

WACREN Update

Building resilient DNS Infrastructure and Introduction to
DNSSEC

Ouagadougou, 10 October 2016

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Outline

- WACREN – History, Membership & NREN readiness
- AfricaConnect2 and WACREN network
- Horizon 2020 and other collaboration activities
- WACREN EduID
- WACREN Cloud

WACREN - Brief history (1)

- May 2006 in Nairobi: AfNOG 2006
 - First thoughts on establishment of a RREN in West and Central Africa
- November 2006 in Accra: Regional workshop on R&E networking
 - Establishment of a group of stakeholders
 - No formal organisation
- November 2009 in Accra: Open Access Conference
 - Setup of a Task Team
- August 2010: Incorporation of WACREN in Ghana (with AAU support)
- March 2011 in Dakar: Retreat on WACREN Strategic Plan
 - Election of Executive Board
- July 2013 in Abuja: First General Assembly
 - Election of non-Executive Board
 - Appointment of CEO

WACREN - Brief history (2)

- March 2014 in Lomé: First annual Conference and Second AGM
- April 2014: Signature of DANTE-WACREN Agreement in the framework of the AfricaConnect Project (EC funding)
- May 2014: Appointment of a Chief Technology Officer (CTO)
- March 2015: Cancellation of Second Annual Conference scheduled to be held in Abuja - due to geopolitical reasons
- June 2015: Official start of the AfricaConnect2 project
 - GEANT and WACREN to jointly manage Cluster 2 of the project
- June 2015: Third AGM held in Tunis during AIS 2015
- February 2016: Appointment of a Senior Network Engineer (SNE)
- March 2016 in Dakar: WACREN 2016
 - Second Annual Conference and Fourth AGM
 - Renewal of the 3-year term of the tenure of the Board

WACREN – Region covered



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

WACREN - Current Membership

- Currently 11 established NREN members
 - RerBenin – Benin
 - RIC – Cameroon
 - RITER - Côte d'Ivoire
 - GabonREN – Gabon
 - GARNET – Ghana
 - MaliREN – Mali
 - Niger-REN – Niger
 - NgREN – Nigeria
 - snRER – Senegal
 - TogoRER – Togo
 - TchadREN - Chad
- Associate members: RENATER (FR), Eko-Konnect (NG)
- Initiatives in Burkina Faso and Sierra Leone
- Contacts with stakeholders in Liberia and The Gambia

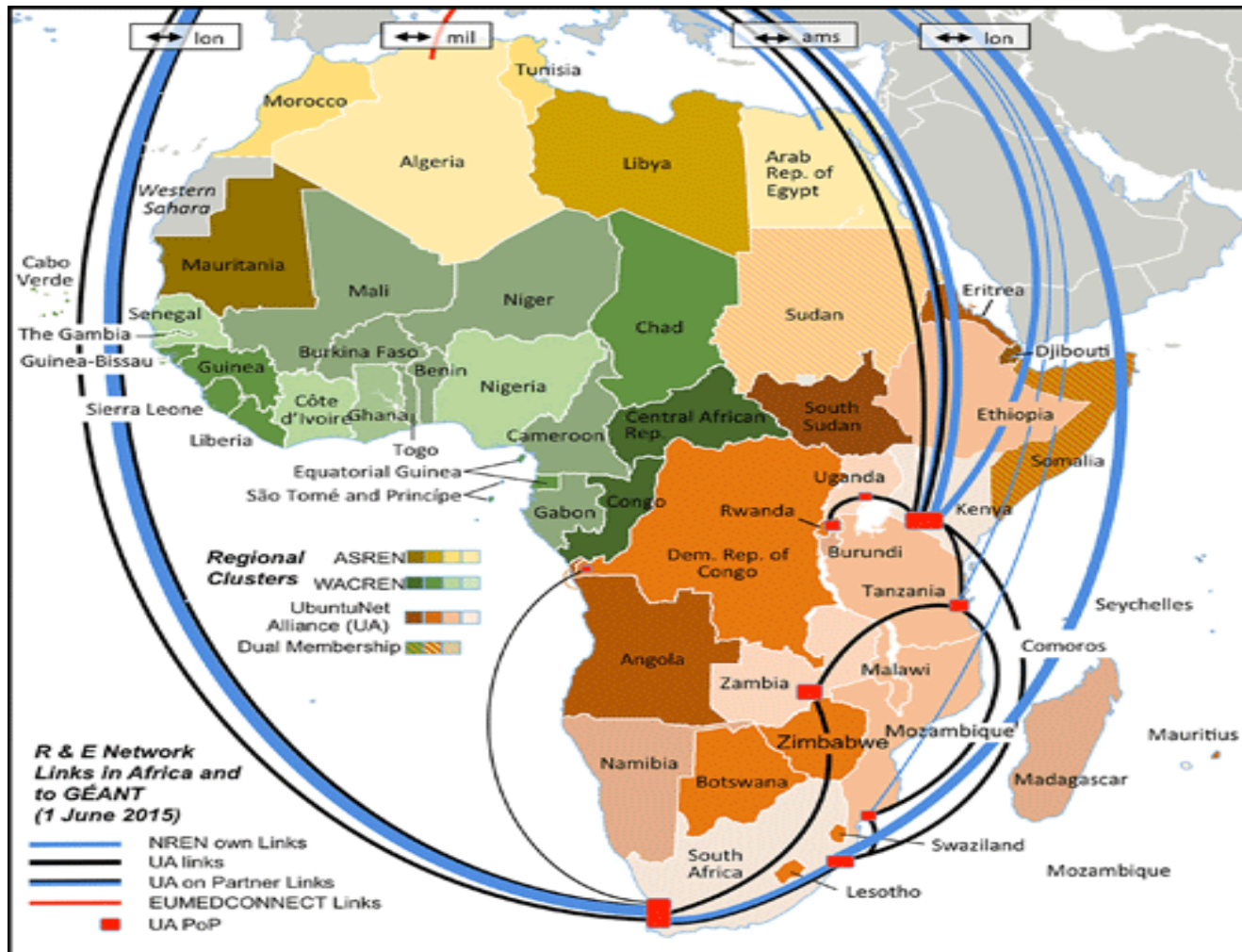
NREN Readiness (1)

