



***“Research and Education Infrastructures  
in the Arab region”***

***MENOG17***

***Muscat, Oman***

***19 April 2016***

*Yousef Torman,  
Co-Managing Director, ASREN,  
[torman@asrenorg.net](mailto:torman@asrenorg.net)*

# e-AGE 2014

Intercontinental Connectivity of the Pan Arab Network

10-11 December, 2014

Muscat, Oman



14 Arab NREN  
representatives



**MENOG 11**

- Agenda
- Workshops
- Presentations
- Call for Presentations
- Meeting Plan
- Attendee List
- Meeting Venue
- Travel Information

## MENOG 11



### **MENOG 11 took place from 30 September until 9 October 2012, in Amman, Jordan**

**There were 95 attendees from 18 different countries.**

MENOG meetings offer network engineers and other technical staff the opportunity to share their experiences and knowledge, and identify areas for regional cooperation.

**Program:**

- Workshops : 30 September – 4 October
- MENOG 11/RIPE NCC Regional Meeting : 7-8 October
- Tutorials : 9 October

Registration for the Tutorials and Conference are free-of-charge and open to all interested parties.

Search for:

**Meeting Host**



**Platinum Sponsor**



**Gold Sponsor**



***ASREN hosted MENOG 11 in Amman, September 2012***

# What are Research & Education Networks?

- Research and education networks are **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.

# 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

# Major 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.

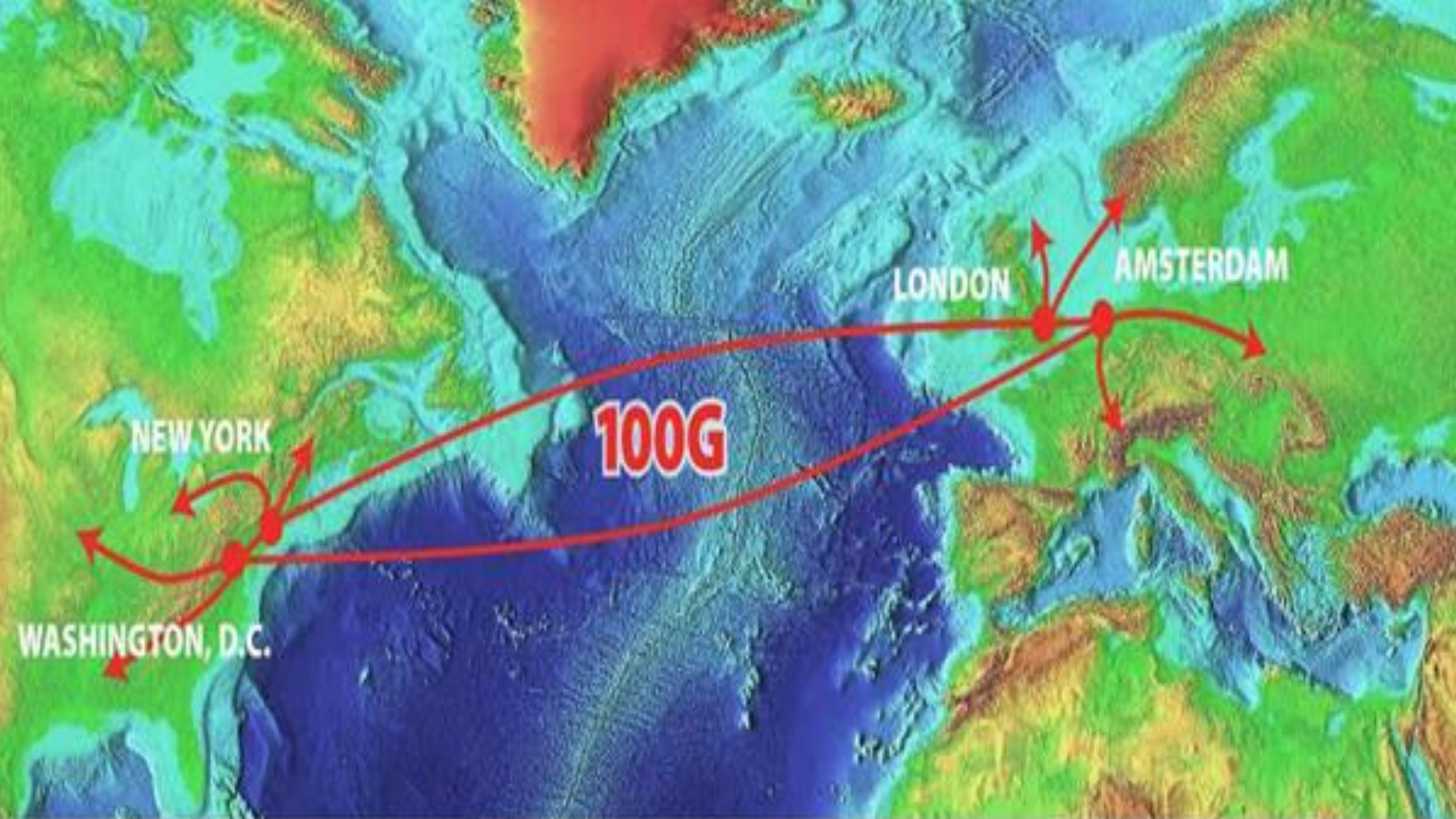
# NRENs: Major Services

- 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. Available statistics in some countries have shown that savings can go up to 40% on access costs, while enabling common access policies and configurations at the national level.
- 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.

## **NRENs: Major Services** *(continued)*

- Video conferencing services, media streaming, IP telephony, access federations, and wireless roaming for the purpose of facilitating communications, exchanges of lectures, and coordination of meetings, training and conferences between all users in universities and institutes.
- 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.







# Global Network Architecture (GNA)



A coordinated worldwide effort that efficiently interconnects national and multinational R&E Networks around the world in a manner which increases the international reach, capacity, and capability of the global R&E network for the benefit of all countries.

