

Report of the Broadband Meeting Which Occurred between 8th – 9th May, 2007.

Theme: The Digital Freedom Initiative and the Government of Rwanda.

This meeting's participants came from areas of, Private, Academic and Government trying to develop and promote broadband or bandwidth network in the East African region.

The event was officially opened by H.E. President Paul Kagame, the President of the Republic of Rwanda. In his opening remarks, he expressed gratitude to the participants, and encouraged the meeting discussions to be productive. He reminded the participants that, the principle objective of the meeting is to provide technical and policy support to assist East Africa develop national and regional broadband interconnectivity for improved, reliable and secure connections into the global communication systems.

The main host of the meeting was the Honorable minister of Infrastructure, Eng. Albert Butare. In his opening remarks, he thanked the US and other partners for the indication of commitment to develop the sector in the region. He mentioned that, Rwanda needs a backbone bandwidth to connect us to the rest of the world in order to fulfill its 2020 vision strategy. He expressed the need of the region to harmonize its policies that would allow broadband cross-border connectivity, leading to economic and social development in the region. This initiative would result to stimulation of business and wealth creation for the citizens.

The event was moderated by Ambassador David Gross, U.S. Coordinator for International Communications and Information Policy, U.S. Department of State, who welcomed the guests for the extra-ordinary event, he reminded the participants that the meeting is a result of a get together in Washington D.C, which gathered and asked for an action; and this is seen as the first piece of action; with the participation of private, government, academic and enterprise-for a cause to help our people and people in whole world. He concluded by indicating that there is need for a low cost and high quality bandwidth, and we owe it to our children and community to make this happen.

The opening plenary session

Moderator: Ambassador David Gross.

First Presenter: James Foster, CISCO Distinguished Engineer

Topic : Demystifying Broadband A Business/Technical View

Business models for comparison with other models.

- Railroad system models
- Road system, very different from railroad because it is built by the government.
- Telecom system model, significantly different very centralized and everyone is a customer.

- Telecom business models.

Who does what?

Networks: distance, cost and ownership. In these networks there is separate ownership. For instance, buildings, campus neighborhood are a local ownership (Users are owners). Whereas, District National and Regional continental are separate ownership (Users are customers).

Keys to broadband

- Must deploy more bandwidth at all levels
- Must increase investment
- Keep it simple-technology and business
- Software getting more expensive and complex
- Hardware getting faster and cheaper
- Use fewer but higher capacity satellite connections-aggregate local demand
- Enable competition-3 or more operators
- Reduce man-made barriers
- Enable small scale operators.

Second presenter: Russell Southwood, Balancing - Act Africa.

Russell discussed on how African countries can get a better connectivity and services, through the need for actors in international, regional and national level.

However, he mentioned about the challenge of shifting the focus on structure and mechanics of industry to the ability of user to define what they want; which is better quality service & lower prices, wider coverage and more diverse services. He further pointed out the three strands of tackling the challenges of connectivity in Africa, which are, International, Regional and local arenas. However, Internationals don't want to talk about it except to say "Band is the fuel of the new economy".

For instance, Mali is costed \$5000 of its fibre because it has to go through Senegal. This is what will happen to land locked countries if not careful in getting their fibre from another country. So what do these countries need do? – Definitely, more bandwidth and players in all these countries; high volume bandwidth & low cost; No special deals for providers-for-instance, charging highly because of being the only provider (provider should not take advantage of their customers). Whereas in the local arena, IP offers chance for small scale providers to offer small scale niche products at a low cost.

He argued that, the change of mentality can low prices, and increase volume of connectivity throughout the chain.

Government Presentations-Policy Direction, Future Visions, Challenges:

Rwanda

Minister Butare Albert from the government of Rwanda outlined that the country's vision 2020 embraces ICT as one of its development pillars. The government of Rwanda established ten developmental pillars among which, Human development capacity, Electronic Education, Infrastructure, and Sustainability of the private sector, Legal regulatory sector and Governance. He further mentioned that, the country has liberalized the ICT sector, and has also an ICT policy in place.

