second policy concern involves particular interconnection challenges in emerging markets.  We know that the worldwide spread of IXPs has been very rapid since all of the network access points were in the US but still it is important to note that many countries do not have Internet exchange point in their borders and various digital divide discussions often miss this.  They completely miss this when they talk about access.

Countries without an IXP in their borders have many disadvantages.  There can be technical inefficiency and latency when local traffic is routed through another Country rather than staying within the borders.  It can cost more to interconnect, but from a political perspective it is a critical infrastructure issue for countries without IXP.

Finally, because IXPs concentrate the flow of traffic between networks and interconnection, whether bilateral or a shared interconnection point, this can serve as sites of government surveillance and censorship or targeted areas for internet disruption. Now, these outages are not necessaritly caused by technical or political problems but we’ve also seen that they can stem from peering disputes.

So with all of these policy concerns it is not surprising that regulatory questions arise.

It's also important to know that there are, as Uta mentioned, already region specific laws that affect interconnection.  There is tax law, there is competition law, licensing and then ex-post kind of regulations around antitrust issues and peering disputes.  But rather than having globally coordinated regulation, though, my final point is that there are alternatives that can comport better with Internet Governance norms.  Governments can, at a minimum, eliminate regulatory uncertainty in regions.  They can facilitate and create incentives for IXPs and something that is often overlooked, they can help with human capacity building and technical expertise.

But on the privatized side we know that since this is a highly privatized area, this legitimacy comes from a number of things: transparency, accountability and openness, as well as expertise.

I think there is a real opportunity here for network operators to at least make visible their private arrangements.  Transparency is also critical if you think about interconnection arrangements as sites of potential censorship filtering, blocking and surveillance.

So constraints on interconnection are constraints on access to knowledge, that's how I see it, so it is an incredibly important area and I appreciate the opportunity very much to raise some of these issues and I look forward to what others have to say.

And thank you for letting me come in remotely.

>> UTA MEIR-HAHN:  Thank you very much. That was good to hear and understand and very forceful remarks. Who would like to continue?  Maybe Mike Jensen, if that is possible.

>> MIKE JENSEN:  Sure.  Thank you.

I think the first point I would like to make is that it is very difficult to develop an idea of what a best practice might be globally.  Countries really do vary incredibly and the policy environment in each Country and the market environment and the technical environment, the geography, so to have a one size fits all policy really doesn't make much sense, I think.

And we can see huge variation in the levels of effectiveness of IXPs and the level of adoption and the extent to which IXP are spread around different countries in different models and I think we have to be careful about thinking that there is one single policy.

But having said that, I think that there are some areas that are of universal concern and areas that we might want to focus on.

One of those I think is this idea that Uta touched on earlier about the requirement to license a foreign operator who wants to be present at an exchange.  I think that this is a big constraint to developing local Internet interconnection economy.

It is rather like saying that a global brand has to get a license in the Country for its brand to be distributed there.  Obviously the local operators who distribute that brand have to get their business licenses and whatever other licenses that they need to comply with.  But you find that the international brand has to do the same thing and it is the same with required thinking that these operators who are purely providing connections to the local industry and not actually selling any services in Country, for them to be required to get a license seems to be unproductive and inefficient and is not good for the local Internet economy.

The other area I think that is of particular concern, especially when we see Internet exchange points in emerging countries where there is a dominant operator, is the difficulty of encouraging that dominant operator to be present at the exchange.  And we often see reticence by the dominant operator in participating in the interconnection at the exchange.

And I think, again, it is difficult to generalize about how to encourage that operator and, again, it's not always the case.  In some cases, the dominant operator is participating at the exchange in the early stages of the exchange.

So, I think, again, you know, it's the usual case.  It is not a technical issue here, it's a social issue that needs to be addressed and an awareness raising issue and these things take time for everyone to understand how beneficial it is to the local Internet economy for everyone to participate.

And there can be a huge range of attitudes.  I'll just end with an anecdote that surprised me.

And, again, it also touches on the issue of the mandatory multi-lateral peering.  I was talking to the dominant operator in Serbia, and the Internet exchange points there has a mandatory multi-lateral peering policy and the dominant operator was present at the exchange and they liked that mandatory peering policy because it meant that they didn't have to explicitly or overtly peer with the second largest operator there, their biggest competitor.  Everyone was required to do that.  So at that exchange point they were quite happy to have a mandatory policy simply because it allowed them to save face.

