



eGYAfrica 2010 Workshop: Better Internet Connectivity
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Internet Infrastructure & Access for Research and Education in Kenya

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Outline

- Overview
- Kenya ICT Board
- Kenya Education Network (KENET)
- Internet Connectivity in Universities

1. OVERVIEW

ICT in Kenya developed in line with Vision 2030- a development plan by which Kenya is to become a newly industrialized nation by the year 2030.

- Government of Kenya has devoted a section to plan for the incorporation of ICT in the implementation of vision 2030.
- Mandate of implementation given to the Kenya ICT Board and Kenya Education Network (KENET).

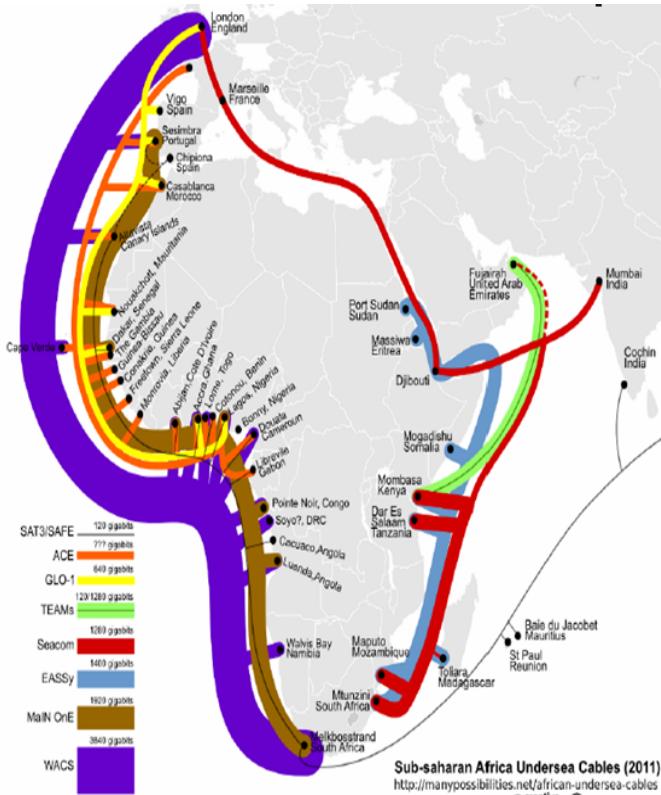
To this end, the government has initiated projects and programmes and formulated policies that is geared to support the “strengthening the foundation for a knowledge economy” which directly contributes to wealth creation. Some of these includes but not limited to:

- **Developing affordable information and communication network infrastructure and applications-** The development of ICT Parks and Digital Villages which are envisaged to gradually lead to low-cost provision of ICT goods and services.
- **Installation and commissioning of The East African Marine Systems (TEAMS)** in collaboration with the United Arab Emirates and local private firms. This submarine fibre cable provides Kenya with an affordable high-capacity bandwidth.

- **The East African Sub-Marine Cable Systems:** The main objective of the project is to improve the quality of bandwidth available for global connectivity by linking the East African region to the Global Submarine System.
- **Installation of SEACOM** - an undersea cable to connect the east african coast to the rest of the world. The cable was launched in 2009 and is carrying most of the fibre traffic from Kenya, Tanzania, Uganda, Rwanda and other East and Central African countries
- **National Terrestrial Fibre Optic Network Project** in an ongoing project intended to complement the TEAMS project by ensuring maximum utilization of capacity and connectivity in all districts in the country.**(a private firm Kenya Data Networks(KDN) has been laying fibre optic network covering all the three East African Counties .Kenya Data Networks is a “Full Service, Data Communications Carrier” that was licensed by the CCK in January 2003 as a “Public Data Network Operator” with a mission to build world-class infrastructure in Kenya. It operates the largest data and Internet backbone in East Africa).**

