



# Role of KENET as an NREN in Supporting Research Services in HEI.

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At Giraffe Beach Hotel, Dar Es Salaam, TZ.*

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# Agenda

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- About KENET – governance, organization and mission
- KENET as an NREN
- Role of KENET in supporting Research Services in KE,
  - Research repositories
- KENET Research Engagements
- Repository Management Best Practices
- AOB

# KENET Governance and Organization

- KENET was constituted as a **not-for-profit TRUST** in November 2000 by five founder universities.
  - Daystar, JKUAT, Moi, UoN and USIU
- **KENET Trust has 13 Trustees Slots**
  - BoT has 7 VCs, DG of CA, CEO of a research institution, PS TVETs, and 2 Private sector representatives –
  - BoT is supported by a Management Board (13 slots)
- **Membership organization** – Universities, TVETs, medical colleges, teaching hospitals and affiliate institutions.
- **KENET builds and operates the national research & education network** – the research education platform of Kenya.
- **KENET promotes research & education collaboration and partnerships** at national, regional, and global levels.

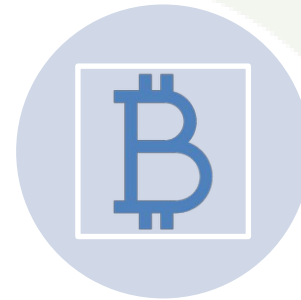
## KENET Membership Categories (Jan 2024)

S. No.	Category	Total No. of Members	No. of Connected Campuses as at Jan 2024
1	Public Universities	70	189
2	Research Institutions	21	67
3	Teaching Hospitals	10	24
4	Medical Colleges	4	85
5	Tertiary Colleges	74	72
6	Teacher Training Colleges	18	13
7	Capacity Building Institutions	7	15
8	Affiliate Institutions	25	31
	<b>Total</b>	<b>229</b>	<b>496</b>

# KENET's Vision, Mission, Motto, Core values



**Vision:** *Be an academic community significantly contributing to the achievement of **high research and innovation productivity** levels of Kenya*



**Mission:** *To enhance digital transformation and inclusion of member institutions.*



**KENET Motto:** *Transforming learning, **research** and working environments using digital technologies*



**Core Values:** *Openness – Diversity – Excellence- and Integrity*

# Role of KENET as a National Research and Education Network (NREN)?

Operator of a dedicated high-speed and resilient national academic network (internet)

- To support educational technology services e.g., support a digital learning platform,
- Promote national and global research collaboration
- Support cloud-based research computing and storage services (or Open Science )

It is a critical national digital infrastructure for the academic and research community of a country, connecting it to the world!

- *Aggregates demand for services thus driving costs down*
- **Community cloud infrastructure provides critical identity and trust services, web hosting, hosting LMS or Disaster Recovery sites**

Operator of critical Identity and Trust services for the academic and research sector

- Holds in trust Internet address blocks issued by global Internet registries for the academic sector
- Issues digital certificates for secure Websites and webportals
- Operates the academic Cybersecurity Emergency Response Team (CERT )

Convenor of academic and research community forums – e.g., *Researchers, principals, ICT directors, librarians, VCs, lecturers, regional partners etc.*

# KENET Services



**Provide dedicated high-speed and resilient national academic internet**

Develop and maintain core and distribution network for academic internet



**Provide community Cloud (Enterprise) Services**

3 data centres for hosting the services



**Provide Research Services**

Build and maintain research infrastructure to support research needs of the community.

Offered for free to members





# KENET Services

- **Provide community Cloud (Enterprise) Services**
  - **Co-location Services** – renting space for physical servers.
  - **Virtualization Services (Infrastructure as a Service):** lease of compute resources and storage on KENET cloud.
  - **Disaster Recovery site hosting services**
  - **Services that can be hosted at the KENET cloud:**
    - Websites - *free*
    - Learning Management Systems eg Moodle, Canvas
    - Library Management Systems eg Koha
    - ERPs/Information management systems/SIMS
    - **Digital Repositories** e.g Dspace
    - Identity Management Systems
    - Primary/Secondary site for critical Institution applications – dns servers etc
    - Research Data archival