Kenya

Minister Mutahi Kagwe of Kenya, informed the discussants that Kenya has a 2030 vision as well, and with economic, social and political pillars. That the government of Kenya encourages a more participatory work, looking forward to knowledge based economy. The national budget sets aside a certain percentage to promote ICT and IT in schools. Evidently, the country has experienced reduction in price of international connectivity. The country is encouraging entrepreneurs in education but has to work on infrastructure. He pointed out that, the African countries should be able to take up challenges because they produce opportunities. The view now is that we are moving forward to a globalized village.

Uganda

Minister Ham-Mukasa Mulira of Uganda, mentioned that the country had initially (1990s) drafted a strategy without embracing ICT, resulting in transformation of the new vision 2035 which included ICT as one of its development pillars. There is liberalization of the sector and there is need for entrepreneurs to construct infrastructure. So far there is a government strategic intervention in construction of fibre optic network in a number of institutes and sectors. The members of parliament of Uganda need to understand the role of ICT in developing the country.

Burundi

The representative from Burundi said that, the initiative of establishing the ICT sector was in the past century, but was hard to implement due to excessive poverty. Burundi had already liberalized the sector seeing with it four service providers or operators. The World Bank has financially supported Burundi in setting up the backbone of the national policy, and plan of Action for national development in E-governance, E-health and E-education.

Tanzania

The delegate from Tanzania informed the discussants that, the country's mission of the vision is to improve livelihood and alleviate poverty, and ICT was viewed as one of the vehicles for development. Tanzania established their ICT policy in 2003. The policy addressed the issue of better and improved communication, cheaper and affordable network; and a need to construct infrastructure. Tanzania saw that the growth of ICT would be better witnessed in its education system, thus creating a new Dodoma University with an ICT school. It also resulted in expansion and enhancement of ICT in

other public and private Universities and colleges. The challenge of language barrier to have mass access to the internet lead the University of Dar-el-salaam to design the Swahili software which would facilitate most of its citizens to access the internet.

Afternoon Session:

Topic: Demystifying the Complexity of Broadband (Hands on Demo)

Presenters: Phillipe Dongier, World Bank.

Daniel Hurley, Director Critical Infrastructure Protection
National Telecommunications & Information Administration
U.S. Department of Commerce.

Phillipe Dongier: Lowering the Cost of Broadband Access in East And South Africa:
Policy Considerations.

General approach: Promoting competition at each level of the network
The goal of low-priced broadband can be compromised at any level.

Promoting competition at each level of the network, and using regulation as a complementary strategy.

- Where possible, promote market structure based on competition
- Regulation to promote competition effectiveness, in particular for network interconnection and for terms of access to landing stations
- Where no competition, regulation needs to be made very strong and ring-fenced

Additional Governments' "Push"

- Where commercial viability is absent, catalytic subsidies (supply side) or capacity pre-purchase guarantees (demand-side) can provide incentives to operators to roll out certain 'strategic' links (e.g. Burundi Backbone and possibly Tanzania-Burundi link and Tanzania-Rwanda link)
- Providing on an open access basis public facilities such as ducting in roads (already happening in Rwanda)
- Providing on an open access basis access to / rights of way on electricity, rail, and oil pipeline infrastructure

Cable project promoters could be invited to demonstrate how:

- Onward connectivity arrangements have secured competitive prices, accessible to all operators

- Management or SPV Management has incentives for a high-volume/low-price strategy
- Any purchaser buying or leasing capacity can activate their capacity under full circuits in any country
- There are provisions for wholesale prices to be cost-based and non-discriminatory regardless of the status of the capacity purchaser (original owner party or not)
 - Allowing sufficient return on investment to attract investors
 - Project promoters could be asked to indicate what capacity price they would guarantee to service providers, as a maximum

A frank, candid and direct discussion between Governments and all project promoters (EASSy, TEAMS, SEACOM, FLAG/Reliance) is essential. Ask each cable promoter to demonstrate how their proposed project structure ensures low-cost broadband access, and the operational readiness of their proposed project. And governments can assess the projects against criteria.

