



**KENET Annual Community
Newsletter 2018**

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Executive Director's Note



The first Heads of Institution (HoI) Forum was held in December 2009. The main purpose of the forum then was to disseminate the results of the **E-readiness Survey of 50 East African universities that included 17 Kenyan universities**. The survey research was supported by a Rockefeller Foundation research grant awarded to two researchers through KENET (Prof. Meoli Kashorda and Prof. Timothy Waema). The grant covered the cost of that first forum.

The theme of that first forum in 2009 was **'Strategies for Accession to Higher Levels of E-readiness of Universities'**. *E-readiness surveys assess the preparedness of a community or country to reap the benefits from Information and Communications Technologies (ICTs)*. The researchers had developed a modified e-readiness assessment tool in 2006 during the first e-readiness survey of 25 KENET member institutions. The tool measured e-readiness using 17 indicators that were **staged** on a scale 1 to 4, with stage 1 being **unprepared** while stage 4 is the **highest state of preparedness** for a particular indicator. Only **four** of the 17 indicators are directly related the foundational Internet and ICT infrastructures (i.e., *Internet availability and affordability, Telephony Infrastructure, Quality of Campus Networks, and Stability of Institutional Power*).

KENET funded the e-readiness surveys of Kenyan universities in 2013 and 2015 using a modest research fund established by KENET Board of Trustees. In future, the comprehensive e-readiness surveys shall include all KENET member institutions. The e-readiness reports and data since 2006 are available online at <https://e-readiness.kenet.or.ke>.

The Annual Core Data Survey of all member institutions is a mini-survey e-readiness survey and tracks the four foundational indicators of e-readiness. It does not include the perception surveys of the users (i.e., staff and students). The state of e-readiness of our community matters because it is what determines the **growth of KENET as the National Research & Education Network of Kenya**. For example, in October 2009, KENET bandwidth subscriptions were only **200 Mb/s** of satellite bandwidth while in October 2018 it was **24,000 Mb/s**. That is an increase of 1,000 times, all due to enhanced e-readiness of our community and not growth in members (membership has increased by only 2x in the 10 years).

This 10th Forum therefore comes back to the theme of **"Achieving and Sustaining High-Levels of E-readiness"** of our community. This is not only because new members join KENET often at stage 1 or 2 of e-readiness (i.e., unprepared or initial stages of e-readiness) but also as a reminder that **sustaining** high-levels does requires **annual institutional investments** in ICT infrastructures and staff development in the effective use of ICT in teaching, learning, research and administration.

This newsletter has many stories that demonstrate how we have been improving the e-readiness of members by connecting new members in the last one year. We are building "extreme networks" to connect remote or isolated sites and campuses (e.g., KMFRI Sang'oro research station in Western Kenya) or through the 25+ Direct Engineering Support activities undertaken in 2018 at both the large institutions (e.g., KU and UoN with subscriptions of over 2,000 Mb/s) and the small (KMTC Nyamache with a subscription of only 5 Mb/s).

The newsletter contains stories of faculty and graduate researchers forums. For example, Open Science practices workshop and Hackathon that used the KENET research cloud as well as computer science / information systems heads of department forum that attracted 80 participants, including 16 early career PhDs in CS/IS. These forums have increased the capacity of the faculty and researchers to benefit from shared research and education cloud-based infrastructures that KENET has been building in the past five years.

2018 has been exciting year and I hope this year's forum shall motivate the different member institutions to continue to enhance their state of their e-readiness through investments, staff development and appropriate institutional ICT strategies.

Prof. Meoli Kashorda
Executive Director, KENET

Governance

➤ New KENET Board of Trustees Appointed

In 2018, the KENET Board of Trustees appointed Prof. Paul Zeleza as the Chair of the Board, and three new Trustees; Dr. Kevit Desai, Prof. Isaac Kosgey and Prof. Victoria Ngumi.

Prof. Paul Zeleza, Chairman



Prof. Zeleza took over the KENET Board of Trustee chairmanship from Prof. Timothy Wachira, former Vice Chancellor of Daystar University. Prof. Zeleza is currently the Vice Chancellor of United States International University- Africa (USIU-A). Prior to joining USIU-A, he was Vice President of Academic Affairs at Quinnipiac University in Connecticut, USA. He holds a doctorate in Economic History from Dalhousie University in Halifax, Nova Scotia, Canada.

Dr. Kevit Desai, Trustee



Dr. Desai, Principal Secretary, State Department of Vocational and Technical Training in the Ministry of Education filled the place of Prof. Collette Suda who ceased being a Trustee. Dr. Desai is also the Chairman of the Permanent Working Group on TVET in Kenya (PWG) through which he champions linkages between, government, TVETs, private sectors and other development partner linkages, towards the transformation of Kenya's technical and vocational training platform. He holds a PhD in Robotics Systems Engineering.

Prof. Isaac Kosgey, Trustee



Prof. Kosgey, the Vice-Chancellor of Moi University, was appointed to the KENET Board of Trustees to fill the vacant slot on the board

after Prof. Richard Mibey ceased being a trustee in September 2016 upon the end of his tenure as Vice Chancellor of Moi University. Prof. Kosgey previously served as the Deputy Vice Chancellor, Administration, Finance and Development at Laikipia University. He holds a Doctor of Philosophy degree in Animal Sciences from Wageningen University, The Netherlands.