# KENET Research Services

- **KENET Research Compute Infra - Virtual lab & GPU Clusters**
- **KENET Trust & Identity services**
  - Eduroam (EDUcation ROAMing)
  - Digital certificates (free SSL Certificates)
  - Identity federation (RAFIKI)
- **Research productivity and benchmarking services – since 2016**
- **Facilitating Special Interest Groups in computing, engineering and applied sciences**
- **Facilitate access to global high-performance computing facilities for KE researchers**
- **Provide Research & Innovation mini-grants & Travel grants**



***All research services are offered for free to researchers, faculty and students of member institutions.***

# KENET Research Infrastructures

1. **Virtual Lab** - <https://vlab.ac.ke> - (compute & storage).
  - Comes with pre-configured virtual appliances e.g R Studio, Jupyter Notebooks etc. Free to researchers
2. **GPU Clusters** – for powerful research computing & data intensive needs
  - Consists of four (4) servers each with: Two (2) NVIDIA A30 GPU cards, HDD – 1.5 TB, RAM – 380GB, VCPUs – 96
  - KENET setup at a cost of KES 18m. Plans to upscale due to high demand
  - June-2024, secured additional grant of EUR 200,000 through UA & EU-funded Africa Connect3 to expand the cluster
3. **Federated authentication** - RAFIKI (the Identity Federation of Research & Education Institutions) (<https://rafiki.ke/>)
  - allow **single sign-on** access to services/resources provided by collaborating institutions outside the institution or federated access
4. **Digital Certificates** – free SSL certs
5. Facilitates access to Center for High Performance Computing (**CHPC**) facilities in SA or EU Grid infrastructure
6. Facilitates access to **HPC services** of partners like **public cloud** (AWS or Azure)

# Open Access/Science Infrastructure

## Connectivity

- **Academic Internet Bandwidth**
- **eduroam** – Free WiFi Roaming
- **Web Collaboration Tools**
- **Off-Campus Connectivity**
- Remote Access (eduVPN)
- **Highly skilled human capacity**

## Cloud/e-Infrastructures

- **Research Computing Resources**
- **Persistent ID Infrastructure**
- **GPU Instances** for AI/ML Researchers
- Research Mini Grants
- Travel Grants for Researchers
- **Highly skilled human capacity**

## Digital Identities

- **Digital Identity Databases**
- Identity Federation (RAFIKI)
- Digital Certificates
- **Highly skilled human capacity**

# KENET Identity and Trust Services

- The KENET Identity federation, called **RAFIKI** (<https://rafiki.ke/>), is trusted by the **global inter-federation** called eduGAIN (see <https://edugain.org>).
- Federation of identities allows access to online resources hosted by other collaborating institutions using credentials assigned by the home institution.
- Member institutions as minimum must setup institutional Identity Provider database to access eduGain resources
- Example – **simplified access to research4life database (single sign-on or SSO)**
  - *KENET is currently piloting with ICIPE, KU and Strathmore on federated or simplified access to Research4Life using institutional single sign-on credentials*

# Supporting Research Collaboration

## eduroam - Free and secure WiFi

- **Free for users** in participating institutions worldwide (in 179 countries)
- **Secure Access** since each user on eduroam WiFi is authenticated
- **Global Roaming** for researchers visiting their peers in other collaborating institutions

## KENET Web Conferencing - <https://conference.ke>

- Supports **virtual meetings for researchers**, educators and students (hosts over 100k virtual meetings/year)
- **Free** for faculty, researchers and staff in the KENET Community

## Travel Grants & Mini Grants

- **Early Career PhD** – Mini Grants of KES 1.5M for multidisciplinary research
- Supporting Special Interest Groups in Material Sciences, Engineering and Computer Science
- Approximately 12 mini grants issued per year to research teams
- **Travel grants** for early career PhD to present papers in indexed conferences

# Role of KENET in development and management of digital repositories

## 1. Infrastructure Support

- Provide high-speed network connectivity crucial for accessing and sharing digital resources
- Maintain secure and reliable infrastructure for data storage and transmission
- Provide cloud computing services for hosting repositories – *7 institutions*

## 2. Technical Expertise

- Offer technical guidance on repository software selection and implementation . *>20 system administrators*
- Provide training and support for institutional repository managers
- Assist in implementing interoperability standards and protocols