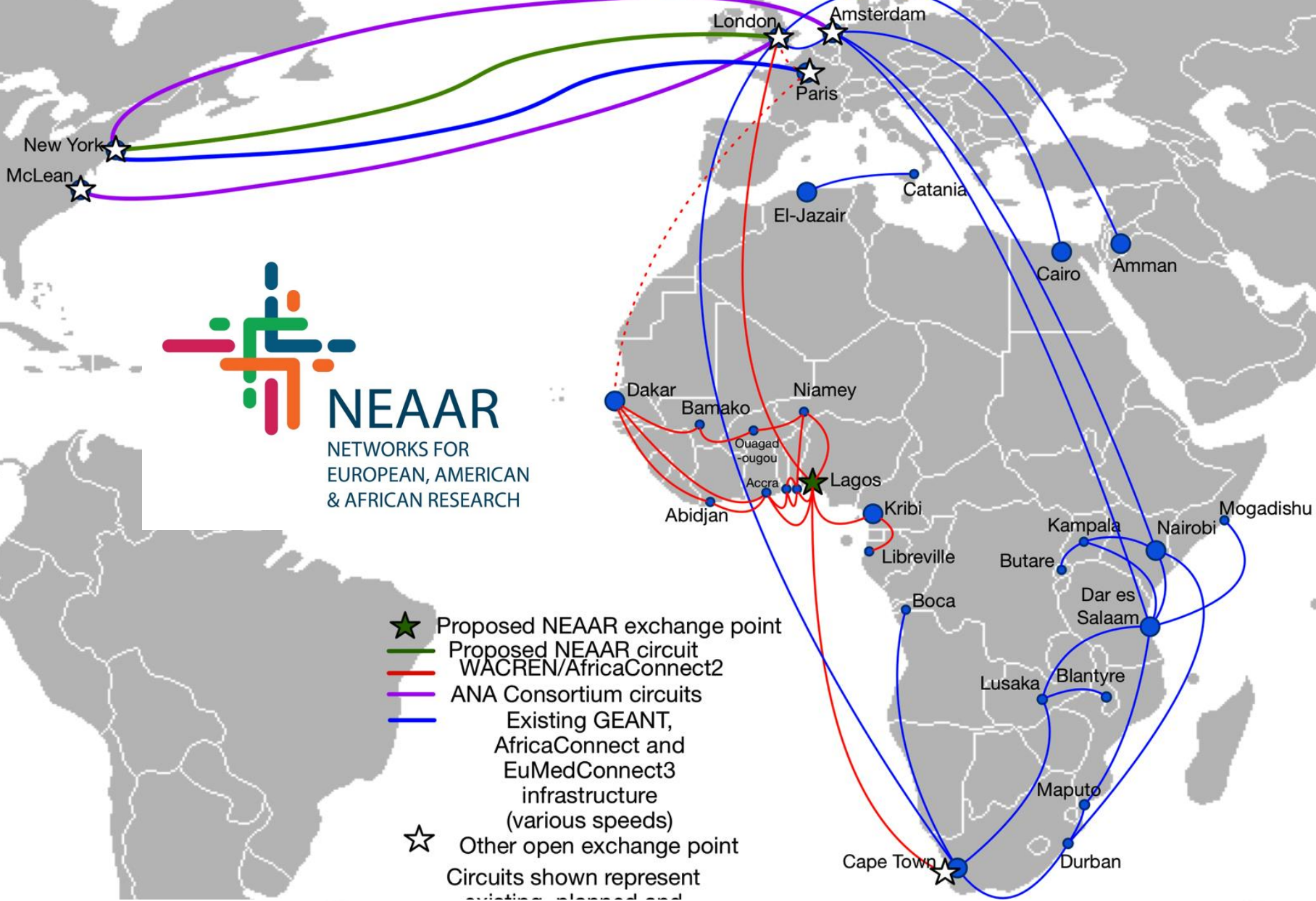




# NEAAR

NETWORKS FOR  
EUROPEAN, AMERICAN  
& AFRICAN RESEARCH

- ★ Proposed NEAAR exchange point
  - Proposed NEAAR circuit
  - WACREN/AfricaConnect2
  - ANA Consortium circuits
  - Existing GEANT, AfricaConnect and EuMedConnect3 infrastructure (various speeds)
  - ☆ Other open exchange point
- Circuits shown represent existing, planned and



# What an NREN (v2) is not—*what it must become*

specialized regional ISP—*essential global platform*

afraid to take risks and experiment—*innovation incubator*

supply-side market player—*demand-side market maker*

contract broker—*market aggregator*

knowledge carrier—*knowledge multiplier*

provider of shrink-wrapped solutions—*economic development engine*

business-as-usual partner—*transformation vehicle*

neutral collaboration connection—*collaboration enabler*

disinterested community service—*community developer*

political tool—*political stabilizer*

**National R&E Networks: Not just networks anymore**



INTERNET  
2

STEPHEN WOLFF

Internet2

JUNE 2013

NREN 3.0

@TNC 2013

## Implications/consequences

---

- **Globalization** ⇒ No NREN is an island
- **Team science** ⇒ (possibly virtual) team networks for virtual communities
- **Big Data** ⇒ More than just bigger pipes

## Further implications

---

- **Globalization** ⇒ It's time to *engineer* global R&E connectivity: from *NRENs* to a *GREN*
- **Team science** ⇒ A one-size-fits-all IP network is not enough. SDN (e.g., OpenFlow, OSCARS) will help *users and applications* configure the network
- **Big Data** ⇒ Re-architecting (Science DMZ), tuning (Web10G), measuring (perfSONAR)

# Welcome to the Case for NRENs portal

A pool of resources to assist national and regional R&E networks (NRENs and RRENs) 'make a case' towards their users, funders and partners.

A toolkit of guidance materials to support in particular new and emerging NRENs.

[Find out how to use and contribute to this portal](#)

NRENs are essential in providing advanced ICT services to the research and education communities. Whilst they are well established in [Europe](#), countries in other parts of the world **face difficult challenges persuading stakeholders of the inherent value in operating an NREN.**

There is **no one-size-fits-all model for a successful NREN.** However, many share similar challenges and can benefit from being part of a **learning and sharing community.**

## Get in touch with NREN mentors in your region

If you are a new NREN or about to start up and need advice and guidance, R&E networking representatives in your region are available to assist and mentor you:

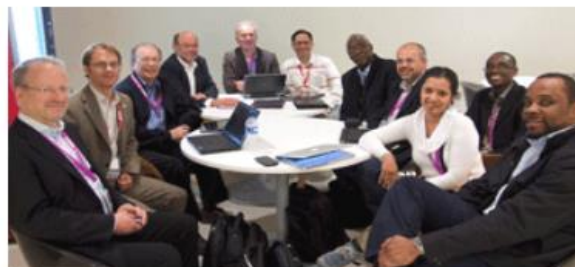
- North Africa & Middle East: [Yousef Torman](#) (ASREN)
- West & Central Africa: [Omo Oaiya](#) (WACREN)
- Eastern and Southern Africa: [Dr Pascal Hoba](#) (UbuntuNet Alliance)
- Asia-Pacific: [Dr ByungKyu Kim](#) (TEIN\*CC); [Markus Buchhorn](#) (APAN)
- Central Asia: [Askar Kutanov](#) (CAREN)
- Caribbean: [Colleen Wint](#) (CKLN)
- Latin America: [Florencio Utreras](#) (RedCLARA)

## Affiliations

The portal was developed in response to demand from a number of regional networks where NRENs are starting up to share global experiences and best practice.



## About us



### NREN Case Review Group

Members of the Review Group that compiled this portal include veteran R&E networking professionals and representatives of the regional network organisations from outside Europe.

[Find out more.](#)

## Latest contributions

### Feasibility Study for a UN Technology Bank for the Least Developed Countries

Proposal submitted by an expert panel to the UN in Sept 2015, which outlines the role of NRENs in facilitating a Technology Bank for LDCs.

[Download the PDF](#)

### Cookbook for ZAMREN applicants

Guidelines to assess the ICT maturity level of institutions applying to join ZAMREN, applicable also to other emerging NRENs.