Prof. Victoria Ngumi, Trustee



Prof. Ngumi was appointed as a Trustee to replace Prof. Mabel Imbuga who ceased being a Trustee upon the end of her tenure as Vice – Chancellor of Jomo Kenyatta University of Agriculture and Technology (JKUAT) on July 31, 2018. Prof. Ngumi was serving as the Deputy Vice Chancellor in charge of Administration, a position she has held since October 2014. She was a beneficiary of the Fulbright scholarship that took her to Clemson University, USA, earning a PhD in Plant Physiology. Her achievements include being the first Principal of the JKUAT Karen Campus, having served as the founding Director of the Alternative Degree Programme.

View full profile of the Board of Trustees: <https://www.kenet.or.ke/node/10>.

Trustees are assisted by a Management Board whose current Chair is Prof. Edwin Ataro of the Electrical Engineering Department, Moi University. The annual KENET Board of retreat is an annual event for Management Board members and Trustees. This year's retreat was held on 13-14 September 2018 at Enashipai Resort & Spa, Naivasha and reviewed the KENET strategic plan 2016-2020.



KENET Board of Trustees, Management Board and staff during the Board of Trustees Retreat

View full profile of Management Board Members: <https://www.kenet.or.ke/node/12>

Community

➤ Nineteen New Institutions Join KENET Membership

The KENET Community is experiencing tremendous growth each year due to its dedication in providing ICT-based solutions to education and research institutions. Since January 2018, nineteen (19) new Institutions have joined KENET, increasing the membership tally to 145. These nineteen (19) new members represent Universities and University Colleges (1), TVETs and colleges (8), Government institutions (2), research institutes (3), hospitals and nursing schools (3) and affiliates (2).

The new members include; *National Museums of Kenya, Regional Centre for Mapping of Resources for Development (RCMRD), Tourism Research Institute (TRI), Global Programs for Research and Training, Moi Teaching and Referral Hospital, Tunapanda Institute, The Mater Hospital & Nursing School, and Hekima University College.* The nine TVETs who joined KENET in 2018 include *Kisii National Polytechnic and Meru National Polytechnic.* Most of the new institutions are already connected to the KENET network.

Table 1: Membership and Connectivity Status as of November 2018

No.	Membership Categories	Number of Members	Connected Members
1	Universities and University Colleges	69	65
2	TVETs and Colleges	25	24
3	Government Institutions	14	11
4	Research Institutions	20	15
5	Hospitals & Nursing Schools	8	8
6	Affiliates	9	8
	Total	145	131

KENET Network

➤ KENET Expands Network Infrastructure in Multiple Institutions

In 2018, a total of 32 new institutions have been connected to the KENET network. Among these, is KMFRI Sang'oro, a 20-year old Aquaculture Research Station located 70KM from Kisumu near River Sondu Miriu. There is no Mobile or Internet network in KMFRI Sang'oro as it is surrounded by mountains. However, KENET is in the process of connecting the research centre to the Internet using a microwave radio link. KENET also extended last mile fiber to several remote institutions including KEMRI Kisian.

KENET is also in the process of connecting Tunapanda Institute, a



KENET engineers evaluating extreme engineering challenges to Deliver Connectivity to KMFRI Sang'oro

non-profit Community-Based Organization in Kibera, that empowers low income households through education in technology, design, and business to increase self-expression and income. The connectivity was supported by a connectivity grant from the Internet Society, a partner of KENET in training and promotion of Internet services in low-income areas.

KENET has activated a total of **2,400 KM** of fiber, connecting a total of **95** of the 249 connected campuses to **1,000 Mb/s** last mile connections, representing 38% of the total number of connected campuses. KENET has also connected 82% of the campuses on last mile fiber and 18% on last mile radio links as illustrated in Table 2.

In addition, KENET is currently activating an additional 170 KM of dark fiber to provide **1,000 Mb/s** last mile fiber connection to 26 KENET Member institutions. This project will also provide backup to existing 7 KENET-member institutions. This has been necessitated by the need to increase availability, reduce the costs associated with leased lines and provide broadband access to KENET datacenters for shared services. The project is expected to be completed in January 2019.

Table 2: State of Last Mile Fiber Connectivity for KENET Members

Campuses	Number	Percentage
Last Mile Fiber	204	82%
Last Mile Radio	45	18%
Total Number of Connected Members	249	100%

KENET Expands Backbone Network

In July 2018, KENET completed the implementation of its core network upgrade from 10Gb/s to 40Gb/s. The backbone links to Nakuru, Meru and Kisumu were also upgraded to 10 Gb/s. This has enabled the KENET backbone network to distribute more capacity as the demand for Internet and connectivity in the connected member institutions increases. Finally, the capacity of the International circuits was upgraded in October 2018 from 9 Gb/s to 16 Gb/s. This upgrade will satisfy demand for the next two (2) years.

