
Workshop report: Challenges facing network operators in developing countries

Internet Governance Forum 2008

4 December 2008, 11:30 - 13:00

Room 1, Hyderabad International Convention Centre

Co-organizers

The following organizations, representing geographical diversity and multi-stakeholder values, were partners and participants in the workshop:

Technical community:	AFNOG (African Network Operators Group) Afrinic (African Network Information Centre) APNIC (Asia Pacific Network Information Centre) ARIN (American Registry for Internet Numbers) SANOg (South Asia Network Operators Group) LACNIC (Latin American and Caribbean Internet Addresses Registry) PCH (Packet Clearing House) PITA (Pacific Islands Telecommunications Association)
Intergovernmental:	CTU (Caribbean Telecommunications Union)
Civil society:	APC (The Association for Progressive Communications) GIPI (Global Internet Policy Initiative)

The following regions were represented:

- Africa
- Asia
- Pacific Islands
- Europe
- Latin America
- Caribbean
- North America

Panelists

- Adiel Akplogan, Afrinic
- Sylvia Cadena, APNIC
- Richard Misech, Palau National Communications Corporation
- Bernadette Lewis, CTU
- George Sadowsky, GIPI
- Gaurab Raj Upadhaya, SANOg, npIX, PCH

Biographies of the panelists are available at:

<http://wiki.icons.apnic.net/display/icons/Panelists>

Summary of discussion

Before the workshop, panelists had all submitted lists of issues they considered to be the most challenging issues facing network operators in developing countries. The list is available at:

<http://wiki.icons.apnic.net/display/icons/Workshop+Issues>

The workshop was organized around issues rather than standalone presentations, allowing for dynamic and open discussion between panelists and workshop attendees throughout the workshop. The main themes of the session were:

- Capacity building
- Technical challenges
- Markets and competition
- Policy and regulation
- Costs

Below are summaries of the discussion of each of the main themes discussed.

Capacity building

Challenges:

- Experts are often imported from outside developing regions to set up networks. After the experts leave, and the networks grow, there is often not the local expertise to maintain the increasingly complex infrastructure.
- Network infrastructure in developing countries requires innovative solutions that experts from developed countries have not encountered. For example: unpredictable power supplies, using trees instead of building communications towers.
- Many people who receive good training in developing countries then leave to find better opportunities in other countries. It is a challenge to provide well-trained workers with job opportunities that will keep them in their original country.
- Training courses conducted in isolation by experts from developed countries do not provide the ongoing development operators really need.
- There is sometimes a mismatch between training courses offered and the training actually needed. For example, it is often tempting to send an operator to a state of the art training course on the latest equipment when what would actually be of more benefit is a more profound training on basic networking issues.
- It is not just technical capacity that is needed. Operators need to understand policy issues that impact on their work, such as IPv6 and the exhaustion of IPv4.
- The rate of growth in development in developing countries is much faster than the rate experienced by developed countries. The issue of continually needing to build capacity with limited resources to keep pace with accelerating technical complexity is an issue unique to developing countries.

Possible solutions:

- Encourage ongoing cooperation and exchange between developing countries to share and develop knowledge specific to the challenges faced by developing countries.
- Create long-term training programs by integrating more practical skills development within university and college curriculum.
- Encourage ongoing training through network operator group meetings. For example: AfNOG.
- Training needs to go beyond simply giving operators the skills to use equipment. Rather, training should give people the skills to use equipment in innovative ways.

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- There need to be ongoing collaborative platforms, such as mailing lists, that allow operators to network and share skills after training events are held.
 - Develop incentives to encourage operators to return to their developing countries and collaborate in developing networks. For example, perhaps countries could offer to pay overseas student loans if the student returns and works in the country for a few years.
 - Encourage training and training materials in the local language. Encourage alternative educational methods such as multimedia and online learning.
 - Develop train the trainer programs so capacity-building efforts can be shared and multiplied within countries and regions.

Technical challenges

Challenges:

- Web content is often hosted outside developing countries, meaning that networks must pay for the bandwidth used to reach content.
- It's not enough that technical operators understand the technology; the community needs some understanding of how to use technology too. In one developing country, the antennas were being used to dry clothes on because the community didn't understand what the antennas were for.
- Connectivity is a problem for islands. Connectivity between islands separated by vast oceans is currently achieved by satellite, which is expensive.

Possible solutions:

- Developing countries should look for internal solutions that suit their particular needs rather than importing solutions from outside that may not be appropriate or may be too expensive.
- Encourage Internet exchange Points to reduce connectivity costs.
- Encourage content to be hosted locally.
- Involve the research and academic communities to help develop localized solutions.
- Educate the community so it receives good value from the technical infrastructure.