[Download the PDF](#)

### Implementing NRENs in landlocked African countries

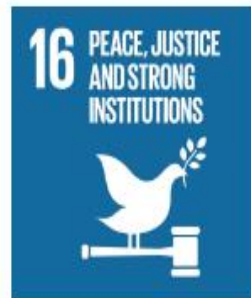
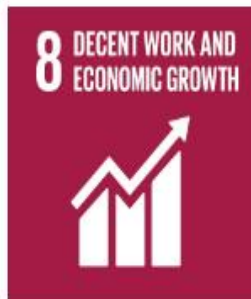
Challenges and critical success factors in setting up





# SUSTAINABLE DEVELOPMENT GOALS

<https://sustainabledevelopment.un.org/?menu=1300>



# R&E Networks are key enabler for UN SDGs

- By expanding the scope of community tools, educational resources and scientific applications
- By building sustainable internet and human networks

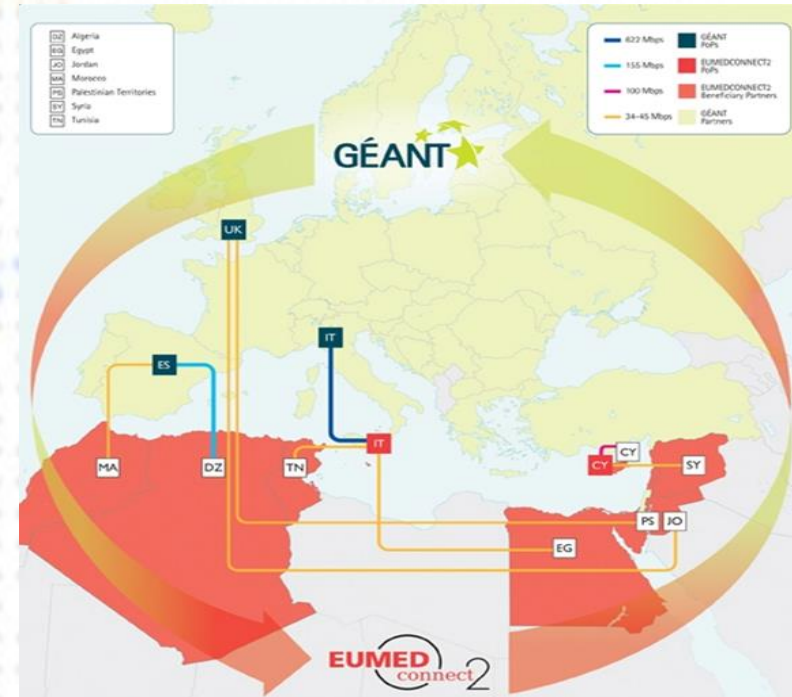


# EUMEDCONNECT Programme

EUMEDCONNECT Research and Education network project 2004 -2016 (3 phases), 14M Euro of EC funding

The only regional Research and Educational Network in the Arab Region

National Research and Education Networks in Algeria (ARN), Egypt (EUN), Tunisia (CCK), Jordan (JUNET), Morocco (MARWAN), Palestine (PALNET) and Syria (HIAST) were connected to its European counterpart GÉANT



More 2 million users in around 700 institutions

# Connecting the Eastern Mediterranean research and education communities



This project is funded  
by the European Union



# AfricaConnect2

## Connecting the research and education communities across Africa

[Find out more](#)



### AfricaConnect2 supports the development of high-capacity internet networks for research and education across Africa.

It builds on existing networks in Eastern & Southern Africa and North Africa and will extend connectivity into West and Central Africa.

By collaborating with AfricaConnect2, the pan-European GÉANT network strengthens Europe's links with the African continent and provides African research and education communities with a gateway for global collaborations.

"I look forward to further e-developments for research and education across Africa and trust AfricaConnect2 will be able to enforce these positive changes."

**Yousef Torman**  
Co-managing  
Director, ASREN



### Quick Links

[GÉANT](#)  
[GÉANT project](#)  
[TEIN](#)

[EUMEDCONNECT3](#)  
[CAREN](#)  
[EaPConnect](#)

### AfricaConnect Events

#### UbuntuNet-Connect 2015

Beyond connectivity: the road to NREN maturity.  
PRESENTATIONS NOW AVAILABLE!

**Date:** 19 November 2015 to 20 November 2015

**Location:** Maputo, Mozambique



# Regional Efforts,

- **PAN Arab Network, 2005**
  - Initiated by MoICT of Jordan to study the feasibility of using the power distribution grid network to build a PAN Arab network. The study was sent to the League of Arab States.....
- **Rome Declaration 2006**
  - The Arab MED NREN managers signed a declaration in Rome to work on establishing a consortium to take the responsibility of creating an Arab Med Network...
- **NAP, the Network Access Points 2007**
  - A business initiative to build Internet exchange points for the Arab region....
- **CAMREN 200?**
  - Was proposed as an action for the Rome Declaration....



Launched in Cairo  
December 2010,  
Under the  
Patronage of  
HE Amro Moussa,  
Secretary General  
League of Arab  
States

- Endorsed by League of Arab States
- Chaired by HE Secretary general of League of Arab States
- Officially Registered in Dusseldorf Germany as non for profit company GmbH in June 2011

