Towards ensuring NREN sustainability in WACREN

Competitive Edge of NRENs and Financial Sustainability

(fDLuDCf project)
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Overview

- About WACREN
- Developments at country level
- Sustaining WACREN
- Business and Financial Models
- Our NREN sustainability tips
- WACREN Network update
- Available NREN service portfolio

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About WACREN

- Registered in Ghana in 2010 as non-profit
- 1st board set up in 2011
- Minimal activity until CEO assumes office in 2013
- Small role in AfricaConnect 1 - 2014
- Starts implementation of AfricaConnect2 – 2015
- 2nd board instituted - 2015

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Geographical Coverage

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

Current membership

- Currently 12 formally established NRENs
  - RerBenin – Benin
  - FasoREN – Burkina Faso
  - Cameroon – RIC
  - RITER – Côte d'Ivoire
  - GARNET – Ghana
  - GhREN - Ghana
  - MaliREN – Mali
  - Niger-REN – Niger
  - NgREN – Nigeria
  - SLREN – Sierra Leone
  - TchadREN - Chad
  - TogoRER – Togo
- Associate members: RENATER (FR), Eko-Konnect (NG)
- Initiatives in Gabon, Senegal, Liberia

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NREN Development

- Slow, but significant progress in some countries
- Most advanced

Country	NREN	NREN funding model (public/private/mixed)	NREN staff (in FTE)	Number of institutions connected through NREN	Current backbone bandwidth capacity
Benin	Réseau d'Education et de Recherche du Benin (RerBenin)	Mixed (foreseen)	3 (part-time)	4	1.5 Gbps
Burkina Faso	FasoREN	Public	6 (part-time)	0	1 Gbps
Ghana	Ghanaian Academic and Research Network (GARNET)	Mixed	4 (part-time)	10	7 Gbps
Nigeria	Nigerian Research and Education Network (NgREN)	Mixed	18	40	2 Gbps
Togo	Réseau d'Education et de Recherche du Togo (Togo-RER)	Mixed	2 (part-time)	4	1 Gbps

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Sustainability

- What does this mean to us?
    - Ability to finance WACREN from service revenues
    - Progressively reduce dependency on donor funding
- How do we plan to achieve?
    - Long term transparent operational plan with ownership and support from NREN members
    - Build and sustain demand for services
    - Reduce operating costs
    - Involve private sector

Critical Elements

- Low Internet bandwidth prices
  - Low cost campus wireless
- Innovative R&E services
- Well-trained and motivated ICT staff
- Community participation in service development and governance.

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WACREN Business Model

- Skinny Secretariat
- Federate interests of NREN communities
- Capitalize network to reduce operating costs
  - Indefeasible Right of Use - IRU
- Share costs of international connections
- Leverage NREN Capacities
  - Access to submarine communication cables
  - Peering with local commodity networks at Internet Exchanges
  - Research Communities
  - Establish NOCs at NREN Level & Capacity Building for NREN techs to maintain NOCs
  - Local industry relationships

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Financial Model

- Secretariat and Staffing Costs

- Costs of Regional Network

- International Connectivity

- Service Costs

- Capacity Building

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Sustainability Tips for NRENs

- Have a clear REN mission and policies owned by members and accepted by industry.

- Have a representative council of members in addition to the board to sustain collective.

- Drive conversations towards collaboration within the community and with external stakeholders – Government, Telcos, Regulator

- Look for dark fibre or wavelengths – be change agents.

- Do not compete unfairly with the market

- Ultimate goal is to increase demand!

