

# **Geography of the Future Internet: weighing initiatives in the Mediterranean and Sub-Sahara Africa**



*Fondation "Partager le Savoir"  
Sharing Knowledge Foundation*

Euro-Africa e-Infrastructures. Helsinki 9-10 December  
2010

Robert Klapisch

# “The World is Flat”

- This assertion by Tom Friedman is premature. The Internet is not (yet) universal and there are strong differences between regions.
- Sub-Sahara Africa is lagging Europe in e-infrastructure by 10/15 years, even though progress is rapid in certain aspects.
- The Mediterranean/MENA region is somewhere in the between, but it also lags regarding knowledge development.
- We believe that a comparison of recent initiatives in both regions can be useful for further progress.



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# **Africa and Europe: Facts of the Divide**

## **(1) The Digital Divide**

- **Internet Penetration**
  - **Africa 10.9 % vs. EU 67.6%, US 77.4%. ME 29.8%**
  - **Growth 2000-2010: 2357%**
- **Percent Broadband**
  - **Broadband access is only 3 % in 2010, vs 35% in Switzerland but should grow rapidly (undersea cables, WIMAX, mobile 3G)**
- **Electric Power consumption (KWh/yr/cap)**
  - **France 7700, Finland, 16 351**
  - **Africa 570, Morocco 744, Nigeria 126, South Africa 4770**



# Africa and Europe: Facts of the Divide (2)

## The Knowledge Divide

- Africa has 5% gross enrolment in tertiary education (vs. 70% in Europe). Poor research infrastructure forbids meaningful contribution to World Scientific output, despite considerable Human Potential.
- Mediterranean/MENA situation somewhat better but still lagging (R&D spending is only 0.3 % of Arab States GDP vs. Finland 3.4% . R&D Spending per cap./year is 10 USD in Arab States vs. 1300 USD In Finland
- Promising initiatives:
  - King Abdullah Science and Technology University (Saudi Arabia)
  - Mubarak Science Park (Egypt/UNESCO)
  - SESAME (Jordan/UNESCO)



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# Answer to the Divides: National and Regional RENs

- **National Research and Education Networks** greatly increase communication between researchers inside a country and also allow access by students.
- **Regional Groupings of REN** allow scientific collaborations with Europe (GEANT) and with other world scientific networks. There are 3 such groupings
  - **EUMEDCONNECT** links Mediterranean Africa/MENA with GEANT
  - **UbuntuNet** connects several Southern-Eastern RENs between themselves and is linked to GEANT since 2008. This link will now be enhanced by AfricaConnect
  - **WACREN is an alliance between West and Central African countries that is making rapid progress**