You can see that there are a lot of issues that are not necessarily objective, or technically make sense that come into play in terms of determining how we establish the best kind of interconnection regime in the Country.

Thank you.

>> UTA MEIER-HAHN:  Thank you very much. Mr. Misra, if you like, you might be a good person to respond to this.

>> MANOJ KUMAR MISRA:  Thank you.  I think Internet connection is always one of the important issue for the telecommunications sector and it has been called like it is a life line of the network services.  So it is very important.  If I said the experience of the India of India has evolved the system over the period of time and how they have developed their device and then how they are moving to the (Indiscernible) services.

So India has defined this, involved commercial and you know technical arrangement. Under this service providers agreed to connect their equipment, network and services to enable their customer to have access to customer, service and the network of other service providers.  So there is a mandatory requirement that it is necessary that the connecting person should be a licensed entity in India. Then they can connect.

And then there is a regulation under the TRA act and where the TRA has been given a mandate how to regulate or how to supervise the system is there.  So the interconnection is a wide world.  For the media network is a different meaning is there, and India, let me say, the experience in 2002 what they have done, they have issued a regulation which is called “reference interconnect offer”, which is the umbrella regulation where they have provided an underline principle and this principle is equally applicable for the Internet service providers, tedium, and less to …(?) service providers in India providing a service.

But let me say another point of view.  In 2004 TRA has recommended for the creation of the national Internet exchange.  That is called the NIXI there.  NIXI is taken care about the small operator but I think it is mentioned, there are some struggles going on because it is the interconnection, Internet interconnection is still in India.  It is under the (Indiscernible).  But there is a guidance available.  High level guidance available under which the people have to work.  Like in the case of the interconnection especially for the Internet bandwidth.  Indian regulator has come out with the regulation.  That is -- but it's in particular for the bandwidth service providers because they are a very important part of the broadband services system.  Where they have came out, that is called the “cable access charges regulation” in 2007 is there.  There are some fight is also going in the code for the cause of the incumbent that the operator has a different view of them.

But if you are talking about the framework how they are evolving for the Internet, yes, it is very important, and the reason considering the importance of the growth of the broadband and the Internet, Indian regulator is removing its old framework of the “reference interconnection offer” regulation 2002.  Recently they have issued the consultation paper about the, a pre-consultation paper and there was a detailed consultation paper last year in 2014 but they have not come out with the final, you know, regulation.

So in that state, in India it is not a hundred percent or greater.  There is a framework is there and the matter is left on the commercial negotiation.  If there is any problem is coming they can approach to that regulator and regulation needs to be (Indiscernible).  So this is the overall picture where India is working.  Of course in India broadband is one of the highest priority of the Government of India. And government has put a principle that is called, for the government, there should be less government and more governance and the government regulator is going to put a framework under which operators, I mean the licensed operators are the entity who are going to connect.  This would be a governance there should be very less involvement of the regulator and the government and they, you know, make the growth over the period of time.

So this is the framework.  I'm happy to thank you.

>> UTA MEIER-HAHN:  I think we should turn to Mr. Bashir to.

>> MOHAMED EL BASHIR:  Thank you very much.  I just a few slides.  Three slides I just prepared.  If we can show them.

So basically my talk will be about incumbent operators and their role in interconnection.  And they could be really blocking or resisting interconnection and I think there is two areas regulator areas where if it exists it might be that, let's say, hostile behavior from the operator,  I think the first one is availability of interconnection reference regime, or guidelines.  That's important.

And I think the second area is easing up the incumbent control on the infrastructure.  That is critical, because that will promote more competition and also bring more players to the table which they will enforce, maybe, the incumbent operator really to weigh the benefits.

So I will talk on easing up infrastructure access. Basically, the issue is we have incumbent operators who have control for legacy reasons on infrastructure.  One of the options that regulators currently in emerging let's say, regions or African, Middle East are considering, is open access which is allowing third parties telecom operators, ISPs to deploy their networks using the incumbent operator’s facilities.  So this is critical because it will expedite the broadband role-out and it should promote the choice for consumers as well as bring more players to the market who will eventually, I think the operators in monopoly situation, they tend to be very aggressive against interconnection.

