Research and Education Networking in Eastern and Southern Africa

This presentation will be given also at the TERENA Networking Conference, 15-18 May 2006, Catania, Sicily.

Workshop on
e-Infrastructure Partnerships for African and European Researchers

Pretoria, 2 May 2006

Duncan Martin
The UbuntuNet Alliance and TENET

The goal set in Tunis

No later than 2008, universities and research institutions in Southern Africa will have access to broadband services and the global Internet on the same level as peers in the developed parts of the world, with a quality of service in the Gbps rather than Kbps and with delays, variations and error rates as defined by normal properties of properly run terrestrial fibre networks.

Bjorn Pehrson, AAU Conference, Tunis, Nov 2005

But, do we know what the target looks like?

GÉANT2 Marks a Giant Step Forward for European Research Activity

Press Release, Luxembourg, 14 June 2005

Next generation network with massive performance of 500 Gbps is a global reference for scientific networking excellence.

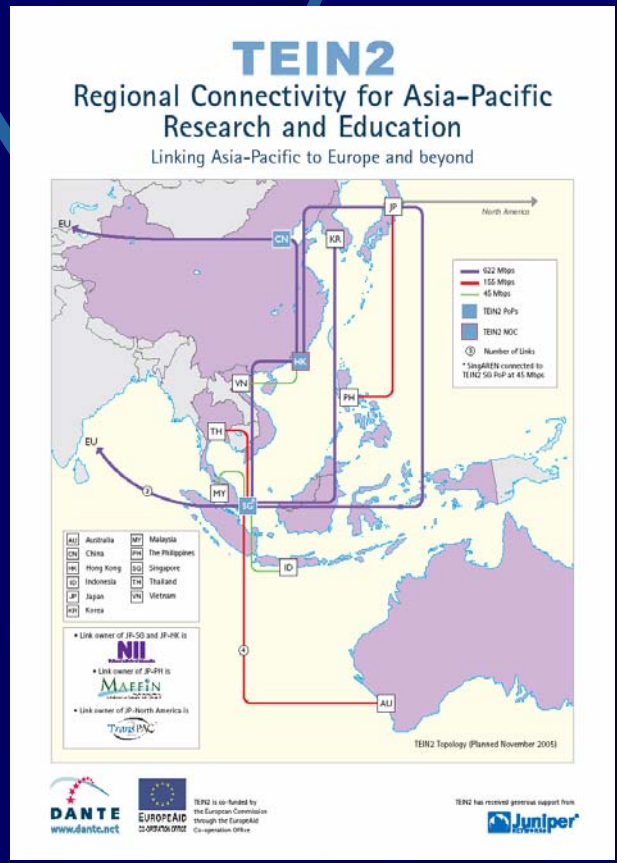
The network provides standard IP connections alongside switched links on some routes. The switched circuits provide dedicated point-to-point links, when needed, for the most demanding applications.

First Large Scale Asian Research Network Deployed

Press Release, 15th December 2005

TEIN2 project provides researchers in ten countries with gateway for global collaboration.

TEIN2, creates the first large-scale research and education network for the region, linking ten countries at speeds of up to 622 Mbps.



INTERNET2 ANNOUNCES ABILENE REPLACEMENT

Speaking at an Internet2 conference, Douglas Van Houweling, president of the organization, gave some details about the backbone network that will replace Abilene, Internet2's current high-speed backbone, in about 18 months.

The new network, will initially offer roughly 10 times the bandwidth now provided by Abilene.