National legislation and regulatory frameworks are equally important

- National legislation/regulatory framework needs to be adapted to secure that market players behavior be consistent with open access
- Example at the level of the landing station
 - cost-based, non discrimination
 - information disclosure obligation
- Work on national legislation/regulatory frameworks to be finalized well in advance of cable project(s) being operational

What about Transit to Landing Stations?

- National transit is crucial for land-locked countries
- Regulation can ensure that:
 - transit to be on a cost-recovery basis
 - peering arrangements across the borders (swap of capacity)
 - liberalization of right of ways alongside electricity, rail, and oil pipeline infrastructure, to induce roll-out of competing transit infrastructure
- Additional Government push, where required:
 - providing open access to ducts in roads
 - targeted subsidies (supply side) or guaranteed capacity purchases (demand-side)

In order to lower cost of Broadband access, governments need to be pro-active about;

- promoting competition at all level of the networks
- discussing directly with all project promoters

- establishing effective regulatory mechanisms well in advance of cable project(s) being operational
- providing targeted additional support

Presenter: Daniel Hurley, Jr.

The National Telecommunications and Information Administration acts as the President's advisor.

Broadband Technologies: Traditional, Wireless, Emerging and Rural. President Bush's Broadband vision is, competitive supply as key to improved broadband deployment, and efficient spectrum management as key to improved broadband deployment.

President Bush stated that, "The role of the government is not to create wealth; the role of our government is to create environment in which the entrepreneur can flourish, in which minds can expand, in which technologies can reach new frontiers."

Mr. Hurley informed the participants about the benefits of broadband by again quoting President Bush's statement that, "Broadband will not only help industry, it will help quality of life of our citizens." The benefits will be realized in;

- Tele-Medicine
- Distance Learning
- Tele-Work
- National Security
- Jobs and Economic Growth.

Mr. Hurley covered the concepts of spectrum management, mentioning spectrum as the range frequencies of electromagnetic radiation from zero to infinity. And spectrum is a scarce, renewable natural resource occurring in three dimensions: space, time and frequency; that spectrum recognizes no national or international boundaries, however, physical properties limit the applications of certain technologies in certain bands.

He also covered the advantages of managing spectrum as national leaders, which are, to promote economic growth, to ensure national security, promote universal access of communications technology developments and services; and to serve vital needs such as public safety, scientific research, transportation infrastructure, and law enforcement.

Spectrum management trends drivers include:

- Convergence of Wireless (terrestrial and satellite) and Wireline technologies
- Increased deployment of advanced wireless technologies in developing economies
 - 3G, WiFi, WiMax

Additional trends and movements:

- More flexible, market oriented regulatory policies
- Shifting spectrum from incumbents "ownership" models to allow use/reuse on unlicensed basis
- Harmonization of spectrum on regional bases
- Government sharing with non-governmental users.

9/05/07

Roundtable II

Moderator: Kelly Wong, University of Maryland

Topic : Connecting Universities and expanding their Role Vision for expanded University role

The session was opened by Mr. Kelly Wong, who introduced the presenters to discuss the role of Universities in broadband expansion. As their mandate is education research and out reach.

The first presenter was from the KENET organization. The organization was established in 1999, funding from the US government. It was viewed as a vehicle for expansion of internet in Kenya.

KENET's role:

- Providing connectivity cost-effectively
- Promoting local content sharing and increased use of ICT in member institutions
- Enhancing ICT leadership capacity in member institutions

KENET's vision is to be a world-class research and education network in Africa by 2010. And mission is to drive the integration of ICT in research and learning through quality, effective and efficient provision of ICT services and to be a key partner in the development of the ICT society.

The bandwidth cost declined with time in Kenya, as before KENET bandwidth cost to universities was approx. US\$ 4000 per 64Kbps (or US\$ 63 per Kbps) through ISPs (1999). And now it is approx. US\$ 2330 per Mbps (or US\$ 2.33 per Kbps). KENET aims for lower than US\$500 per Mbps after fiber connectivity to the rest of the world.