## 3. Standards and Interoperability

- Promote adoption of common metadata standards
- Facilitate interoperability between different institutional repositories
- Support implementation of protocols like OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)

# Role of KENET in development and management of digital repositories

## 4. Collaboration and Resource Sharing

- Enable cross-institutional collaboration
- Facilitate resource sharing between member institutions
- Create networks of federated repositories

## 5. Capacity Building

- Organize workshops and training programs
- Share best practices in repository management
- Develop documentation and guidelines

## 6. Services

- Host shared repository platforms
- Provide authentication and authorization services
- Offer preservation and backup solutions
- Support research data management

## 7. Policy Development

- Help develop institutional repository policies
- Promote open access initiatives
- Guide compliance with national and international standards



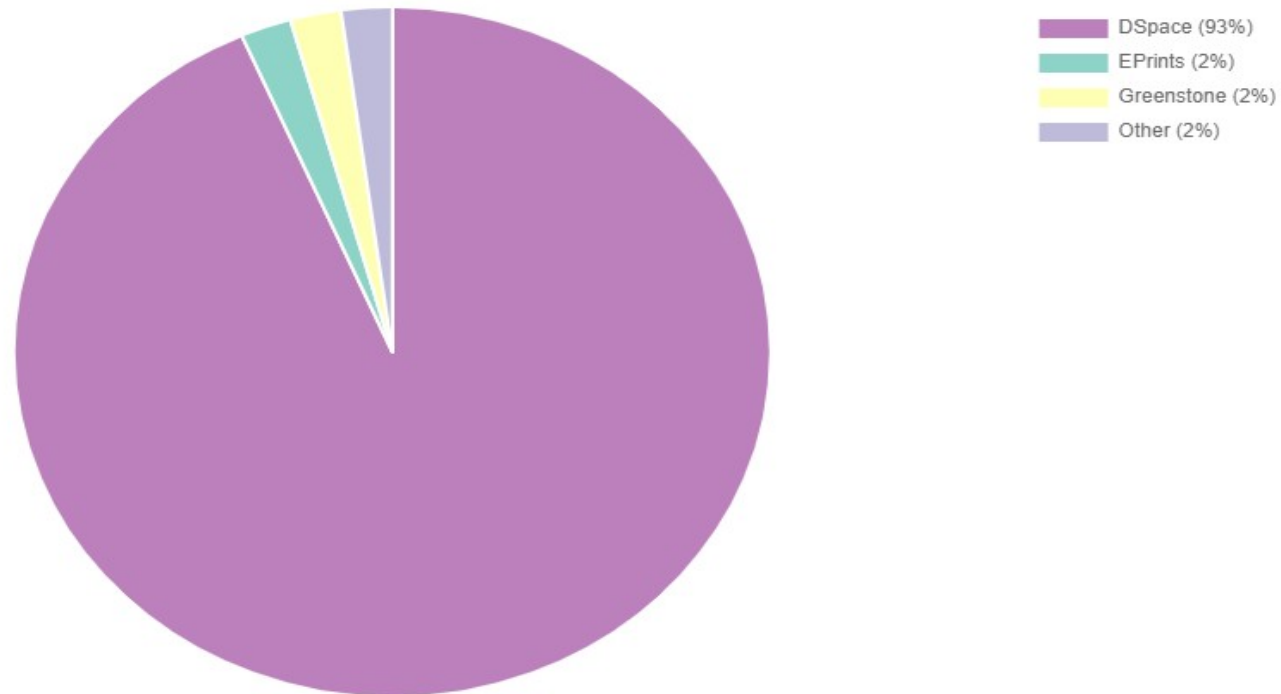
# Digital repositories – KE Use Cases

← → ↻ v2.sherpa.ac.uk/view/repository\_by\_country/Kenya.default.html

Number of items: 46.

An overview of this collection.