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WACREN Network Update

WACREN Network
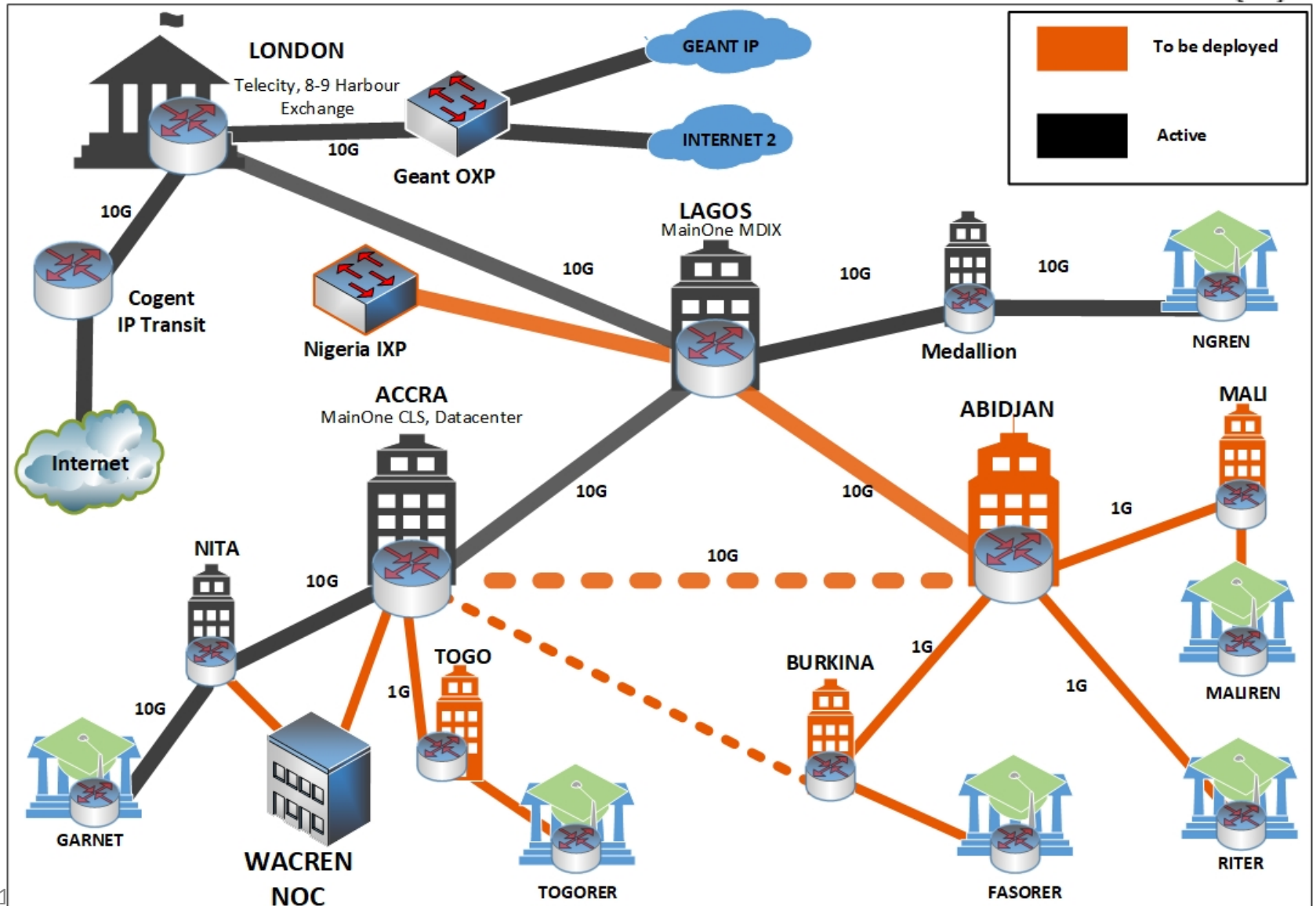
WACREN Network deployment