KENET Projects are;

- E-readiness Survey (Completed)
- KENET, GOK, World Bank Partnership – Higher Bandwidth and Better Connectivity
- KENET & Google – Mail Services
- Local relevant content initiatives
- Collaboration in UbuntuNet Alliance on affordable external connectivity.

KENET has got opportunities and challenges and among those are:

- There is higher ICT awareness in member institutions
- 85% of faculty members have access to fixed telephone lines either at the workplace or at home
- Majority of faculty, staff and students think that Internet speeds are higher at cyber cafés than at their institutions
- 50% think their campus network is stable

- More than 80% prefer using external email services e.g. yahoo.com to their institutional email host
 - 50% of students can access their institutional email from off-campus
 - Only 14% of students think that their institutional email service always works
 - Majority of institutional websites informational – no interactivity
 - E-learning platform not present in most universities/colleges
 - Low ratio of PCs to Students (average less than 1:100)
 - Only about 43% of staff and faculty use email regularly to communicate
 - ICT function is only a section or a small department within the majority of institutions (low visibility).

The second presenter was Albert Nsengiyumve from the Rwandan Universities. He notified the discussants that the Ubuntunet Alliance for research and education networking is an alliance between 8 East African Coastal countries and 11 Land locked; with the mission to ensure that African research and Education Institutions have efficient and affordable bandwidth for their member research and education institutions to participate in global research and networking worldwide.

The objectives of the Alliance are:

- **Objective 1** - To build the UbuntuNet backbone using a staged approach which connects clusters of NRENS. The UA backbone will be made up by existing cross continental links and planned fibre infrastructure projects.
- **Output** - A reliable and affordable (ideally dark fibre) gigabit backbone which links all NRENS in Africa.
- **Objective 2** – Foster, stimulate and support NRENS development
- **Output** - development of NRENS in Africa to promote research and education networking and collaboration.

Within each NREN institutions they have their own;

- IP address blocks
- Connection circuits to the NREN.

However, the institutions share:

- NREN's backbone capacity
- NREN'S network identity
- NREN'S peering agreements with other REN's
- NREN's general Internet access
- Other NREN services

The following resources are needed to enhance and improve the networking of Ubuntunet Alliance:

- Cross-border links operated by telcos, mobile operators, power companies,...
- Sub-marine cable connectivity
 - SAT-3 West Africa cable (WASC)

- SAT-3 Far East cable (SAFE)
- East Africa Submarine System (EASSy) (proposed)
- ☐ In some cases satellite capacity as an interim solution.

Mr. Albert continued by stating that there have been some developments in the Eastern and Southern Africa, which include:

- ☐ Optical fibre currently being deployed
 - national operators
 - cellular operators
 - electrical power companies
 - Pipeline companies
 - consortia
- ☐ NRENs are emerging rapidly as vehicles for:
 - inter-institutional collaboration
 - bandwidth procurement
- ☐ UbuntuNet Alliance has been formed
 - An African regional REN

The floor was given time to expound on the role of the African Universities in broadband.

The presenters indicated that the universities are to diffuse technology more widely. More training and development in networks, and equipment are needed.

The representative from Kenya indicated that, the interconnectivity between the East African countries is harmonized but, the question is how to go about the under utilized resources the countries have in order to improve and enhance the connectivity.

The discussion also involved: Access to networks, licensing by governments to service providers. The question of licensing was seen as a barrier to rural network access. The government representative answered by saying that, government intervention into service provider is rare and it happens in protection of its citizens.

After the Panel discussion there were Presenters from the World Bank and USTDA.

One of the World Bank Regional Communications Infrastructure Program (RCIP) representatives presented the organization's role in the area of ICT. He indicated that, the world bank put the instrument in place to leverage private sector participation, alongside other development partners efforts (AfDB, AFD, DBSA, DFID, EIB, EU, KfW, and SIDA) and sister organization IFC). And is open to Angola, Botswana, Burundi, Comoros, DRC, Djibouti, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Seychelles, Somalia, South Africa, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe – provided that these countries are eligible for World Bank financing at the time of application.