Education Technology Initiatives

➤ KENET Partners with SomaliREN for the SomNOG Conference

KENET is keen on collaborating with upcoming and established regional and international National Research and Education Networks (NRENs). KENET partnered with the Somali Research and Education Network (SomaliREN) in support of its annual Somali Network Operators' Group (SomNOG) Conference and workshops held on October 15-21, 2018. KENET made its networking lab accessible to the workshop participants who used it for hands-on lab practice on Routing and Switching. The 26 workshop participants remotely accessed the KENET training lab and acquired hands-on experience in building campus networks and configuring switches and routers. Mr. Abdullahi Bihi Hussein, SomaliREN CEO said that, "this was the easiest workshop on networking that we have ever run, we had no logistical issues, and less worry about the possibility of hardware malfunction during the sessions. The KENET team was very supportive." He further noted that, "the local traffic exchanged within the regional backbone shows that there was minimal local collaboration. Starting peer to peer collaborative efforts in the form of small projects can create and nurture a culture of collaboration among the NRENs."

➤ Blockchain developers training for faculty

Under its skills academy program, IBM conducted a one-week Blockchain Developer training for faculty members across Kenya. The training was held between 15-19 October 2018 at the KENET training room. The main objective of the training was to enable

faculty to provide students with foundation skills required to develop blockchain applications and get them ready for the job market. The course covered basic concepts required to understand blockchain technology and included hands-on exercises which were conducted on the IBM Cloud Lab hosted at the KENET data center. By hosting the IBM Cloud Lab, KENET supports IBM's premier training and certification initiative for academia in Kenya.

More on IBM Cloud Lab: <https://www.kenet.or.ke/content/ibm-cloud-lab>

➤ Use of KENET Virtual Lab Fosters Kenya-Australia Research Collaboration

The KENET Virtual Lab is a research cloud computing platform where researchers can spin up pre-configured virtual appliances on demand, as well as store and share data. Prof. Elijah Ateka, an Associate Professor of Plant Virology in the Department of Horticulture at the Jomo Kenyatta University of Agriculture and Technology (JKUAT) collaborates with Dr. Laura Boykin from the University of Western Australia (UWA) in a gene sequencing project.

The use of the KENET VLab in their research resolved the challenges of online file sharing and unsuccessful file transfer. On the KENET VLab, they were allocated 5 TB of storage space, which enabled them to successfully share large volumes of data in real-time. Prof. Ateka noted that their data transfer process was made efficient and less tedious using the KENET Virtual Lab.

Read full Q&A Interview: <https://www.kenet.or.ke/content/qa-use-kenet-virtual-lab-fosters-kenya-australia-research-collaboration>

Enterprise Services

KENET has been offering data centre and community cloud services since 2011 when its two data centres at the University of Nairobi (UoN) and United States International University- Africa (USIU- Africa) were commissioned. The data centre services include Server(s)/Rack colocation in the data centres for hosting of institutional systems, web applications, and disaster recovery sites among others. In such cases, KENET provisions high-speed dedicated Layer 2 links (100 Mb/s and above) between the primary sites and the off-site systems



Participants of the SomNoG Conference (Photo:Courtesy)

colocated at any of the three KENET data centres at Catholic University of Eastern Africa (CUEA), UoN, or USIU-Africa.

Most of KENET member institutions subscribe to community cloud services by leasing virtual machines and/or storage. This is the typical Infrastructure as a Service (IaaS) that includes Storage as a Service. For instance, in 2018, over 80-member institutions are hosting their institutional websites with KENET on a shared platform, while about ten (10) of the institutions host their websites on dedicated virtual machines. Web hosting for up to 20 GB storage is a FREE membership service for members. Other members lease virtual machines and off-site backup storage.

A new data centre at CUEA

KENET completed the setup of a new data centre at CUEA in September 2018. The new Tier 3 data centre can accommodate up to 10 server cabinets for colocation of member institutions equipment. The data centers are equipped with redundant power supply, air conditioning and uninterruptible power source (UPS) with 20 cabinets.

More on enterprise services: <https://www.kenet.or.ke/enterprise-services>

➤ KENET holds breakfast meeting with Education CS, ICT CS, and Heads of Institutions

On June 18, 2018 KENET hosted a breakfast meeting with the Education Cabinet Secretary, Amb. Dr. Amina Mohamed, the Ministry of ICT Cabinet Secretary, Mr. Joe Mucheru, and Heads of Institutions. The meeting held at the Norfolk Hotel, Nairobi was well attended by 97 guests who were CEOs and representatives from Universities, University Colleges, Colleges, Research Institutes, Government Institutions, and affiliates.



Education CS Amb. Dr. Amina Mohammed and ICT CS Hon. Joe Mucheru during the Breakfast Meeting

The meeting served as a platform to discuss and follow-up on pertinent issues that were discussed during the December 2017 Heads of Institutions forum; on gazettelement of KENET as an NREN of Kenya and joint procurement of ICT services and equipment through KENET. It was discussed that the directive on public procurement of ICT services had the potential to bypass KENET as an NREN. CS Joe Mucheru clarified that public member institutions that already subscribe to KENET services are considered compliant to the directive and do not have to participate in the joint procurement of the services through the Ministry of ICT.