- **NG-GH-UK Aggregation live**
  - IP transit in London
  - Peering with GEANT IP
  - Peering with NEAAR
  - Peering at IXPN in progress
- **GH edge Live**
  - Services to GARNET [Aug 2018]
- **NG edge Live**
  - Services to NgREN [Dec 2018]
- **TG edge live**
  - Services to TogoRER [June 2019]
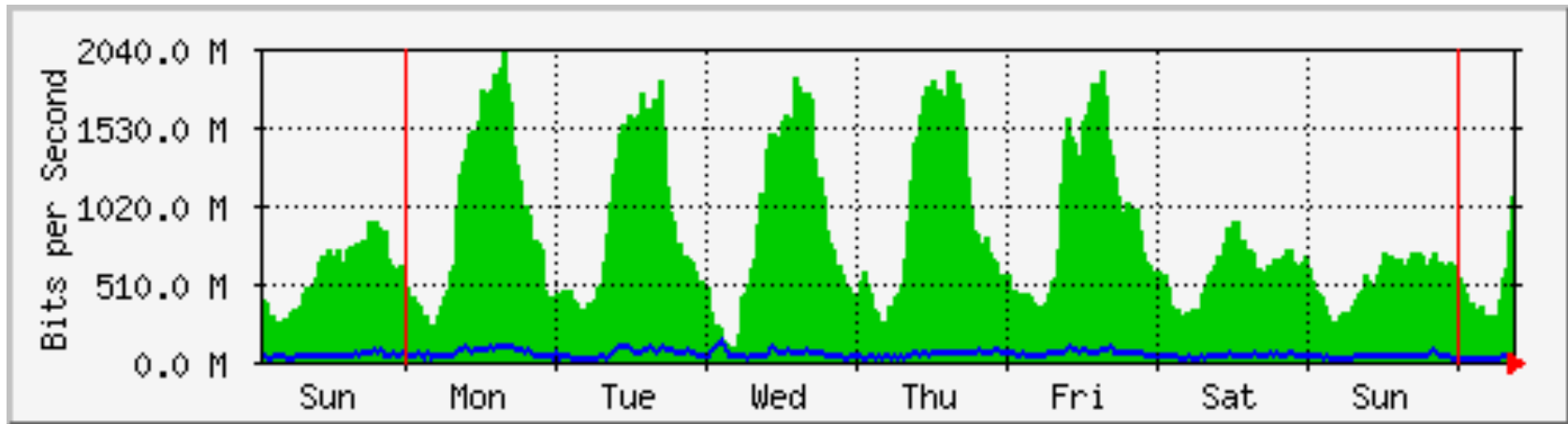- **Preparing for CI and ML-BF** [anticipated in Q4]
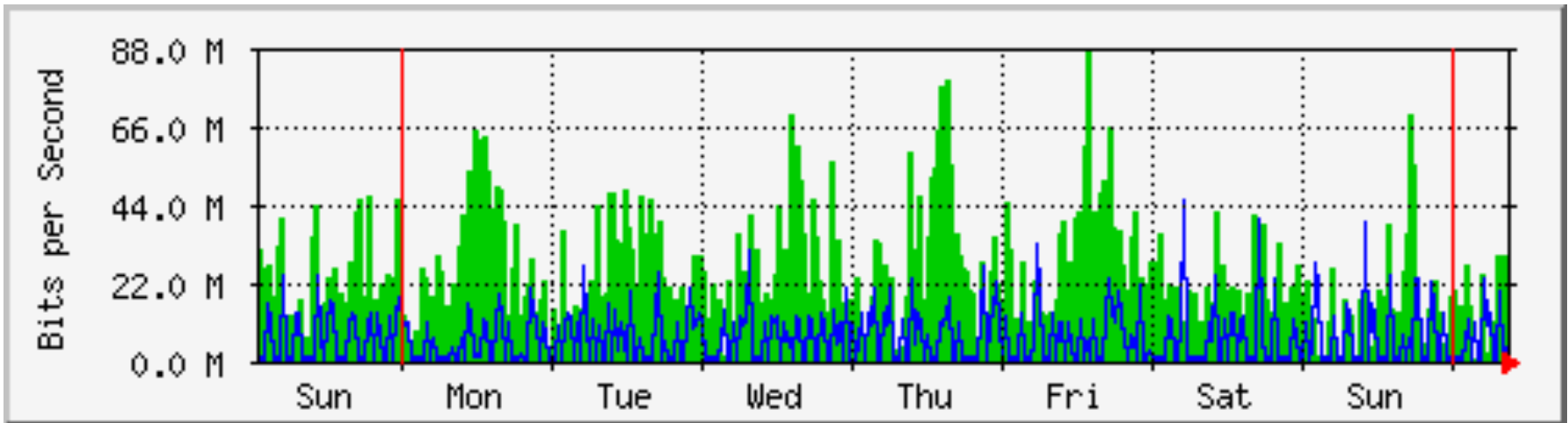
WACREN Network deployment (2)

