



Morocco National Conference on MARWAN Moroccan NREN



Centre National pour la Recherche
Scientifique et Technique

"An Innovation Enabler through
Advanced e-Infrastructures"



This event is co-funded
by the European Union



Palm Plaza Marrakech Hotel
13 - 14 OCTOBER 2022



Yousef Torman, Managing Director, ASREN



Arab States Research and Education Network
المنظمة العربية لشبكات البحث والتعليم

Morocco National Conference



on
MARWAN
Moroccan NREN



Centre National pour la Recherche
Scientifique et Technique

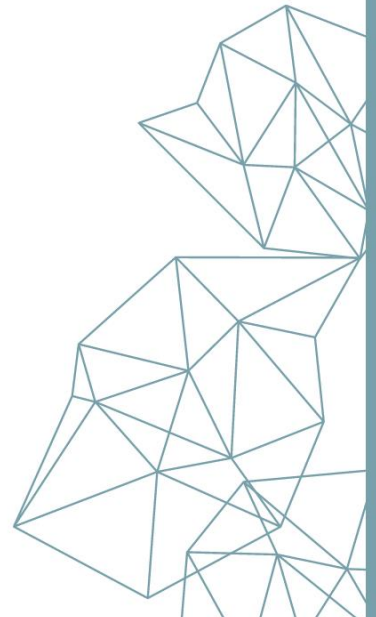
"An Innovation Enabler through
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What are Research & Education Networks?



- Research & Education networks are **non-commercial dedicated** networks connecting the Universities, Schools, Research Centers, Hospitals, Museums and any other institution that may have research and education activities.
- National Research and Education Networks (**NRENs**) are established to provide connectivity and communications services for the research and education communities at the **national level**
- Regional Research and Education Networks (**RRENs**) are connecting the NRENs to provide connectivity and services to researchers and educators across the borders.
- Altogether are considered as the Global Research and Education Network (**GREEN**)



Main Drivers for Research Networks

- **Technological:** Satisfy high demand *eScience* initiatives, **Multimedia Collaboration**, Distributed High Performance Computing (**HPC, GRIDs**) for **Earth Sciences, High Energy Physics** (CERN, LHC...), **Bioinformatics, Computational Chemistry, Radio-astronomy, Engineering Planning** (computations, emulations & simulations), **Cultural** (archiving, collaborative digital access & processing) ...
- **Social:** Common culture of R&E community, Virtual Organizations VOs, collaborative research, tele-education, Smoothing the Digital Divides, affordable high bandwidth linkage to the Global R&E community
- **Economic:** Demand aggregators: University & school staff, students, researchers. Consolidation & control of diverse public expenditures. Promotion of Information Society (e-Government, e-Business, e-Health). Stimulation of technological & telecom markets → Competitiveness



Main Objectives for R & E Networks

- Provide scientific research and education institutions with **reliable means of communication** in order to facilitate ease of cooperation and coordination
- Strengthen the notion of **partnership** and encourage joint scientific research among communities.
- **Minimize cost of research** by using diversified academic and technical resources to be made available for use on the network with no need for duplicating investment.
- The fact that students, teaching staff, and researchers use such dedicated networks would eventually **uplift efficiency and productivity** and would boost the concept of creativity and innovation.