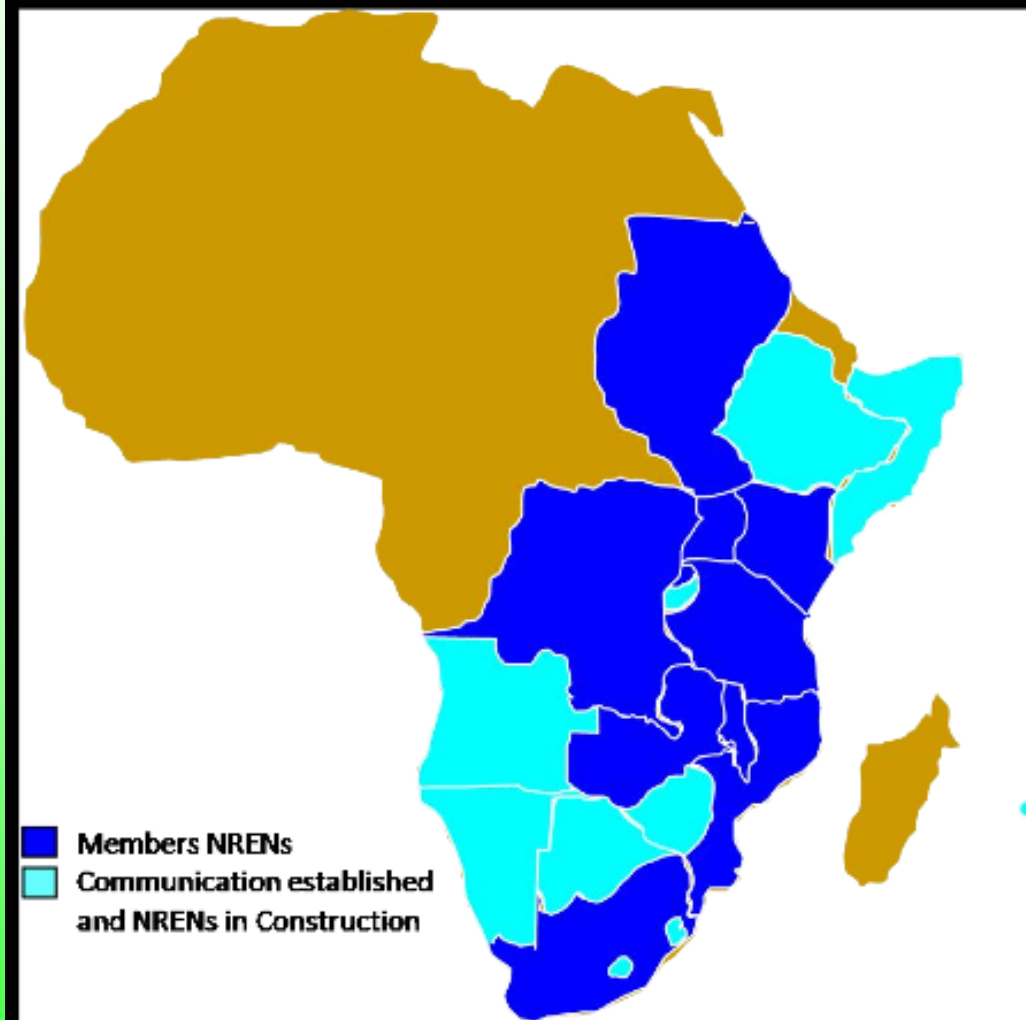
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# Regional groupings of NREN

## UbuntuNet Alliance Membership



**Area coverage:  
China, Europe,  
and India put  
together..**

- The most advanced alliance in Africa is the UbuntuNet grouping 10 countries in South and East Africa.
- In some sense more advanced than EUMEDConnect where each country connects individually with Europe with very little South-South cooperation.
- West and Central African Universities have been lagging but are now moving fast to create WACREN.