He further reflected on the objectives of the instrument which are two over-arching development objectives of the Regional Communications Infrastructure Program:

1. *Connectivity Development Objective*
To support the population and businesses of Eastern and Southern Africa region to have access to quality and affordable telecommunications services
2. *eGovernment Development Objective*
Making use of affordable capacity to contribute to improved efficiency and transparency of selected government functions through eGovernment applications.

He gave guiding principles of the RCIP to infrastructure financing, and these include:

1. Open Access to the Infrastructure
2. Leveraging Private Sector Participation and Investment
-- Where commercial viability is absent, catalytic subsidies to provide incentives to operators to roll out infrastructure
3. Economically viable and sustainable once IDA financing has been factored in.

He further showed countries that are in Phase 1 of the financing.

1. Burundi:
Main activity: targeted subsidy for the National Backbone through a Public Private Partnership (cooperation platform with all fixed/mobile operators)
2. Kenya:
Main activities: capacity purchase schemes for universities, BPO and Government users ; eGovernment
3. Madagascar:
Main activity: targeted subsidy for the National Backbone through Public Private Partnerships (competitively allocated subsidies on link basis).

Kenya, Burundi and Madagascar operations were prepared within 4 months.

How it works

1. Government indicates its interest to be part of the RCIP Program (IDA support request from Minister of Finance)
2. Government formulates a Project made of eligible activities to be supported by the World Bank under the RCIP Program
3. Eligible activities are consistent with RCIP Development Objectives and Guiding Principles
4. The Project cycle follows the normal World Bank safeguards procedures

5. Financing terms match each country's existing IDA/IBRD status

Examples of eligible activities for financing

1. regulatory framework harmonization
2. landing station or virtual landing station (for landlocked countries)
3. national Internet Exchange Point (IXP);
4. capacity purchase schemes related to regional/international infrastructure for priority targeted user groups (universities, Govt users, BPO);
5. where commercial viability is absent, catalytic subsidies to provide incentives to operators to roll out terrestrial backbone infrastructure and rural ICT;
6. Government virtual private networks
7. eGovernment applications.

Arleen Seed from the World Bank in charge of the eRwanda project, informed the participants about World Bank's ICT support to the government of Rwanda in general and in particular. She mentioned about Rwanda's extraordinary step of developing the Vision for using ICT for sustainable development, growth of the economy. She stated that, the concept was elucidated in the Vision 2020 statement, namely to reach middle income status by 2020 and to use ICT as an enabler to achieve development. President Kagame asked the World Bank to take the lead in supporting the NICI Plan with some concrete actions.

She put across some of the support projects in the pipeline for Rwanda, whose key is the development of the government portal which will have two parts: intranet and extranet.

The intranet will have the government's back end databases and provide the mechanism for collection, manipulation and dissemination of data for the government itself. The extract will have the public website of the central ministries and also local government. The project will fund content development for each of the ministry sites (messages from the government to the citizen such as on health, education, agriculture, environment, legal and so on- the content will be developed based on the needs of the community and in languages which they understand, in formats which are acceptable to them.

There is a good deal of investment in the following:

- Help RITA to establish the ICT standard for government offices
- Purchase and install equipment needed for the central ministries, district offices and provincial offices to reach that standard.

- Support the RURA- Rwanda Utilities Regulatory Authority. This will take form of both management and technical support, provision of monitoring equipment and also training.

The Representative from the USTDA welcomed the participants and informed them about the willingness of the USTDA to support ICT projects in their various countries. She recalled assistance so far awarded to some East African countries. However, she outlined the limited resources the organization due to its operational size and funding.

Discussion session was opened and questions were opened to donors. The main question was that, "why does funding come with conditions? And why does the AID has to be implemented by an expatriate company?" The donor's reply was that, some grants and loans come with a lot of paper work. And take away points from the discussion were:

- To kick start Market
- To address Market failures
- Make markets work better
- Reducing donor conditionality.