Dr. Kevit Desai, PS for Technical and Vocational Education and Training (TVETs), and Prof. Ntiba, the then PS University Education and Research, and Mr. Jerome Ochieng the PS for ICT and Innovation were also in attendance. Dr. Desai affirmed that Universities and TVETs will work together, identifying KENET as a facilitator in ‘promoting linkages in social, economic and education clusters.’



From 2nd right, KENET Executive Director, Prof. Meoli Kashorda, Education CS Amb. Dr. Amina Mohammed and ICT CS Hon. Joe Mucheru with Heads of Institutions pose for a group photo during the Breakfast Meeting

The Ministries of ICT and Education vowed to support KENET and therefore member institutions in its mission of catalyzing research and education through ICT. CS Mucheru emphasized that education and research stakeholders ‘should use the forum of KENET to build the scopus of technology.’ Amb. Dr. Mohammed also identified Science, Technology and Innovation as ‘crucial drivers for achieving economic growth’.

➤ **Dr. Kevit Desai Commits to work with TVETs during TVETs Forum**

About 60 Principals from Technical Vocational Education and Training Institutions (TVETs) attended a Forum organized by KENET. The Forum held on June 18, 2018 at the Sarova Panafric Hotel in Nairobi was aimed at discussing ways in which the TVET Community can be better strengthened and enlarged. Dr. Kevit Desai, PS State Department who graced the event as the guest of honour identified TVETs as the ‘number one transformer for education’ as well as the ‘biggest and greatest potential enablers towards socio-economic growth’.



Dr. Kevit Desai giving his keynote at the TVET Forum

Dr. Desai also placed emphasis on the importance of innovation in transforming TVETs across the Country, and stressed that high level ICTs (penetration, network and capacity) are the key to achieving this transformation. In addition, the PS identified KENET as an ideal ‘facilitator to the development and transformation of TVETs’ taking into consideration that ‘TVETs are experiencing a growth rate of 30% per term.’ Dr. Desai also vowed that the Ministry will support TVETs and identified 3 agendas focus areas; governance, quality assurance with all bodies, and nexus between SMEs and training.

➤ **KENET Executive Director Presents Case of KENET at a Prestigious Conference**

KENET Executive Director, Prof. Meoli Kashorda made a presentation on the case of KENET at the Terena Networking Conference (TNC) Conference in Trondheim, Norway on June 10-14, 2018. Prof. Kashorda was one of the keynote speakers, and the only keynote speaker from Africa. His presentation, ‘**Building National Research and Education Networks in Eastern and Southern Africa – the case of KENET**’ illustrated how KENET has been able to overcome the obstacles of lack of adequate road/electricity infrastructures, limited penetration of fibre networks, and low network engineering skills to build a high-speed network. KENET milestones in transforming education and research through ICT, even in the remotest of areas was also highlighted. TNC Networking Conference is considered the largest and most prestigious European research networking conference which brings together decision makers, managers, networking and collaboration specialists, and identity and access management experts.

View presentation: <https://tnc18.geant.org/core/presentation/182>



Prof. Meoli Kashorda making his presentation at the TNC18 Conference in Norway

ICT Directors' Forum Discusses Sustainable and Secure Administrative Information Systems

The Annual University ICT Directors' Forum for ICT Directors, Managers and Heads from Universities and University Colleges took place at the Sarova Panafric Hotel on 21 September 2018. A total of 84 participants attended the Forum themed, *'Sustainable, Scalable and Secure University Administrative Information Systems'* with the keynote address by Universities Funding Board (UFB) Chairman, Prof. Kinandu Muragu. This year's Forum explored ICT administrative and management issues that affect the Institutions and conferred the future role for KENET in Universities administrative information systems.



Prof. Kinandu Muragu giving his keynote address at the Forum

The Forum program was packed with various [presentations](#) from Member Institutions and KENET, touching on the state of administrative information systems in Universities, framework agreements for procurement of ICT services and equipment, and cyber security awareness programs. Prof. Muragu, who presented his keynote address on *'University Core Data for Supporting University Funding Decisions'* noted that there is need for 'timely, accurate, real time and historical data' in Institutions ranging from programs, student staff ratios, infrastructure requirements for each program and the research input.

The afternoon breakout sessions enabled the IT managers to tackle 4 key topics in groups and reinforce the Forum theme. The topics covered were, *'Experience with Performance and Cost of Integrated Administrative Information Systems'*, *'Developing Framework Agreements for Joint Procurement of ICT services and Equipment'*, *'Cloud-based administrative Information Systems'* and *'Open Source Community Developed & Supported Administrative Information Systems'*.

Read full article: <https://www.kenet.or.ke/content/ict-directors%E2%80%99-forum-discusses-sustainable-administrative-information-systems>

"What we need is clear scientific information, the basis in which we need to make decisions," Prof. Kinandu stressed. He added that, "When we have IT professionals who preach the language of data, we can have data that we can analyse and process." The UFB Chairman also urged the participants to consider creating an e-university system, a common data dashboard system in which all Universities in the Country can access cloud services to help solve pertinent problems such as enrolment and administrative services.

