KENET, UbuntuNet Alliance and the Internet Measurements Lab (MLAB) Platform

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Kenya Education Network (Kenyan NREN)
&
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KENET – National Research & Education Network of Kenya

• Licensed Private Educational Operator since 2002
  – Special license category
• Not-for-profit membership organization
  – Public + Private Universities, Local + Int’l Research Institutes, Technical colleges, Government affiliated bodies (80 members + 130 campuses connected)
• Governed by a Board of Trustees
  – 5 Vice Chancellors, PS in charge of education, Regulator CEO, and CEO of Research Institute
• Founder Member of the UbuntuNet Alliance, Eastern and Southern REN
KENET Network of 130 Campuses as August 2013
NREN Infrastructure and Sources of Funding in Africa

• **NREN Network infrastructure =**
  – Int’l / regional links + national distribution network + campus networks

• **Who has financed different segments of KENET?**
  – **Int’l links** - GoK / World Bank + Supplier Financing (3 x STM-4 IRUs + 1 STM-1)
  – **Distribution Network** – Government + Leased Line Providers + Institutions (Up 20 Gb/s last mile capacity as of August 2013)
  – **Campus ICT investments** – Institutions (95%) + KENET + Google GASP
UbuntuNet Backbone

• 14 NREN members in Eastern/Southern Africa

• EU/UA funded Africa Backbone
  
  – Phase 1 is Kigali <> Kampala <> Nairobi <> Dar <> Maputo <> Mtunzini <> Nairobi (STM-4 links)

  – Nairobi <> Amsterdam (peer with GEANT, AMSIX, and IP transit)

• Aggregates Traffic demands to/from Akamai + Google + R&E + other local content in Africa
KENET as an NREN

- **Aggregates HE Demand** for bandwidth and leased lines
  - Increasing buyers power of the higher education sector and reducing costs
  - KENET beneficiary of supplier-financed IRUs
- **Aggregates Internet traffic from Higher ED AS**
  - KENET generates up to 1 Gb/s of Google cache traffic
  - 1 Gb/s connection to KIXP
- **Develops High-end ICT talent** – technical + project management
  - Capacity building for KENET and member institutions
- **Builds advanced research infrastructures** and community in different areas
  - Africa Science Gateway and federated services (KENET CA, iDP, EDUROAM)
  - ICT/Internet, Educational technology, Medicine, and Agriculture
Measurement Lab (MLAB)

• What Is It?
  – Open, distributed platform for researchers to deploy measurement tools
  – Open data

• Some Measurement Tools
  – NDT (Network Diagnostic Tool) – Speed & Diagnostics
  – NPAD (Network Path & Applications Diagnostics)
    – Identifies performance problems on the end-to-end path
  – Neubot – Gathers data for network neutrality
  – ShaperProbe – Identifies traffic shaping in the path
  – Glasnost – Identifies application-specific traffic shaping, Deep packet inspection on the path
Nairobi MLAB Node @ KENET (2013)

Measurement Lab

- Three (3) Physical Servers
- 1Gbps KIXP Connection
- 50Mb/s International Capacity
- IPv4/IPv6 Support
- KENET Technical Usage?
  - Leased line / links commissioning tests
- Promote use by consumer organizations, regulator, and the emerging Internet research community
Kenya Statistics – Download Throughput

Public Data

- Broadband performance using...
  - Download throughput
    - Network-limited time ratio
    - Number of tests
    - Packet retransmission
    - Percentage of tests in co...

  Clear

- Compare by: Country
  - All Locations
  - Afghanistan
  - Aland Islands
  - Albania
  - Algeria
  - Andorra

  Clear selections

- Location

Download throughput

Data from Measurement Lab  Last updated: Jul 8, 2013
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Kenya Education Network

Statistics of Downlink Throughput – Per Provider
Kenya Statistics – Uplink Throughput

Public Data

- Packet retransmission
- Percentage of tests in connection
- Receiver window scale
- Receiver-limited time ratio
- Round Trip Time
- Upload throughput

Compare by

- Country

Location

Data from Measurement Lab  Last updated: Jul 8, 2013
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Download Stats – Africa Selected

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Top Testers – Africa Selected
Thank You

Q&A