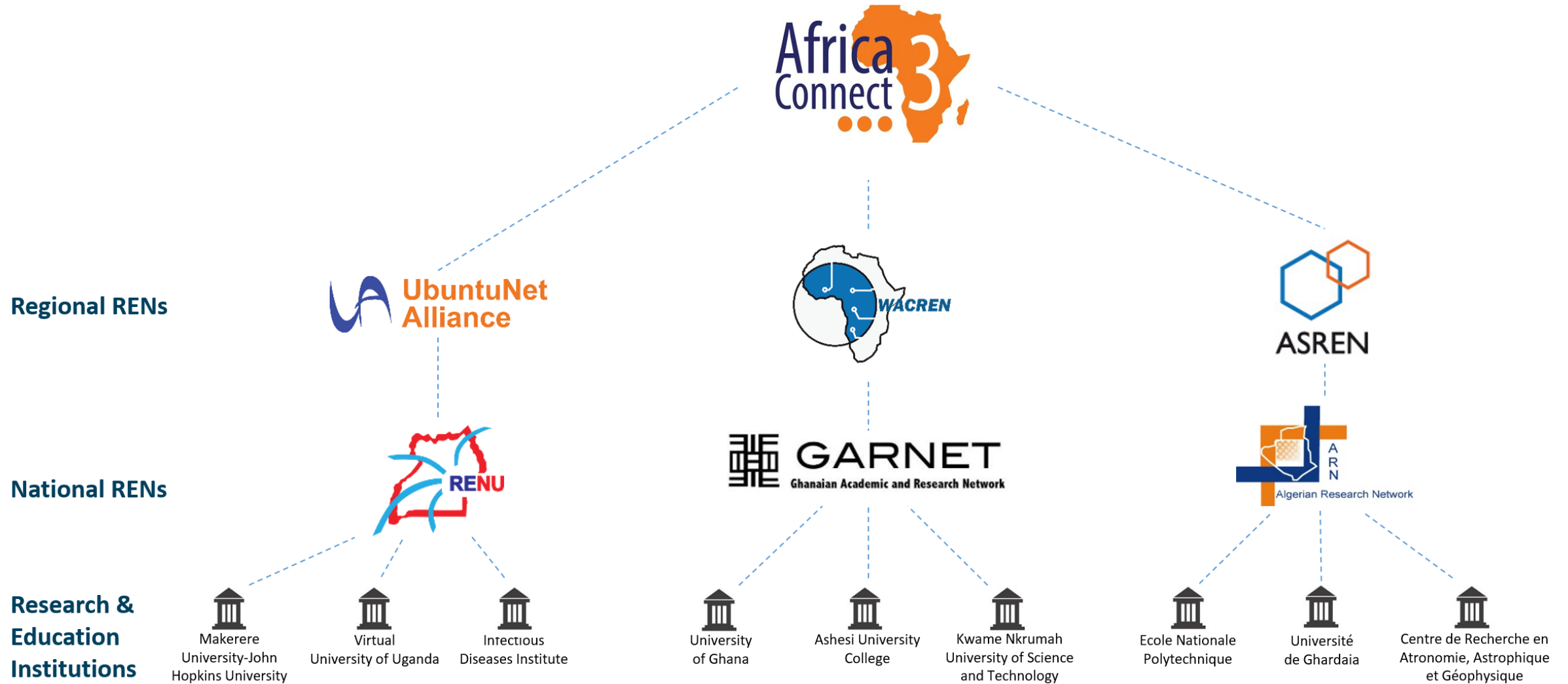


Main Services of NRENs

- Unified connectivity to all research and education institutions to provide country-wide standard communication facilities and capabilities to faculty, researchers, students, and staff, leading to better sharing of resources, information, data, knowledge and expertise.
- Consolidated Internet services, with the NREN acting as an ISP to universities and research institutions.
- Connectivity to regional research networks, providing opportunities for joint research collaboration and online education initiatives.
- Access to content, common repositories, and library resources of all universities with a unified subscription to all journals and periodicals for all Universities and research centers.
- Video conferencing services, media streaming, IP telephony, access federations, and wireless roaming
- Consolidated agreements with software vendors on behalf of all Universities for licensing, with savings reaching up to 50% in some cases.
- Common caching, filtering and anti-spam and anti-virus protection services provided by NRENs to all connected institutions.
- Furthermore, an NREN can be eligible to create and manage a national Internet Exchange depending on the regulations of the Country, and provide domain name registry services and networking consultancy



How Research and Education Networks work?