➤ Research Priority Areas Identified at the Computer Science / Information Systems (CS/IS) Faculty Forum

The KENET Special Interest Group on Computer Science and Information Systems (SIG CSIS) successfully organized the first



Participants at the ICT Faculty Forum

IT Faculty Forum that was held on Friday, November 16 at the Movenpick Hotel and Residences in Westlands, Nairobi. The SIG CSIS is coordinated by Dr. Wanjiku Ng'ang'a, a research associate at KENET and faculty member in the School of Computing and Informatics at the University of Nairobi.

The one-day Forum assembled 93 participants who comprised of Heads of IT departments and early career IT faculty drawn from 42 Kenyan Universities that offer IT degrees in computer science, information systems or informational technology. The main objective of the Forum was for the faculty heads to identify key research priority areas in academic areas of Computer Science and Information Systems (IS). KENET shall support faculty in the research priority areas through travel grants and research mini-grants in 2019.

Read full article: <https://www.kenet.or.ke/content/research-priority-areas-identified-it-faculty-forum>

Capacity Building- Direct Engineering Support (DES) Initiatives

➤ Over Fifteen Institutions Benefit from Direct Engineering Support Services

In 2018, over 15 KENET-member Institutions have benefited from Direct Engineering Support (DES) initiatives. [Kenya Wildlife Service Training Institute \(KWSTI\)](#), [Thika Technical Training Institute](#), [University of Kabanga](#), [Kagumo Technical College](#), [Machakos University](#), [Catholic University of East Africa \(CUEA\)](#), National Commission for Science, Technology and Innovation (NACOSTI), Kisii University, Kisii National Polytechnic, Egerton University, Maseno University, University of Nairobi CAVS, Technical University of Kenya, Kenyatta University and Chuka University are the Institutions which received technical support from KENET engineers to enhance their network. KENET DES's are usually aimed at improving network performance and security, as well as enhance the institution's staff implementation of transformational changes to ICT resources and Infrastructure. Some of the activities usually carried out during the DES include; backbone network infrastructure survey, Bandwidth Monitoring and Optimization, installation of Wi-Fi Access points to increase wireless coverage and offering recommendations on best practices regarding the network.

Thika Technical Training Institute - KENET conducted a DES at Thika TTI after connecting the institute to the KENET network. This was by redesigning the Local Area Network (LAN), segmenting the institute's traffic and installing WiFi access points. After the DES, the Institution recorded an improvement in bandwidth consumption. The institution could now consume bandwidth speeds of over 100 Mbps during off peaks(6pm-6am), four times more than the capacity they were consuming prior to the DES.

The University of Nairobi and Kenyatta University – KENET has

commenced to help Kenyatta University and the Nairobi university to upgrade their core network to 10G links. KENET also donated equipment. The University of Nairobi, College of Agriculture and Veterinary Science (CAVS) also benefited from the DES after a Wi-Fi expansion was done. The campus did not have sufficient WiFi access points to provide wireless access to both the students and university staff. KENET donated 20 Access points to UoN CAVS to increase the WiFi coverage at the campus. The installation of the access points resulted in increased traffic consumption from 100Mb/s to over 300Mb/s.

KMTC Nyamache – In July 2018, KMTC Nyamache was connected to the KENET network. It was noted that the Institution did not have a campus network infrastructure which meant that the users could not consume the bandwidth provided. KENET therefore offered to develop campus infrastructure to KMTC Nyamache. This involved installation of structured cabling and access points in the Lab and the Administration offices. This ensured that the users were finally able to enjoy the KENET services.

Egerton University – The DES involved Wi-Fi expansion at the Institution. Wi-Fi coverage at the University was targeted at mostly the students hence the access points were installed in student areas. During the DES, KENET donated 16 WiFi access points to the installed majorly in these staff locations. The University can now roam within the university without losing connectivity as KENET assisted the Egerton University team in installation and configuration of the access points and enabling of roaming services.

Regional Centre for Mapping Resource for Development (RCMRD)- RCMRD recently joined the KENET community and is connected via a 1Gb/s last mile fiber to the KENET data center. RCMRD subscribes to the EUMETSAT services which require a low latency and reliable connection during data transfer. Currently, RCMRD receives a subset of the EUMETSAT data through the EUMETCast satellite service. However, EUMETSAT connects to the GEANT network in Europe which is a regional Research & education Network. GEANT is a KENET partner and this partnership enables for low-latency and reliable interconnections between NREN member clients. As such, through the KENET network, RCMRD will be able to subscribe to EUMETCast Terrestrial service which is only offered through Research & Education Networks such as KENET. This additional service will allow RCMRD to access a wider data set from EUMETCast and have better simulation and predication scenarios from the larger data sets for their research. KENET also assisted the RCMRD ICT team in optimizing their LAN to ensure seamless connectivity to the resources required.

