

UbuntuNet Alliance

www.ubuntunet.net

Creating the Future of Research and
Education Networking in Africa

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Part 1: UbuntuNet Alliance for Research and Education Networking



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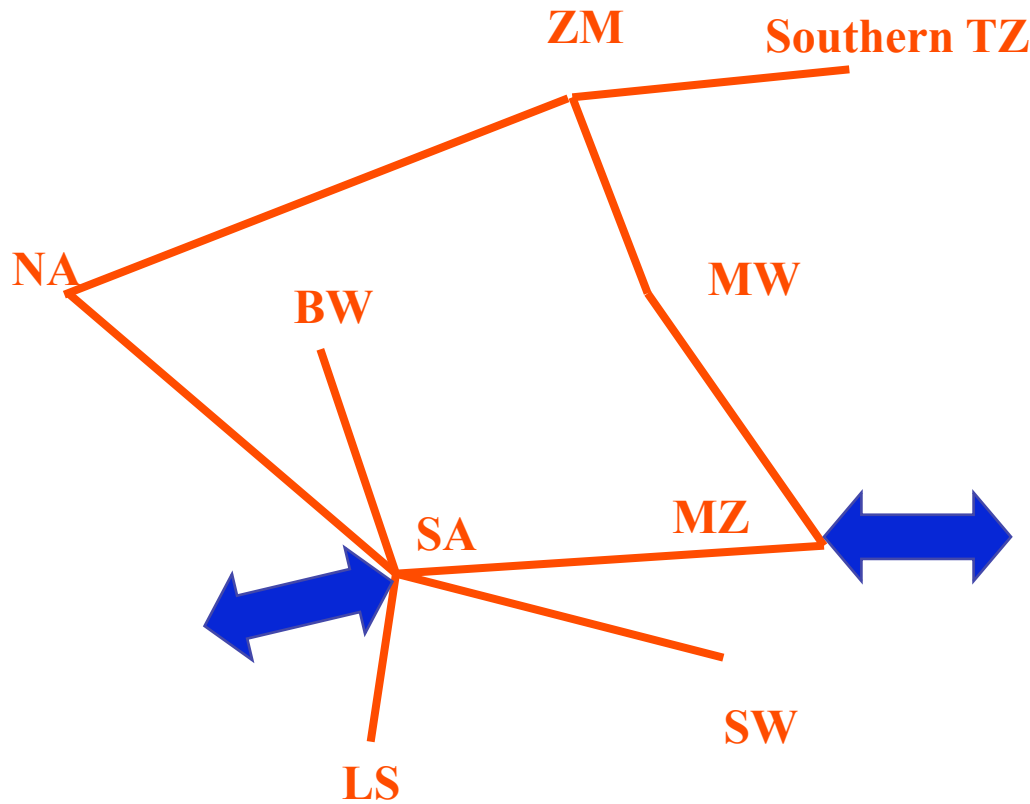
The beginning..

- **Mid 2005:** Availability of terrestrial fibre and the potential east coast submarine cable EASSy catalysed the coming together of embryonic and developed NRENs in 5 countries to initiate the development of an African regional REN . At Internet2 2005 Fall Meeting in Philadelphia during an informal chat among African pioneers in the lobby, Duncan Martin of TENET mooted the name “UbuntuNet” for the regional REN. The name eclipsed all earlier attempts at baptism! The UbuntuNet Alliance was registered in March 2006.