- NgREN (Nigeria)
 - Has legal status
 - More than 2 dozens institutions interconnected
- snRER (Senegal)
 - Legal status still pending (currently under Ministry of HE & Research)
 - All public universities interconnected
- RITER (Côte d'Ivoire)
 - Legal status still pending (currently under Ministry of HE & Research)
 - 4 public universities interconnected
- TogoRER (Togo)
 - Has legal status
 - The two public universities interconnected, but no service provided
- GARNET (Ghana)
 - Has legal status
 - Interconnections yet to be established

NREN Readiness (2)

- Niger-REN (Niger)
 - Has legal status
 - Universities and research institutions yet to be interconnected
- RIC (Cameroon)
 - Legal status still pending (currently under Ministry of HE & Research)
 - Some interconnections between public HE institutions
- MaliREN (Mali)
 - Has legal status
 - Universities and research institutions yet to be interconnected
- RerBenin (Benin)
 - Legal status still pending
 - No interconnections so far
- GabonREN (Gabon)
 - Legal status still pending
 - No interconnections so far

NREN Readiness (3)



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AfricaConnect 2

- Main project WACREN is currently involved in
- Second phase of the AfricaConnect Project
- EC Funding (26.6 M€)
- Project started in June 2015
- Project duration: 2015 - 2018
- Objective: Support RENS in Africa and interconnect with GEANT
- Three clusters
 - Cluster 1: UbuntuNet Alliance
 - Cluster 2: WACREN
 - Cluster 3: ASREN
- 80:20% funding scheme
- Budget for Cluster 2: 12.25 M€ (2.5 M€ counter-funding by WACREN)
- Implementation of Cluster 2 component: GEANT and WACREN

AC2 implementation

- Guiding principle: inclusiveness
 - 6 countries expressed - at ministerial level - interest for participation
 - All WACREN members likely to join the project at one stage or the other
- First activities:
 - Capacity building workshop – Abuja, Sept./Oct. 2015
 - AC2 Cluster 2 kick-off meeting – Montpellier, Dec. 2015
 - Retreat on WACREN network design – Gorée, Feb. 2016
 - Second AC2 Cluster 2 meeting (March 2016 in Dakar)
 - Information day for suppliers (March 2016 in Dakar)
 - AC2 Connectivity Dialogue Opened (May 2016)
 - Capacity building workshop - Ouagadougou, October 2016
 - Connectivity Tender Evaluation (October 2016 in Dakar)