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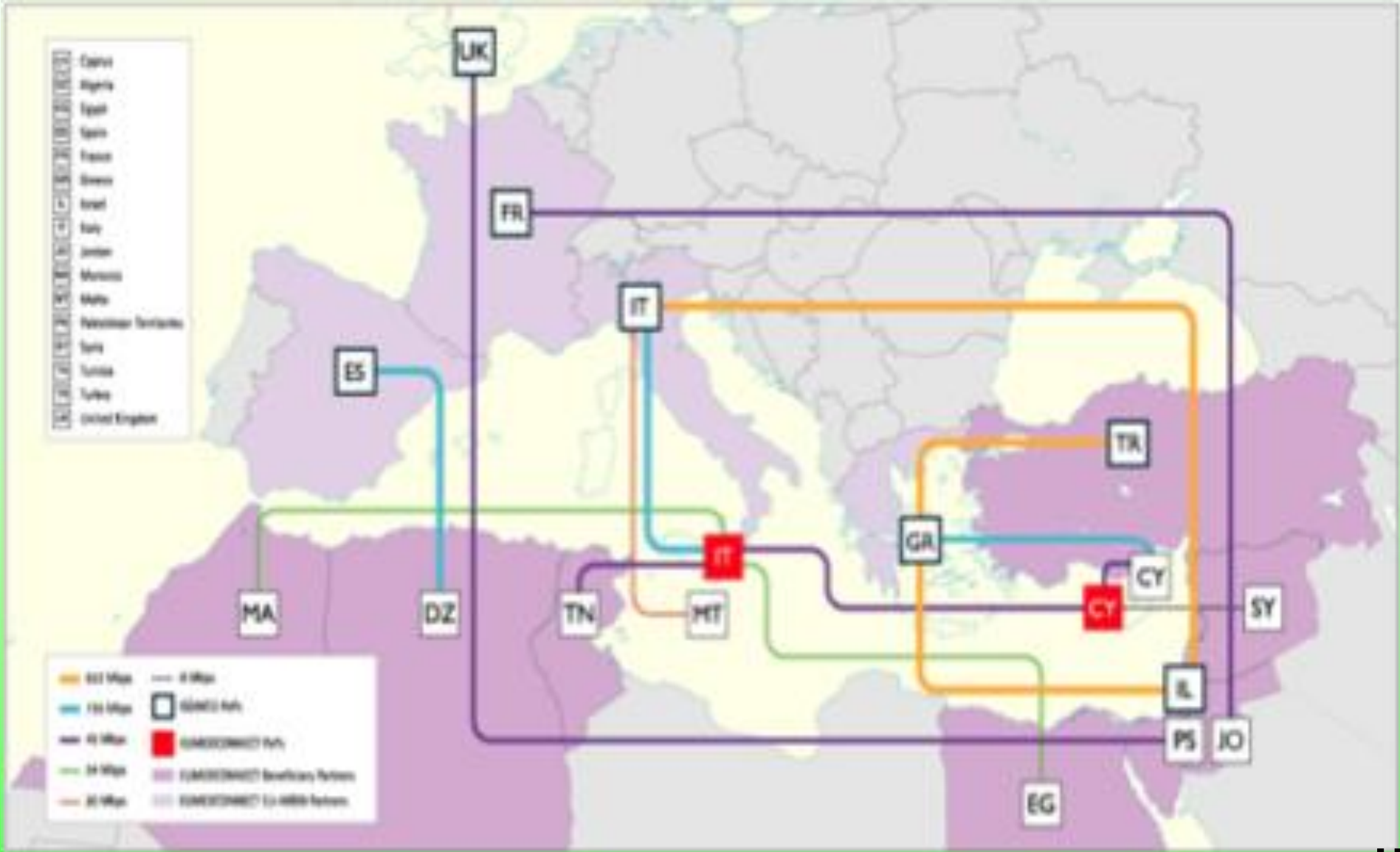
# Reaching Across the Mediterranean

EUMEDCONNECT 2 allows 2 million users in 700 institutions in North Africa and ME to be linked to 4000 research institutions in Europe and provides a gateway to World Research.