- **ICT Hardware:** ICT hardware is a very important component of ICT infrastructure and a pre-requisite to any meaningful deployment of ICT services to the population. The government has ***zero-rated the ICT hardware*** to speed up the acquisition of this important component.
- **ICT Software:** The government is currently holding negotiations with various ICT software providers with a view to securing bargains which will make ICTs affordable and universally accessible. In addition to providing fiscal concessions on software, the government will also promote local software development by encouraging a scheme to ensure that at least 50 per cent of government software procurement is sourced from local software developers. The government will also encourage software multinationals like Microsoft and Oracle to offer special incentives like free development tools, training, certification and marketing support to local software developers.
- **Policy, Legal and Institutional Reforms**

Different policies, legal and regulatory frameworks are to be looked into to guide and speed up the uptake of ICT in all sectors of the economy.



- SEACOM

- Bandwidth: 1.28 Tb/s
 - Service Date: ACTIVE as of 7/23/09
 - East African Landing Point(s):
 - Mombassa, Kenya
 - Dar Es Salaam, Tanzania
 - Djibouti
 - Terrestrial providers: KDN (10 Gb), Jamii Telecom
 - Owners: Privately held (77% African Owned)

•TEAMS (The East African Marine System)

- Bandwidth: 1.28 Tb/s (Increased as competitive response to SEACOM)
 - Service Date: Landed and active as of Sept 2009
 - East African Landing Point(s): Mombasa, Kenya
 - Owners: Kenya Gov't (20%), Safaricom (20%), Telkom (20%)
 - KDN (10%), Essar (10%), Wananchi (5%), Jamii (3.75%)
 - Access Kenya (1.25%), Others (4 – 1.25%).

Represents proportions of 85% Kenya Ltd, other 15% owned by Etisalaat of UAE

• **EASSy** (East African Submarine Cable System)

- Bandwidth: 1.4 Tb/s (Increased as competitive response to SEACOM)
 - Service Date: Expected June 2010
 - Proposed East African Landing Point(s):
 - Mombassa, Kenya; Mogadishu, Somalia,
 - Dar Es Salaam, Tanzania
 - Owners: Telkom SA, Neotel, MTN, 26 total telcom investors (largely underwritten by DFIs – World Bank/IFC, EIB, AfDB, AFD, DfW)



National Fibre Coverage by KDN

- ❖ So far 3 fibre optics cable networks are in use but cost of internet still high. Reason: The service providers have to recoup their money!

It is with the sole purpose of achieving these ICT related objectives that the Ministry of Information formed THE KENYA ICT BOARD.

