

# Ubuntu Connect 2014

## Technical Capacity Building at KENET

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# Agenda

1. KENET Capacity Building Agenda
2. The KENET Community
3. Focus of Capacity Building
4. Planning & Infrastructure
5. Impact & Lessons Learnt
6. Conclusion

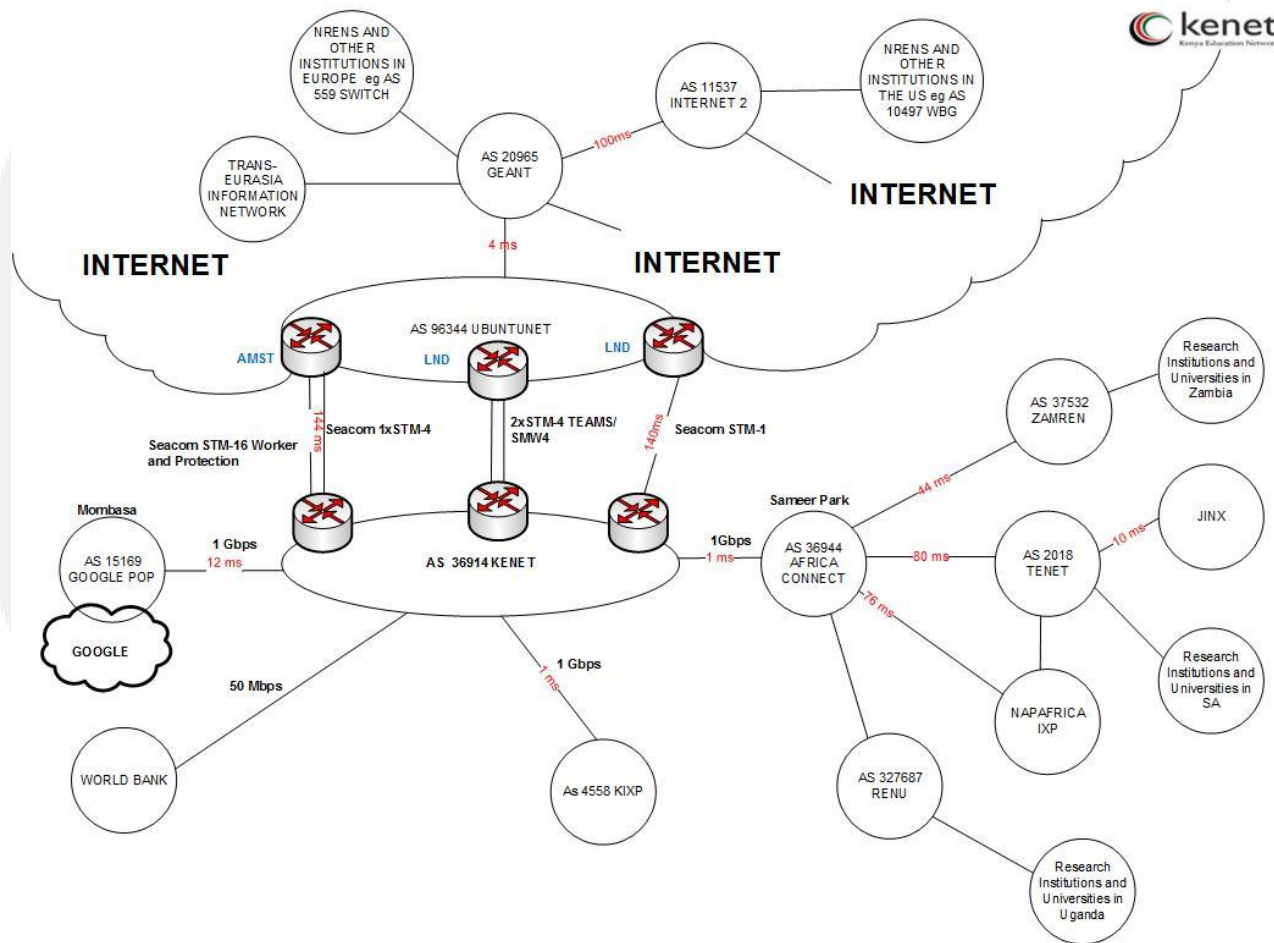
# What is Our Agenda

- KENET Network
  - International, national and campus network infrastructures
  - What services running on the network?
- Technical ICT talent pipeline for higher education community
  - Graduate trainees and interns
  - Backend ICT staff - Systems / network administrators and engineers
  - End-user support staff
  - Project managers with experience in ICT procurement
- Objectives of KENET training programs
  - Building technical skills for operating campus networks
  - Build an ICT techies community for higher education – residential!
  - Empower the KENET community – Reduce support tickets

# Kenya ICT in Higher Education and ICT Context

| No | Parameter   | Dimension           |
|----|---|---------------------|
| 1  | Size of Kenya (in Sq. KM)                         | 582,646             |
| 2  | Population (Millions)                             | 43.18               |
| 3  | Mobile Subscriptions (Millions)                   | 31.3                |
| 4  | Mobile Money Transfer Subscriptions (Millions)    | 21.1                |
| 5  | Internet Users (Millions)                         | 19.2                |
| 6  | International Internet Bandwidth Available (Gb/s) | 862.8               |
| 7  | Number of Undersea fiber cables at Kenyan Coast   | 4                   |
| 8  | Number of Universities / Enrollment 2014          | 66 / Approx 500,000 |
| 9  | Number of Research Institutes                     | 12                  |