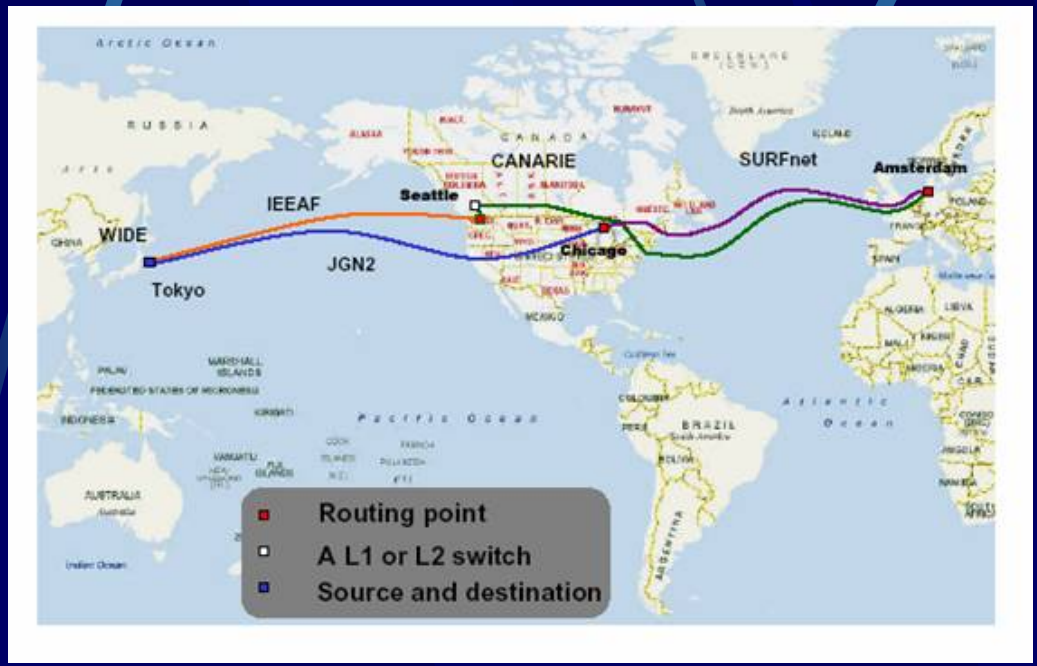
Each institution would have a wavelength dedicated to conventional Internet traffic and access to a separate wavelength that the institution could use as it chooses….

Chronicle of Higher Education, 26 April 2006

New World land speed record!
8.8 gigabits per second!

Tokyo – Seattle – Amsterdam – Chicago – Tokyo
20 February 2006

8 international networks and exchange points
Round trip distance: 32,000km
Round trip latency: Latency 500ms



University of Tokyo
(Dr. Kei Hiraki, Team Leader)

WIDE Project
Chelsio Communications
JGN2 network
Northwest GigaPop
NTT Communications
APAN
Fujitsu Computer Technologies
IEEAF
CANARIE
StarLight
SURFnet,
SARA
University of Amsterdam

Yes! We see the target!