Feedback from the field:

“The DES has made it easier for students and staff to access Internet across the Campus due to the various access points put in place. We have many ongoing projects across our Campus, and this project

will hasten the ongoing projects since the measures are already in place”- **Mr. Patrick Chirchir, University of Kabianga**

“The training and DES were quite an eye-opener for KWS Training institute in many aspects, but what primarily resonated with us was the Network Optimization which helped identify bottlenecks, obsolete devices and even to some extent network loops within the network. The KWS ICT team is grateful for the help accorded via the DES, collaboration and knowledge shared throughout the week by the KENET engineers.”- **Mr. Anthony Kaloosya, Kenya Wildlife Service Training Institute**

“The network has been working very well and we are quite happy. We always integrate ICT in our learning and host ICT workshops and outreach programs, and good connectivity from KENET has enabled us to achieve this.” -**Mr. Kiboi Mwatha, Kagumo Teachers Training College**

Schools Connectivity Initiative

➤ Schools Connectivity Initiative Paves way for Applied Learning at Alliance Girls

When the [Schools Connectivity Initiative](#) was launched in 2014, Alliance Girls High School was one of the schools that jumped in on the free mass connectivity bandwagon. Before then, numerous Internet Service Providers (ISPs) had presence in the National School but the high cost implications and fluctuating bandwidth were deterrents making the School to seek other options. After experimenting with the one-year School Connectivity Initiative, Alliance Girls High School sought to settle with KENET as its Internet provider four years down line to serve its students and teachers.

Mr. Wanyonyi Waswa Head of Computer Studies and ICT at Alliance Girls High School noted that Alliance Girls High School has gone beyond using the Internet for basic use such as communication, researching for assignments to create solutions. Mr. Waswa cites that robotics is one of the areas that the School has been recently exploring. Using an applied teaching approach, students are given exposure by participating in various competitions to apply their skills in the real world. The Internet has been a key facilitator for their research.



Mr. Wanyonyi Waswa in one of the Computer Labs at the School

“Currently we are emphasizing on Science, Technology, Engineering, Arts and Mathematics (STEAM) and for us to get content which we cannot get in local text books, we have to visit some sites that are teaching about STEAM because the students normally participate in robotics competitions. During the first term this year, we emerged second best at the East Africa First Lego League (FLL) Championship,” he said. “We therefore usually require constant Internet connection to get content to learn more in areas such as robotics and coding,” he said.

The School Connectivity Initiative coordinated the various commercial, educational and government organizations that were interested and willing to provide low-cost Internet access and promote the use of ICT in Kenyan schools. KENET signed a partnership agreement with the Wananchi Group Limited (WGL) and the Nairobi County Government to connect 245 Nairobi County Schools to Internet using the Wananchi home fiber infrastructure. The general objective of SCI is to improve the quality of education by transforming teaching, learning and administration of schools in Kenya by leveraging ICTs. [Read full article: https://www.kenet.or.ke/content/schools-connectivity-initiative-paves-way-applied-learning-alliance-girls-1](https://www.kenet.or.ke/content/schools-connectivity-initiative-paves-way-applied-learning-alliance-girls-1)

Research Services

➤ KENET Travel Grants Awarded Increases in the FY 2018/2019

In the Financial Year (FY) 2018/2019, KENET awarded a total of 14 travel grants. The grants were awarded between July and November 2018. The grantees represented nine (9) various universities across the country and comprised of 10 faculty and 4 graduate students, who attended conferences within Africa and outside the Continent. In bid to increase research visibility and promote awareness, KENET awards up to 15 travel grants per FY to faculty and graduate students in Science, Technology, Engineering and Mathematics (STEM) areas. In the FY 2017/2018, KENET recorded the highest number of travel grants awarded, exceeding the 15-travel grant limit per FY. The grants awarded increased in terms of total amount awarded, scope institutions represented, and number of grantees awarded.

KENET sponsored 3 grantees to attend the International Data Week Conference held in Gaborone, Botswana on 5-8 November 2018. Mr. Obwaya Mogire (SEKU) made his presentation on ‘Open Data Policy Framework Towards Vision 2030 Agenda’. Mr. John Kinyuru (JKUAT) was also sponsored to present a paper, while Irene Kimani co-authored four papers in the session ‘Open data, open science in Agriculture and Nutrition a Case for Developing Countries’. KENET was represented by Management Board member, Janegrace Kinyanjui and Senior Applications Developer, Ronald Osure, who made a presentation on ‘Data Transport for the Long Neck of Research’ at the Conference.



From Left to Right: Janegrace Kinyanjui, John Kinyuru (JKUAT), Ronald Osure and Obwaya Mogire

Another grantee, Mr. Clement Shiluli from [Maseno University](#) was awarded the KENET travel grant to attend the [International Society for Advancement of Cytometry 33rd International Congress](#) in Czech Republic on April 28 to May 2, 2018. He presented his paper on

‘Challenges in Implementation of the AERAS 402 Vaccine Trial in Infants, in an Area without Prior Experience in Western Kenya: A Laboratory Perspective’.

“I express my utmost appreciation to the Kenya Education Network for supporting me through the travel scholarship award to be at the Cyto 2018 Conference in Prague, Czech Republic. I had an opportunity to learn from the best in the field of flow cytometry. I was able to find new networks and collaborations to help me advance my research interests,” said Mr. Shiluli.

KENET continues to support [Special Interest Group](#) academic areas in engineering, computer science/information systems, medicine, agriculture and education in hopes to advance these sectors. The travel grants offer an opportunity for KENET members to acquire exposure and increase visibility of their research and increase the research ecosystem in Kenya.