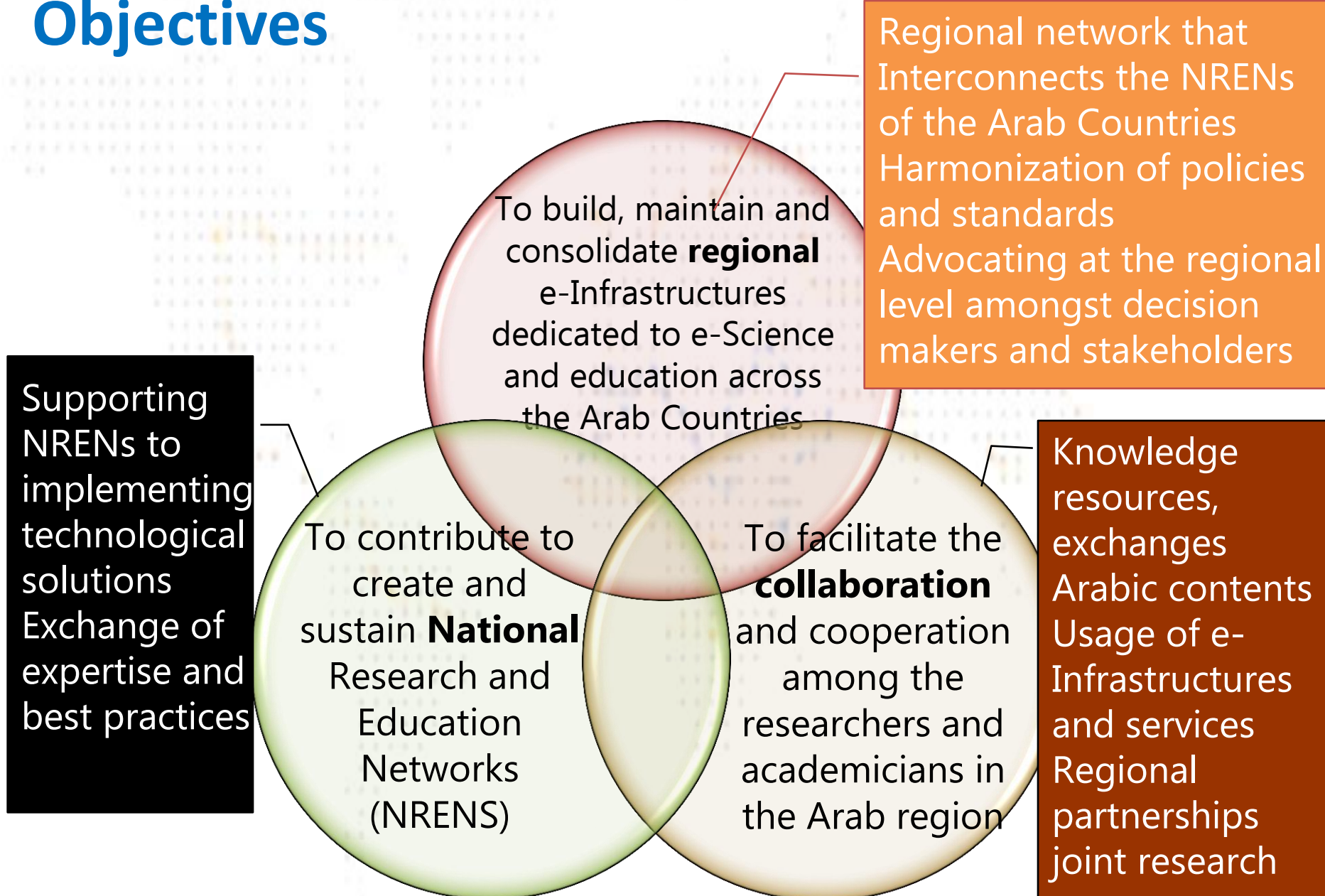




A legal non for profit organization with Arab NRENs as shareholders for promoting world-class Pan-Arab e-Infrastructures and E-services for the R&E communities to boost Scientific Research and regional Cooperation

- **Vision Statement:** 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 statement:** 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.

# Objectives



# NREN Status – Arab World - 2011

Existing Arab NRENs	
Morocco	CNRST-MARWAN
Algeria	CERIST - ARN
Tunisia	CCK (RNU)
Egypt	EUN
Sudan	SudREN
Somalia	SomaliREN
Jordan	JUNet
Palestine	PalREN
UAE	Ankabut

Starting (Planned) NRENs	
Lebanon	CNRS??
Oman	TRC
Qatar	Qatar Foundation
Syria	SHERN, HIAST

No NREN, No Information	
KSA	KACST – KAUST?
Bahrain	
Iraq	
Libya	
Kuwait	
Mauritania	
Djibouti	
Yemen	
Comoros	

# NREN Status – Arab World - 2017

## Existing Arab NRENs

Morocco	CNRST-MARWAN
Algeria	CERIST - ARN
Tunisia	CCK - RNU
Egypt	EUN
Sudan	SudREN
Somalia	SomaliREN
Jordan	JUNet
Palestine	PalREN
UAE	Ankabut
Oman	OMREN
Qatar	QREN
KSA	KACST-ISU

## Starting (Planned) NRENs

Lebanon	Universities Consortium
Bahrain	University of Bahrain
Syria	SHERN, HIAST ??
Iraq	MOHE
Libya	MOHE
Yemen	YCIT-HE
Mauritania	MOHE & USTM