So open access, there could be different forms of that open access in terms of either wholesale arrangements with streams or back fiber access to docks.

So what are the major issues from a regulatory point of view? It is basically ensuring a fair and reasonable and non-discriminatory interconnection arrangements between the players in that market.  And the infrastructure really plays a living role.  If a regulator is able to ease up the control of the incumbent really, that means giving other stakeholders a chance really to have an equal footing, or at least have a negotiation from a strong stance view.

One of the issues, I mean there are different models in terms of how that could be done.  There is a technical option that is available in terms of network sharing access to passive infrastructure, to dark fiber.  The other option, which is basically government public-private partnerships.  And we are seeing that is increasingly happening worldwide from the NBN in Australia to also national broadband initiatives where the government is playing a leading role with the incumbents as well to ensure that there is a roll out of fiber.

So the government and the regulators through those initiatives could really try to influence the incumbents and ease up interconnection arrangements.

So in Africa recently we're seeing that there is hybrid model where there is investment in infrastructure as well.  In some countries the government play a major role themselves in terms of establishing an IXP, that could be from the range of just bringing everyone to the table and facilitating that discussion where the stakeholders themselves could agree on forming that IXP to the extent of even establishing and operating that IXP themselves technically.  So there is a major role for government regulators to play and in terms of they're supposed to be facilitators.  From my experience the best role is to really bring the stakeholder on the table, facilitate things, but not go into operations.  Let the industry do their work.

So, for regulators, new market entry and roll out of new services is critical.

I think one of the areas, as well, that is many regulators need to do some more work on that area, basically developing those frameworks or guidelines, some of them are technical in nature in terms of access, specifically I'm talking.  So the lack of clear rules and responsibilities make it difficult, really, to, for interconnection.  There is a range of those issues.  Ranging from right-of-way procedures that enables operators, ISPs, the role-out of fiber which is enabled then at the end to also interconnect to a meeting point.  To in building and cabling, as well.

And we have seen countries like Singapore where they have an advanced regime where they need buildings to be wired, fiber, they need it to be connected in a certain manner.  They need also real estate developments to be ready.  So the way forward I think is infrastructure readiness in terms in the different models, in terms of the public-private partnership easing up the incumbent operator’s control on passive infrastructure, allowing more players to come on board that will at the end as well, give them more power in negotiation of interconnection.

I will add another aspect, which is basically the security aspect. We have seen that recently.  I mean one of the selling points you can also use maybe, or regulators use to influence incumbent operators is that there is no need for traffic to leave the Country for example, to have a local Internet connection, and that is important, because basically there is no need for an Email sent from a government department to another government department to go all the way to, let's say, London or Amsterdam for it to come back.  So, I mean, local interconnection could be justified from this point of view in terms of for the security it's important; so that is what I think.

Thank you.

>> UTA MEIER-HAHN:  Thank you very much. Now I would like to hand over to Bill Woodcock.  Already attaching the first question.  And that would be in how far should we care about local regulation with regard to connectivity as a global resource.

>> BILL WOODCOCK:  Before getting to that question I would like to just commend Mike for bringing up a really critical and timely issue which is the notion of best practices in the field of exchange points.

As Mike said every situation is different and there are thousands of variables in building a good, functional exchange point that serves its constituents, its community, and the solution that works in one place is not going to fit the problem that exists in another place.  And trying to boil anything this complicated down to a few pages of cookie cutter makes the problem far worse rather than better.  The only way to make this work well is to go and look at the specific issues faced in a specific environment.  Their economy, their competition, their physical environment, their regulatory environment, the state of the existing infrastructure, all of that needs to be taken into account and at the end of that, the most important thing, the goals and the desires of the participants in that particular exchange.

So the right way to do this is not to drop a paper on them and say do this it worked somewhere else, but instead to say there are 500 examples out there.  Every one of them was complex.  Every one of them addressed many different questions and each one of them has taken a slightly different approach to solving the problems that they had in front of them.  Find the parts and pieces that you like, find the exchange points that solved things that you're interested in in ways that you admire and try to emulate those parts, right.  Don't take anything wholesale.  Just take the best pieces of each and try and emulate those.