➤ KENET Awards CS/IS Mini-Grant Winners

Four abstracts were selected for the [KENET Computer Science \(CS\) and Information Systems \(IS\) Mini-Grant](#), an initiative intended to promote early stage CS/IS research and development in current and emerging research areas in Distributed Ledger Technologies (DLTs) and Big Data Analytics (BDA). The grant attracted 35 submissions from 16 public and private Universities when the call was announced on March 26, 2018. The grant amounted to Kshs. 1, 500, 000 (15,000



Participants at the ICIPE Forum

USD) for each winner and lasts for 12 months starting August 1, 2018 to July 31, 2019.

Out of the 20 entries in BDA and 15 in DLTs, two mini-grants were awarded per research area of focus. Early stage research was the focal point of the Mini-Grant so as to enable researchers to undertake proof-of-concept work to support Research and Design (R&D) ideas and concepts. The winners worked in group led by the lead researcher while others had the option of submitting their individual research proposal. The winners represented KENET member institutions; Africa Nazarene University, Murang'a University of Technology, Meru University of Science and Technology, University of Nairobi and Strathmore University.

The topics that were awarded in the areas of DLTs were: *"Distributer Ledger Technologies in Land Registry Transactions, a case for the Kenyan Context* (Dr. Andrew Kahonge) and *Digitize academic certificate using Blockchain to curb fraud: the case of a Local University in Kenya.*" (Dr. Joseph Sevilla).

In BDA, topics awarded were: *Real Time Surveillance of Crop Pests and Diseases Using Deep Learning Techniques* (Prof. Geoffrey Muchiri) and *Development of a framework for Automatic Identification of Hate Speech on Social Media by leveraging sociolinguist features and text-mining techniques* (Dr. Amos Gichamba).

At the end of their research project, the winners are expected to publish their work in reputable journals and grow a community of

researchers. Hence, through this mini-grant, KENET hopes to not only support individual research teams, but to facilitate institutional collaboration and formation of communities of practice in the research areas of focus, leading to enhanced research capacity in member institutions.

Read full article: <https://www.kenet.or.ke/content/kenet-awards-csis-mini-grant-winners>

➤ KENET holds Eight Research Forums in bid to Promote Research Collaborations

In 2018, KENET held eight separate research Forums. The KENET research services team met with researchers from [International Centre of Insect Physiology and Ecology \(ICIPE\)](#), [Kenya Agricultural and Livestock Research Organization \(KALRO\)](#), [Kenya Forestry Research Institute \(KEFRI\)](#), [Kenya Medical Research Institute and Strathmore University](#) to better understand their research infrastructure needs and create awareness of some of [KENET research services](#). The various Forums which took place between April 16 and September 7, 2018 shed light to the researchers on how ICT can aid in their research productivity, visibility and benchmarking.

Consequently, other research Forums were held at Maseno University, Egerton University, Regional Centre for Mapping Resource for Development (RCMRD), and The IGAD Climate Prediction and Applications Centre (ICPAC) in October 2018. In addition to providing basic high-speed Internet as a facilitator for research,



Participants during the half-day KALRO Forum

KENET aims at exposing researchers to advanced [KENET research services](#) through such Forums. The Forums assessed their needs and exposed researchers to KENET research infrastructures that aid in improving research productivity, visibility and benchmarking.

“We need ICT in research and research in ICT,” remarked Dr. Joseph Sevilla, Director of @iLabAfrica and [winner of the CS/IS Mini-Grants](#) for his paper, ‘Digitize academic certificate using Blockchain to curb fraud: the case of a Local University in Kenya’. Dr. Sevilla was speaking while opening the research Forum at Strathmore University.

As research becomes data intensive and collaborative, the need for e-infrastructures increases. High-speed data transfers and petabytes computing are some requirements that researchers need. Taking this into consideration, KENET user-driven research services offer Community Cloud, digital certificates, and High-Performance Computing (HPC) for researchers to collaborate, process and store their data with ease. In addition, the [African Open Science Platform](#) pilot project promotes institutional Open Research Data Policies. KENET has been building some of the critical research infrastructures components required for a federated Open Science Platform as part of the EU-funded [SciGaia Open Science Platform project](#) in preparation of wide adoption of Open Science practices in Kenyan universities and research institutions.

➤ KENET Hosts Open Science Workshop and Hackathon

In bid to promote Open Science, KENET hosted the [Open Science Workshop](#) and [OpenScienceKE Hackathon](#) held on August 10-11,

2018 and August 30-31 respectively. The two-day workshop and two-day hackathon were organized by the Bioinformatics Network led by Caleb Kibet, a [Mozilla Science](#) grantee. KENET hosted the workshop at its [40- seater capacity training room](#), fully equipped with Internet access, video and audio technologies.

Open Science Workshop

The workshop trained 30 participants on tools that foster Open Science. The researchers were drawn from seven institutions and encompassed master’s students in bioinformatics, and a lecturer. The workshop, themed ‘Open Science for Collaborative and Reproducible Research for Bioinformatics’ was aimed at sensitizing bioinformatics researchers on research tools to facilitate open and reproductive science.