2. THE KENYA ICT BOARD (<http://www.ict.go.ke/>)

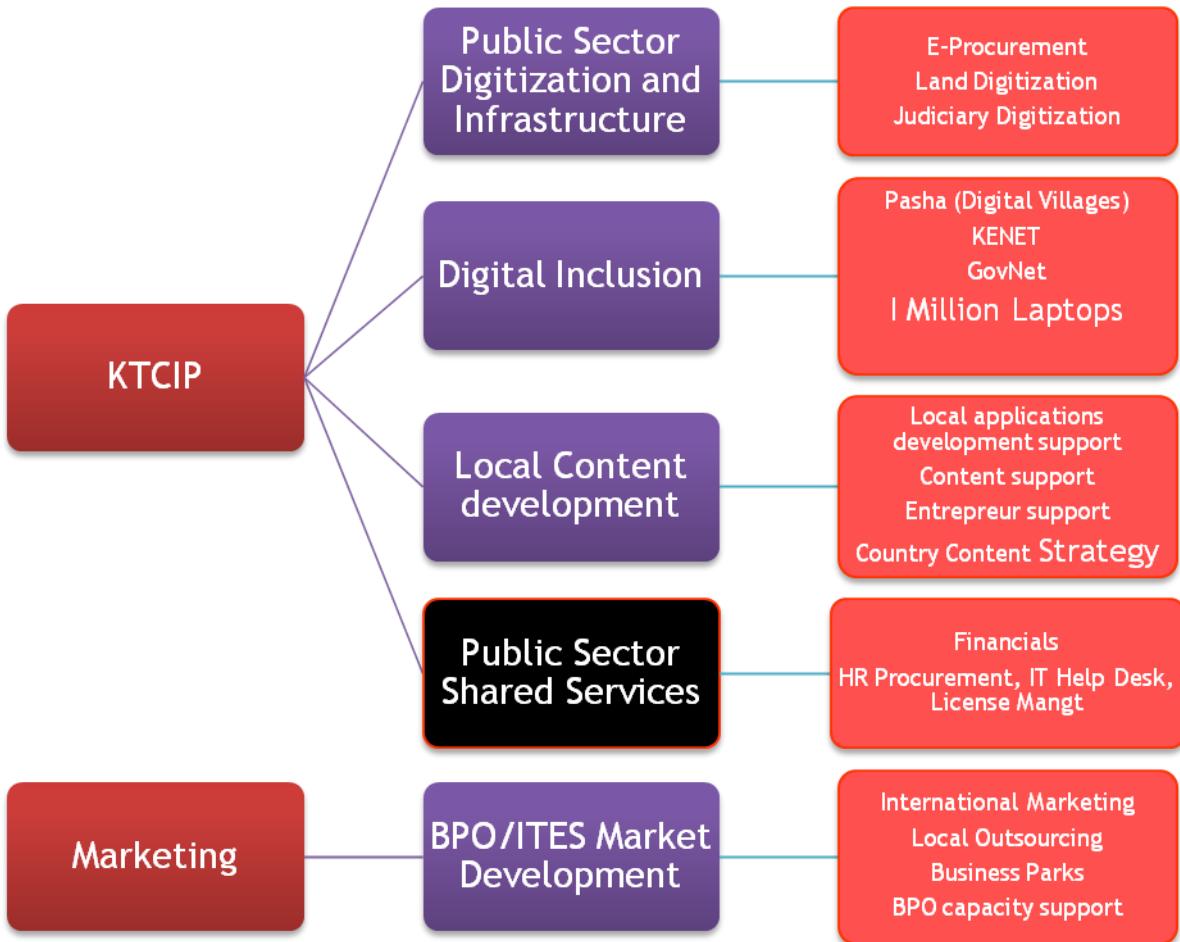
- The board was established in 2007 to advance the development of the ICT sector and to use ICTs as an enabler in the achievement of national development.
- It is the implementing agency under the Ministry of Information and Communication

The ICT board mandate is four-fold

- **Marketing** - Positioning and promoting Kenya as an ICT destination (locally and internationally), especially promoting Business Process Outsourcing (BPO) and Offshoring.
- **Advisory**- Advise the government on all relevant matters pertaining to the development and promotion of ICT industries in the country

- **Capacity Building** - Providing government and other stakeholders with skills, capacity and funding for anchor implementation of ICT projects for development.
- **Project Management** - Coordinating, directing and implementing anchor ICT projects in development.

ICT board programs include:



❖ Focus is to accelerate activities related to:

- **Connectivity:** BPO, [universities](#), Connecting Govt, Digital Village Initiative, SMS service initiatives, Government Information Portal
- **eGovernment:** Land Title, High Court Registrar, Drivers' Licence, Wealth Declaration Forms analysis, Company Registry, Pension