You know, beyond everything else it kills innovation to tell people “do this!”, if instead you look at the problem and you create the best possible solution for that problem, that's how we advance.  That is how things get better over time.

So, turning to the question of local regulation for global infrastructure, I think there are, of course, big Internet service providers that operate globally, big content networks that operate globally across many, many different markets and there are tiny Internet service providers that operate only within a part of a single metro area.  It is very tempting to say, well, out of any given thousand ISPs only two are big enough to span multiple countries and only ten are big enough to span whole countries and only, you know, 50 span multiple metro areas and, so, this is catering to the needs of the big companies at the expense of the small, but there is no small ISP that doesn't aspire to grow and, so, if you allow local regulation to become burdensome to the ISPs that grow by differing too much from norms, then it is not just difficult for the big ISPs who are already big, it is difficult for all the ones that are coming up under these regimes where what they are used to dealing with is different from global norms.  And when they try to grow outside of their home market it, they find that things are just very different in other places and they are unprepared to compete globally.  So I think that this question of local regulation, obviously all regulation has some scope.  There is no global authority for regulating carrier interconnection.  There never will be.  But I think global norms are very valuable in the area of carrier interconnection.

And I think one of the really important things to note is just how well the private sector has done at self-regulation in this area.  As most of you probably already know, we surveyed 140-some odd thousand peering agreements in 2011 and found that 99 and a half percent of them did not need to be formalized on paper because both parties, both generally big international carriers agreed that they would just do the normal thing.  So they were able to do a hand-shake agreement ask say, we'll just follow the norms, we don't need to write anything down because we're not deviating from the norms.

There is no regulatory environment in the world that has 99 and a half percent compliance.  Much less a global environment that can enforce 99 and a half percent compliance to somebody else's rules.  It's only through industry development of its own best practices and norms and so forth that you can achieve that degree of coherence.

So, that kind of talks about what happens when people do want to interconnect.  Then there is the question as has been alluded to of what happens when people don't want to interconnect.

Typically the smaller the carrier is, the more desirous they are of interconnecting because the less market power they have to try to force anyone else into becoming their customer.  If you are a small ISP you can't deny someone interconnection and hope that they will give you money.  If you are a market dominant provider, however, you can deny someone interconnection and then hope that they will turnaround and say, well, we have to interconnect with you in order to provide good service to their customers, therefore will open our wallets and pay what you demand.   Even though there is no value being conferred there.  There is no value being traded for the money.  It's an extortive process rather than a provider customer process.

So there are sort of bottom up and top down ways of addressing this, and what I think we've all observed is that the bottom way up way of addressing this doesn't work very well, right.  Individual Internet exchange points and their members saying our policy is an MMLPA, a mandatory multi-lateral peering agreement so anyone who comes to this exchange point must peer with everyone else, simply causes the people who don't want to peer with those people to stay away from that exchange point.

There are exceptions where it serves some useful function for a big guy to come and peer but the rule is much more like in Perth where the big Australian carriers are all present in the building but they don't peer with anybody at the exchange because the exchange has an MMLPA and none of them want to be forced to peer with anybody they don't want to peer with, therefore, nobody gets the advantage of having them on the switch fabric.

So the bottom up, MMLPA, it's been well understood for a long way that that doesn't work well.

On the other hand, the top down government regulation of any market dominant player tends to work pretty well, right, if you have a communications regulator, if you have a competition regulator, having them say, well, as long as you have 70% market share, you need to not behave in an abusive manner, and that means you not trying to compel people who don't want to be your customer to be your customer.  If somebody wants to interconnect with you on an equal basis you need to treat them as an equal even if they are actually smaller than you, not categorize them as someone who owes you money for some reason.

>> UTA MEIER-HAHN:  Okay.  Can you wrap it up?

>> BILL WOODCOCK:  Okay.

>> UTA MEIER-HAHN:  I have many questions, but I'm sure that you have many questions, as well.  So I would like to stick to the promise.  Also the remote people, please, if you have questions, tell our remote moderator.

And now I would like to give over the microphone to the people here in the room who have been incentivized to think by the input of our panelists.