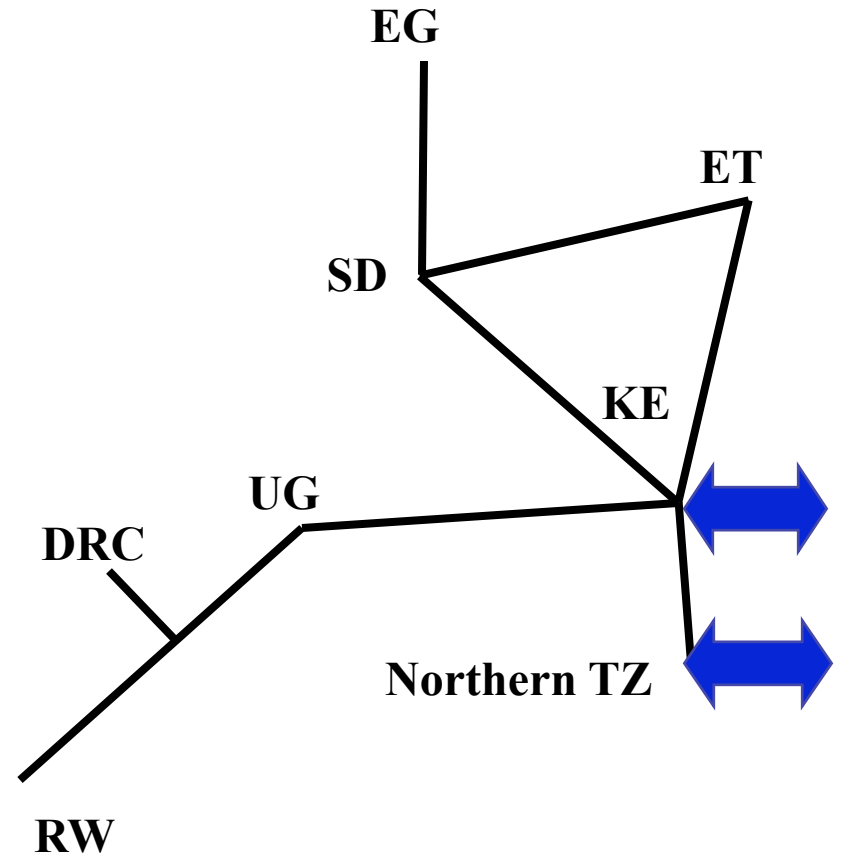


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South and East Clusters



South Cluster



East Cluster

Our Role...

- **Our role: enabling connectivity of national and regional RENs, with sufficient and affordable connection to each other and the international research community via fibre .**
- **We work with the AAU REN Unit which provides continent-wide policy level stimulus, guidance and international governmental level negotiations and linkages.**

There is still a lot to do..

Formal REN, advanced network and sufficient bandwidth: **NONE**



Formal REN and underlying operational infrastructure: **Kenya, South Africa, Sudan**



Formal REN but no underlying operational infrastructure: **Rwanda, Tanzania, Zambia, DRC, Uganda, Malawi, Mozambique**



REN in formation: **Botswana, Swaziland, Lesotho, Ethiopia, Namibia, Somalia, Eritrea**

Part 2: The current reality and our thesis



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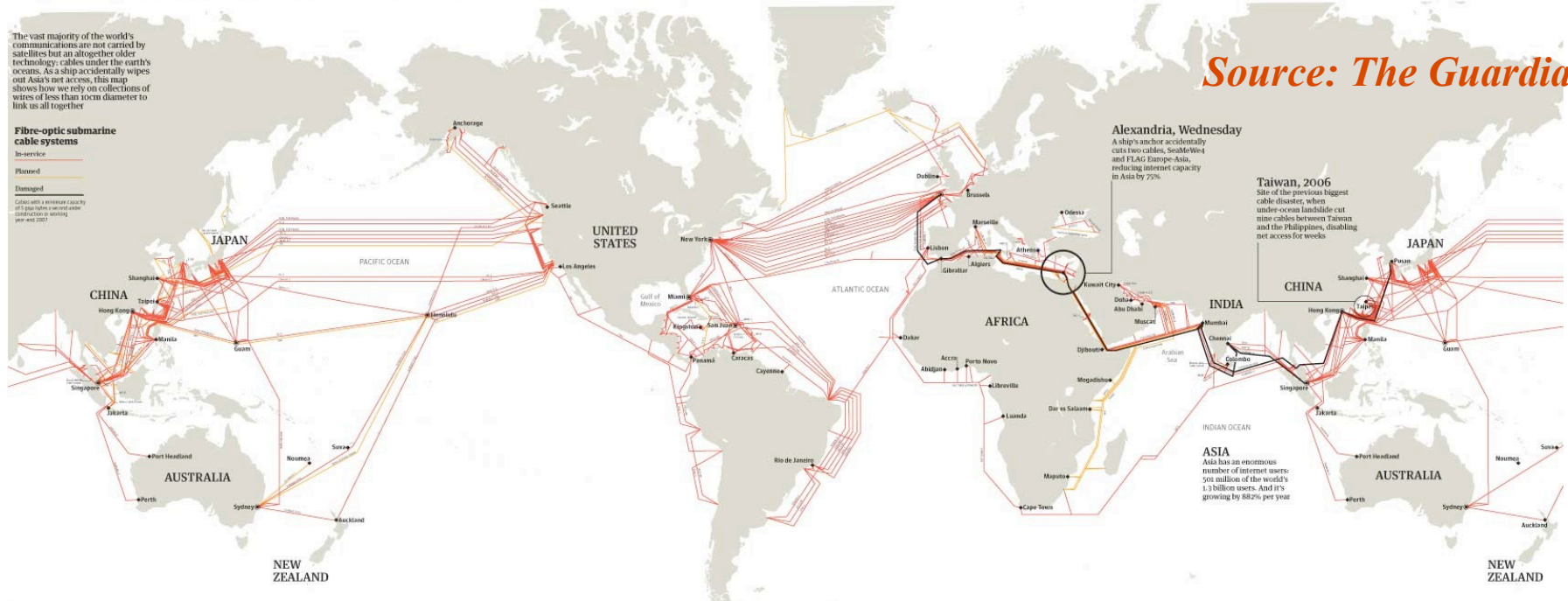
Reality - Africa remains isolated from the GII