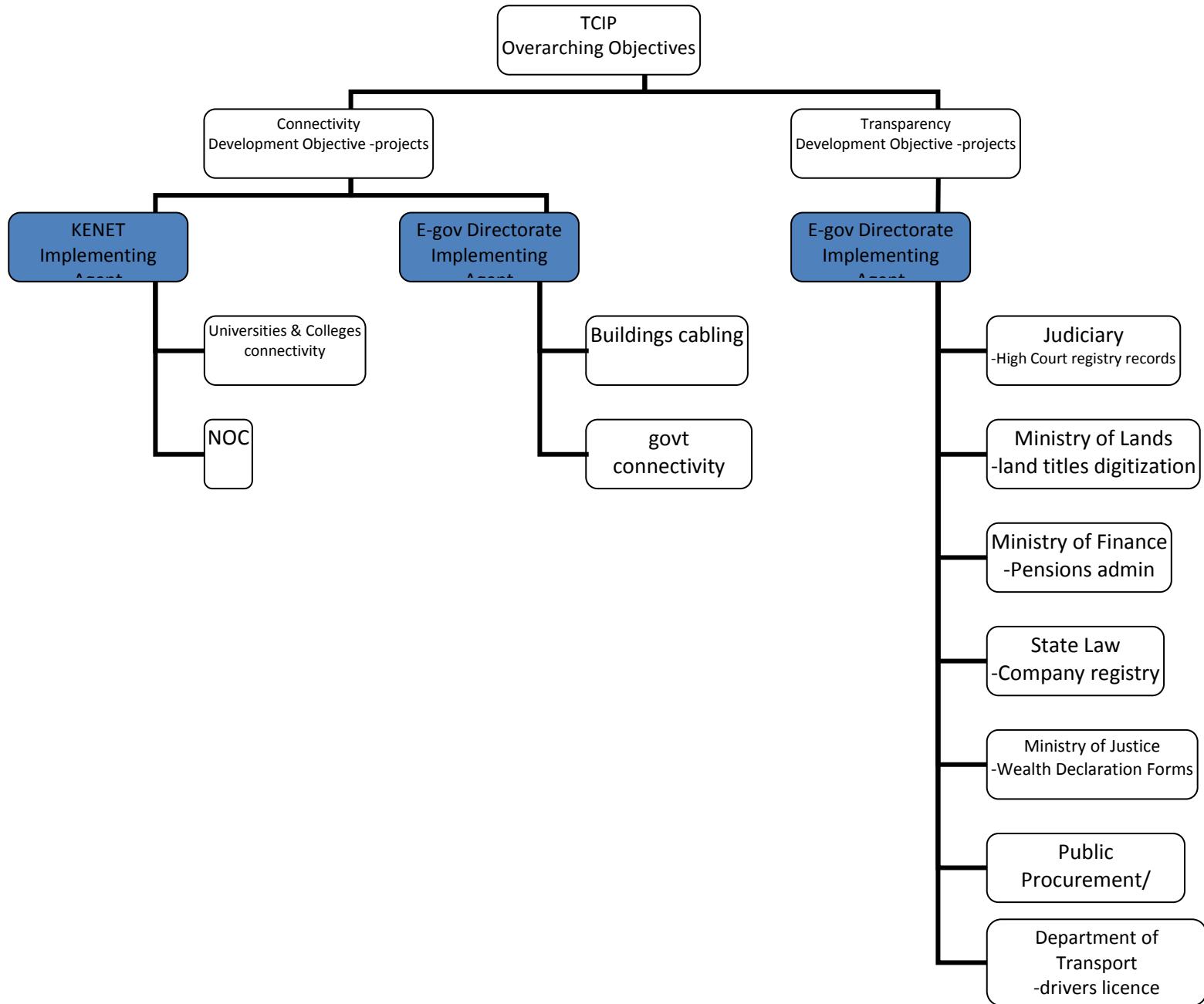
Administration Phase II, initial support to IPRS / eProcurement at Supply Branch

- Related activities labeled “Enabling environment”

➤ **Kenya Transparency Communications Infrastructure Project (KTCIP)**

The Kenya Transparency and Communications Infrastructure Project (KTCIP), funded by World Bank and implemented by the Kenya ICT Board, includes a component to implement the Connectivity related Initiative. The ICT board has identified **Kenya Education Network (KENET)** to be the organ it will use to achieve this when dealing with higher education institutions.