Please, if you have questions or would like to make comments on what you've heard.  Some is quite contradictory, I think.  Pleasing to the mic or find our helping person.

Are there any remote questions or comments?  Remote moderator is shaking her head.

>> AUDIENCE:  It is a long walk over here.  Hi.

I'm Mike from Google and I work on peering interconnection as a part of wide range of hats that I wear.

Some really interesting points by the panel.  Thank you.  I think one, in particular, Bill brought up was around market power and competition in the market.  And we're talking a little bit about regulation of interconnection.  And in most instances said 99.5% of all peering arrangements are done without even a contract which is very different to the way voice interconnection has traditionally been done.

When there are issues with interconnection, the fact that these come up are perhaps a symptom of underlying issues.  They're a symptom of a lack of competition of the market.  Consumers not having enough choice.  So that certain people can exercise market power in their interconnection negotiations.  So if there is a temptation to regulate interconnection, my suggestion would be to look at the cause of needing to regulate and try and deal with the underlying cause, whatever that is.

>> UTA MEIER-HAHN:  Anybody want to react to the commentary?  Other comments?  Please.  Also introduce yourself briefly, please.

>> AUDIENCE:  My name is Thomas Grub.  I work for Deutsche Telekom, the German incumbent.  I do also have a history of working for the Swiss regulator where I was the economic advisor for interconnection procedures.

So I would like to offer two comments.  The first one would be that we should remind ourselves that peering comes from the notion of peer, which means equal or at least comparable in a sense, so I cannot agree, of course, with statements like we should treat small operators on equal terms.  They're simply not equal.  I mean, it hasn't been stated too obviously, but what is often claimed is that we need to interconnect on a settlement free peering basis.  I don't think that is economically justified because we're not talking about the global resource here, that's just there or falls from the sky, it is basically private property and private investment, so we should be mindful of the incentives to keep that infrastructure.  If you can just get connectivity to the whole world merely for the fact that you have a couple of access customers, I don't think that is the right incentive to build up bandwidth globally.  We do have to build up the bandwidth and I do think that the system has worked quite well without too many regulatory constraints.

So the second point about transparency, I agree it's not a very transparent business.  However, it is possible to see who is interconnected to whom quite easily.  There is databases, of course, practices and commercial conditions are rather in the dark, but that is normally the normal state for competitive markets.  I mean, just think about what happens if all the prices become public.  It's not very competitive anymore, or there is not much to negotiate anymore, but it needs to be negotiated because there are asymmetries that have to be dealt with commercially, they can be dealt with commercially, and coming from Europe I do think that we do have the right regulatory instruments already in place to solve conflicts that may arise, be it with competition law or be it with regulation.  So my questions to the panelists would basically be: shouldn't there be a distinction for internet exchange point participation, maybe between Tier 1 and Tier 2 operators.  I don't think it is helpful to force Tier1s in there, because as Professor DeNardis has already mentioned, there is also security issues.  Just imagine what happens if the national Internet exchange point goes down.  Maybe you would be quite happy to have a second one provided by the local incumbent also still providing connectivity with relevant players.

Thanks.

>> UTA MEIER-HAHN:  Mr. Bashir already signified to answer and then Bill Woodcock, please.

>> MOHAMED EL BASHIR:  My response would be, with the background from my region, in the Middle East.  I mean, the experience that I have also seen on the region also the markets are, let's say, we have duopoly operators in those markets and then a couple of, I think in the majority of cases those operators went into commercial agreements themselves.  There was no regulatory intervention at all.  But at later stages we are faced with many disputes where one big incumbent operator was muscled and then big market share was abusing their dominance.  So the regulators I can say in the region I come from and seeing what is happening there, there is no intention just to intervene.  There was reasons that led to that intervention.

The other comment is basically about Internet exchange point.  Currently working on an effort to establish one.  And actually, without the intervention of the regulator and also push from the government, we will not be successful in bringing the incumbent to a table, although with that happening still there is struggle.

And basically it is not just bringing the operators in the table, or ISPs on the table, we have content providers who have a role here.  For example, you have universities academic networks, content providers who need to sit with other stakeholders like yourself for the different categorization that you label them and discuss, actually, those interconnection arrangements.