Optical fibre…
100 Gb/s…
Géant2…
Switched lightpaths…
NRENs…
Regional REN…

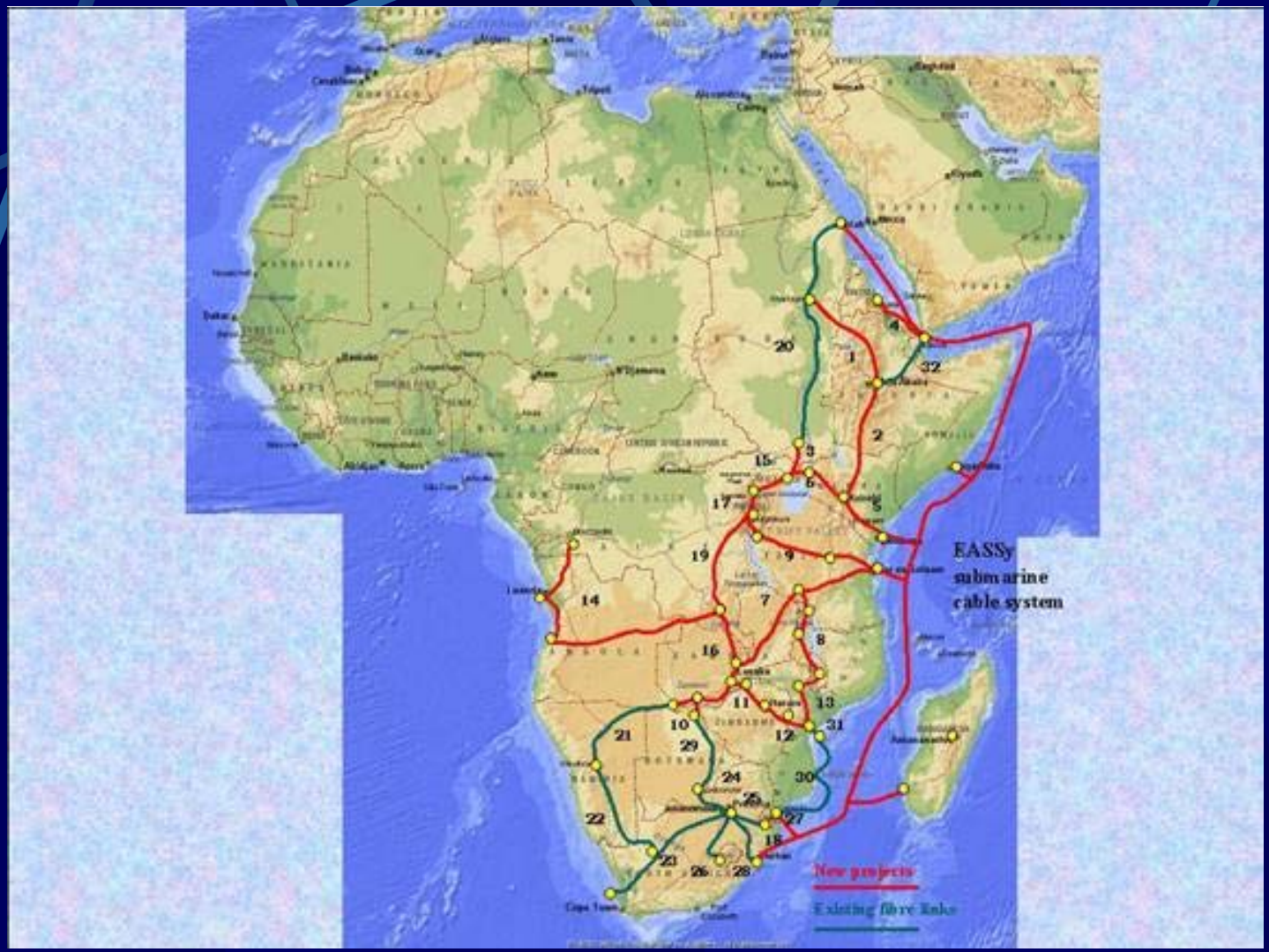
Developments in Eastern and Southern Africa

- Optical fibre is being deployed in the region
- NRENs are emerging rapidly as vehicles for:
  - *inter-institutional collaboration*
  - *bandwidth procurement*
- UbuntuNet Alliance has been formed
  - *An African regional REN*

Drivers of fibre deployment
in eastern and southern Africa

- amazing uptake of mobile telephony
- deployment of fibre by power companies
- removal of the restrictive regulations
- prospect of the East Africa Submarine System (EASSy)
  - *"wet" system, and*
  - *"dry" system – back-haul into the hinterland*
  - *Special accommodation for land-locked countries*

Slide from SARUA Fibre Study



EASSY: Demand for open access

- NEPAD, governments, civil society, Donors, World Bank all want EASSy to be an engine of economic growth
- "Open access" is the proposed criterion
- "SPV model" is the proposed solution
  - *Separates investment from access to bandwidth*
  - *Runs on commercial principles; but*
  - *Inter-Governmental Assembly*
    - controls policy and has veto power on SPV Board
- Actions
  - *NEPAD is coordinating*
  - *Regulators are working*
  - *End-May meeting of ICT Ministers*