NOC/SOC:

- **Availability**

- **Stability**

- **Performance**

- **Flow analysis**

- **Documentation**

- **Threat intelligence feeds**
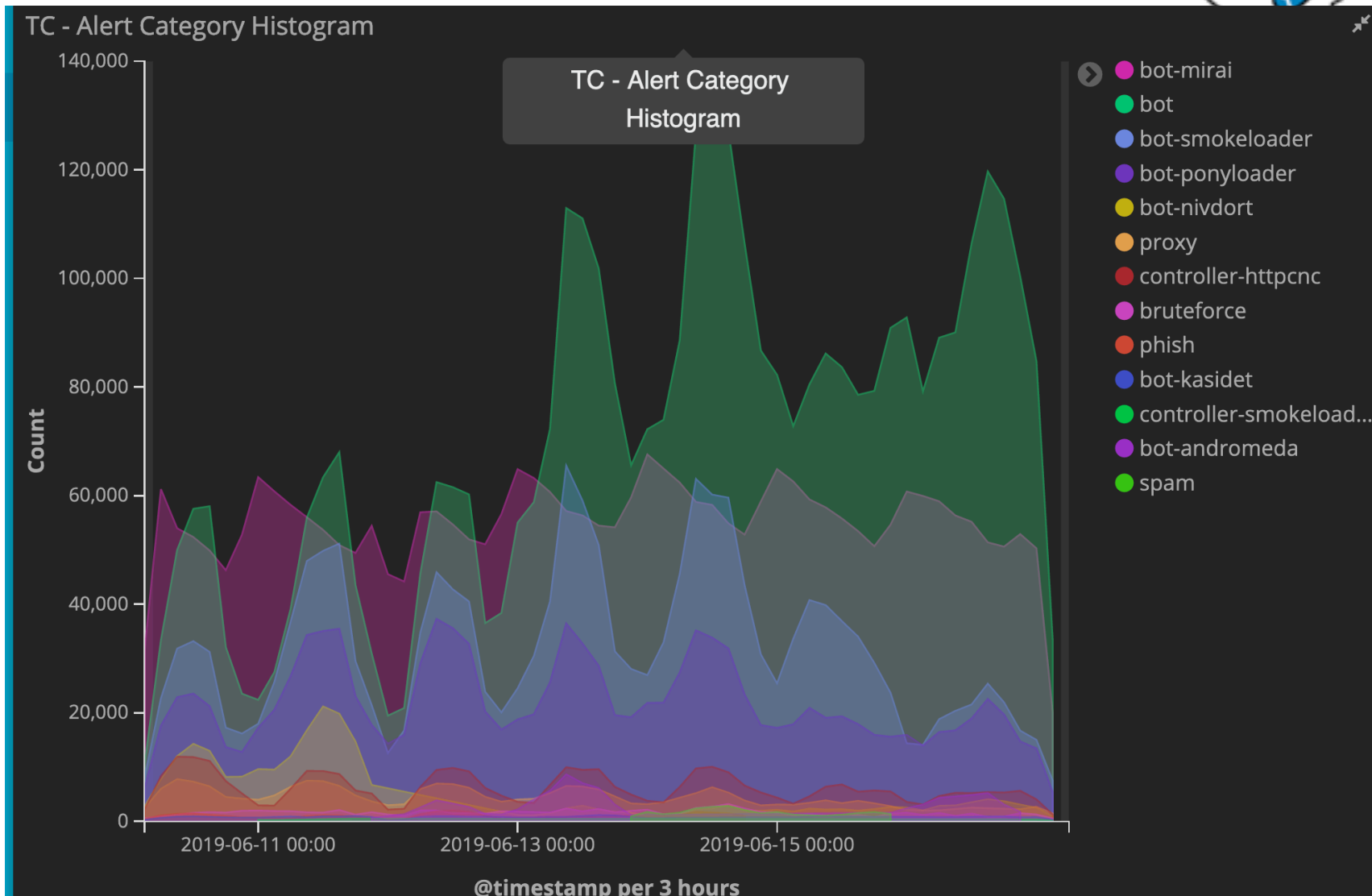
- **DDoS Mitigation**