So, I think the best really, model is Bill could talk more details, but I think the best model is to bring everyone in the table, regardless of the size.  Yeah.

>> BILL WOODCOCK:  I could, if we had more time, refute the many of the assertions there point by point, but instead I will -- not Mohamed's, but the gentlemen from Deutsche Telekom, instead I will give you two things from my level.

The first is a bit of brevity.  Discussing regulatory distinguishing between Tier 1 and Tier 2.  The joke within the Internet industry, the ISP industry is that Tier 1 is yourself, Tier 2 is your customer or your competitor and Tier 3 is your customer's competitor or your competitor’s customer.

So the point here is this notion of tiers is something that advertising and sales people used to bamboozle customers, is always relative.  Tier 1 is always yourself.  Tier 2 is always somebody else.  You can't regulate on the basis of that because it's relative.

The second point is a lot of regulation is aspirational.  You don't necessarily just regulate to enforce the status quo.  Often you regulate to make a better world.  So if you have a market dominant incumbent who is abusive, then, yes, you don't just enforce the status quo and say you've got 70% market share you don't need to interconnect with anybody, you don't need to treat anybody as equals.  We know they're not equals right now.  The goal is not to preserve that situation.  The goal is to have a competitive marketplace of equals who compete with each other to provide better services to the market, to the customers.  And so, yes, it is aspirational.  You treat people as equals if you want them to become equals.

>> UTA MEIER-HAHN:  Any more questions?  Otherwise I will ask one. Well, I've heard you all talk here about governmental guidelines, but also best practices.  And I would like from each of you to contextualize and put in relation these two concepts of rule making, let's say.

>> MIKE JENSEN: Well, I think what it boils down to is how open the market is.  Ideally if we have an open market which we can achieve or accelerate through regulation, and then we don't actually have to make that many other rules.  If the market is truly open and anyone can come into it, then ideally we will have a good environment where there are no barriers to entry and the market will naturally grow and we don't have to have many other rules and to make sure that people can participate whereever they wish to in the market.

There may need to be some special rules made about dominant operators.  We have a tradition of the SMP regulation, which is quite well accepted (Indiscernible) significant market power and those operators need to be controlled.  I think we have to distinguish between a developed Country and the  developing Country market because in many cases these incumbent operators in a developed Country already have a huge control of the market they service, 99 percent of the end user customers in many cases.  Whereas in a developing Country we may not want to apply quite the same sort of rules where these incumbent operators may only be servicing 2 or 3 percent of the market or 5 or 10 percent of the market.  So I think we have to look carefully at that kind of blanket approach to regulation.

Thank you.

>> BILL WOODCOCK: I think my preference is always for relatively light touch regulation.  I think something that people often lose sight of is the fact that the regulator's responsibility is to advocate for the people, for the common good.  Not to arbitrate disputes between competitors.  Not to advance the state of profits in the industry.  Not to enhance our shareholder value.  It is the people's interest in the quality of the service they're receiving and the price of that service.  And, so, we often see sort of revolving door between regulatory affairs departments and the regulators that are supposed to be regulating an industry and, so, it is very easy to lose sight of that advocacy principle.

Where I don't think you want to allow that to become too much of an imposition is when the regulation can stifle either growth or innovation.  And, so, my preference is always for regulators to say, you, industry there, we see a problem here, because prices are too high or quality is too low or the advance of the market is too slow or whatever.  Go fix that problem.  You figure out how, but you fix that problem.  And if a year from now you haven't fixed it then we will step in with regulation.

And almost always industry will go solve the problem as long as there is a credible threat that the problem will be solved for them if they don't do it themselves.

And then you don't need to have actual regulation if the threat of regulation solves the problem.

>> UTA MEIER-HAHN:  I also have another question.

>> MANOJ KUMAR MISRA: So I think it is a very relevant question.  My answer would be this would be a regulation or not.  Depending on the nature of the competition in that exact area.  Like in India there are a little more 600 ISP providers.  Then the market analysis happens.  If there is a level of competition, if competition is there, then it is going to take care about that.  Otherwise, as a principle this would be some kind of the oversight regulation.  So this will not be happening, that the fighting, you know, going on among the operators.  So it depends on the nature of the level of the competition in the particular broadband area.  Perhaps as the operator it would be always preferred it may be left on some kind of the market process, which is going to cover.