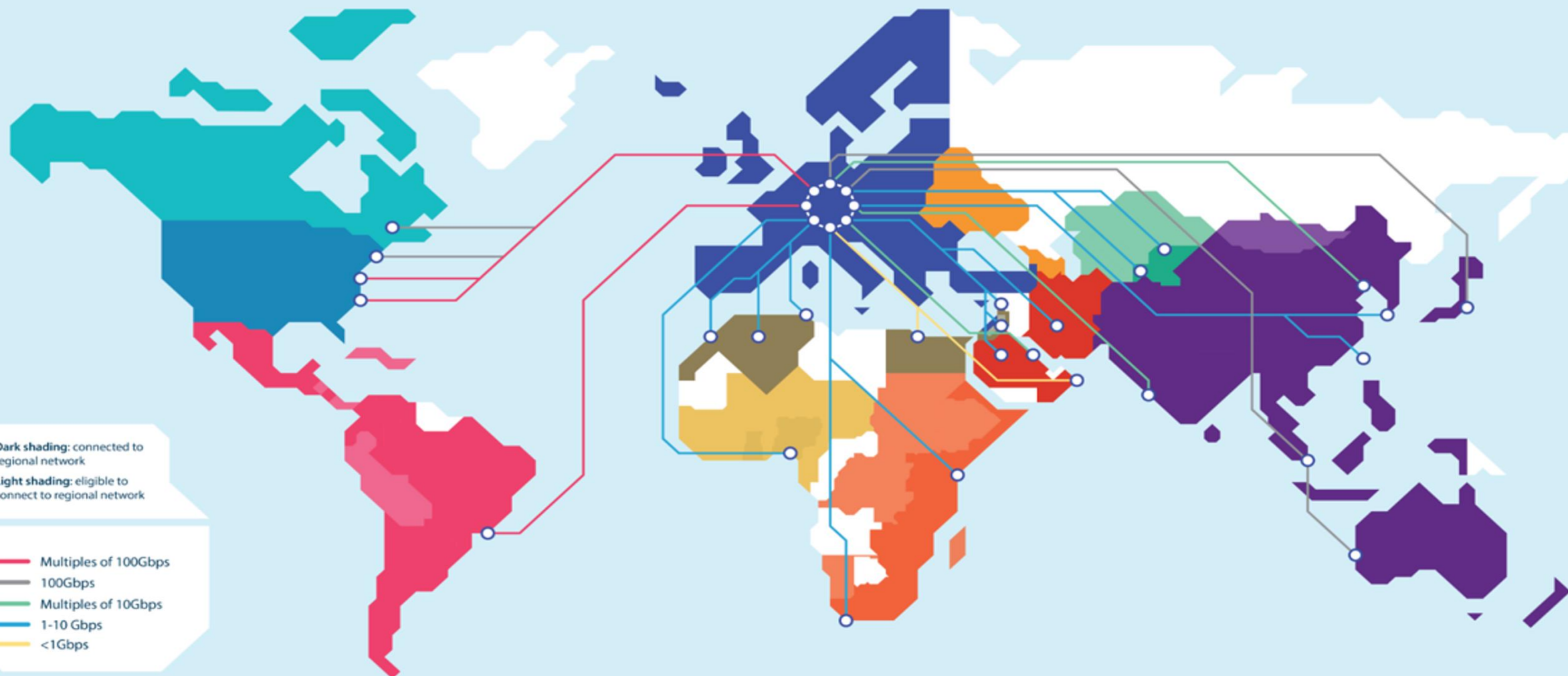




NRENs RRENs Around the World



At the Heart of Global Research and Education Networking



Canada & USA



Latin America



Europe



North Africa & Eastern Mediterranean



West & Central Africa



Eastern & Southern Africa



Central Asia



Asia-Pacific



Other R&E Networks

ASREN



Arab States Research and Education Network (ASREN), is a legal non for profit organization with Arab NRENs as shareholders for promoting world-class Pan-Arab e-Infrastructures and E-services for the R&E communities to boost Scientific Research and regional Cooperation

- **Vision:** Pan-Arab collaborative research and education projects and activities, contribute to boost the scientific research, innovation and education levels in the Arab countries by uplifting efficiency and productivity of research and education communities.
- **Mission:** To implement, manage and extend sustainable Pan-Arab e-Infrastructures dedicated for the Research and Education communities and to boost scientific research and cooperation in member countries through the provision of world-class e-Infrastructures and e-services.

- Launched at LAS in Cairo December 2010, Under the Patronage of LAS S.G. Endorsed by LAS, European Commission, AArU, FASRC and AICTO and more
- Honorary Chaired by HE Secretary general of League of Arab States
- Officially Registered in Germany as non for profit company GmbH

MARWAN & JUnet are the first founders of ASREN

ASREN Objectives



- 1. Build, maintain and consolidate regional e-Infrastructures dedicated to e-Science and education across the Arab countries:**
 - Developing, managing and operating a regional network that interconnects the NRENs of the Arab countries.
 - Promoting harmonization of policies and standards in relevant areas at a regional level.
 - Advocating/lobbying at the regional level amongst decision makers and stakeholders
- 2. Contribute to creating and sustaining NRENS:**
 - Supporting NRENs to implement leading-edge technological solutions while pursuing cost-effectiveness
 - Favouring exchange of expertise and best practices amongst NRENs' personnel in the region
- 3. Facilitate collaboration and cooperation among researchers and academics:**
 - Increasing availability and accessibility to knowledge resources
 - Promoting development of scientific and cultural content in Arabic
 - Facilitating knowledge exchange and transfer processes across the region and worldwide
 - Promoting the adoption and usage of e-Infrastructures and services among the scientific community
 - Strengthening regional partnerships and encouraging joint scientific research



Areas of Intervention

- Dedicated Research and Education Networks at national, regional and global levels
→ Network Management and Monitoring, Network Security, PerfSonar, MANRS. ...
- Research and Education Services
→ Educational roaming → eduroam, Federated Access through eduGAIN
- Science Cooperation
→ UN-SDGs through science, Open Science, Open Access, OER, Open Science Platforms, Science Diplomacy
- Community Engagement
→ Science Communities and Communities of Practice, R&E Communities, Technical Communities
- Scientific Computing
→ HPC, Clouds, Grids
- Internet Access, Security and Governance



ASREN's Region is Evolving



SHERN



TechCARE



Partnering with the World



اتحاد الجامعات العربية

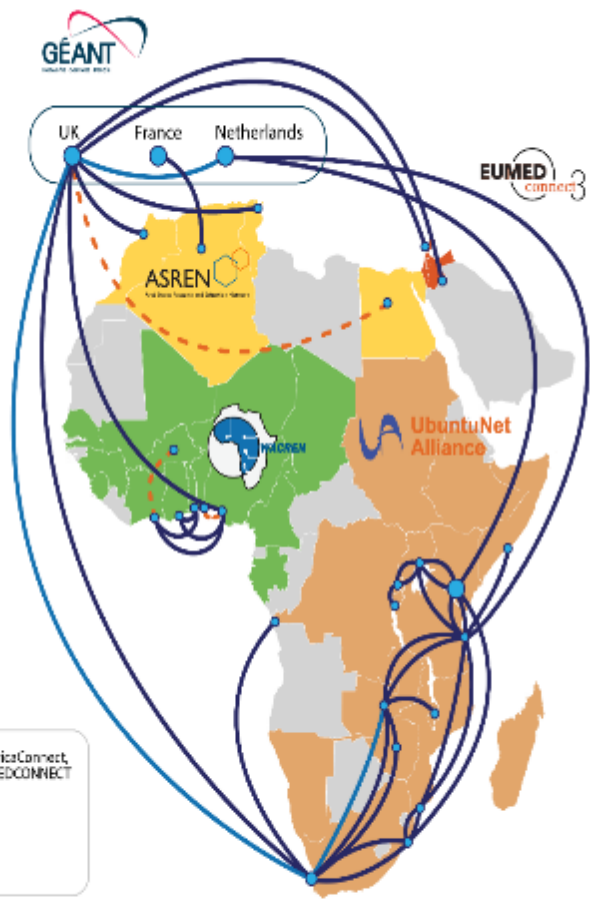


Connecting the Eastern Mediterranean research and education communities



This project is funded
by the European Union





- Start date: 16 November 2019
- Duration: 48 months
- Funds: European Union Grant Contract
Budget: 37.5M EUR (80% EU co-funding)
- Funding for connectivity, equipment and cloud