The internet's undersea world

The vast majority of the world's communications are not carried by satellites but an altogether older technology: cables under the earth's oceans. As a ship accidentally wipes out Asia's net access, this map shows how we rely on collections of wires of less than 10mm diameter to link us all together

Fibre-optic submarine cable systems
 In-service
 Planned
 Damaged

Cables with a maximum capacity of 100 Tbps were online as of 1st January 2007
 year-end 2007



Source: The Guardian

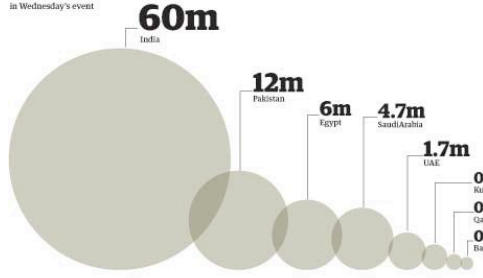
Alexandria, Wednesday
 A ship's anchor accidentally cuts two cables, SeaMe-WE4 and FLAG Europe-Asia, reducing internet capacity in Asia by 75%

Taiwan, 2006
 Site of the previous biggest cable disaster, when under-ocean landslide cut nine cables between Taiwan and the Philippines, disabling net access for weeks

ASIA
 Asia has an enormous number of internet users: 500 million of the world's 1.3 billion users. And it's growing by 88% per year

Internet users affected by the Alexandria accident

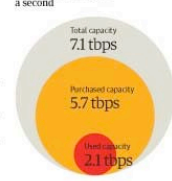
The main countries affected in Wednesday's event



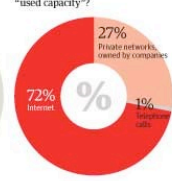
World cable capacity

Submarine cable operators light (turn on) capacity on their systems to sell bandwidth to other carriers. Carriers buy extra capacity, mainly to hold in reserve. On the trans-Atlantic route 80% of the bandwidth is purchased, but only 29% is used

Capacity in terabytes a second



What makes up "used capacity"?



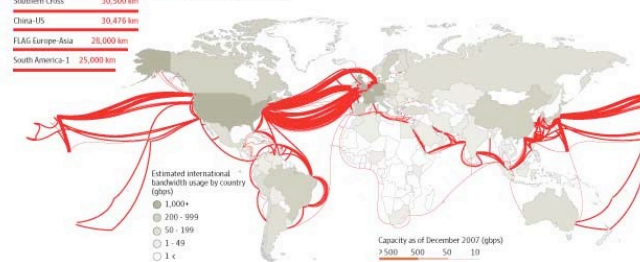
The longest submarine cables

The SeaMe-WE-3 system from Norden in Germany to Keeljo, South Korea connects 32 different countries with 39 landing points

SeaMe-WE-3	39,000 km
Southern Cross	30,500 km
China-US	30,470 km
FLAG Europe-Asia	28,000 km
South America-1	25,000 km