## No NREN, No Information

Kuwait	KITS and Kuwait University
Djibouti	
Comoros	

# ASREN's Region is Evolving





# Shareholders Progress

## Current Shareholders



CNRST



مجموعة تالون أبو غزالة  
Talal Abu-Ghazaleh Organization



SudREN



## In the Process



## Expression of Interest

**Qatar**  
**Lebanon**  
**Oman**  
**Bahrain**  
**Yemen**  
**Libya**

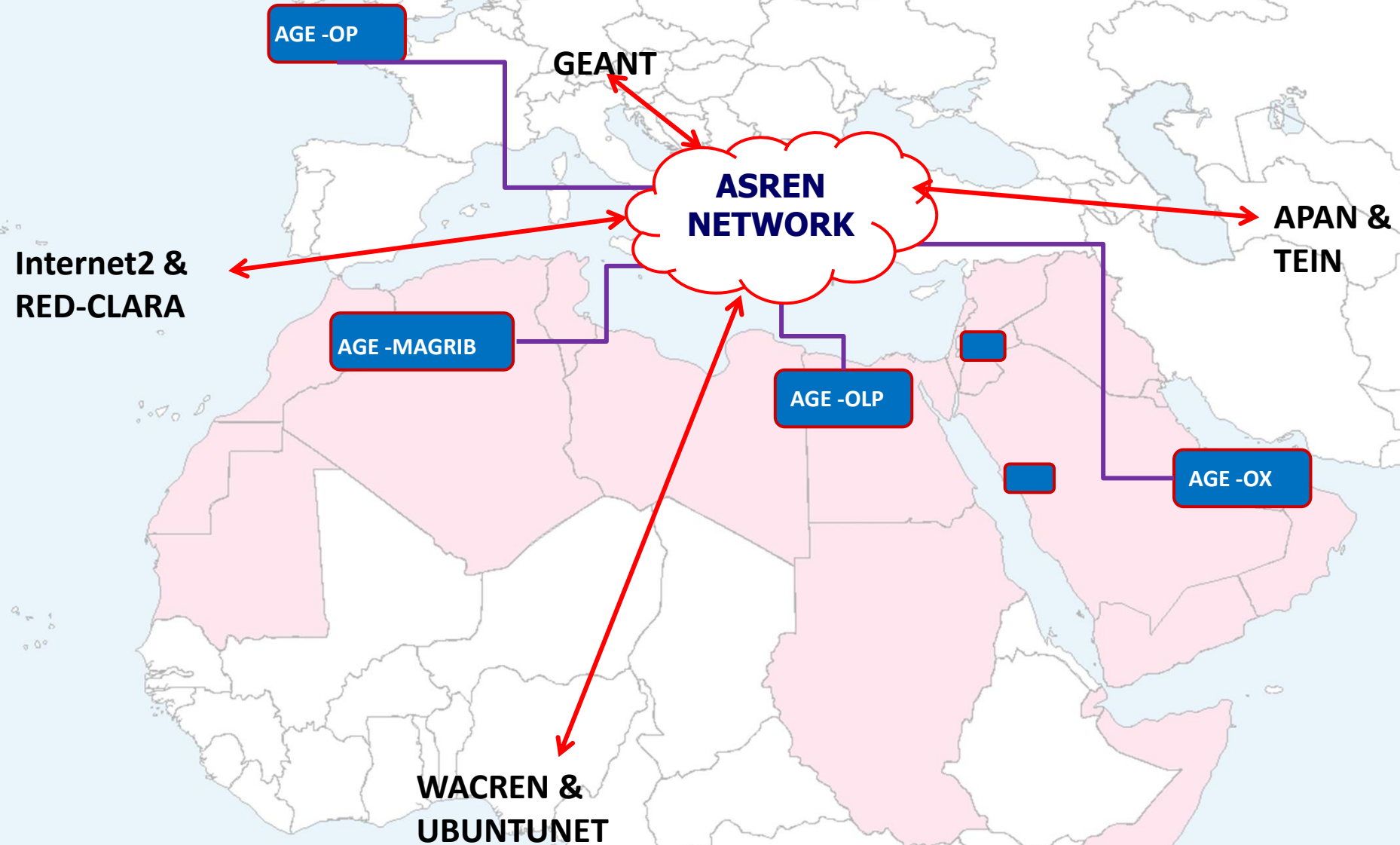
Shareholders Update

<http://www.asrenorg.net/about/shareholders.html>



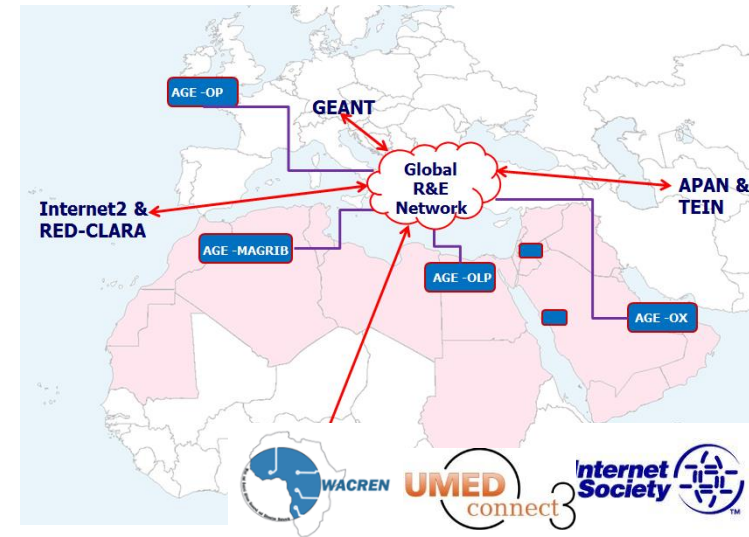


# ASREN Network



# AGE - OP

- Arabian Global Educational Open PoP
- Installed and operational at London Telicity in cooperation with GEANT and WACREN
- Operational & ready to interconnect
- Operations by ASREN and GEANT
- ASREN team visited DANTE (GEANT Association in Cambridge to get training and to agree operations, monitoring, support...
- STM1 Connection to Jordan has been operated.



# AGE-OX

- **Arabian Global Educational Open Exchange (AGE-OX) to open in Fujairah, United Arab Emirates** led by national network Ankabut in Fujairah
- 10G connectivity to Internet2 in Singapore and future links to Internet2 in Europe/Americas to support US Campus & Research collaborations across the Middle East



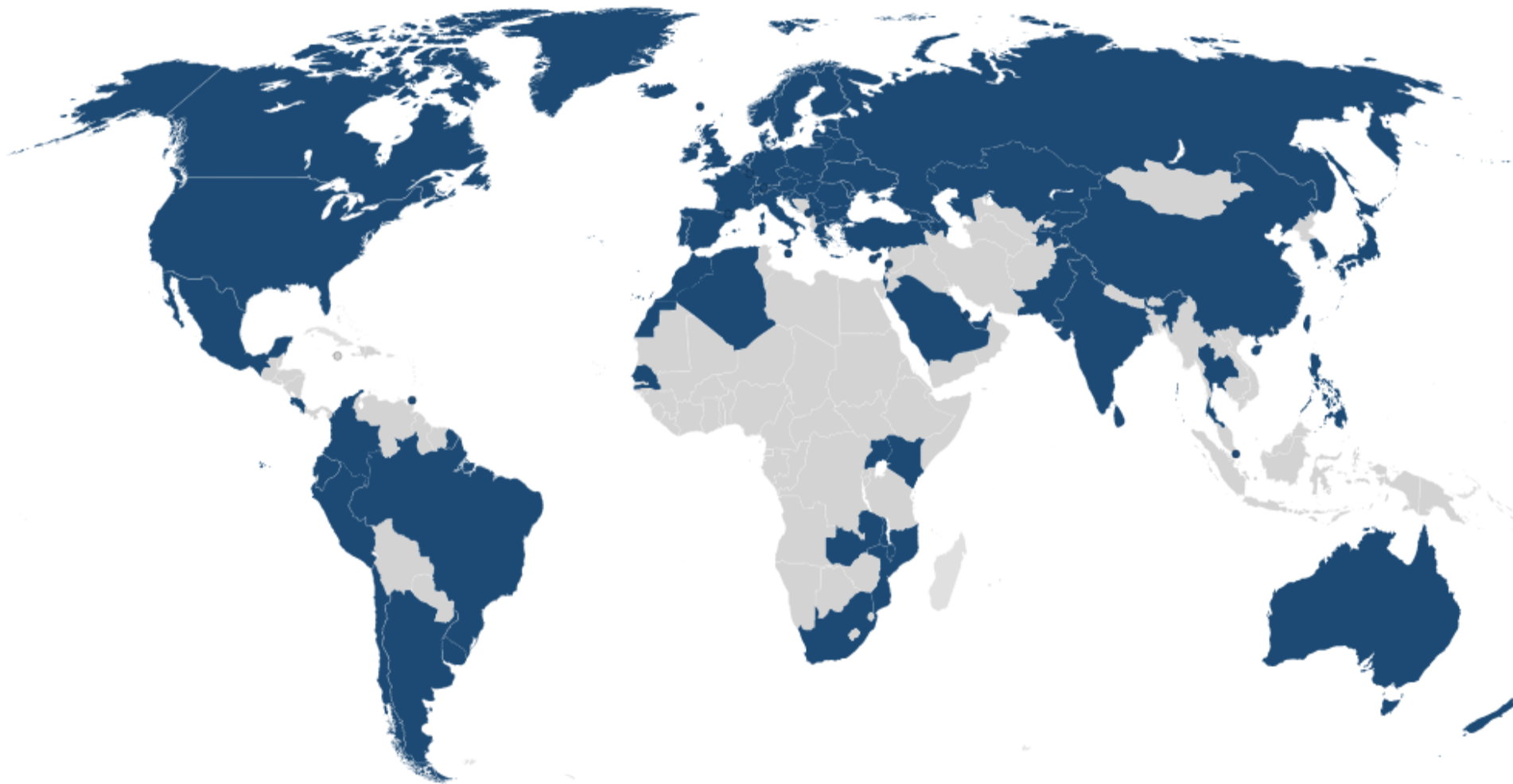
NEW YORK UNIVERSITY



ankabut  
عنكبوت

Arabian Global Educational  
Open Exchange (AGE-OX)