Africa Connect 3



The AfricaConnect3 project receives funding from the European Union under Grant Contracts DCI-PANAF/2019/411-583/584/585/586



4 Contracts, 4 Clusters

Donor : Directorate-General International Cooperation and Development (DG INTPA).

Procurement, overall coordination and support

GÉANT
Cluster 0

Cluster 1 Eastern and Southern Africa UbuntuNet Alliance

Cluster 2 Western and Central Africa WACREN

Cluster 3 North Africa ASREN

Managing Regional Networks, expanding the provision of services, capacity building, engaging with end users, raise awareness of the role of digital transformation for education and research.

Cluster 1 Eastern and Southern Africa UbuntuNet Alliance

Cluster 2 Western and Central Africa WACREN

Cluster 3 North Africa ASREN

16 Member NRENS

13 Member NRENS
2 ongoing initiatives

4 Member NRENS

What do we aim to achieve?

- There overall objective of the AfricaConnect 3 project is to enhance human capital development within the continent
- The specific objective is to increase the use of digital technologies by African education and research institutions
- The expected results (outputs) for each of the three geographical clusters of the action are the following:

Output 1:
Access of tertiary education and research institutions to affordable and adequate e-infrastructures is improved

Output 2:
Dedicated services and applications are developed for the benefit of research and education communities

Output 3:
Adequate human resource capacity and expertise is built within the research and education communities

Output 4:
Awareness of the role of digital transformation of research and education is raised

AfricaConnect 3 Activities and Work Packages

- **WP 1 – Expand and Upgrade Research and Education Network and e-Infrastructures**
 - WP 1.1 Maintenance and Management of Regional Network
 - WP 1.2 Expansion and Upgrade of Connectivity for NRENs
 - WP 1.3 **Cloud-based e-Infrastructure for African Open Science**
- **WP 2 - Development of R&E Services and Applications**
 - WP 2.1 Service Outreach and Deployment Support
 - WP 2.2 **Trust and Identity Services, eduroam....**
 - WP 2.3 Proactive Cybersecurity for NRENs and their Digital Assets
 - WP 2.4 **Federated Identity Management for Libraries**

AfricaConnect 3 Activities and Work Packages

- **WP 3 – Research and Education Networks Capacity Building**
 - WP 3.1 Governance and Systems Review of UA, WACREN and ASREN
 - WP 3.2 Sustainability Plan
 - WP 3.3 Sharing of Best Practices between NRENs
 - WP 3.4 **Capacity Building under the Africa Training Initiative**
 - WP 3.5 **Women Empowerment in the African NREN community**

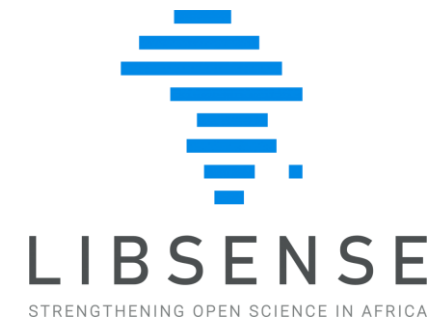
AfricaConnect 3 Activities and Work Packages

- **WP 4 - Advocacy for the role of digital tools in the transformation of Education and Research**
 - WP 4.1 Advocacy and Donor Engagement
 - WP 4.2 REN and User Engagement Conferences
 - WP 4.3 Engagement with User Communities
 - WP 4.4 Project Visibility and Dissemination



Developing R&E Services

- Service outreach to science communities, deployment of R&E applications and access to repositories
- Trust and Identity for seamless access
- Proactive Cybersecurity for NRENs and their Digital Assets
- Federated Identity Management for Libraries

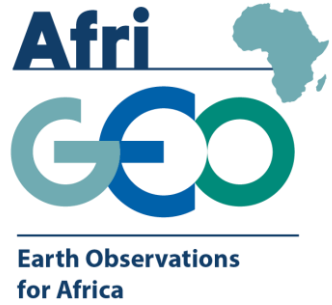


AfricaConnect3 Enables Science Cooperation

1. **Providing connectivity between research and education communities**
2. **Providing mobility services, namely: eduroam, eduGAIN, eduVPN**
3. **Providing clouds infrastructures and services**
4. **Supporting Open Science through the LIBSENSE project**
5. **Engagement with research and education communities**
 - **AfriGEO → African Group on Earth Observation**
 - **GMES and Africa → Global Monitoring and Environment Security**
 - **AERAP → African European Radio Astronomy Partnership**
 - **DEA → Digital Earth Africa**
 - **ASFAP → African Strategy fo Fundamental and Applied Physics**
 - **AfLS → African Light Source Community**
 - **Identifying communities on Climate Actions**

Science Communities

ASREN



GMES AND AFRICA



UA Slide

CGIAR Centers



Brainstorming AfricaConnect4?