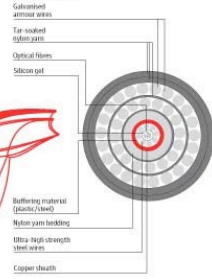
The world's cables in bandwidth

The first intercontinental telephony submarine cable system, TAT-1, connected North America to Europe in 1958 and had an initial capacity of 640,000 bytes per second. Since then, total trans-Atlantic cable capacity has soared to over 7 trillion bps



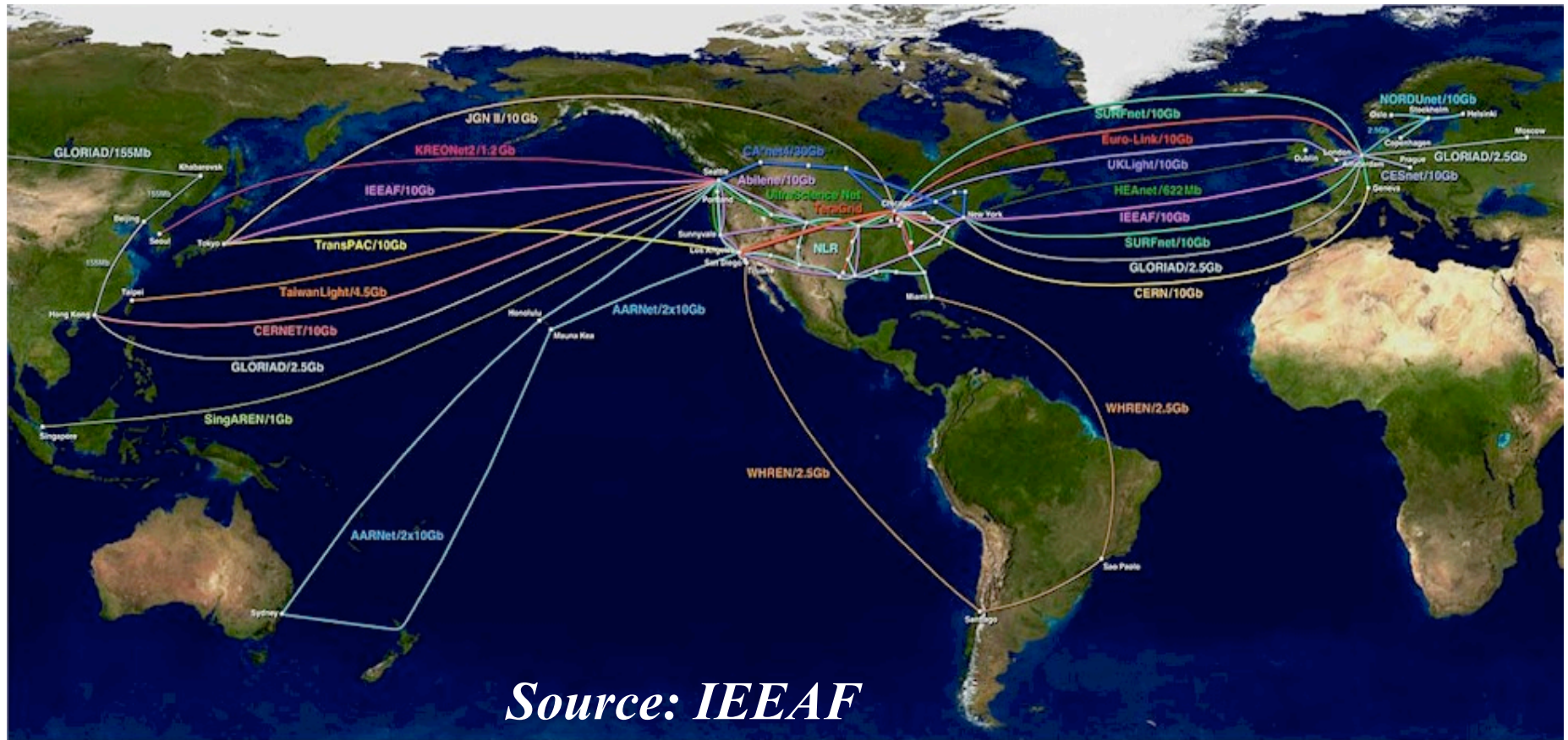
Cross-section of a cable

Cables of this strength are typically 60 mm in diameter and weigh over 10,000 kilograms a kilometer. In deeper waters, lighter and less insulated cables are used



