II. Identity Provider

The KENET Identity Provider (IDP) issues users with an ID (for login) that allows them to access applications in science gateways. An institution can configure its repository to authenticate users of this IDP and therefore make available repositories like journals to known researchers/students from other universities.

2. Travel Grants

KENET offers travel grants to faculty and graduate students in the KENET Special Interest Group academic areas, namely, engineering, computer science / information systems, medicine, agriculture and education (or educational technology). Only conferences whose proceedings are indexed in Elesevier's Scopus or Web of Science databases are eligible (these are the databases used in Webometrics or Times Higher Education University rankings).

3. KENET research mailing lists

KENET has several research mailing lists that are specifically for researchers, and their aim is to promote collaboration and allow sharing of information among the researchers in Kenya.

4. eduroam

eduroam (education roaming) is the secure, world-wide roaming access service developed for the international research and education community.

eduroam allows students, researchers and staff from participating institutions to obtain internet connectivity across campus and when visiting other participating institutions by simply opening their laptop.

5. Video and Web Conferencing

KENET provides a high quality video and web conferencing service to its members at no additional recurrent costs. KENET is already partnering with selected universities for the remote teaching pilot project; the pilot project includes the use of web conferencing technology for remote teaching.

6. Special Interest Groups

KENET has formed two special interest groups in the areas of educational technology and engineering education. This is in line with KENET's mandate of promoting collaboration in education and research and being a catalyst in the transformation of education and research.

EDUCATION SERVICES

Students at Daystar University Remote Teaching Class

1. IBM Cloud Lab

KENET hosts and supports the IBM Cloud Lab which is used for premier training and certification initiative for academia in Kenya. KENET member institutions benefit from the adoption of a cloud-enabled learning environment hosted and maintained by KENET. This platform contains a series of IBM official training courses that accelerate the adoption of the latest technology in the curriculum. This means students work on real-life industry scenarios to develop critical thinking skills. Students also benefit through anytime-anywhere approach as well as engaged in hands-on training exercises from any location on campus or off campus.

Some of the courses conducted on the platform include; Mobile Application Developer, Business Intelligence Analytics, Application Security and Bid Data.

2. KENET Schools Connectivity Initiative

The KENET Schools Connectivity Initiative (SCI) aims to coordinate the different commercial, educational and government organizations interested and willing to promote the use of ICT in Kenyan schools for teaching, learning and administration. The general objective of the initiative is to improve the quality of education by transforming teaching, learning and administration of schools in Kenya.

3. Remote Teaching

KENET is partnering with selected universities for the remote teaching pilot project. The pilot project includes the use of web conferencing technology for remote teaching. These universities include CUEA, Daystar University, and UoN with KENET as the implementation partner and project funder. The objective of the pilot project is to reduce the cost of teaching multiple classes and explore the possibility of remote teaching using a web conferencing.

CAPACITY BUILDING

KENET provides training services to its member institution to enable them to improve on their campus network and efficiently utilize the services offered by KENET.

Participants at the Scalable Campus Network Training

1. Network Management & Monitoring

This training is designed to empower the network administrators from the various institutions with skills that will enable them to effectively manage their campus networks. This enables them to ensure the bandwidth they have subscribed to is being used appropriately as well as mitigating the threats and profiling traffic relating to viruses, spam, peer-to-peer traffic and malware.

2. Campus LAN & WLAN Design

The Scalable Campus Network training equips participants with practical skills that enable them to design and implement a large scale campus network. This course provides the engineers with the necessary TCP/IP skills to design, implement and administer a campus network, as well as both knowledge and skills on switching and routing networks.

3. Scalable Campus Wireless LAN design

This training imparts practical knowledge to participants in the areas of design, implementation and security of a large scale campus wireless local area network (WLAN). The course provides the network administrators with the necessary skills to administer a campus wireless network.