Highlights MARWAN and JUNET

Marwan allows Moroccan scientists to take part in LHC experiments

JUNET, the highest broadband link



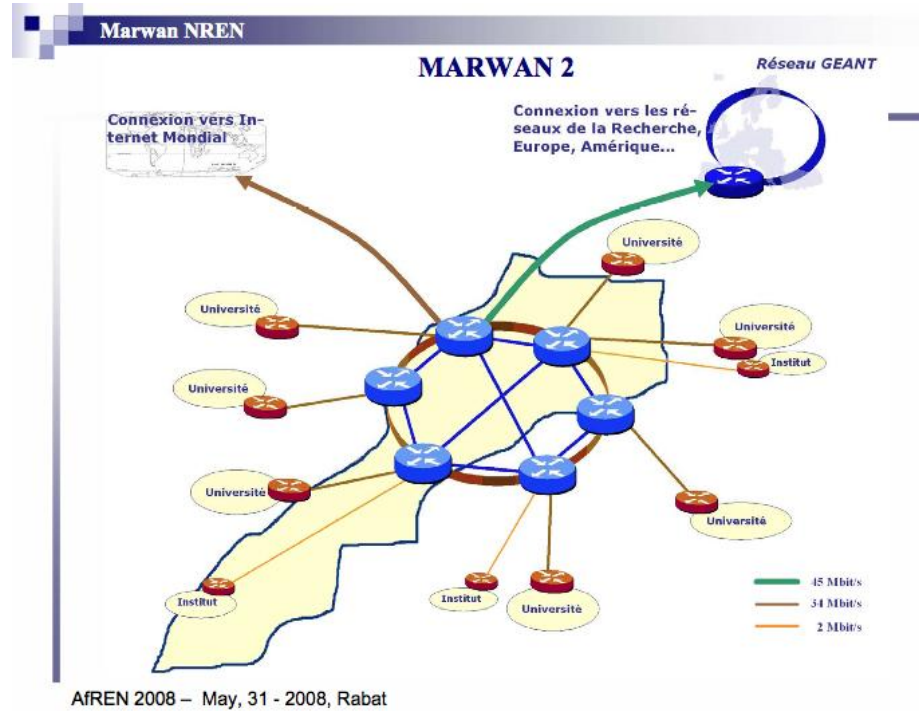
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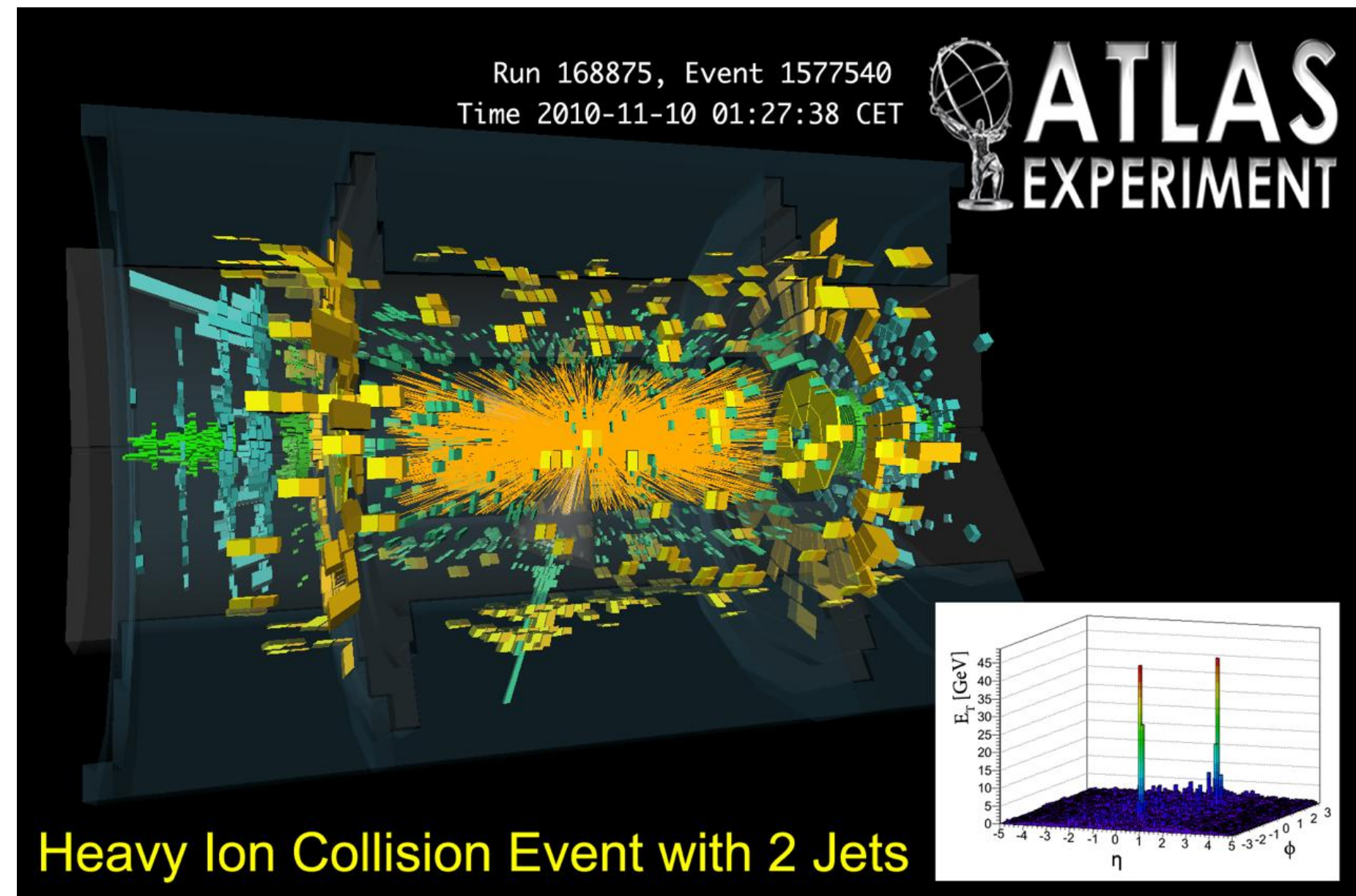
# Marwan: a case study

