Workshop report

Internet Governance Forum 2014
Turkey, Istambul

WS65

The Role of IXPs in Growing the

Local Digital Economy

TUESDAY SEPTEMBER 2, 2014   WORKSHOP ROOM 08

1. Workshop overview

Explains the role and importance of IXPs in encouraging the development of local digital content catalysing the development of the domestic Internet economy.

The panel will look at the technical, policy and economic principles surrounding domestic Internet traffic exchange and the beneficial impact of IXPs, in developed and developing economies.

Themes addressed will include: the role of IXPs in making regions economically autonomous; how IXPs foster development of local content and culture; how IXPs facilitate cyber security and other critical infrastructure like the Domain Name System and Internet businesses.

Start and finish time
10:20AM - 11:10AM.

Attendance
55 participants.

Moderator
Bill Woodcock - Executive Director, Packet Clearing House.

Speakers
Nishal Goburdhan - Internet Analyst, Packet Clearing House.
Ariel Grazier - Chairman of the Argentinian Internet business association (CABASE).
Pindar Wong - Founder of the Hong Kong Internet Exchange and the first licensed ISP in Hong Kong.
Sam Paltridge - Communications infrastructure economist at the Organisation for Economic Cooperation and Development

Remote Moderator
Bevil Wooding - Internet Strategist, Packet Clearing House.

Host Organisations
The Organisation for Economic Cooperation and Development (OECD), Packet Clearing House (PCH), the Internet Service Providers Association of South Africa (ISPA) and the Argentinian Internet business association (CABASE)..

2. Discussion summary

The workshop started 20 minutes later than expected because several of the panelists were coming from another workshop that finished late at 10:10am. there were 40 participants in the room at the start of the session, and that grew to 55 by the conclusion.

The format of the session was a short introduction of the theme under discussion by the moderator followed by 10 minutes of initial remarks by each of the four panelists, followed by the Q&A session.

Bill Woodcock presented the topic by describing the importance of IXPs in encouraging the development of local digital content as a catalyst for the development of the domestic economy. Internet exchanges reduce the operational costs for service providers and network operators, hence enabling the growth of a digital economy.

The first panelist, **Ariel Grazier**, presented the case of Patagonia, a small touristic city 500km away from the nearest city that used to have 40Mbps of bandwidth for the whole town before the arrival of an IXP. The challenge was to connect the city to an IXP and improve their overall situation.

Firstly, the town was connected via a microwave radio connection, increasing the total capacity from 40Mbps to 150Mbps, and they were operating at full capacity everyday. Then they upgraded the connection installing a fibre optic cable, increasing the capacity to 500Mbps.
In economic terms, the connection of Patagonia to an IXP reduced the costs from $1,800 per Mbps/month and 40Mbps to $30 per Mbps/month and a capacity of 500Mbps.

The first Argentinian Internet exchange started in Buenos Aires in 1997 with 10 members. Members shared a 64k connection costing $40,000. Brazilian exchanges also started in 1997, and have a different model than in Argentina where participants joining one exchange have to peer with all other participants. There are about 15 exchanges in Argentina and about 22 in Brazil at the moment.

Nishal Goburdhan was second taking the floor. He is general manager of 3 exchange points In South Africa (Johannesburg, Durban and Capetown). He explained that IXPs are highly available neutral exchange platform and people that connect to the exchange are free to chose who they want to connect with.

In South Africa, IXPs started in1996 when transmission costs to the US were prohibitive. Back then, the return of investment of building an exchange point (the time that it takes for the IXP to pay itself off) would have been two weeks.

Next to speak was **Pindar Wong**. He explained that in the early 90s the Hong Kong Internet environment was very competitive. Connections from Hong Kong to the US cost $40,000 per Mbps and were only accessible to the deeper pockets. In 1995 with the decommissioning of the Internet backbone, there were several attempts to keep traffic local but because of all the commercial competition, he said they had to trust a neutral third party (a university) to run the exchange.

In addition to the economics, Pindar highlighted the social dimension of the exchanges, saying, "If you want to drive a digital economy, you need the engineers to do that."

The first meeting that took place in Hong Kong was in 1996 with the goal of teaching how to build an Internet exchange point. You need to get the experience by trial and error and do so with a rapid iteration.

He underscored the importance of fostering a trusted community, saying, "Roles changed with the time, as engineers moved from one company to the other, but the trust within each other and through the years, that's what really cements the community."

Nishal elaborated further on the digital divide and its economic dimension by pointing at the African Union proposition to get 80% of Africa's content housed in Africa. Right now, Africa is buying services from the rest of the world with the exception of the three more developed economies: Egypt, Kenya and South-Africa. The one thing they all have in common is they have all been running Internet exchange points following best practices.

