KENET Training Lab Workshop September 18-20, 2017

1. KENET Virtual Training Lab Environments

In the year 2014, KENET established a Network Training Lab with the support of Network Startup Resource Center, NSRC (http://nsrc.org/). The network equipment has a replacement value over $100,000 that includes CISCO network switches, routers and a virtualization server. So far, the lab has been used for residential campus network design courses offered to institutional techies and KENET engineers. We plan to **make the lab accessible remotely by ICT staff and faculty of member institutions for network experiments and training.** The logical and physical lab setup is as shown in *Annex 2, Figure 1* and *Figure 2* below.

The physical KENET Training Lab is currently located at the KENET Training room hosted at University of Nairobi Jomo Kenyatta Memorial Library. The training lab consists of Cisco 3750 switches and Cisco 2901 routers that can be accessed within the KENET network. The physical training lab will be available online for use by the KENET community, both ICT staff and faculty for their networks training requirements. This will enable remote training from locations that have broadband connectivity back into the training lab infrastructure.

In addition to the network training lab, KENET also operates a virtualized lab that can be used to complement lab exercises in systems administration supported by Linux or UNIX operating systems. It is currently being used to support a UNIX course for entry-level systems administrators in member institutions. All the trainees need is a computer with access to Internet to conduct the course and can support up to 100 concurrent trainees.

This virtualized lab can also be used to complement the physical labs at the member institutions especially for lab exercises that require specialized software like MATLAB, pSPICE, Adobe Photoshop among others and the virtualized lab is accessible remotely on a 24/7/365 basis.

2. Network Training Topics for Faculty teaching network courses

The use of the training lab enhances the learning outcomes of the practical lab sessions by improving the students' understanding of the TCP/IP in addition to skills to design, implement and administer a campus network; as well as both knowledge and skills on switching and routing networks.

During the practical sessions, the lab can be used to enhance the existing practical lab requirements as per the specific curricula of universities especially on courses that teach students skills that include IP

Addressing, virtual local area networks (VLANs), spanning tree protocol (STP), Internet Protocol (IP) routing & management (addressing, IP subnets) amongst others. Finally, troubleshooting methodologies are also handled to equip participants with the basic flow of events when troubleshooting campus network problems.

Training Model

KENET aims to train at least two (2) Faculty members from each University/ College that will be responsible for taking the students through the training lab (it can be a senior faculty and junior faculty member). The training will take three (3) days and will start on **September 18, 2017** and end **September 20, 2017**. Three (3) trainers from KENET will be available to conduct the training.

Annex 1 Table 1 shows the timetable of the training course for Faculty.

KENET and the Institution shall share responsibilities as follows:

A. Institution Responsibilities

1. The Institution shall nominate two (2) ICT faculty who are conversant with Switching and Routing theory for the initial hands on training.
2. The Institution will provide a calendar showing the dates the students will access the training lab.
3. The Institution will ensure the students complete the hands-on training.

B. KENET Responsibilities

1. KENET will provide remote access to the training lab during the training period for the required students and staff upon receiving the training calendar
2. KENET will ensure uptime of the training lab.

In order to proceed with the Faculty Training, please sign the attached nomination form showing the details of the ICT technical staff who will be assigned to the project.

KENET Training LAB Vs Other Training Models

KENET Training LAB	Dynamips	Cisco Learning Network Store	Packet Tracer
Advantages 1) No operations cost passed to the institutions. 2) Faculty can design specific lab exercises for use by the students. 3) Lab has Cisco 3750 switches and Cisco 2901 routers 4) KENET faculty members to benefit from training on use of the lab. 5) Students and Faculty can access the Lab from the institution.	**Advantages** 1) Free 2) Runs real IOS thus supports most router and switch commands	**Advantages** 1) Students and Faculty access switches and routers remotely	**Advantages** 1) Easy to install on laptop/computer
Limitations 1) Access granted during specific periods based on calendar requests.	**Limitations** 1) Requires high computing resources to simulate. 2) Need to purchase valid Cisco IOS images to run.	**Limitations** 1) Expensive: Each user account costs $200 2) Each user account is limited for 180 days before renewal. 3) Limited to specific Cisco Certifications.	**Limitations** 1) Only free to Networking academy students, instructors and administrators 2) Limitation on the protocols that can be run. Including OSPF, EIGRP and ACLs.

KENET NETWORK TRAINING LAB NOMINATION FORM

Completed by Head of Department

I nominate following ICT Faculty members for the Workshop on use of KENET Online Network LAB on September 18-20, 2017.

	Title (Mr., Mrs., Dr.. Prof.)	**First Name(s), Surname**	**Gender**	**Rank (e.g., Tutorial fellow, Assistant Lecturer, Lecturer, Senior Lecturer)**	**Network course (s) that need lab facilities**	**Email Address**	**Mobile Number**
1							
2							

The nominees will then proceed to fill the online form here:

https://www.surveymonkey.com/r/QFMS6TN

Signed: ……

Name: ……

Designation (Chairman, HoD, Dean, etc) : ……

Institution and Department: …….

