kenet
Kenya Education Network

KENET SERVICES

Transforming education through ICT

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. So far, we have connected over 240-member institutions campuses in 36 different counties.

As a KENET Member, you stand to enjoy the following Benefits among others:

a) Affordable and reliable Internet connectivity and services

Get cost-effective, high-speed and reliable Internet coupled with ICT technical Support and responsiveness for fast resolution of network problems.

b) Capacity Development

Academic and research community support and training for ICT staff, ICT directors, faculty, researchers, and senior leadership of member institutions.

c) Excellent member experience

Access to advanced research services and global high-performance computing facilities and affordable shared services such as collocation of servers, virtual servers or remote storage for e-learning, research and administrative information services.

d) Linkages

Opportunities for research and education collaboration with universities and researchers in Kenya, Africa and Globally.

e) Advisory services

Advanced ICT advisory services in campus network design, network diagnostics, ICT infrastructure procurement and project management, and campus security.

CONNECTIVITY SERVICES

KENET provides its 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 enable researchers and educators to transfer larger data sets per day between campuses

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

1. 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).

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

2. 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.).

3. 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 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 optimization techniques for subscribed resources to achieve value for money.

4. 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.

5. 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. Server/Rack Collocation

Server collocation involves a member institution bringing physical servers to be hosted at one of the KENET data centres. The data centres are served with backup generators, dual power supply, uninterrupted power supply (UPS) and cooling systems to ensure 99.9% uptime. A dedicated communication link for optimal file transfer between the primary and the secondary sites is provisioned.

2. Dedicated Virtual Servers

This service allows an Institution to manage its own services, install their operating system of choice and other custom applications. The virtual servers can be scaled to meet the ongoing needs of the institution without the need of re-installation. This will help the institution make a gradual transition from an on-campus hosting plan to managing a cloud-based virtual server environment without the need to upgrade the on-campus infrastructure. Some of the services that can be hosted on dedicated virtual servers include:

- Websites
- Learning Management Systems (e.g. Moodle)
- Institutional Repository Systems (e.g. DSpace)
- Integrated Library Systems (e.g. KOHA)
- Student Information Systems

3. Backup Storage

KENET currently operates two (2) storage systems at each of the Data Centres at USIU and UON, with a combined storage capacity of 228TB. An Institution can therefore purchase storage at one of the KENET data centres for backing up files of critical systems or even students and staff files. The storage system back ends can scale to 1PB of capacity per site.

4. Disaster Recovery (DR)

DR allows an Institution to maintain and quickly resume mission-critical functions following a disaster. A member-institution can setup a DR site at a KENET Data Centre by collocating servers/racks or hosting virtual servers and associated storage. Additionally, KENET provides a dedicated communication link for optimal file transfer between primary and the secondary sites. At a DR site, an organization can recover and restore its technology infrastructure and operations when its primary data centre is unavailable. Examples of disasters include fire, theft/vandalism, loss or corruption of critical application(s), cyber-attack, environmental hazards e.g. flooding, power problems, cooling failure etc.

5. Web Hosting and Domain name services

KENET offers web hosting services to member institutions either on a shared cPanel server or on a dedicated virtual server. This service is free to members

up to resource utilization of 20GB storage for the cPanel option and 50GB HDD, 1CPU and 2GB RAM for the dedicated virtual server option. Institutions can still purchase additional resources once the free allocation is fully utilized.

KENET also registers and renews domains on behalf of its members. The primary domain (e.g. mycampus.ac.ke) registration and renewal is done for free. Additionally, KENET hosts the domains and provides a domain management portal (domain.kenet.or.ke) where additional domains/subdomains records can be managed.

6. Dedicated Communication Link

Virtual servers, storage and equipment collocation to support services such as a Disaster Recovery site require a broadband connection from an Institution to KENET Data Centres of at least 1 Gb/s. The connection provides high speed communication link between KENET data centre and an Institution's server room.

7. Procurement of joint licenses for cloud-based software

KENET can procure joint licenses on behalf of Institutions for cloud-based software such as TurnitIn plagiarism checker, Elsevier Scival for measuring research output, Microsoft Office 365, SPSS, Firewall licenses etc. KENET can negotiate for lower prices for cloud-based software licenses because of economies of scale. However, this service requires members to constitute a "consortium" and request KENET to procure the services on behalf of the members.

RESEARCH SERVICES

1. Identity Services

This is an approach to authentication whereby users are provided with electronic identities which allows them to access multiple research resources (computing, storage etc.) and to build trust with the service providers. KENET provides the following identification services:

a) KENET CA

KENET CA issues one year personal and server public key certificates (digital passports) to subscribers (users). This certificate allows researchers to access High Performance Computing (HPC) and Cloud Storage in the European Grid Infrastructure (EGI). https://ca.kenet.or.ke

b) KENET IDP/Federation

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. https://idp.kenet.or.ke

c) 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. **https://www.eduroam.ac.ke**

2. Computing & Storage

a) Computing

KENET provides a virtual computing environment known as the KENET Virtual Lab (VLAB) – https://vlab.ac.ke. It is a virtual cloud environment where virtual machines are deployed on demand. Users select the amount of CPU, RAM and disk desired when they are deploying a machine. It is a secure and isolated environment which is only accessible for use by approved users who are affiliated to KENET member-institutions. The platform provides select pre-configured virtual appliances running various scientific software stacks e.g. R for statistical analysis, Quantum Espresso, NumPy/Scikit etc. which can be deployed on demand. In addition to this, various flavours of the Linux operating system like Ubuntu, Debian, Centos and also BSD Unix are available, and these can be configured to run any software a user desires.

b) Storage

KENET has built and tested a federated Open Access Data Repository (OADR) that meets the demands of researchers who need to publish their research data as part of the online open access journal requirement. Access to this service (https://oar.kenet.or.ke) is via the KENET identity provider (https://idp.kenet.or.ke).

3. Facilitation services

Are you in an active Special Interest Group? KENET can help you organize your workshops by providing free hosting at KENET's training room or partial sponsorship.

4. Collaboration tools

a) Video and Web Conferencing

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

b) Special Interest Groups

KENET helps researchers and educators collaborate through Special Interest Groups (SIGs). Currently, we have the SIGs for this groups: Engineering faculty, Computational and Materials Modelling Scientists (CMMS), Educational Technology and Computer Scientists. Each SIG has a mailing list where members collaborate and share useful materials. A user can join a SIG of their choice or request for a new one for their group or team.

5. 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 Elsevier's Scopus or Web of Science databases are eligible (these are the databases used in Webometrics or Times Higher Education University rankings).

EDUCATION SERVICES

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. Some of the courses conducted on the platform are; 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 partnered with selected universities for the implementation of the remote teaching pilot project. The project focused on the use of web conferencing technology for remote teaching. The universities were Catholic University of East Africa, Daystar University, and University of Nairobi. KENET funded the project. The objective was aimed at reducing the cost of teaching multiple classes and explore the possibility of remote teaching using web conferencing.

CAPACITY BUILDING

1. Network Management & Monitoring

This training is designed to empower the network administrators from the various institutions with skills 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 participants 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.

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