If you look at the participants at the exchanges, you can see entities which are really interested in pursuing the online path. In Kenya, for instance, one of the largest participant at the exchange is the Kenyan Revenue Authority which has been pushing the operator to open a second exchange so that people would be always been paying their taxes. The busiest peer in Johannesburg is a bank convinced in the future of providing e-services.

Sam Paltridge was next to speak. He presented the case study of the Internet exchange in Nepal. After Packet Clearing House helped establish the Internet exchange point in Nepal, the publishing of school results online produced a peak in the traffic exchanged at the IXP. The results, Internet content hosted locally in Nepal, would have been otherwise taken routes via Paris, London or San Francisco without a real need to do so.

He further stated that there are several governance models but self-governance is considered a best practice in this field. The whole Internet ecosystem is built around customers at the end of the model paying for whatever service or activity they perform. The discussion today is about how we reduce that cost and a very successful model of traffic exchange is the one we are describing: using neutral Internet exchanges with a self-governed model.

And because they are so successful they also become a potential threat for surveillance, since they are the location where money flows and the Internet has become a central part of the economy.

Bill elaborated further on the Indian situation. From the large developing economies, India is one of the largest but only produces a tiny part of the bandwidth that it uses and imports all of the rest. In 2000, Enron built an exchange point and they thought they were building an Internet trading platform for packets, with the intention of extracting the excess of rent/value generated. This, and a history of monopoly control of domestic interconnection, are the reasons why India is at least ten years behind as a result of the misconceptions about traffic exchange.

3. Q&A Session

This is a summary of the most important questions formulated when the floor was open for the Q&A session:

Q: The cost of building an IXP is not high, but if you look at the global picture, a lot of countries do not have Internet exchange points. Who should lead their establishments? Governments, Internet organisations, ISPs?

Pindar: The physical cost is not high but the level of trust you have to build between the ISPs who are competing is very high.

Ariel: I totally agree with Pindar. The physical cost was just a switch at the beginning. But it took more than a year to have 12 ISPs sitting around a table discussing the way to start. The second IXP we opened took 9 months. Now we are running 15 and the process has become more efficient.

Bill: Speaking from the experience of having helped more than 200 IXPs now, what we have observed is that most exchange points take at least eight months to get started. These months are used by service providers for talking and reaching an appropriate level of trust and investment in the outcome that they will have confidence.

Comment by Adley/APNIC
Adley stressed the importance of capacity development as a pre-requisite for building IXPs. APNIC organises seminars and workshops, sometimes physical and sometimes e-learning to get knowledge across a group of people. Several places have started Network Operators Groups, like in Indonesia.

Comment by Bijal/Euro-IX
There are lots of initiatives in Europe already working together with other bodies and passing knowledge, not necessarily training but explaining from the experiences that we have seen in Europe. Trust and community building are key.

Comment from Russian attendee
In Russia we have dozens of IXPs and the largest one has 400 members so it's pretty large. And each of the IXPs I know became at some stage or another the enabler of local Internet businesses. If some city or small town has own Internet exchange, in this city we have first local providers and new providers because they understand how to do this business.

Remote Question: Fazil from Bangladesh asked examples of exchange points based on software defined networks.

In Japan there are both commercially operated exchange points and there's also a very, very healthy academically operated exchange point operated by WIDE. They experimented with virtual exchange based on MPLS and that's about as close as we get to software-defined exchange points.

People are playing with it but that was actually routing production traffic for a while and was not particularly successful. There are 400 exchanges in the world and there are always experiments happening. If you want to build something what works you just need to follow best practices.

Comment by Malcolm/LINX

LINX is celebrating 20 years and is now one of the largest exchanges in Europe. We are very committed to the idea that it needs to be a bottom-up process, where the members

are in control of what we do and don't do to be neutral between all our members so we cannot be a strategic competitor to our members.

For the past couple of years we have also engaged in a programme of establishing new Internet exchanges in cities in the United Kingdom, for instance Manchester (now with 50 participants) and Scotland. We have also been approached by the government to help establish an internet exchange in South-wales in their behalf. We agreed as long as this has the whole hearted buy-in of the network and peer community.So any active work that we could do would be only that which was designed towards building and establishing that support and we weren't to put in switches or building a data centre or anything like that until we were sure there was a critical mass of networks that wanted to us do this.

4.   Conclusions

The topics discussed in the workshop are very relevant and fundamental to understanding the technology, policy and economic principles and considerations surrounding domestic traffic exchange and the beneficial impact of IXPs worldwide. Furthermore, the diversity, depth of knowledge and experience of the panel made the season informative and engaging for the audience of experienced and non-experienced participants. Feedback from the audience in the interactive session confirmed that the topic and content of the panel was valuable and very well received.

PCH
Packet Clearing House

**Operational support and security
to critical Internet infrastructure**

PCHglobal

www.pch.net

Report prepared by

Gael Hernandez <gael@pch.net>
Research Specialist Packet Clearing House

October 2014