TCIP Objectives:



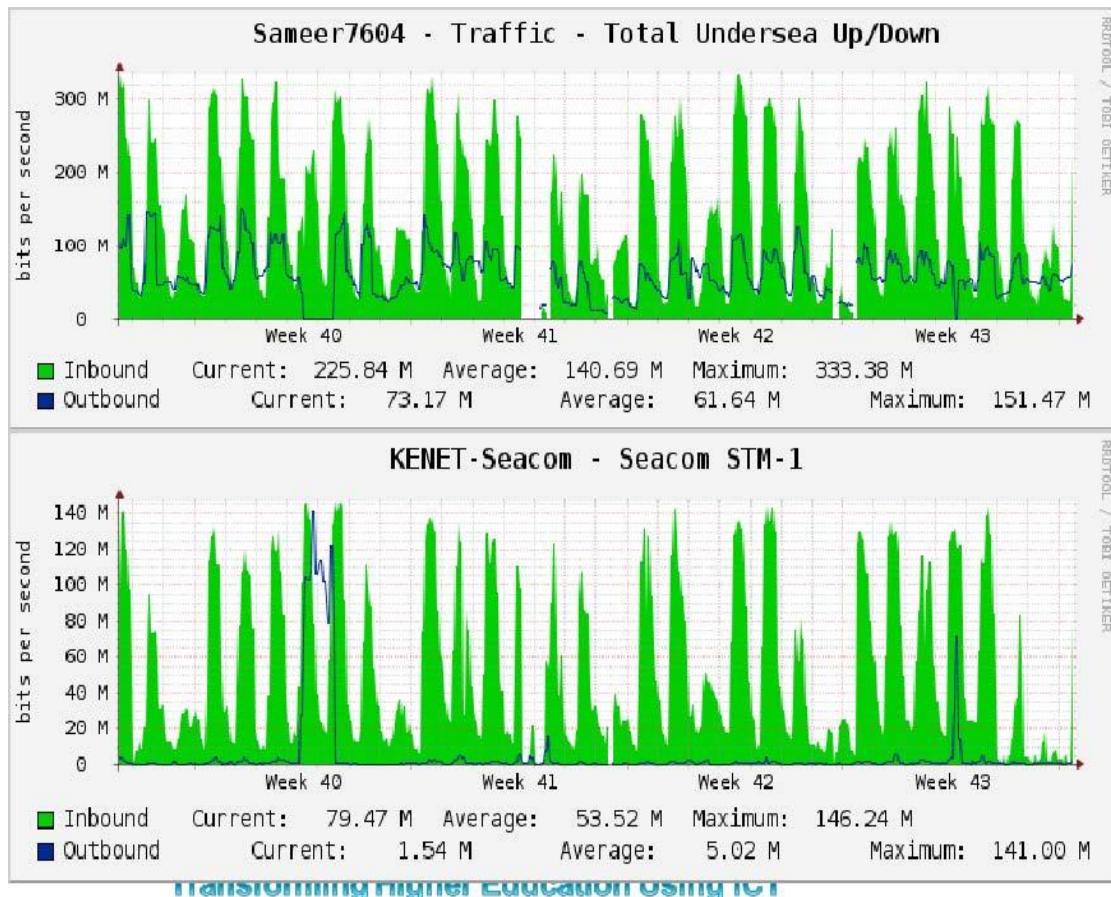
3. KENYA EDUCATION NETWORK (KENET)

- Established in 1999 with a grant of US\$300,000 from US government through the Leland Initiative.
- Prior to its establishment institutions of higher learning accessed internet from local Internets Service Providers (ISPs) at very high costs of about US\$ 4000 per 64 kilobytes/persecond.
- It is against this background that the Kenya Education Network (KENET) (<http://www.kenet.or.ke>) was created in 1999 as a membership institution for educational and research institutions. It was constituted as a trust whose beneficiaries included students, faculty members, and staff in the member institutions.
- KENET is constituted as a trust. It currently has eight trustees: three vice chancellors of public universities, two vice chancellors of private universities, the Permanent Secretary Ministry of Education and the chief executive officers of Telkom Kenya Limited—the national fixed telecommunications incumbent operator—and the Communications Commission of Kenya (CCK)—the Kenya government regulator of all information and communicatins services (<http://www.kenet.or.ke/about/index.php?yah=structure>).