Observations, Global Trends, Priorities

Climate Actions... Health Care ... Internet Governance...

- UN SDGs → Science, Research, Education, Community Engagement
- Science and Science Diplomacy
- Open Science, Open Access, Open Data....
- Science Communities and Communities of Practice
- Scientific Computing
- Science Collaboration Platforms
- Internet Access, Security and Governance

This is a call for a new role/engagement of NRENs



NRENs are making the case: re-thinking the work and values of research and education networks

For around thirty years, Yousef Torman has been working in ICT at highly reputable institutions in the higher education and scientific research sector. The focus of his work has always been to make use of technology for the development and enhancement of the lives of people in his community and beyond through better use of new technologies in education and scientific research.



Africa
Connect 3

I believe that NRENs now have the opportunity to make use of this recognition and the desperate national and regional needs for robust and reliable infrastructures and services. This is why I keep saying that "NRENs are making the case", and they are!

In one of your presentations, you say that African NRENs will become "more than just a network." What do you mean by that and how can they grow beyond their typical role?

I believe that NRENs have to move beyond the sole role of connectivity providers, by seeking to habitually identify and deploy new demand-led value-added services, keeping up with the constantly changing needs of the stakeholders and strengthening the overall case of NRENs from within. Furthermore, NRENs need to evolve to stand the test of time, remain relevant, be able to adapt to global trends and respond to unforeseen national, regional, and global challenges. NRENs can be owner, facilitator, enabler, operator, Post, and secretariat. For example, NRENs can be the host and operator of a national harvesting infrastructure for the institutional open data repositories. NRENs can also host/lead the deployment of R&E cloud infrastructures and the adoption of national/regional "Open Science Cloud Services".

Digital infrastructure has proven to be crucial to support research activities and science cooperation. How are African NRENs positioning themselves in this field in order to meet their communities' needs and keep up with the evolving trends?

In addition to dedicated connectivity, NRENs and RRENs provide advanced services that enable and facilitate collaboration and include applications, tools, and access mechanisms to the R&E communities. NRENs and RRENs are key elements in adopting "Open Science" and "Open Access" to support science and science cooperation.

RRENs and NRENs should take the lead and the responsibility associated with the new role related to "Science Collaboration" through collaborating with national, regional, and global initiatives in this regard. ASREN is taking the responsibility as enabler for science cooperation and strongly promoting "Science Cooperation" through engagement with (1) science communities to promote joint science activities, (2) policy and decision makers to encourage developing and adopting policies on science cooperation at national, regional, and global communities and (3) availing technological infrastructures with tools and services to facilitate this cooperation. Also, ASREN featured at the Science Summit of the United Nations General Assembly 76 with a focus on Arab Science Cooperation and will be the convener of the Arab Science Summit of the United Nations General Assembly 77 in September 2022. Recently, the three RRENs ASREN, GÉANT, and RedCLARA have started cooperating on supporting Climate Actions and Earth Observation forming a "Cooperation Triangle for Climate Action" between Africa, Europe, and Latin America.

African NRENs contribute to the United Nations Sustainable Development Goals (UN SDGs), particularly in the fields of education, gender equality, economic growth, innovation, and global partnerships for sustainable development. What impact do you think UN SDGs have on the strategic planning and branding of African NRENs as full-time innovative and leading actors in the R&E communities?

I agree that NRENs in Africa and around the world are contributing directly and indirectly towards achieving the UN SDGs, especially by supporting science and science cooperation. As achieving the UN SDGs is a global

priority, I consider them as an excellent opportunity for NRENs to bring the attention of policymakers and decision makers to further support them in terms of funding and resourcing to achieve these objectives.

In this context, what do you think is the role of regional projects, like AfricaConnect3, in supporting the work of national networks for their end-users?

Since 2011, the EU co-funded AfricaConnect project has had a very positive impact on the evolution of the African NRENs, at both levels of expansion and upgrade of connectivity for NRENs and deployment of R&E services and applications. Currently in its third phase, AfricaConnect3 (AC3) includes substantial activities that focus on engagement with science communities, supporting open science, clouds, and community services, all of which contributes greatly to the benefit of end-users from universities, research centres, public libraries, and teaching hospitals. Furthermore, through the AC3 project activities ASREN is engaging successfully with science communities in Africa, namely AfriGEO (The African Group on Earth Observations), GMES and Africa (Global Monitoring for Environment and Security), AERAP (The Africa-Europe Science Collaboration and Innovation Platform), ASFAP (The African Strategy for Fundamental and Applied Physics), DE Africa (Digital Earth Africa), and A/Ls (The African Light Source).

For more information about the impact of African NRENs, visit <https://africconnect3.net/>

Yousef, you have been representing ASREN and the AfricaConnect3 project Partners in several scientific international conferences in the past months, advocating that we should move beyond "making the case for NRENs" and rather start thinking that "NRENs are making the case". Why do you think that now is the time to re-think the work and values of R&E networks?