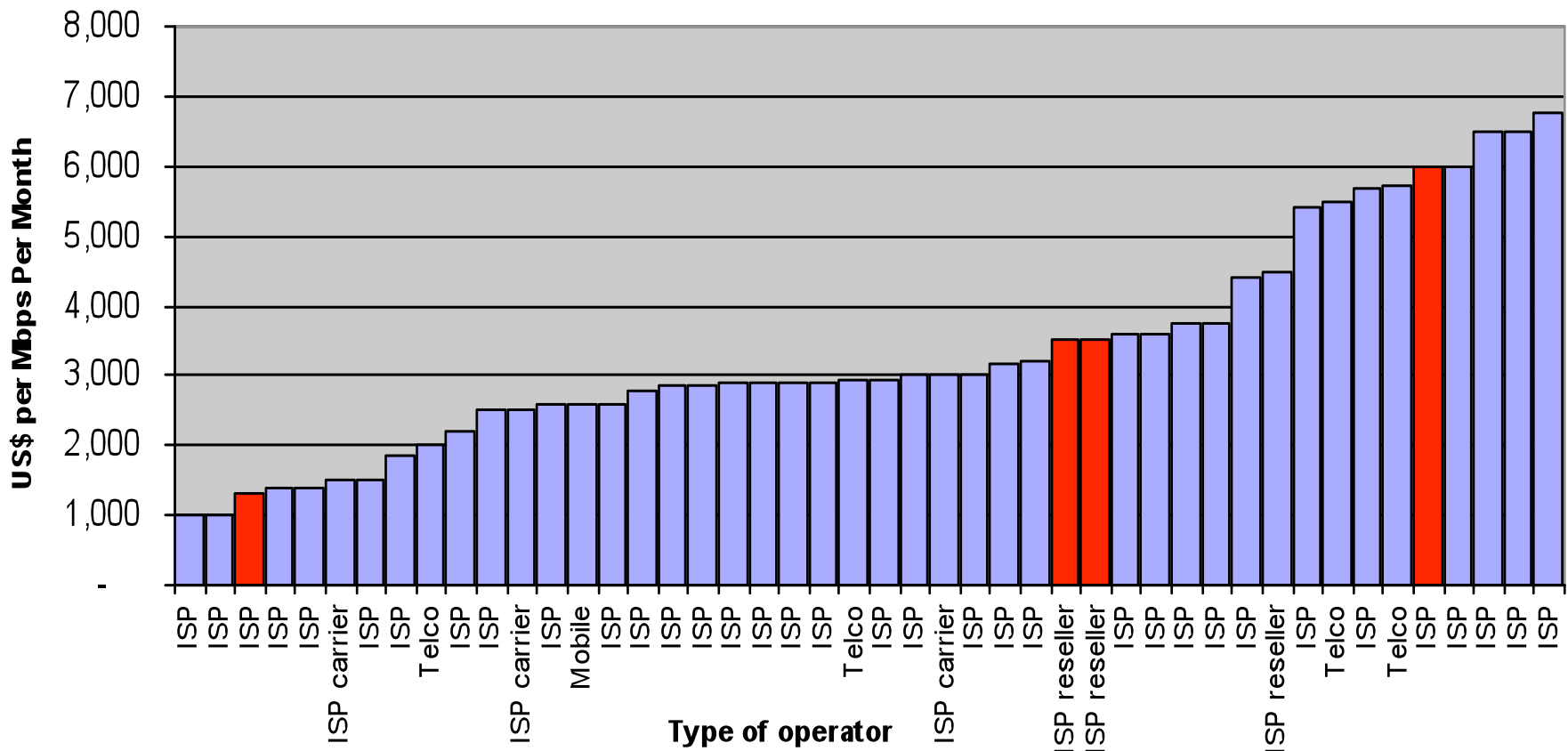
SOURCE: THE GEOGRAPHY CHANNEL; SUBMARINE CABLE MAP 2006; INTERNET STATISTICS FROM INTERNETWORLDSTATS.COM

Reality - Africa remains isolated from dedicated R&E capacity (2004) – still obtains apart from the Med. Sea.