>> UTA MEIER-HAHN:  We've heard a lot of talk about the market forces and actually we had quite differing statements between the panelists here, at least two or three of them and what Laura DeNardis said, if I recall that correct, or please raise your voice remotely.

There had been assertions that the market has done well and there also have been assertions that there is a mismatch between what may seem technically sensible for internet engineers and for instance what the market has done.

And I would like to add the third perspective on the user perspective.  We've heard there is transparency and we know we can look at the Internet structures, if we can, if we are able to. But also the points of control which Internet exchange points exemplify may increasingly become of interest for just regular citizens.

And I would like to hear from you how you think that the market forces which have obviously very well also worked to provide connectivity in many areas of the are world, how they will provide the, which I find important, the legitimization and justifications for the citizens whose communications are being sent over important links and so on.

How is the market going to address the legitimate needs and trust, how is the market going to do the trust building that is necessary for ordinary Internet users?  And maybe that could also be your closing statement.

>> BILL WOODCOCK: I think there are appropriate areas for problem solving and although the desire to keep traffic from crossing national boundaries when it does not need to has huge security benefits.  I think that end to end security is the better solution to that problem, right.  Securing data cryptographically both while it is in transit and while it is at rest solves this problem in a broad and generic way whereas keeping traffic local has economic benefits that make many other things possible, right.  So these are kind of orthogonal, they're orthogonal issues that have these sort of collateral benefits because they're good practices, but fundamentally personal privacy and security, I would say, is a job for cryptography rather than a job for the routing infrastructure.

>> MOHAMED EL BASHIR: I will just, I think the regulations should, regulators should be facilitators.  I mean we lead the industry really to put the standards and see how to implement things. But I think it’s currently, what we are seeing is intervention in terms of, from security and end-to-end encryption is one example where the where the technical communities are taking a lead now, after recent Snowden revelations in terms of ensuring the customer trust, it's still there in the Internet and I think that is critically important, really for the future of the Internet and ensuring that users are trusting the network.

The industry is doing the work now, I don't think there is -- definitely there will be a role for government and regulators in this area, but not a leading role.

Thank you.

>> MANOJ KUMAR MISRA: I think I would like to conclude with, you know, one of the favourite slogans given by my minister. This would be “less government, more governance”.  So I -- my solution would be such a situation if there is a sufficient competition is there, then it is going to take care about subscriber interest.  I mean the customer interest is there.

If there is not, then certainly there will be some kind of oversight regulation to be there, to manage, to take the interest there. There are certain regulations there which need to be taken into the account which may be happens in the wide segment which can be borrowed but all the things depend on the level of competition.

So my answer would be that, if there is sufficient competition there, there will be little need for any kind of hard regulation.

Thank you.

>> UTA MEIER-HAHN:  Is it possible to communicate with Laura DeNardis now?

Would you also like to give a statement to close the session?

Are there any questions that are left unanswered in this room?  Then please step up.  Last, possibility.

There is one question.

Laura DeNardis is coming in.

>> LAURA DENARDIS:  Yes, I can hear you if you would like me to answer that.

Well, there certainly is quite a lot that local governments can do.  As I said, eliminating uncertainty, providing incentives for the spread of IXPs to facilitate the conditions for competition and regarding any potential anticompetitive practices there are a lot of ex-post after the fact things related to antitrust, but there really doesn't make sense, as I said before, to have a uniform global regulatory framework for this.  In light of the rapid spread of IXPs and the pace of innovation and the heterogeneity of the local context.  But still I feel that given this is such an important policy area there has to be a way to have more transparency into what private companies are doing.  Whether that is voluntary practices, sharing of best practices, or letting us know what the interconnection agreements are, I think that that would really help to provide greater accountability and transparency into this important policy area.

>> UTA MEIER-HAHN:  Thank you very much.

With this, I would like to close this very interesting panel, and I

have this feeling that we may be continuing this conversation as locally people start probably to become more interested in the infrastructure, again, which I hope is going to be the case, ask this is going to be good for all of us, I believe.

Thank you very much.

(Applause.)