Throughout the years, NRENs have been struggling with many challenges making their own case towards their stakeholders, funders, and users. This has led to the joint efforts between

national and regional RRENs to establish the "Case for NRENs" portal which provides arguments to address stakeholders to support the creation of NRENs. Global efforts have also launched the "In the Field Stories" blog supporting the case for NRENs through featuring success stories from around the world empowered by these networks.

Today, many stakeholders and decision makers have recognised the necessity of NRENs as development enablers. For instance, NRENs were explicitly mentioned at the UNESCO's Recommendation on Open Science, emphasising their role. The European Commission has always supported NRENs, in addition to the World Bank and other national, regional, and global bodies around the world. The outbreak of the COVID-19 pandemic has also offered the opportunity for NRENs to position themselves as critical for the member institutions to keep learning going and to cope with the pandemic.

He worked as a Director of the Computer Centre at Jordan University of Science and Technology, then he contributed to establishing the Jordanian Universities Network, the official National Research and Education Network of Jordan, and worked as an Executive Director there. Since 2011, Yousef has been the Managing Director of the Arab States Research and Education Network (ASREN), which works on establishing Pan-Arab e-Infrastructures dedicated to research and education (R&E).

Muscat Declaration

MUSCAT DECLARATION 2021

ON SUPPORTING THE DEVELOPMENT OF NATIONAL AND REGIONAL RESEARCH AND EDUCATION INFRASTRUCTURES

In memory of
Dr. Abdulmonem Al-Kharusi
OMREN Director
2014-2021

ASREN

Arab States Research and Education Network
المشبكة العربية لشبكات البحث والتعليم

OMREN

البنية التحتية لشبكات البحث والتعليم
OMAN RESEARCH AND EDUCATION NETWORK

The Declaration

The main objective of this declaration is a call for action to recognize and foster the role of NRENS across the Arab region and to advocate as follows:

- The necessity and urgency for developing an NREN in the countries that currently are without. This should be associated with governance and sustainability plans and actions.
- Supporting existing NRENS in the Arab countries by providing them with the required capacities, capabilities and funding following successful NRENS models in some Arab countries.
- The necessity and urgency for supporting the development of a regional Pan-Arab Research and Education Network to facilitate R&E collaborations across Arab countries and beyond by endorsing the ongoing mission of the Arab States Research and Education Network.
- NRENS in the Gulf region are called upon to join forces among each other and with ASREN for optimized national/international Internet capacity deployment, for creating an Arab-wide sharing and learning community and for ensuring participation in discussions and activities of the global R&E networking community.

What are NRENS and what can they offer?

NRENS provide dedicated support to research and education institutions they serve. Through bulk-purchasing NRENS provide their member institution with cost-effective connectivity to each other in the country and access to international connectivity. NRENS also provide a set of value-added collaboration-enhancing services that include seamless roaming service, access federation, videoconferencing, security tools, capacity building and knowledge sharing.

Whilst NRENS are embedded in a national context, collaboration at regional and global level is key. Strong regions, strong regional organizations (such as ASREN), strong regional backbones, catalyzed by the cooperation of the NRENS in that region, and interconnecting them to the global R&E network infrastructure are key ingredients of a sustainable NREN model.

Call for development of research, ed networks in Arab countries

MUSCATE (Oman Research and Education Network (OMREN)) of the Ministry of Higher Education, Research and Innovation (MoHERI) in collaboration with the Arab States Research and Education Network (ASREN), have announced a call for action to recognize and foster the role of National Research and Education Networks (NRENs) across the Arab region during their annual conference. The call of action focused on addressing the official authorities in the Arab countries, including ministries concerned and stakeholders, in addition to joint Arab action initiatives led by the Arab League to work on developing and improving the infrastructure for research and education at the national and regional



As part of the importance of this call of action, Dr Saif al-Hadhari, Under-Secretary for Research and Innovation at MoHERI, said, "We are proud of OMREN's achievements and what it has provided for

the development of research and education in the Sultanate and beyond. This confirms how the Sultanate recognises

"the importance of supporting and developing the infrastructure for research and education, enhancing its capabilities and providing it with the necessary resources. We call on all the Arab countries to work on developing their infrastructure. We are pleased to share the experience of Oman with those who wish to benefit from"

During the conference, the Ministry and ASREN recalled the role of the late Dr Abdulmonem Al-Kharusi, Director of OMREN (OMA 2013), with his significant contribution to OMREN and to the Arab NRENS as well. — OINA

المؤتمر السنوي لـ «أومرن» يدعو إلى دعم وتطوير شبكات البحث والتعليم في الدول العربية



د. لائل أبو غزالة

لندعو إلى إنشاء مجتمع متخصص على المستوى العربي

إيماناً من هذا المؤتمر الذي يهدف إلى دعم وتطوير شبكات البحث والتعليم في الدول العربية، فإننا ندعو إلى إنشاء مجتمع متخصص على المستوى العربي، يهدف إلى دعم وتطوير شبكات البحث والتعليم في الدول العربية، وذلك من خلال تبادل الخبرات والتعاون في مجال البحث والتعليم. إننا نأمل أن تكون هذه الخطوة الأولى نحو تحقيق أهدافنا المشتركة في تطوير البنية التحتية لشبكات البحث والتعليم في المنطقة العربية.