Date: ……

_____[Stamp]_____

APPENDIX 1

Table 1: Tentative Training Timetable

Day/Time	**9.00-10.30**	**10.30-10.50**	**10.50-13.00**	**1300-1400**	**1400-1600**	**1600-1620**	**1620-1800**
Monday	Welcome and Registration	Tea Break	Introduction to the KENET Training lab	Lunch	Accessing the LAB.	Tea Break	Discussion
Tuesday	Training Topics: IP Addressing, VLANS, STP, Routing		Training Topics: IP Addressing, VLANS, STP, Routing		Designing Labs		Discussion
Wednesday	Hands on Lab		Hands on Labs				

Annex 2: Logical and Physical Topology of KENET Training Lab.

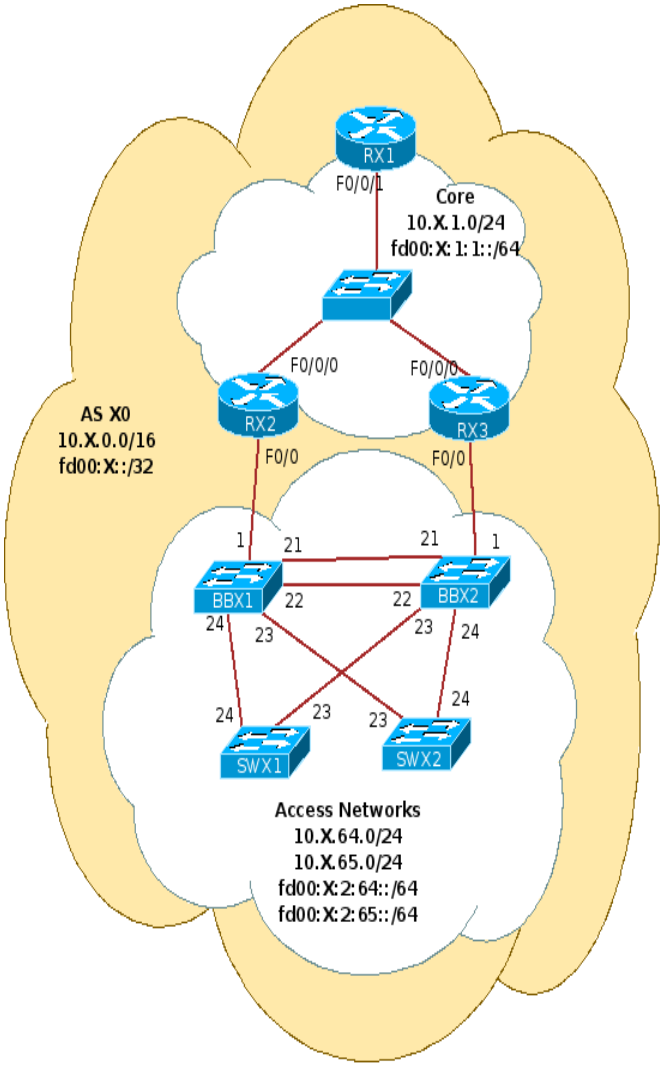

Figure 1 Logical Lab Topology

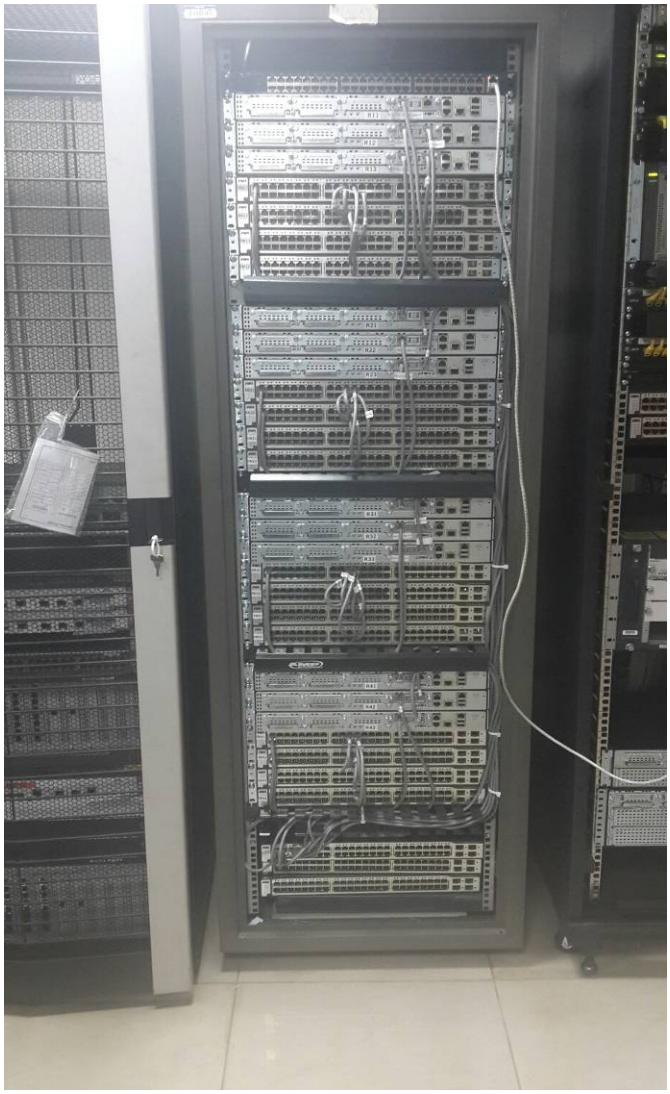

Figure 2 Physical Lab Setup