Meanwhile, on the beaches…

- The EASSy partners continue..
  - *planning and preparing*
  - *Calling for and evaluating tenders*
  - *Seeking further investors / lenders*
  - *Suggesting they'll drop the entire project…*
- Shareholder Club model
  - *Each investment buys bandwidth for life*
  - *Larger investment buys use of landing station too*
- Unlike the SAT-3 partners…
  - *EASSy partners get no exclusivity period*
  - *Several operators at each landing point*

NRENS

- European NRENs are the prototypes
  - *National character*
  - *Inclusive: open to all universities and research institutions*
  - *Inter-connect member institutions*
  - *Connect to Géant and hence to RENs worldwide*
  - *Promote advanced networking*
- In Africa, NRENs also
  - *Act as bandwidth consortia*
  - *Secure general Internet access*

NRENs in E'n & S'n Africa

- Operational NRENs
  - *KENET (Kenya)*
  - *MALICO/MAREN (Malawi)*
  - *TENET (South Africa)*
- NRENs in formation
  - *MoRENet (Mozambique)*
  - *RWEDNET (Rwanda)*
  - *SANReN (South Africa)*
  - *TENET (Tanzania)*
  - *RENU (Uganda)*
- Projects starting up
  - *Botswana, DRC, Namibia, Somalia, Sudan, Zambia*