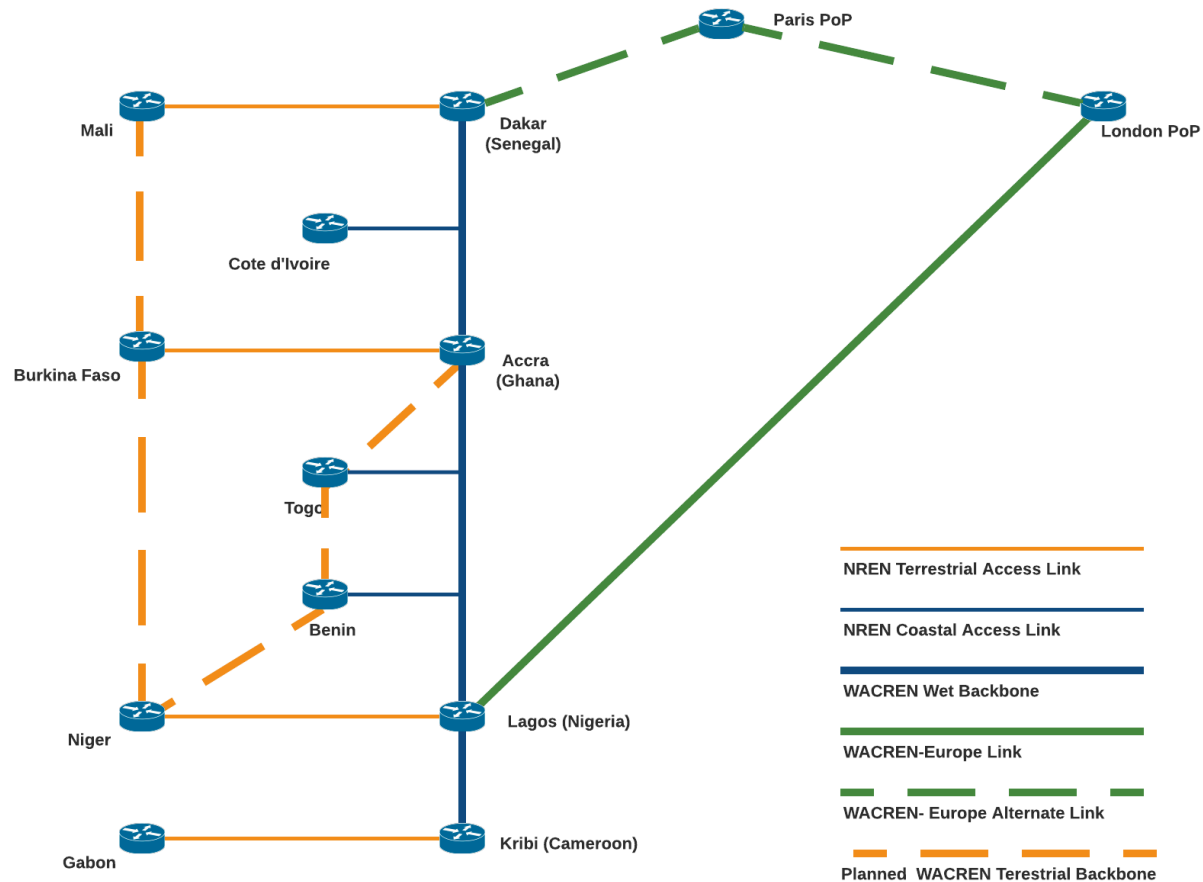
AC2 – How to join?

- Each NREN to contribute for ca. 275,000 €
- Challenges to be addressed in most countries
 - Most NRENS in nascent stage
 - No internal resources yet
 - Need for government support
- But opportunities to secure counter-funding through other sources, e.g.:
 - World Bank projects
 - AfDB
 - UEMOA
- Project is a good opportunity for Burkina R&E community to catalyse rapid development of NREN services.

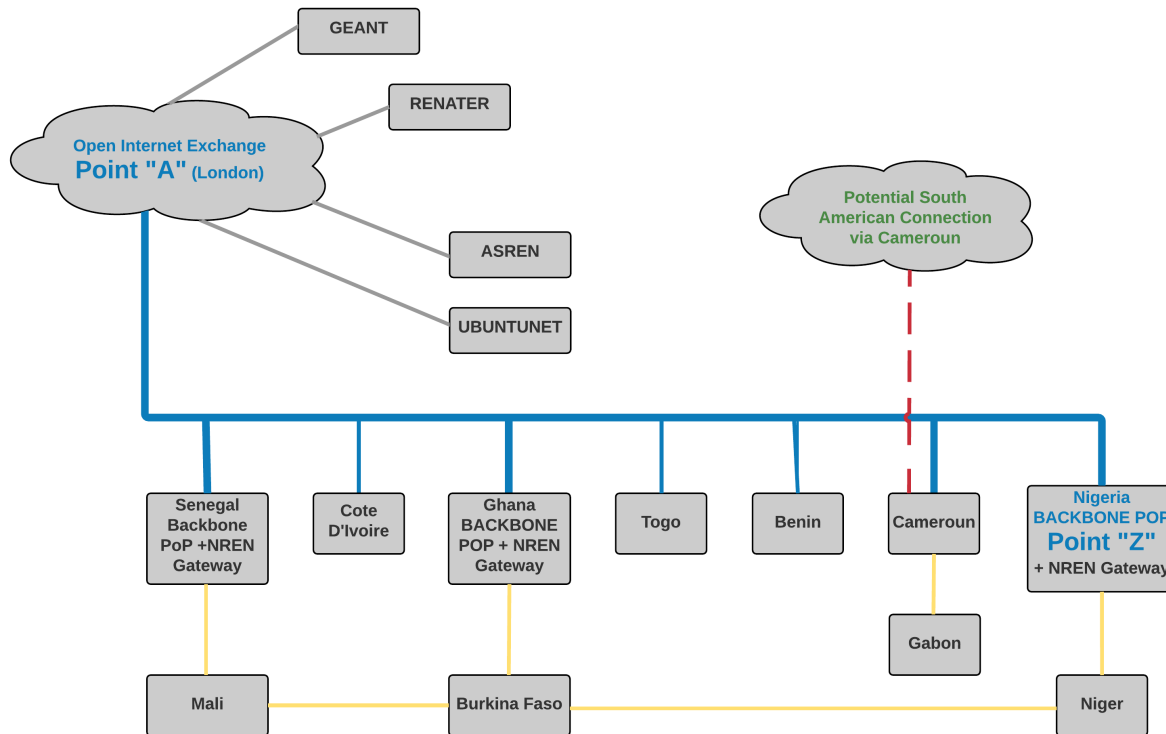
WACREN network topology (1)