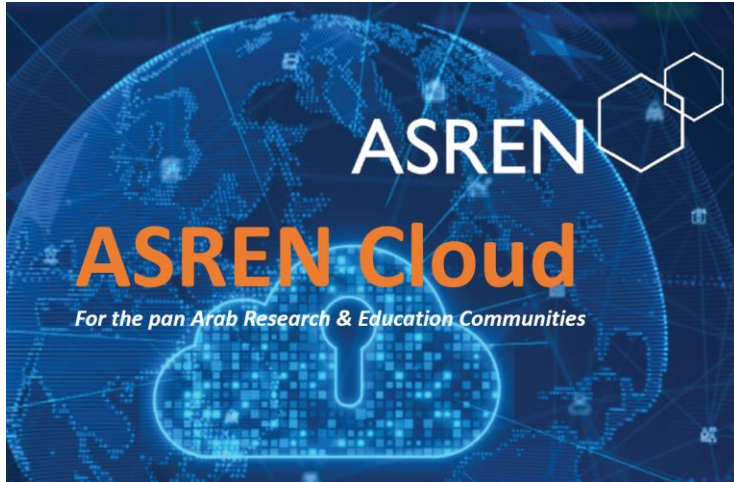


د. سيف الهادي

نعتز بإنجازات شبكات البحث العلمي والتعليم في السلطنة وخارجها

في ظل التطور التكنولوجي المتسارع، فإننا نعتز بإنجازات شبكات البحث والتعليم في السلطنة وخارجها، وذلك من خلال تبادل الخبرات والتعاون في مجال البحث والتعليم. إننا نأمل أن تكون هذه الخطوة الأولى نحو تحقيق أهدافنا المشتركة في تطوير البنية التحتية لشبكات البحث والتعليم في المنطقة العربية.

Cloud Debate (Planstorming)







How are African NRENs contributing to the UN Sustainable Development Goals?

Join the hands-on, face to face workshop alongside **UbuntuNet CONNECT 2022**
Gaborone, Botswana | November 24-25



ASREN efforts to Support Open Science

- LIBSENSE Initiative: Workshops & Activities
- Collaboration with DataCite & ORCID
- Arab Harvesting Infrastructure → Collaboration with LA Referencia
- Collaboration with UNESCO
- Collaboration with EOSC
- Collaboration with AArU
- The Arab Science Cooperation to achieve UN SDGs - UNGA76



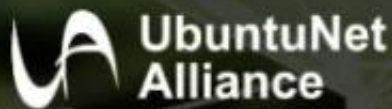


A Panel Discussion on Digital Infrastructures to enable Science Cooperation in Africa