Implementation in Morocco, KSA, Qatar, UAE, Algeria

Pilots in Egypt, Tunisia, Jordan, Oman, Sudan, Kuwait



# ASREN IdP

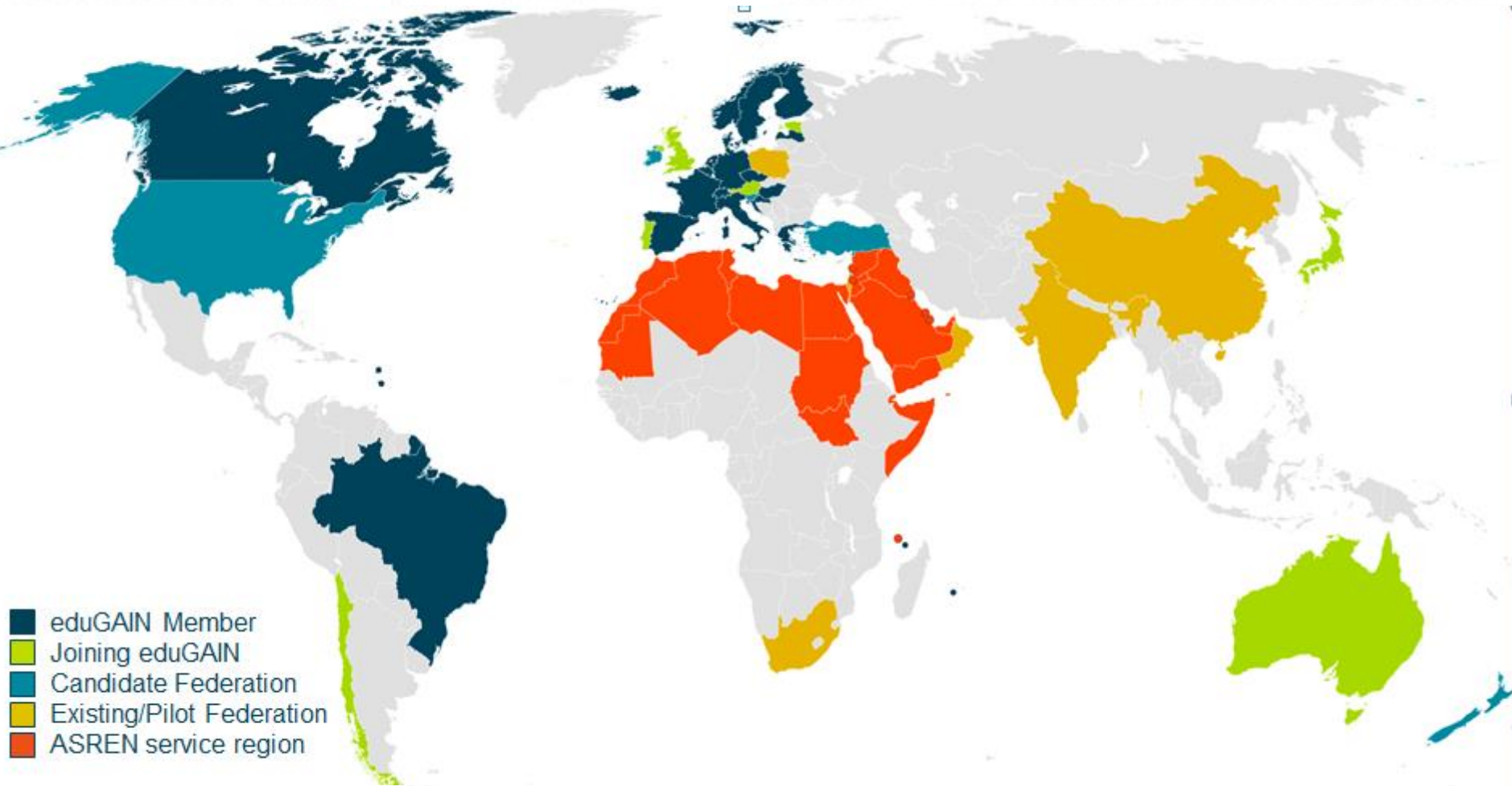
- ASREN IdP Identity Provider is a SAML standard-based service powered by Shibboleth
- Allows the use of a single identity to sign-in into secure websites, Science Gateways ...
- A member of Grid Identity Pool (GrIDP) federation and currently authenticates the users of several Service Providers

A screenshot of the ASREN IdP website. At the top, there is a navigation bar with links for 'About', 'Service Providers', 'Register', and 'Log-in'. Below this is a large banner image showing a network of glowing blue person icons connected by lines, with a hand pointing at one of the icons. Underneath the banner, there is a section titled '&gt;&gt; About IDP Public' with a sub-header 'SELECT YOUR IDENTITY FEDERATION'. Below this, there are two rows of buttons. The first row has a 'Catch-all' button with a globe icon, a 'GrIDP-test' button, and a 'GrIDP' button with a key icon. The second row has a 'Catch-all' button with a globe icon, a 'GrIDP' button, and a 'GrIDP' button with a key icon. This second row is highlighted with a red border. At the bottom, there is a 'Not Sure? Click Here' button with a large blue arrow pointing right.

<https://idp.asrenorg.net/>

***Thanks to the CHAIN-REDS Project***

# eduGAIN



ASREN and GEANT in cooperation of Arab NRENs started to work on Pan Arab Federation of Identities Infrastructure.

ASREN SGW provides a set of tools, applications, and data that is integrated via a portal with graphical user interface, that is further customized to meet the needs of a specific community.



The screenshot shows the ASREN Science Gateway portal. At the top, there is a navigation bar with links for 'Welcome', 'About', 'Applications', and 'Contact Us', along with 'Register' and 'Sign In' buttons. Below the navigation bar, the main content area features a carousel of four circular icons representing different scientific fields: 'Chemistry' (flasks), 'Mathematics' (gears), 'Environment' (sunflower), and 'Engineering' (lightbulb). A 'Download' button is visible over the 'Mathematics' icon, with a 'View original...' link below it. The bottom of the page contains logos for ASREN, Consortium GARR, CHAIN-REDS, INFN, and the Saudi Ministry of Education, along with the text 'Service provider of ASREN' and 'info@asrenorg.net'. The footer includes the text 'Powered By Liferay | Implemented with the Catania SG Framework'.



The screenshot shows the GNU Octave application interface. It features a 'My Workspace' panel on the right with icons for 'Jobs', 'JobsMap', 'Data', and 'Plot'. The main area displays a code editor with Octave code and a plot of a 3D surface. Below the code editor, there is a 'SUBMIT' button and instructions for using the application. The instructions include: 'You may upload your macro file or directly type the code into the TextArea below. Then .press "SUBMIT" button to launch Octave application into a distributed infrastructure', 'Requested inputs are', '(An input file (a Macro file to upload)', 'Otherwise type your macro code inside the text area', 'Pressing the "Demo" button input fields will be filled with Demo values', and 'Pressing the "Reset" button all input fields will be initialized'.