Dr. Caleb Kibet addressing participants at the Open Science Workshop
Read full article: <https://www.kenet.or.ke/content/kenet-hosts-open-science-workshop-0>



Participants of the Open Science Hackathon pose for a group photo

OpenScienceKE Hackathon

Hackathons are a great way to explore, collaborate and work toward solving a problem within a defined period of time. The *OpenScienceKE Hackathon* was unique in that the participants were mostly Bioinformatics students and had intermediate level software programming skills. The Hackathon was aimed at fostering solutions around Open Access and Open Data, and was an extension of the [Open Science workshop](#) which took place three weeks prior. The participants applied skills acquired from the workshop to tackle projects developed collaboratively. Every *hack* group had a team leader and five to eight members. They tackled 3 key topics; Status of Open Science in Kenya: Literature Search, Status of Open Science in Kenya: Data Mining and Publishing Open Access at low cost: what are our options?

Following the Hackathon, the participants will collaboratively author a paper to be published in an open access peer-reviewed journal. The findings will also be organized into a report that will contribute to the greater Open Science project to assess the status of Open Science in Kenya.

Read full article: <https://www.kenet.or.ke/content/openscienceke-hackathon-working-towards-open-science-kenya>

Financials

Internet Bandwidth Price Trends

KENET has been continuously exploring and investing in low cost connectivity solutions that has resulted to a reduction in the cost of internet bandwidth distribution. As a result, the unit price of internet bandwidth per megabit has been dropping as shown in *Figure 1*. Member institutions have benefitted from the price reduction through significant allocation of additional internet bandwidth capacity.

The Finance Act assented to law in September 21, 2018 introduced excise duty chargeable on telephone and internet data services at a rate of 15% effective July 1, 2018. KENET does not consider its services to be "Internet Data Services" and is pursuing a private ruling on exemption for excise duty.

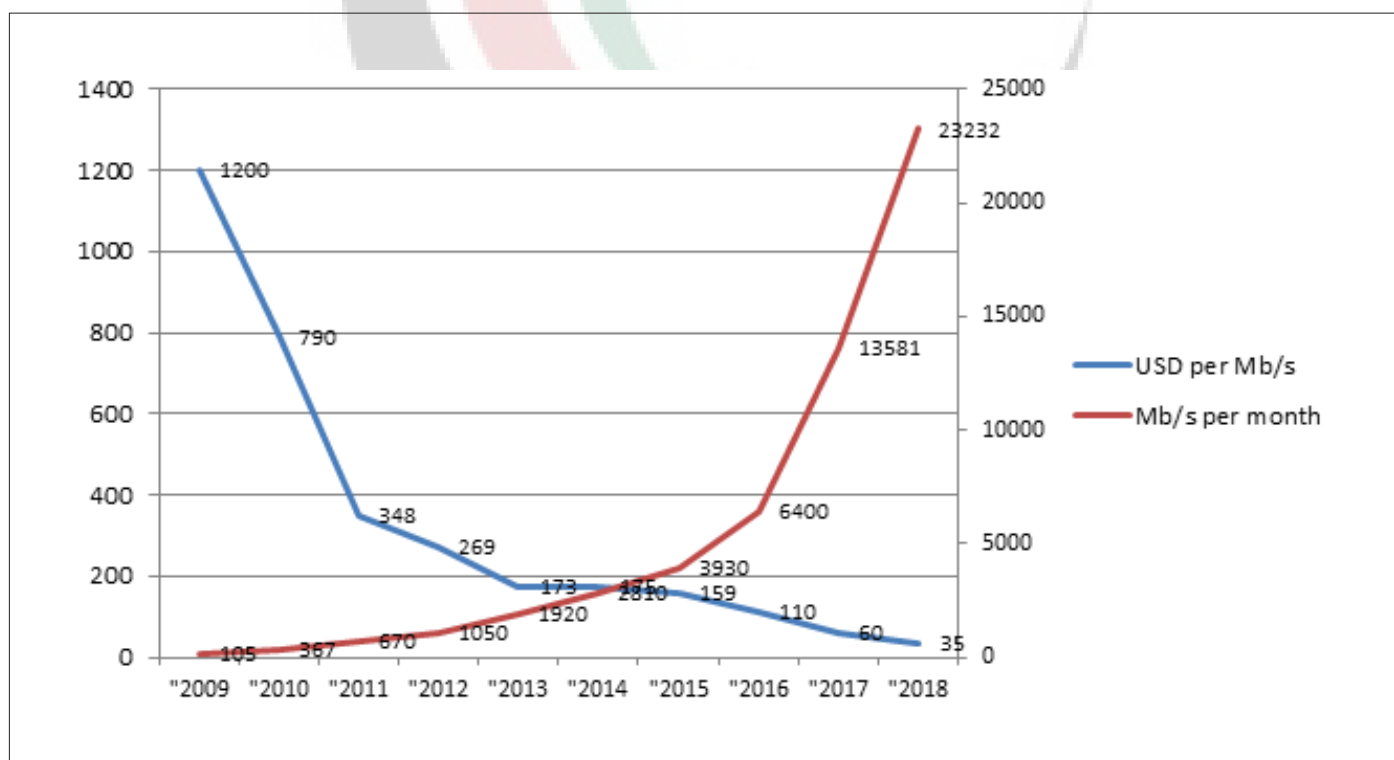


Figure 1: Graph of bandwidth vs distribution capacity over the last ten years



KENET Community Annual Newsletter 2018