Shared backbone at 45 Mb/s (VPN) and links with institutions 2-34 Mb/s. Link with Eumedconnect 155Mb/s



Connects 15 000 researchers and professors from 110 Institutions and 300 000 students.

Has been essential to integrate Morocco to European research.



# Students should be able to study!

- Most universities in SSA (with hundreds of Staff) have less bandwidth than a typical household in Europe or the US.
- As a result, students do not have access to the University network and resort to Internet Cafés.



Internet Café in Ghana

As the price of Internet connections is expected to go down dramatically in the next few years, **connecting students** to the Internet should become **a top priority** for African Universities

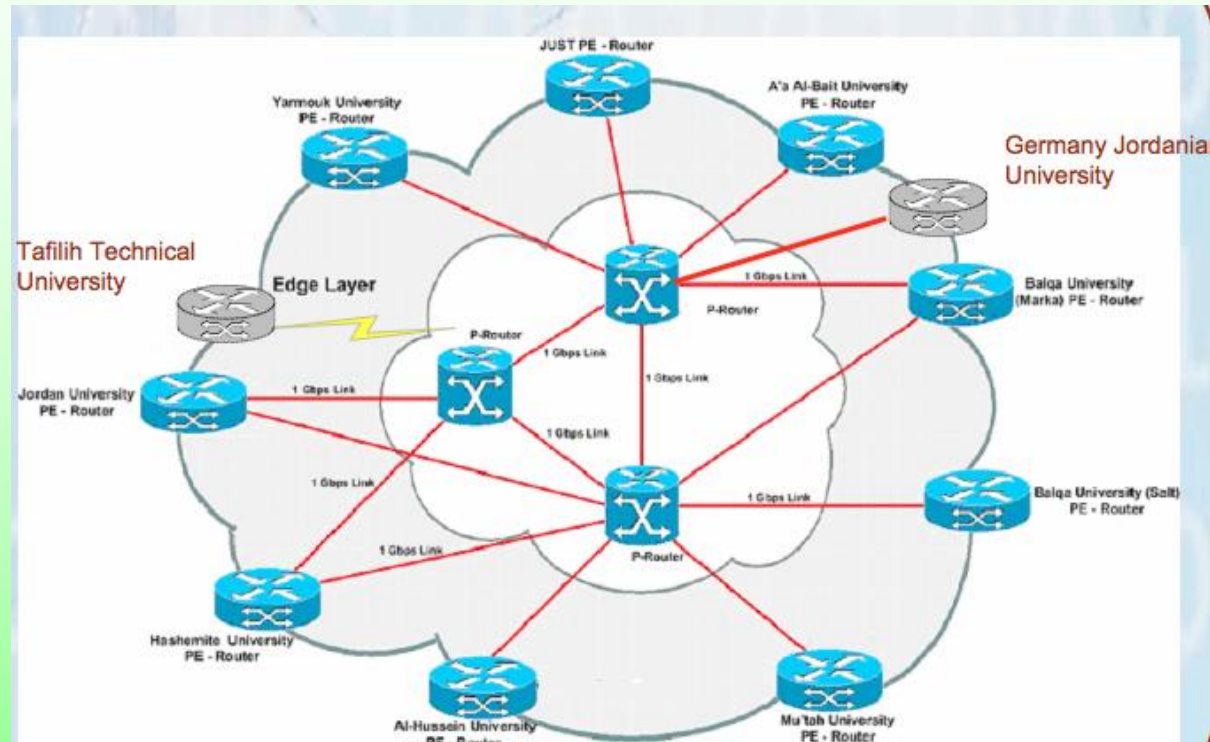


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# Jordan and its National Broadband Network



**Very cost effective  
Emphasis on E-  
Learning**

- Connects 15 National Universities and will extend to 3200 schools.
- **Built using dark fiber leased (IRU) from the National Power Company.**
- Each University has 1Gb/s link to the core
- Allows video-conferencing, VoIP, etc.. between universities.
- One common link to Internet at 155 Mb/s
- Link to GEANT at 45 Mb/s
- Common Library system.



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# Can this Jordanian model be applied to Africa ?

- **Electrical Power Lines routinely include fiber which is used to manage the electrical network.**
- **A large part of the available bandwidth maybe available.**
- **In the case of Jordan, it was a government decision to allocate that bandwidth to the National Uiversity.**
- **Should those conditions be met in other African countries, a very cost effective way to cover the inland African network may be found.**



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# Applying the JU-NET model to linking the Arab RENs

- Using unused capacity from Electrical Power Lines would open up tremendous possibility for linking Arab countries RENs



Feasibility study funded by Jordan, Canada and CISCO