# KENET Network Peering



# Attracting, Retaining & Motivating ICT Staff

| Category of Staff  | What attracts them?   | What retains /motivates them?   | Critical Success factor                         |
|--|---|---|---|
| ICT Senior Staff /<br>ICT director   | Change agents;<br>potential to<br>transform higher<br>education<br>Salary?              | Success in<br>transformation;<br>influence;<br>institutional<br>support | Relationship with<br>CEO                        |
| ICT Middle-level<br>staff (systems /<br>network<br>administrators /<br>engineers | Opportunities for<br>growth; challenging<br>work opportunities;<br>Specialized training | Salary<br>Working<br>environment<br>ICT director                        | ICT leadership<br>ICT projects                  |
| ICT Entry-level staff  | First job;<br>opportunities for<br>training;  | Working<br>environment;<br>interesting projects                         | ICT leadership<br>Training budget /<br>partners |

# Thematic Training Areas

- Training for KENET Members
  - Residential Training
    - Bandwidth management & optimization
    - Scalable Campus Networks
    - Scalable Campus Wireless Design
    - Cyber Security
  - Onsite Campus Training
    - Cyber Security
  - One-day Training Workshops
    - ICT Policy & Governance – for ICT Managers
- Internal Capacity Building
  - Training for entry level engineers
    - Graduate trainee program – One (1) year
    - Internship program – Three (3) months
  - Training for mid-level engineers
    - Hand-on training sessions, AfNOG, etc
  - Training for experienced engineers
    - Twinning arrangements/exchange program

# KENET Training Schedule

- Frequency of Training
  - Ability to successfully conduct four (4) classroom/residential trainings per year
  - Frequency of training limited by logistical requirements for coordinating the administrative activities
  - Training calendar published at the start of the year
  - Four (4) residential trainings successfully conducted in 2014
  - One (1) ICT Policy & Governance training conducted, 2014
- Registration & Course Content
  - Participants register online
  - Training slides & labs adapted from NSRC training content
  - Some training areas have had course content created from scratch
  - Content creation and testing of lab content a difficult task
  - Surveys conducted in each training – determine effectiveness of program



# Residential Training 2014



# Onsite Training 2014





# Twinning Arrangement, DFN 2010



# Residential Training Budget

- Training Budget
  - KENET develops training budget based on training duration
  - Training Budget Composition:
    - Accommodation costs for participants at hotel
    - Meals for the participants
    - Training facilitation items – stationery, etc
- Training Cost
  - Residential training cost per participant – US\$ 1,000 per week
  - Non residential training cost – US\$ 600 per week
  - Training week composed of five training days
  - Non residential training discontinued due to lack of control of reporting time
- Training class size
  - Ideal class size of 20
  - Average class size of 25, most courses are oversubscribed