Traffic characterisation

Aggregated Internet Traffic (GARNET March 2019)

Traffic characterisation(2)

Aggregated Global R&E traffic

Traffic characterisation(3)

Top Alert over Time: last 7 days

Lessons Learnt

- **uRPF**
  - From strict mode to loose mode
  - Traffic source rfc1918 and un-routed blocks
- **IPv6 still not popular**
  - V6 peering not exciting
- **BGP Multihoming still an issue**
  - NRENs to WACREN Networks
  - Campus Networks to NRENs
- **Incident response teams to be built**
  - Alerts can be dealt with

Available NREN service portfolio

Identity and Trust - eduID

- eduID.africa cloud hosted identity provider platform deployed – https://eduid.africa
  - Extended to support Gsuite and o365
  - Updated to support eduroam – Jan 2019
  - Currently 8 pilot institutions
- ATI workshop to onboard institutions in Nigeria held in March 2019 - https://indico.wacren.net/event/80/
- ATI roadshow across region planned
- eduroam confederation continues to grow

Video Conferencing - ZOOM

- Cloud hosted video
    - Authentication in provider cloud
    - Meeting Connectors processing and recording audio and video deployed in Ghana and Nigeria
- Can use commodity components for conferencing rooms
- Deployed as SP in WACREN eduID Federation
- Connectors planned for WACREN PoPs

Security – Collaboration Frameworks

- Developing regional CSIRT trust and support infrastructure
  - Starting with team databases and secure communication platform
- Vital for coordinating actions and collaboration
- Linked with Trusted Introducer, AfricaCERT, FIRST, and JPCERT to maintain trust at global, regional and national level.

TRAINING – Women in WACREN

- **Women-led capacity building initiative**
    - To improve STEM skills through experimentation with robots and electronics
    - 10-week e-learning on Python completed
    - Starts July 1 as prerequisite to F2F workshop later in the year
    - DevOps lifecycle managed on WACREN Gitlab
- **Maker space offered by Covenant University, Nigeria**

TRAINING – All Varsity News Network

- ## Initiative to develop a WACREN communication network

  - Share resources to better inform audiences about the role and potential of NRENs and strengthen partnerships with key stakeholders

  - Document research innovation facilitated by or that could be facilitated by NRENs and improve teaching and learning in communication arts and science fields

  - Build sustainable student media with wider audiences accessible through RENs

- ## Kick-off workshop in Accra in collaboration with US Embassy in June 2019

LIBSENSE – NREN & Libraries

- Survey and workshops run in Ubuntunet Alliance, WACREN and ASREN - https://spaces.wacren.net/display/LIBSENSE

- Terms of Reference developed for REN-Library collaboration

- Collaboration with ORCID to develop workshops and documentation resources in French

- Cloud based repository hosting service in development in collaboration with NII, Japan

Capacity building – Africa Training Initiative

- Iterative social program in partnership with Ubuntunet Alliance and ASREN for framework for capacity building in all areas of REN related skills development
  - Training, input into university programs, student involvement, industry participation and fostering Internet research
  - NRENs at the core as committed local partners for facilitation and ownership
  - knowledge partners in and out of Africa provide global expertise, knowledge transfer and professional.

Capacity Building– Africa Training Initiative

- Current focus
  - Joining eduroam.africa and eduid.africa
  - Campus network development – Enterprise wireless and IPv6
  - TRANSITS I and CSIRT Maturity
- Portal for the program to integrate eduID and WACREN Zoom

Thank You

https://www.wacren.net

https://twitter.com/WACREN

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