Internet access costs remain incredibly high (Cost of VSAT access, 2006)

Price per Mb, ranked in ascending order



Source: Balancing Act African Satellite Markets Report 2006

Our thesis..

- *“Improved and affordable regional and international connectivity will enable African researchers to produce proportionate intellectual output and generate a proportionate amount of intellectual property goods to achieve parity with the rest of the world”*
- *Lemma: “World class connectivity will cause a reverse brain drain to Africa”*

- *Part 3: Identifying and Addressing Challenges*

Challenge 1: Africa is Huge!

To the next map...

Africa is Huge!

The following countries could fit within Africa:

	Area (sq. mi)
China	3,705,390
United States	3,618,770
India	1,266,595
Europe	1,905,000
Argentina	1,065,189
New Zealand	103,736
	<hr/>
	11,664,680 sq. mi or 30,211,551 km ²

Africa's area: 11,707,000 sq. mi.
or 30,321,130 km²



Africa is Huge and Varied

- Africa is not only geographically extensive – it contains multi-dimensional differences: National identity; Political economy; Culture; Language; External linkages; level of economic development
- Fortunately it also has a strong sense of historical, cultural, and geographical identity..
- *Our approach: recognising the need to work through partnerships in a mutually supportive environment, based on common architecture and/or interface standards; & Cluster approach*

Challenge 2: Disabling telecomm policy and regulation

- **Most of the countries still have either monopolies or very limited competition in the provision of access services, especially the international gateways.**
- ***Our approach: engagement of national and regional administrations, making a research-based case for liberalisation, and for special consideration for research and education networking as a development stimulant***

Challenge 3: Scarcity of technical human capacity

- **Competing with a rapidly growing and lucrative industry for limited human resource.**
- **Challenge of poor training in institutions...**
- ***Our approach:***
 - *Share expertise (communities of practice)*
 - *Work with organisations like Afnog, and offer internships to address capacity deficits;*
 - *Create a network engineering group*
 - *Guide universities on improved curricula*

Challenge 4: Very limited fibre to Africa

- **Background given in earlier presentation by Duncan**
- ***Our approach:***
 - *Opportunistic approach...*
 - *Seek donation of IRUS where possible on upcoming fibre (working with IEEAF which has donated 10Gb capacity on Seacom to the Eastern Cluster)*
 - *Secure IRUs at concessionary rates (TENET has done this on Seacom for the Southern Cluster)*

Challenge 5: The global mindset

- Most organisations look at creating access for African researchers as “taking Africa to the world” – means Africa must bear the cost
- *Our approach: We urge a new mindset: “bringing the world to Africa”. The message – “Come and meet us at the cable landing points in Africa – It is an investment. Not only are you better able to afford it, we shall all benefit”*

Challenge 6: Limited effective NREN activity

- **Background given in an earlier presentation by Boubakar.**
- ***Our approach:***
 - *Promote awareness of benefits of REN activities*
 - *Seek contact in all countries in each region to start NRENS and to become part of the regional RENs*
 - *Organise and/or participate in events in countries with emerging NRENS*
 - *Work with continental and regional organisations (AAU, E-Africa Commission, Nigerian ICT Forum, etc)*

Challenge 7: Limited funding

- **Funding of research and education networking is a new thing in almost all African countries, due to lack of awareness of benefits**
- ***Our approach:***
 - *Support lobbying and advocacy at national level to increase public funding to the growth of connectivity and NRENs (it is working)*
 - *Develop a clear business case and model that will create continuing relevance and withstand competition*
 - *Develop a clear master plan as a basis for engaging development partners (CORENA)*

Appreciation to our supporters to-date

- **IDRC and Connectivity Africa**
- **Cisco**
- **KTH (Sweden)**
- **DANTE**
- **IEEAF**
- **Open Society Institute**
- **Open Society Initiative for Southern Africa**
- **TENET's FRENIA (Fostering Research and Education Networking in Africa) Program, funded by The Andrew W Mellon Foundation.**
- **USAID**
- **GEO**
- **University of Washington**



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Conclusion: We are creating the future..

- We are creating the future of Research and Education Networking in Africa. We own this challenge as Africans. We must and we shall address it. If our development partners support us, success will come much faster. If they do not, we shall still succeed, albeit taking much longer.

• *Thank you*



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