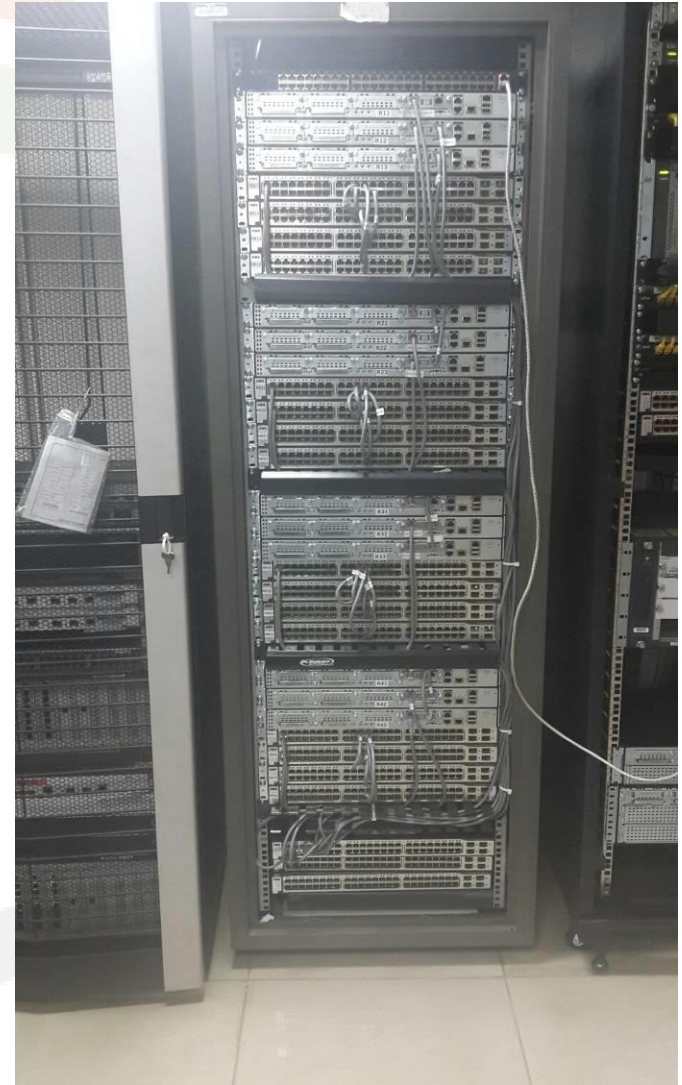
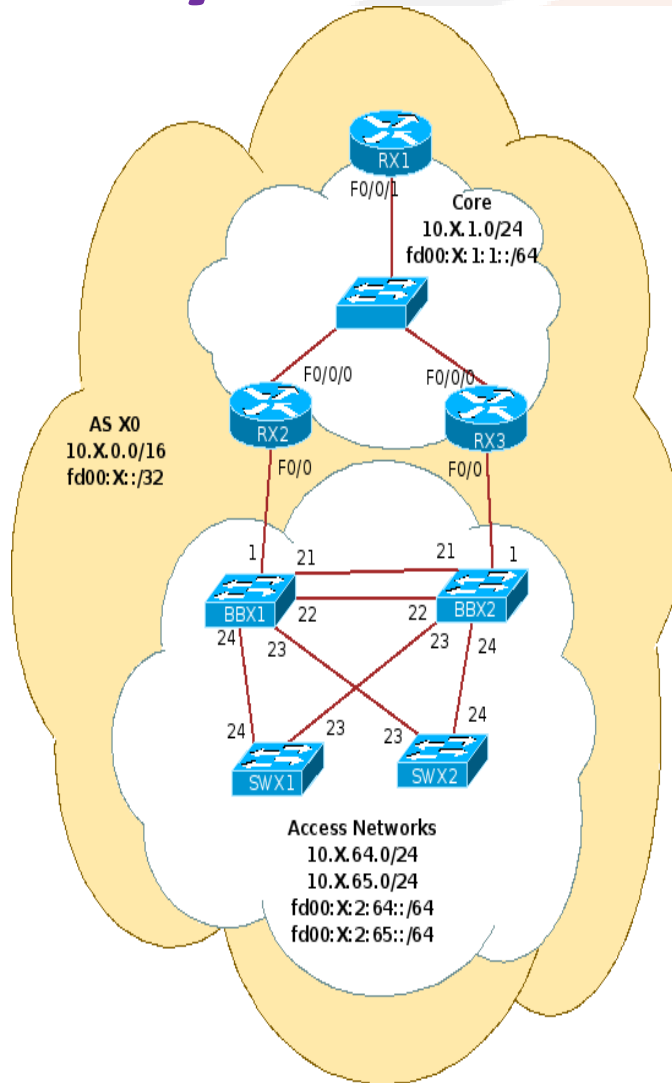
# Pool of Skilled Trainers

- KENET Staff
  - Experienced NOC engineers
  - Specialists in different focal areas
    - Network Routing, Switching & Security
    - Systems Administration, Linux/Unix tools
    - Cyber Security – CEH
    - Campus wireless networks & mobility
- NSRC
  - Donates trainers when requested
  - Cover for all costs of the donated trainers
  - Conduct training of trainers
- Experienced Consultants from Industry & Academia
  - Provide expertise where KENET has gaps internally

# Physical Training Lab

- Physical Training Lab, 2014
  - Provides hands-on training in network switching & routing
  - Equipment donated by NSRC – Approx. US\$100,000
  - Consists of Cisco routers and switches
  - Able to train four (4) groups
  - Each with seven (7) devices to configure
  - Training Lab available online for remote access
- Virtual Training Lab Kit, 2013
  - Virtual Lab based on Mac Mini Setup
  - Provides portability, good when no broadband connectivity at training location
  - Equipment donated by NSRC

# Physical Training Lab - Topology



# Partners in Capacity Building

- Funding for Participants
  - Network Startup & Resource Center, NSRC
  - Google
  - Kenya ICT Authority
  - KENET Members
- Provision of Trainers
  - NSRC
  - Aptivate
- Twinning Partners
  - German NREN, DFN
  - South African NREN, TENET
  - Indiana University & NSRC



# Impact & Lessons Learnt

- Lack of dedicated trainers
  - Stretches KENET NOC team
- Training Duration
  - Ideal duration, 3-5 days
- Inadequate Staffing
  - At the Universities
  - Universities find it difficult to release their only engineer
- Lack of motivation
  - Some university engineers not motivated to implement changes
- Risk of Staff Turnover
  - Risk of being training pipeline for the commercial sector
  - Is it part of the wider capacity building agenda of the R&E community?
- Twinning Arrangements
  - Host institution MUST dedicate their experienced engineers out of their busy schedules to assist with the twinning

## Conclusion

- **Need for High End ICT Talent**
  - At the NREN and at the universities
  - KENET doing its part in capacity building as part of the wide agenda of research & education networks
- **Scaling Up**
  - Need to scale up program
  - Review course delivery methodology

# Questions



*Transforming education  
through ICT*

# Thank You

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