4. Cyber Security

The cyber security training focuses on empowering system administrators on how to secure the services, servers and networks within the campus.

kenet
Kenya Education Network

KENET SERVICES

Kenya Education Network
University of Nairobi,
Jomo Kenyatta Memorial Library
Address: 30244 00100, Nairobi.
Mobile: 0732150500/7, 0703044000/7
Email: info@kenet.or.ke
Website: www.kenet.or.ke

Transforming education through ICT

Participants of the KENET Virtual Lab Workshop

The Kenya Education Network Trust (KENET) was established in 1999 as a membership non-profit organization and is registered as a Trust to serve higher education and research institutions in Kenya. We focus on providing value added broadband connectivity, enterprise data services, e-learning and collaborative research to the education and research institutions in Kenya. We have connected over 200 member institutions campuses in 36 different counties.

As a KENET Member, You Stand to Enjoy the Following Benefits Among Others:

a) **Affordable broadband Internet and connectivity services**
b) **Capacity building of ICT staff member institutions.**
c) **Access to advanced research services and global high performance computing facilities (e.g. Africa Science Grid Gateway)**
d) **Academic cyber security support services (i.e. CERT services)**
e) **Opportunities for research collaboration with universities and researchers in Kenya, Africa and Globally.**
f) **Access to affordable shared services such as collocation of servers, virtual servers or remote storage for e-learning, research and administrative information services.**
g) **Advanced ICT advisory services in campus network design, network diagnostics, ICT infrastructure procurement and project management, and campus security.**
h) **Academic and higher education ICT community support for ICT staff, ICT directors, faculty, researchers, and senior leadership of member institutions (e.g. Vice Chancellors)**

KENET SERVICES
Connectivity Services
KENET provides broadband Internet services, by connecting member institutions to national and international internet. KENET provides members with a secure, fast, reliable and dedicated internet connection that promotes research, education, innovation and collaboration among member institutions and helps them accomplish their educational and research mandates.

Our members have access to over 10Gb/s high speed internet connection that is dedicated to education and research. Researchers and educators can transfer larger data sets per day between campuses in support of their research, as well as access grid computing infrastructures and high performance computers.

Students and staff have access to commodity internet (educational videos, Wikipedia, YouTube, Facebook, coursera, etc) through dedicated commodity connections, supported by peering arrangements and caches for major content providers.

We offer the following connectivity bundled services. These services are not charged to connected members.

1. Domain Registration and Hosting
A domain name is the name used to uniquely identify your institution on the internet, as well as a named link for publishing digital resources; and can be in the form of your website url (e.g. www.mycampus.ac.ke) or distance learning portal link (eg. ecampus.mycampus.ac.ke).

KENET is a .KE domain register. We provide domain name registration, renewal and hosting services to our members.

2. Public Internet Addresses
Public Internet addresses are unique permanent addresses assigned to Internet connected devices so that they can be independently identified and located on the Internet. Servers and systems with public IP addresses can be used to host digital resources (e.g. websites and repositories) that are published for access within the campus as well as off-campus using Internet connection.

KENET manages IP addressing space (IPv4 and IPv6 addresses) on behalf of its member institutions connected to the KENET network. Each member is assigned a minimum of 256 (/24) publicly routable IPv4 range of IP addresses.

3. Email Filtering and Scrubbing
Member institutions who host their emails at their campuses have access to a secure platform at KENET to protect members' email boxes from harmful and unwanted emails (e.g. spam emails; emails with bad attachments - malware, viruses, trojans, worms, cryptoware, etc).

4. Bandwidth Monitoring & Optimization
KENET members who have subscribed to connectivity services are granted access to resource utilization graphs that show amount of resources (e.g. bandwidth) the member is currently consuming and the protocols on the link. This assists the members in reporting and planning data management activities. Member institutions are also provided with assistance and advice on techniques of optimization of the subscribed resources to achieve value for money.

5. Training and Direct Engineering Support
KENET has set-up and furnished a training room within its Secretariat offices located at the Jomo Kenyatta Memorial Library, University of Nairobi. The training facility has a sitting capacity of 40 persons. KENET uses this facility to train staff and member institutions on fiber and wireless network technologies, campus infrastructures, systems administration and cyber security courses.

Direct Engineering Support (DES) is also provided to members to enhance the institution's staff implementation of transformational changes to ICT resources and infrastructure.