- Core + Access
 - 10G+ Core
 - 1G+ Access
- 3-4 main hubs: Cameroon, Côte d'Ivoire, Ghana, Nigeria, Senegal
 - Final decision on hubs dependent on variety of connection options and cost
- Redundant links from hubs to NRENs
- At least 2 intl. links: to London and Paris (GEANT POPs)
- Multiple Submarine Cable Access
- Peering at Open Internet Exchange Points

WACREN network topology (2)



WACREN network topology (3)



10GE Wet Backbone

1GE NREN Access

Terrestrial Link

Submarine link from Point "A" to Point "Z" with option to land in every country of presence

Activities - H2020 Projects (1)

- WACREN is Consortium Member in three (3) projects funded in the framework of European Commission Horizon 2020 Programme
- Projects from May 2015 – April 2017
- **TANDEM** (TransAfrican Network Development)
 - Aimed at creating the favourable conditions for WACREN to benefit maximally from AfricaConnect2
 - To facilitate WACREN integration into the global Research and Education networking community and long-term sustainability
- Ongoing user needs survey
- Project site - <http://www.tandem-wacren.eu/>

Activities - H2020 Projects (2)

- **Sci-GaIA** (Energising Scientific Endeavour through Science Gateways and e-Infrastructures in Africa)
 - Aimed at producing clearly structured guides and educational documents for training NREN representatives, Communities of Practice (CoPs), and, importantly, to get universities to develop Science Gateways and e-Infrastructures in Africa
 - Participation requires federated access
- Project website - <http://www.sci-gaia.eu/>
- **MAGIC** (Middleware for collaborative Apps and Global vRtual Communities)
 - Aims at establishing a set of agreements for participating world regions – Africa
 - Consolidate middleware for a marketplace of services and real-time applications to benefit global science communities
- Project website - <http://magic-project.eu>

Other projects

- PADTICE (completed in December 2015)
 - In collaboration with UNESCO and UEMOA
 - Maybe opportunity in second phase of PAES
- Internet2-WACREN collaboration program
 - Goal: Create sustainable and robust cyberinfrastructure to support collaboration between and US West & Central African Academics and Researchers
 - Workshop in GS in Chicago in May 2016 to update, consolidate on existing collaborations and open up new possibilities
 - Trust and Identity
 - Future Internet – SDN, IoT, etc

- Federation as a Service (FaaS) pilot of infrastructure for authentication and authorization
 - promote the use and adoption of Identity Federations and shared e-Research services
 - Bootstrap establishment of NREN Identity Federations
- Centrally hosted cross-federation components
 - Metadata Management - Resource Registry, eduGAIN
 - Using JAGGER from HEAnet
- Identity Provider (IdP) in the Cloud
- Federation operation, business and policy development workshops
 - Policy development workshops - Localised templates for federation policy and practice statements
 - Ansible training for deployment and configuration management

FedID @ WACREN2016

- Why Identity Management and Federations
 - The Campus Identity System
- Use-Cases and Services
 - Digital Library Content and Licensing
 - Research and Collaborations
 - eduroam, eduGAIN and Social Identity Mapping
- Business Models, Governance and Management
 - Building a business model
 - Policies and Practices
- Global Outreach and Participation

Slides available at
<https://indico.wacren.net/event/21/>



WACREN Cloud



- Cloud Computing and Shared Infrastructure Services
- Based on presence in datacenters across the region
 - MoU signed with Galaxy Backbone and Rack Centre in Nigeria to develop pilot and business plan
 - Discussions in GH, SN and ML
- Evaluating various technology options including a collaboration with GRNET on Synnefo
 - open source cloud stack based on Google Ganeti clusters and compatible with Openstack

Contacting WACREN ...

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THANK YOU

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