- The trustees are assisted by a management board representing universities and research institutions in Kenya. **As expected, one key objective of the trust is to provide cost effective Internet access that would support teaching, learning, research, and management.**
- It currently provides Internet services to **42 higher education institutions**. Another five higher education institutions have already lodged applications to become members.
- The institutions include all the 13 private and 6 public universities in Kenya as well as national and international research bodies. In total, the institutions have a student population of about 100,000 and over 5,000 faculty members and researchers.
- Apart from providing Internet services, KENET also aims to transform and strengthen the capacity of the leadership and the faculty members of the member institutions so that they can make more effective use of information and communication technologies (ICT) in teaching, learning, research, and management. This will be achieved by organizing workshops for heads of the member institutions and facilitating training of ICT support staff in the management and expansion of institutional IT infrastructures. **KENET is also evolving into a National Education and Research Network(NREN) that**

supports faculty members and researchers in Kenya. KENET IS NOW UBUNTUALLIANCE MEMBER.

- KENET receives and distributes about 600 Mb/s to the member institutions but the traffic has very little NREN.



KENET intake at SEACOM

Challenges

The two main challenges KENET faces include:

- Frequent downtimes which are mainly caused by failures on the KDN networks. KDN fibre cuts are due to ongoing roads reconstruction.
- Connecting those institutions or campuses who are far from the fibre network (have to use radio)
- Delay in payments by member institutions.

4. INTERNET AT INSTITUTIONS OF HIGHER LEARNING – (The Kenya Polytechnic University College)

- In 2002, Network/Internet Infrastructure on a UTP backbone was installed and the institution was connected for the first time to the internet via a 64 kbps line through KENET.
- The internet line had a subsidized cost of Ksh 37,000.00 (approxUS\$ 650 then) per month, which translates to **US\$ 5,000 per Mb/s per month**
- Prior to this the institution had only three connection to the internets via external modems. One was located at Information

and Liberal Studies Lab (Environmental resource centre), at POLYMIS centre and at GIS lab. On the acquisition of the 64kbps line, the modem lines were disconnected.

- In the third quarter of 2004 the ICT Centre launched a 128 Kbps Internet link to all its users (inclusive the Cybercafé) and saturation of the bandwidth was rare.
- Over time the number of users and their usage grew up steadily and by the second quarter of 2005 the bandwidth was very often saturated and users started lodging complaints.
- In June 2005 the bandwidth was doubled to 256 Kbps. But the usage kept rising and in the second quarter of 2006 the same saturation scenario was reached as one year earlier. In June 2006 the bandwidth was doubled again to 512 Kbps. It was like this till the end of 2008.
- This was increased and by Early 2009, KPUC was receiving a total of 4 Mb/s (2.5Mb/s downlink and 1.5Mb/s uplink). This seemed small for an institution of this stature and therefore the administration decided to upgrade it to the current 13.68Mb/s (5.84 Mb/s up link and 7.84Mb/s downlink).

- All the computers at the KPUC network are have been hooked to the internet to accelerate the academic activities in the institution. To date, the bulk of the contents being carried on the line are either from Facebook, YouTube or other social or entertainment sites.
- All students hostels and dinning halls are connected to the internet. Discussions are going on, in the spirit of public-private partnership (PPP), to avail a Wi-Fi network within the institution. This is in addition to the one currently under design to be implemented by POLYICT centre. When complete, KPUC fraternity shall enjoy flexible access to the ICT facilities.
- The University College spends about **Ksh. 6.2 million (US\$ 80,000)** per year on internet services.

Challenges

- **Non-core business usage**- access to phonographic materials , face book, You Tube etc (blocked!).
- **Virus Threats**- KPUC has invested in Enterprise level antivirus and is testing various content filtering solutions so that threats can be kept out of the internet network.

- **Cost of connectivity**- The speed is scheduled to increase in early January 2011 due to expected cost reduction by KENET. This will not affect the overall internet budget. The budget can only be reviewed when the academic content traffic increases substantially.
- **Excess bandwidth –** idle bandwidth that is not being used when all non core business access blocked, but which still has to be paid for.

Recommendations

- Need increased networking amongst researchers to make maximum use of the available bandwidth.
- Subscriptions to online journals by institutions to bridge the digital divide.
- More government support to bring down costs of internet access.
- More usage for distance learning & intranet communication.

Thank you