21 September 2022 | Virtual



Science Summit at **UNGA77**
13-30 September 2022



ASREN 

Arab Science Cooperation Summit at the Science Summit at UNGA77

22 September 2022 | Virtual



ARAB SCIENCE
COOPERATION SUMMIT

SUSTAINABLE DEVELOPMENT GOALS



Science Summit at UNGA77
13-30 September 2022

Katowice Declaration

Increased Collaboration to support Earth Observation efforts



Katowice Declaration

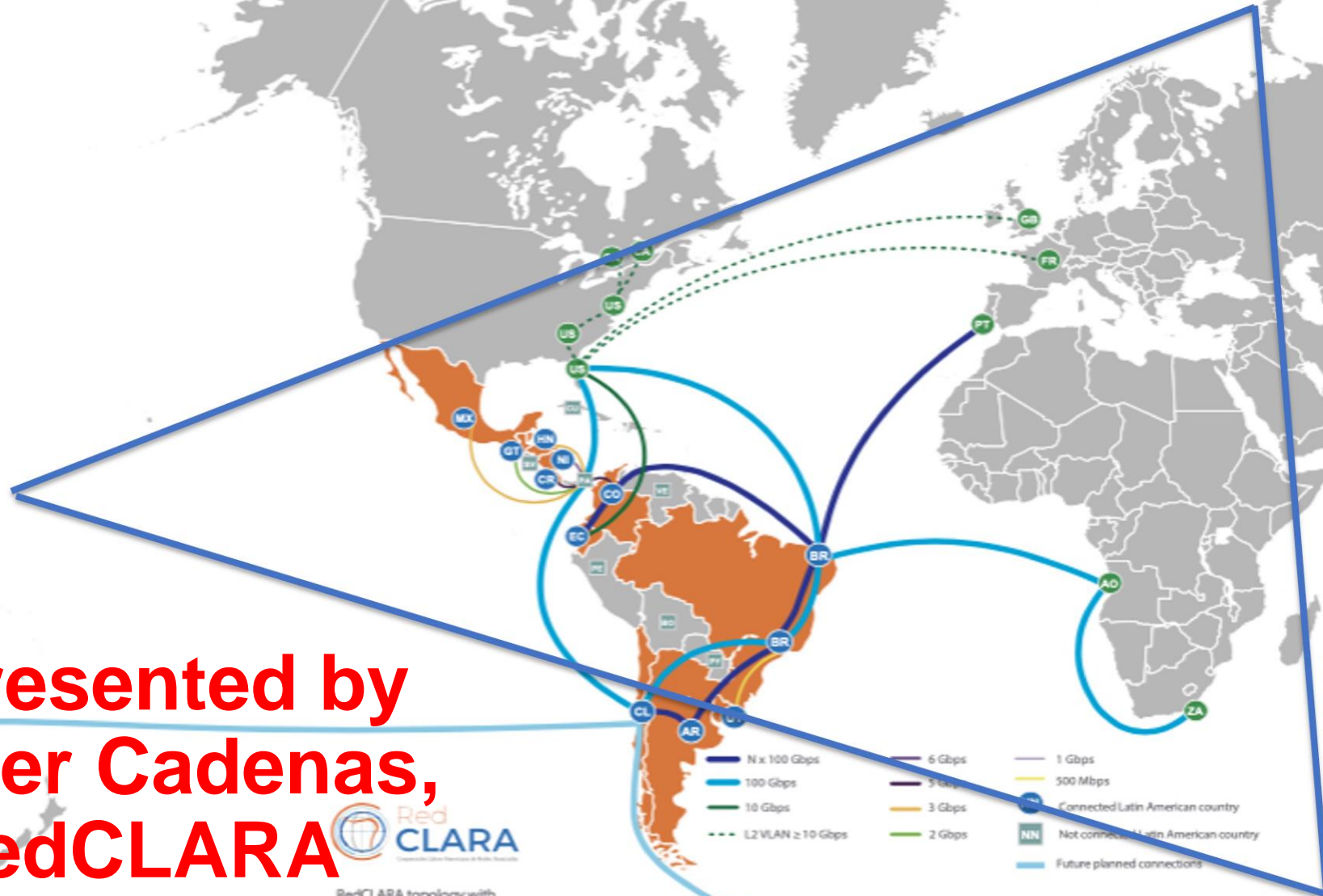


- A rapid and fluid exchange of data, information and knowledge among researchers worldwide is an important facilitator of scientific progress.
- It is noted that technical challenges exist regarding the synchronisation of platforms that support GEO- data transfer within and between continents, which requires further work to resolve. This includes the need to increase technical capacity.
- Human capacity building within and between NRENs and RENs on this subject should be supported.
- The Parties recognise the need for increased engagement with end-user communities that produce and digest GEO-data. It is recognised that a proportion of GEO-data end-user communities are unaware of the technology that can be provided by NRENs and RENs for their research and education needs.
- Open access policies need to be formed and adopted in line with the UNESCO Recommendation on Open Science.
- The Parties recognise the diversity of research priorities for end-researcher communities. This requires a better effort from RENs and NRENs to understand research priorities for each continent and identify areas of overlap in order for more effective collaboration.
- RENs and NRENs have a role to increase digital literacy where this subject allows, especially when increasing the level of digital literacy for women active in the GEO ecosystem.
- RENs and NRENs should also be involved in governance efforts in areas where GEO communities are also active. Cooperation between RENs has already begun in this area.
- A global research and education network (GREN) is something that would greatly enable both the technical and human capacity building noted in points II. and III.
- Enhancing the effectiveness of research along the GEO 'chain' will be essential in order to fully exploit the value of geospatial data. This can be done by regularly upgrading infrastructure and technology to meet the present-day requirements of end-user communities.
- RENs and NRENs provide the mechanisms that enable the realisation of many of the United Nations' Sustainable Development Goals. Collaboration with GEO-communities will be a vital example (and potential metric) to measure REN and NREN contributions here.
- REN and NRENs should baseline where they already are regarding the Sustainable Development Goals. This includes the need to understand the level of open science usage in different world regions.

[Katowice Declaration - Collaboration to support international Group on Earth Observation \(GEO\) efforts - 10 June 2022 \(geant.org\)](https://geant.org)



A cooperation triangle for climate action



**A Slide Presented by
Luis Eliécer Cadenas,
CEO of RedCLARA**



RedCLARA topology with operational BELLA submarine cable and future connections

ASREN to start its Regional Harvesting Services



- **LA Referencia** and ASREN worked together in a pilot experience using **LA Referencia** software platform:
 - harvesting and validating samples of Arabic repositories
 - knowledge sharing and technical meetings
 - evaluating the software as an alternative for building services
- The pilot was very successful, and both learned a lot in the process.



→ **Deployment agreement signed in June during TNC22**



RedCLARA
Cooperación Latino Americana de Redes Avanzadas



LA Referencia
Red de repositorios de acceso abierto a la ciencia

Discussing the future of connectivity



- **DG NEAR**
- **DG INTPA**
- **EIB**
- **UfM**
- **AFR-IX**
- **GEANT**
- **ASREN**



ASREN's Team at the conference



- Yousef Torman
- Raed Al Zoubi
- Eriko Porto
- Yasmeen Al-Kouz

Please see us for further discussion



e-AGE22

Cairo, Egypt | 13 - 15 December 2022

Science Cooperation - Taking NRENs Further

ASREN



Thank you

Any questions?

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rg



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