Markets and competition

Challenges:

- Even in deregulated markets, it can be difficult for new competitors to enter the market in developing countries because newcomers must first obtain resources/connectivity from the incumbents. Additionally, it is hard for new entrants to spend money on training staff if it is economically difficult just for the business to stay afloat.
- In developing countries with very small markets (such as islands in the Caribbean or the Pacific), even with deregulation, the small number of customers available means that it is difficult for new businesses to attract customers as incumbent telecommunications companies continue to control the infrastructure.
- Often, networks rely on connectivity via out-of-country or out-of-region links when there are in-country or in-region connections available. This situation usually occurs due to isolation caused by competition fears. For example, the closest large IXP that networks in Latin America can currently join is in Miami. In South Asia, the closest large IXP available is in Los Angeles.
- While many developing countries now have IXPs, there is still a need for regional IXPs to allow nearby countries to exchange traffic with each other more cheaply.

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- It was noted that political differences between countries meant that IXPs in nearby countries weren't willing to trust each other. In addition, some governments viewed IXPs as collusion between ISPs and therefore discouraged IXPs.
 - Where there isn't enough of a potential customer base in a low population density area, there may be no interest for businesses to provide a service at all.

Possible solutions:

- Encourage awareness of the benefits to all who join IXPs. Allay fears that cooperation via technical solutions such as IXPs may lead to competitive advantages for only some of the exchange participants.
- Educate governments about the benefits of IXPs to allay fears about anti-competition.
- Develop alternative models of ownership to those used in developed countries. For example, the Bolivian mobile phone system is owned by the mobile phone owners.
- Encourage local innovative use of services. For example, in Haiti, a cyber café set up to serve students and others without Internet connections at home found that the overwhelming use of its service was by people using VOIP to communicate with relatives abroad.

Policy and regulation

Challenges:

- IT policy is often developed in silos without open dialogue between stakeholder groups. This can lead to policy that makes Internet operations and further Internet development within countries more difficult to achieve.
- Because of policy silos, it can make it difficult for newcomers, with services that may cross existing legislative or regulatory boundaries, to enter the market. The outcome can be that existing operators continue to dominate the market, despite government efforts to encourage competition.
- A lot of regulation in developing countries over the past decade and a half was aimed at encouraging competition and managing monopolies. However, in many cases, an unintended side effect has been to actually encourage monopolies. For example, as monopolies historically have been a source of government revenue, tax regimes are based on entire revenue rather than profit. This can impede networks from being deployed in rural areas or doing high-risk operations that have high costs but low profit margins.
- Governments in some developing countries are failing to listen to advice from network specialists from within the country in favour of listening to advice from experts from developed countries. However, external experts do not always understand the specific needs of Internet operations in a developing country.
- There is often a high turnover of staff within regulatory bodies due to changes in governing party interests, leading to a continual need to educate each newly appointed head of regulations.

Possible solutions:

- Encourage development of open multistakeholder dialogue when governments are developing policy or regulation in the telecommunications sector to ensure the policy or regulatory outcomes support growth and innovation in Internet operations.
- Governments should be encouraged to develop policies that encourage Internet development in rural areas.
- Encourage regional Internet and telecommunications bodies with understanding of local issues to liaise with governments on policy making.
- Encourage governments to consider convergence issues when developing policy and regulations.

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- As well as encouraging network operators to participate in government policy processes, regional and national Internet organizations should encourage government participation in Internet activities. For example, regulators from the Caribbean invited to a regional ARIN meeting became aware of issues networks had in trying to get their provider independent IP addresses routed by incumbent operators. This resulted in regulators agreeing to work on fixing this in policy or regulatory space.
 - Network operators need to be patient about the time it can take regulators to develop enough understanding about technical issues to be able to adequately address the challenges. For example, in the eastern African region, it took a sustained dialogue over ten years for regulators to develop unified license regimes. If network operators had not been patient in continuing the dialogue, the changes would never have been achieved.

Costs

Challenges:

- The cost of buying and importing technical equipment not available from within the country can be very high.
- There's a prevailing thought in some developing countries that it's automatically cheaper to host content, etc, in developed countries such as the US. However, this is not always true.

Possible solutions:

- Encourage the use of low cost equipment with low power usage.
- Buy experimental equipment by very small companies around the world. Such companies may be willing to sell their equipment for less to have the experience of getting their equipment deployed and used.
- Encourage government and banking services to be hosted on local infrastructure to demonstrate the cost advantages of local hosting and access to content providers and network operators.