## Software Platforms Overview



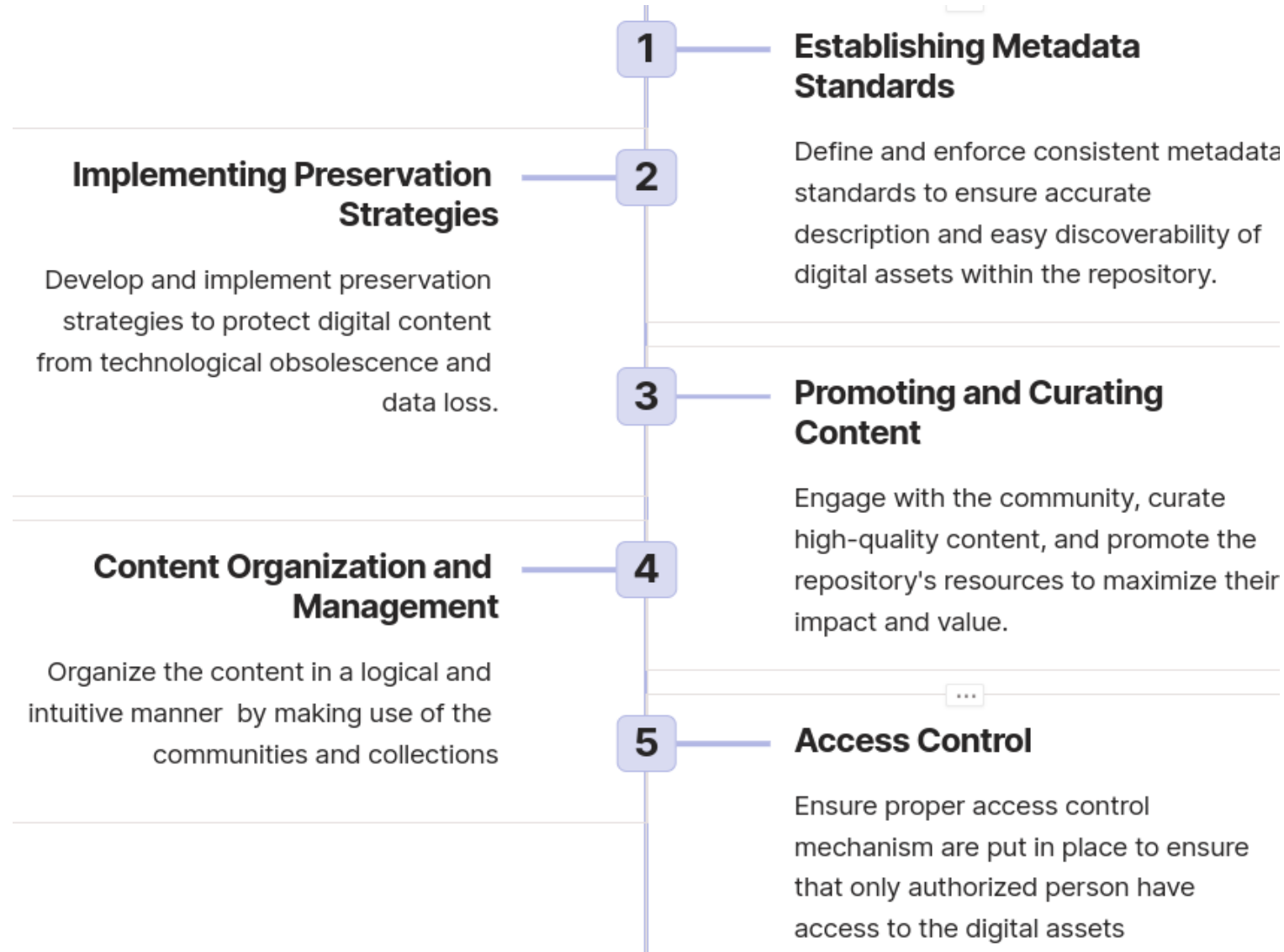
# Digital repositories – KE Use Cases

## Institutions currently supported by KENET

- Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA)
- Kenya Institute of Special Education (KISE)
- Kenya National Library Services (KNLS)
- Maseno University
- National Research Fund (NRF)
- University of Kabianga

[https://v2.sherpa.ac.uk/view/repository\\_by\\_country/](https://v2.sherpa.ac.uk/view/repository_by_country/)

# Repository Management Best Practices





# Thank You

[www.kenet.or.ke](http://www.kenet.or.ke)

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