Thanks to the **CHAIN-REDS Project**

<https://sgw.asrenorg.net/>

# SOME OF THE APPLICATIONS AVAILABLE

## COMPUTER SCIENCE AND MATHEMATICS

Sonification



Sonification is the use of non-speech audio to convey information or perceptualise data. Auditory perception has advantages in temporal, amplitude, and frequency resolution that open possibilities as an alternative or complement to visualization techniques.

Octave2



Octave is a high-level interpreted language, primarily intended for numerical computations. It provides capabilities for the numerical solution of linear and nonlinear problems, and for performing other numerical experiments.

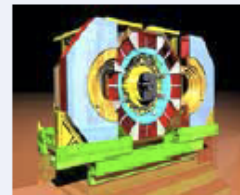
R



R is a language and environment for statistical computing and graphics.

## HIGH-ENERGY PHYSICS

BESIII



The BESIII experiment is to study basic elements made of matter, interaction among elements and matter, basic rules of particles, etc.

## LIFE SCIENCES

GROMACS



GROMACS is a versatile package to perform molecular dynamics, i.e simulate the Newtonian equations of motion for systems with hundreds to millions of particles.

## OTHERS

ASTRA



The ASTRA project aims at reconstructing the sound or timbre of ancient instruments (not existing anymore) using archaeological data as fragments from excavations, written descriptions, pictures, etc. ([www.astraproject.org](http://www.astraproject.org))



# Other SGW

## Morocco and Algeria



MaGrid  
La Grille de Calcul Marocaine

Ar En Fr Sign In

### Moroccan Grid Science Gateway

Home Applications

#### Welcome to the MaGrid Science Gateway

By definition a **Science Gateway** is a "community-developed set of tools, applications, and data that is integrated via a portal or a suite of applications, usually in a graphical user interface, that is further customized to meet the needs of a specific community".

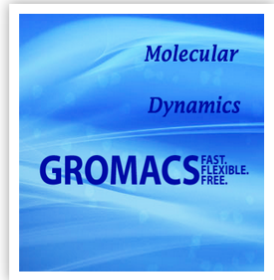
#### How To Access

The access to the MaGrid Science Gateway requires federated credentials issued by an Identity Provider.

If the organisation you belong to has an Identity Provider, click on the link "Sign In" which appears in the top right corner of the page.

Otherwise, you can get federated credentials registering to [the MaGrid Catch All Identity Provider](#) which belongs to the eduIDM federation.

When registration procedure will be completed, you can sign in again and select eduIDM as your Identity Federation and then MaGrid Catch-All IDP as your Identity Provider.



[Contact Us](#) | [Privacy Policy](#) | [Terms of Use](#)

Powered By Liferay  
Implemented with Catania SG Framework  
This is a Service Provider of:  
 



Algerian Research Network

Home Applications DZ e-Science Grid About My Data

#### Welcome to DZ e-Science GRID Science Gateway

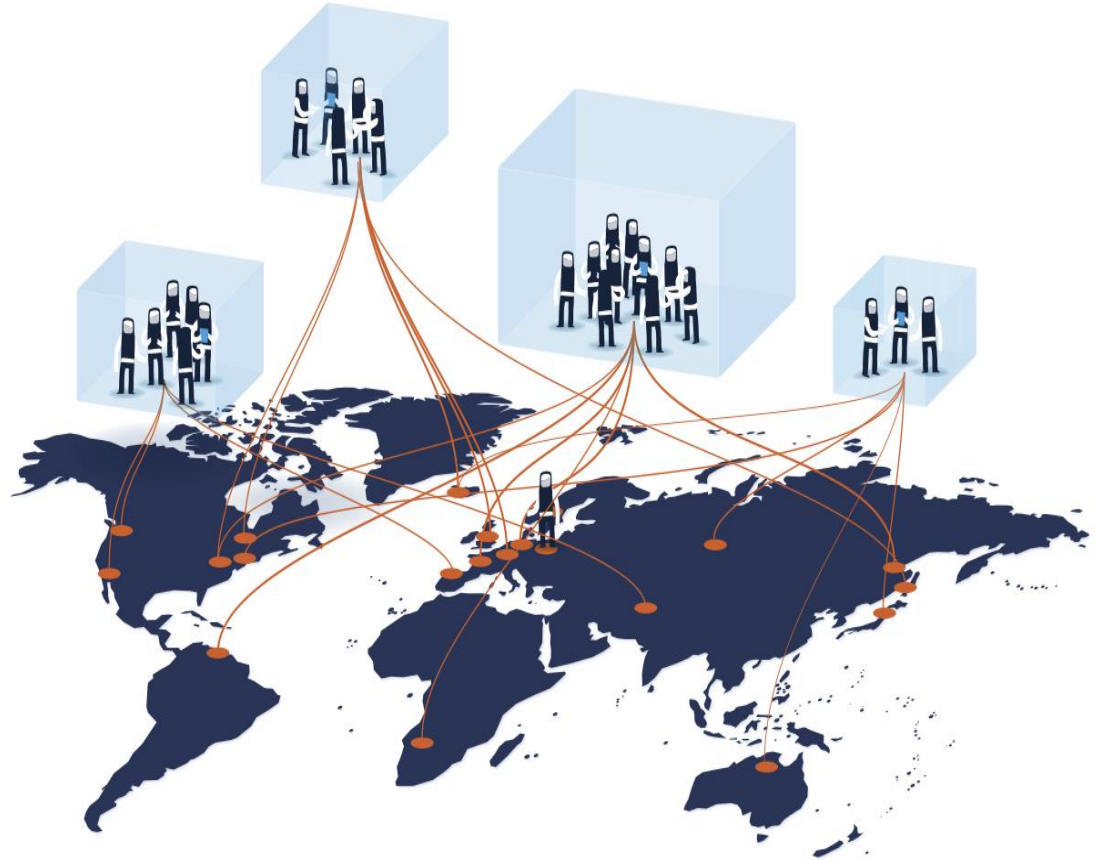
DZ e-Science GRID Science Gateway is a computational web portal that enables scientists to run scientific simulations, data analysis, and visualization through their web browsers.

A science gateway on DZ e-Science Grid is how to deploy scientific applications rapidly on computational resources and expose these applications as web services to scientists.

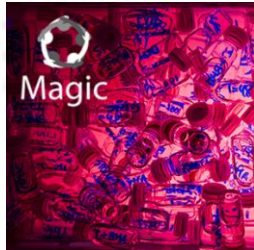


# Global Science Communities

- Groups of experts (researchers and/or academics) from different parts of the world with a common interest, working together on activities, sharing best practice, knowledge and experiences



# Four Communities



## E-Health

First meeting: Feb 2nd

Members: 58

Thematic Leader: Luiz Ary Messina,  
National Coordinator of Rute (Rede Universitária de Telemedicina), Brazil.



## Biodiversity

First meeting: Feb 11th

Members: 31

Thematic Leader: José Ramón Martínez  
Professor and researcher of the Universidad Autónoma de Santo Domingo (UASD), Dominican Republic.