The DES initiatives address campus network infrastructure, cyber security, systems design and administration, among others aimed at improving ICT services delivery.

6. Cybersecurity Incident Response
KENET operates the KENET-CERT coordination center that promotes awareness on cyber security incidences as well as coordinates and assists member institutions in responding effectively to cyber security threats and incidences.

KENET-CERT works closely with Kenya's National Computer Incident Response Team coordination center (CIRT/CC) as a sector CIRT for the academic institutions.

Enterprise Services
The KENET enterprise services portfolio consist of the services offered at a fee to member institutions. These services include:

1. Data Centre Services
KENET has two operational data centres that offer its members the following services;

I. Co-location Services - This involves the member bringing their servers to be hosted at the KENET data centres. Our data centers are served with backup generators, dual uninterrupted power supply systems which ensure that power supply doesn't fail. The data centres are also equipped with a redundant adequate air conditioning system.

II. Virtualization Services - This involves members renting space on KENET servers through virtualization. This gives the members the advantage of customizing the server specifications to their needs.

The private servers help member institutions to make a gradual transition from an on-campus hosting plan to managing a cloud-based virtual server autonomously without the need to upgrade the on-campus infrastructure. The virtual server can be used to host among others:

1. Learning Management Systems (eg Moodle)
2. Institutional Repository System (eg DSpace)
3. Integrated Library System (eg KOHA)
4. Student Information System

The service allows a member institution to manage its own services as well as installation of the operating system of choice and other custom applications. The virtual servers can be scaled on demand to meet the ongoing needs of the institution without the need of re-installation. This service is hosted within Kenya and has a high uptime guarantee of over 99.5%.

III. Server Leasing Services - This involves the members leasing high end servers from KENET.

2. Storage Backup
KENET provides data storage backup solutions to member institutions that aid in ensuring business continuity for critical services. A disaster can occur leading to data loss as a result of computer server crashes, accidental data loss or sabotage. To ensure critical business functions resume; data recovery process is necessary from an off-site data backup location to meet critical service restoration timelines.

KENET storage backup solution is hosted in Kenya at a high uptime facility with redundant connectivity options that ensure that data recovery process is completed in the shortest time possible.

3. Disaster Recovery
To ensure business continuity for our member institutions, KENET provides server collocation space or virtual server hosting at secure locations with guaranteed high uptime of 99.95%. These facilities allow member institutions to install and manage their DR site at a location outside the university premises.

The service complements the primary data at the member institution in case of a disaster event that may occur at the member institution by ensuring that critical services are provided at the disaster recovery location in one of KENET's facilities.

KENET disaster recovery facilities are fitted with dual power installations backed up by dual diesel generators and over four (4) physical optical fiber cables that guarantee continuous connectivity to the services.

4. Campus Network Advisory Services
These are offered for certain projects on a cost recovery basis. Advisory services are offered in the following areas; Campus Network Design, WLAN setup design, ICT Project management related projects etc.

KENET's role in such projects includes; design of campus networks, RFP preparation and evaluation, project supervision and management of the project.

5. Virtual Private Network
For member institutions requiring interconnecting intranets for multiple campuses, the KENET VPN is the ideal solution for high-speed data communication between the campuses.

KENET assists its members to set up VPN services, including Remote and Corporate VPN:

- Remote VPNs – It allows remote access to University based resources once staff and students are out of campus. Some of these resources include: University based Library resources (e.g. online catalogues), online journals subscribed to by the Universities (e.g. JSTOR), shared directories within the universities (software stores, repositories, lecturer notes, etc.)
- Corporate VPNs – It interconnects various campuses to access centralized resources like FMS systems.

RESEARCH SERVICES

Some of the travel grantees from JKUAT, KU and UoN who attended the IEEE AFRICON 2017

1. Grid Computing
KENET provides the following research infrastructures which allow researchers to access research e-infrastructres.

I. KENET Certification Authority (CA)
KENET CA issues one year personal and server public key certificates to subscribers. This certificate allows researchers to access High Performance Computing and Cloud Storage in the research grids.