Morocco, Algeria, Egypt, Palestinian Authority, Syria and Jordan signed the Rome Declaration in September 2006.

Is there unused capacity all along?

Is there political support among Arab governments ?

## Enter ASREN !



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# ASREN: Arab States Research and Education Network

“The ASREN initiative will connect our researchers and scholars allowing them to share knowledge and to collaborate. It is a unifying network for the Arab region, and I commend it.”

Amro Moussa  
Secretary General of the Arab League



“Investing in e-Infrastructures will advance inter-Arab research and education and promote cooperation with Europe and the World”

Talal Abu-Ghazaleh, Chair of UN  
Global Alliance for ICT and Development (GAID)



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# ASREN Features

- Members: Algeria, Egypt, Morocco, Palestinian Authority, Syria, Tunisia, UAE (not in EUMEDCONNECT)
- Other Arab NRENs : Saudi Arabia, Qatar, Oman
- The endorsement of the Arab League gives ASREN a measure of government and financial support which bodes well for its future.
- ASREN should be able in time to secure long term funding from the Arab region after EUMEDCONNECT2 (or its possible successor). terminates.
- Above all, the real success of ASREN would be to initiate cooperative research among Arab states.



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# ASREN Launch Event

- **8-9 December at the Headquarters of the Arab League in Cairo**



League of Arab States



European Commission



Eumedconnect 2 project



The Arab organization for  
quality control in education



Talal Abu-Ghazaleh  
Organization



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# Conclusion

- There are useful lessons to be learnt from MENA as well as SSA.
- Using available dark fiber from Power Lines would be a cost effective way to complete a land network in SSA.
- The computation Grid is a powerful tool to enable African Science enter into cooperative projects both at a regional and international level.
- ASREN is a welcome development and could get inspiration from what UbuntuNet has already accomplished