## Environment

First meeting: Feb 18th

Members: 28

Thematic Leader: David C. Smith,  
Coordinator Institute for Sustainable Development, The UWI, University of the West Indies, Jamaica.



## Remote Instrumentation

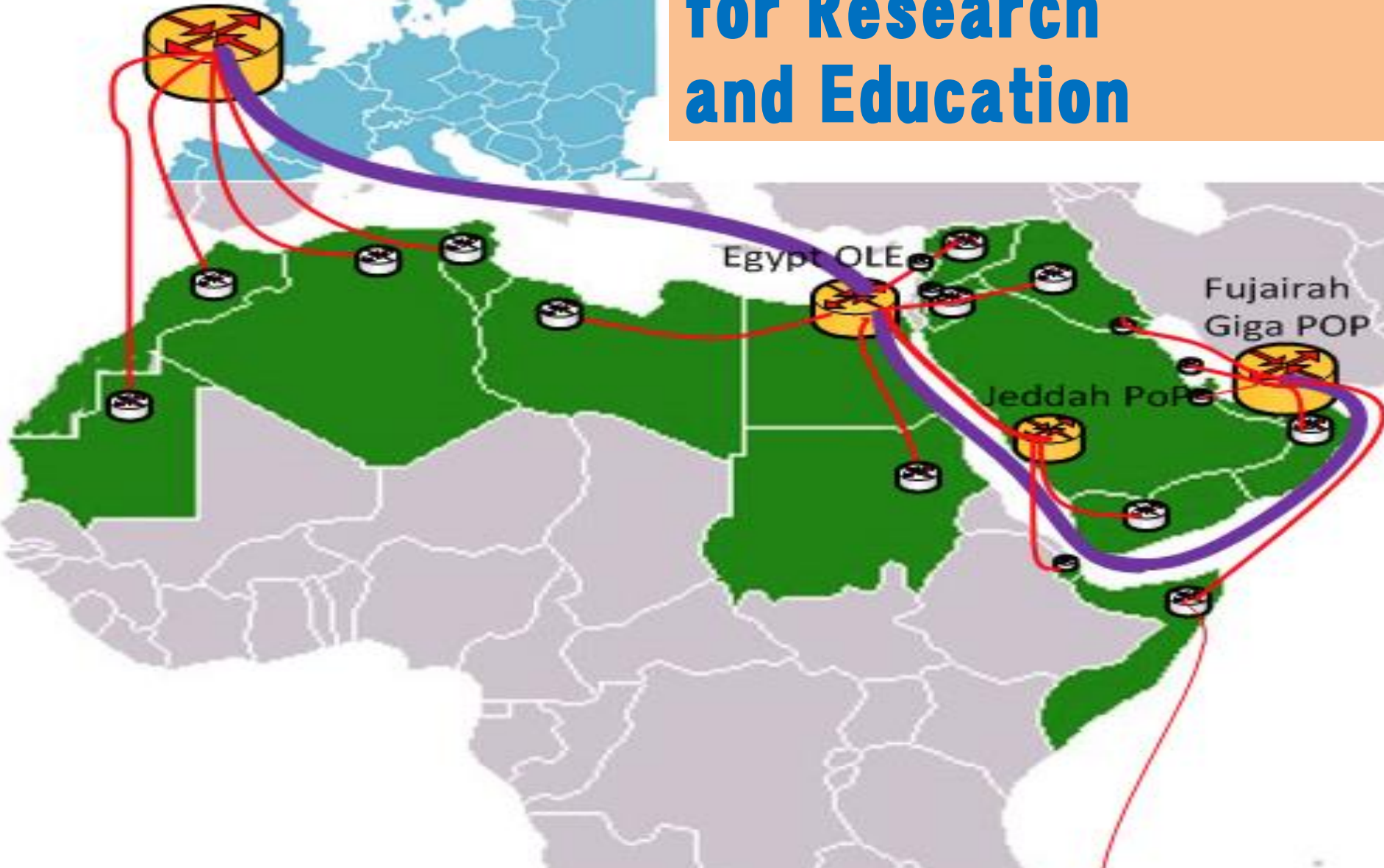
First meeting: Feb 25th

Members: 16

Thematic Leader: Patricia Santiago,  
Associate Professor Physics Institute, Universidad Autónoma de México (UNAM), Mexico.

# ArabConnect for Research and Education

London PoP



Egypt OLE

Jeddah PoP

Fujairah  
Giga POP

# Major Obstacles and Concerns...

- Financial support
- Technical Support
- Political Support
- Applications, Services, Contents
- Promotion
- Bureaucracy
- Monopoly, Regulations
- NRENs involvement
- Time...

*This slide is unorganized intentionally*

**I used to carry this heavy slide with me for the last 4 years.**



**Yousef Torman 2005-2011**

# Challenge:

- 1- Leadership commitments.
- 2- Telecom operator.
- 3- Regulation.
- 4- Finance.
- 5- Clear organization .
- 6- Infrastructure.
- 7- Lack of collaborative projects (local & international).
- 8- e-Education tools.
- 9- Mobility.
- 10- Social Networking.
- 12 - communication and knowledge sharing between users & NRENs.
- 13- Security and Data Ownership.
- 14- New users with little IT & technology knowledge (NREN).
- 15- Technology knowledge of the researcher.



**Fahem Al Nuaimi, CEO, Ankabut, UAE, Internet2 SIG Meeting, Abu Dhabi, 17 March 2013**

**Fahem Al Nuaimi 2012**

# Concerns

- Lack of NREN interests and engagement in regional development
- Inability of NRENs to raise resources
- Limited support of telecom providers for RE capacity
- Limited competition for cross-border networks
- Limited number of champions at NREN levels



**Six months of history, December 2013 to June 2014**

**Salem Alagdash 2013**

# **We need your help and support**

- **Internet\* organizations**
- **National operators and carriers**
- **Regional and global operators**
- **Regulators and ICT ministries**
- **LAS, ITU, ESCWA...**
- **Technology providers**

# TNC17 – The Art of Creative Networking

Linz, Austria 29 May - 2

June 2017

GÉANT invites all community members to actively contribute  
to shape the future of research and education

<http://tnc17.geant.org>





Under The Patronage of His Excellency  
**Ahmed Aboul-Gheit**  
Secretary General of the League of Arab States

# e-AGE 2017

7th International Platform on Integrating  
Arab e-Infrastructure in a Global Environment  
League of Arab States, Cairo, Egypt  
4-3 December, 2017

**“SCIENCE AND INNOVATION”**

<http://eage2017.asrenorg.net>





# Call for Sponsorship

# e-AGE 2017

**Cairo, Egypt**

**3-4 December, 2017**



<http://asrenorg.net/eage2017/?q=content/why-get-involved-0>



# Thank You

Yousef Torman

Managing Director

Arab States Research and Education Network, ASREN

[www.asrenorg.net](http://www.asrenorg.net)

[torman@asrenorg.net](mailto:torman@asrenorg.net)