KENET

TENET
Tertiary Education Network

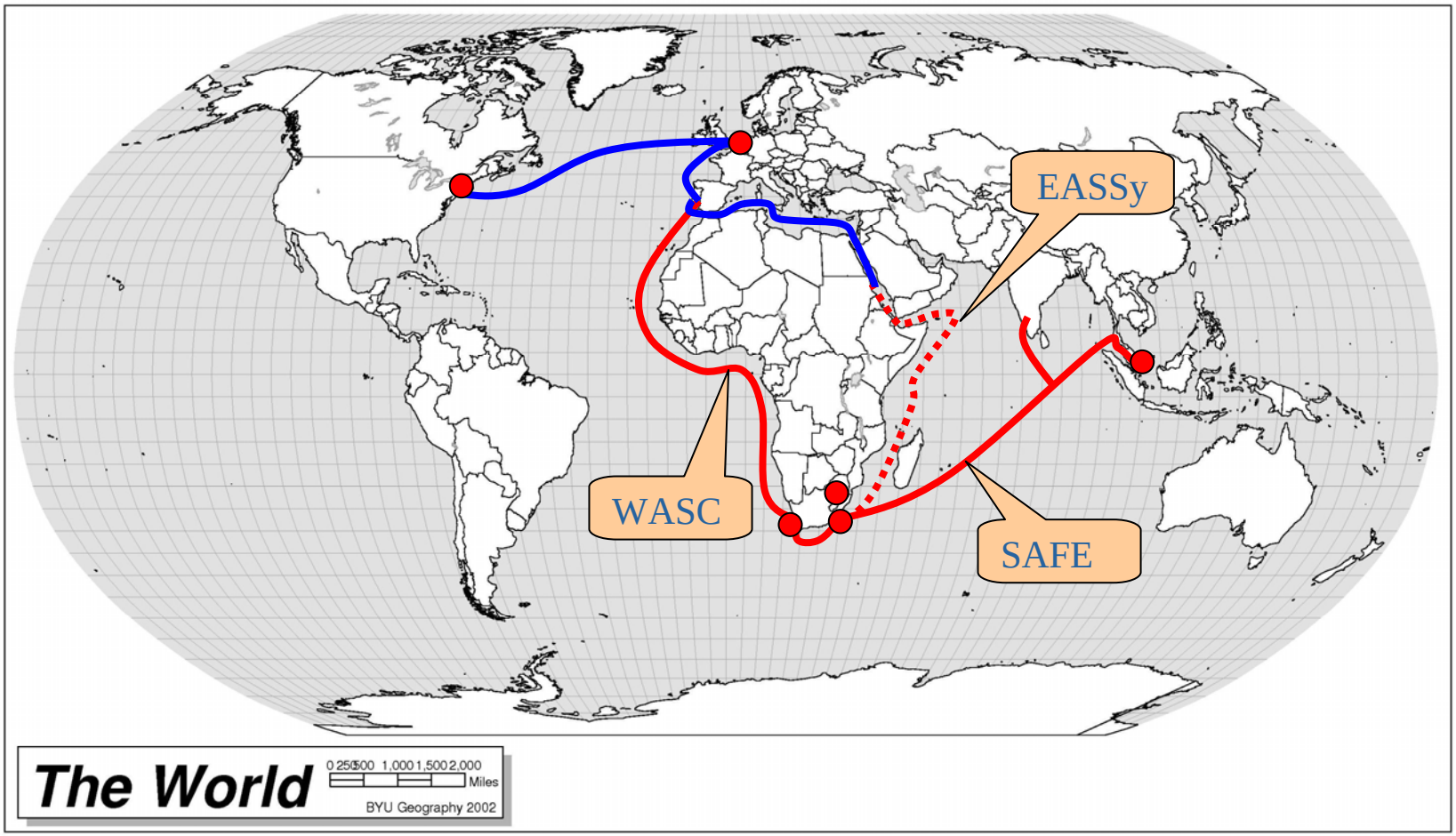
The UbuntuNet Alliance

- Fledgling *regional* Research and Education Network
  - *The "Géant of Africa" (See www.ubuntunet.net)*
  - *Registering as a non-profit association in Amsterdam*
  - *Registration now only a few weeks to completion*
  - *Full legal capacity to conduct business world-wide*
- Membership open to all NRENs of sub-Saharan Africa
  - *Founding NRENs; KENET (Kenya), MAREN (Malawi), MoRENet (Mozambique), RwEdNet (Rwanda), TENET (South Africa)*

The UbuntuNet Alliance (2)

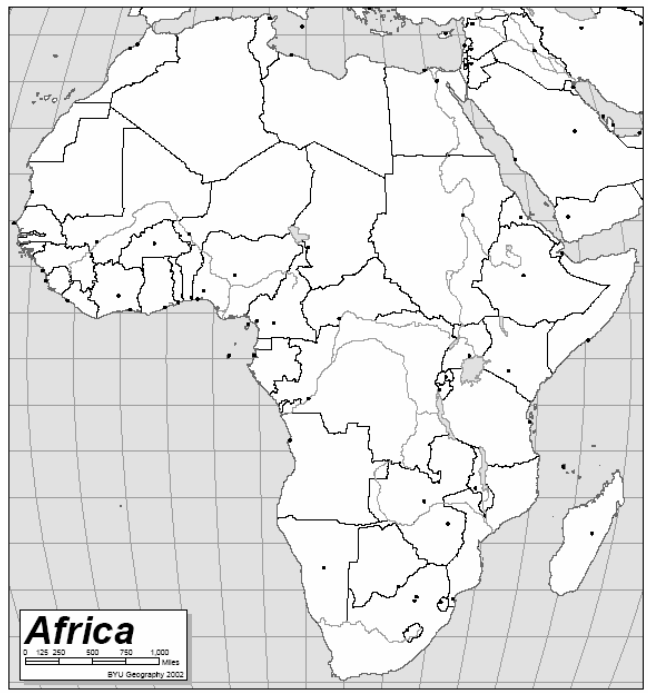
- Strong support from AAU, SARUA
- Strong support from the EC
  - *Planning workshop in Brussels 6-7 March 2006*
  - *Hopeful that an EC-sponsored "feasibility study" will commence soon.*
- Trying to join the EASSy Consortium
  - *NEPAD Workshop in Pretoria 2 weeks ago*
  - *We're talking to the Consortium*
  - *To be open or not to be open – that is the question….*
- Sponsors
  - *IDRC (Canada), SIDA (Sweden), OSI, OSISA*

Envisaged intercontinental connectivity

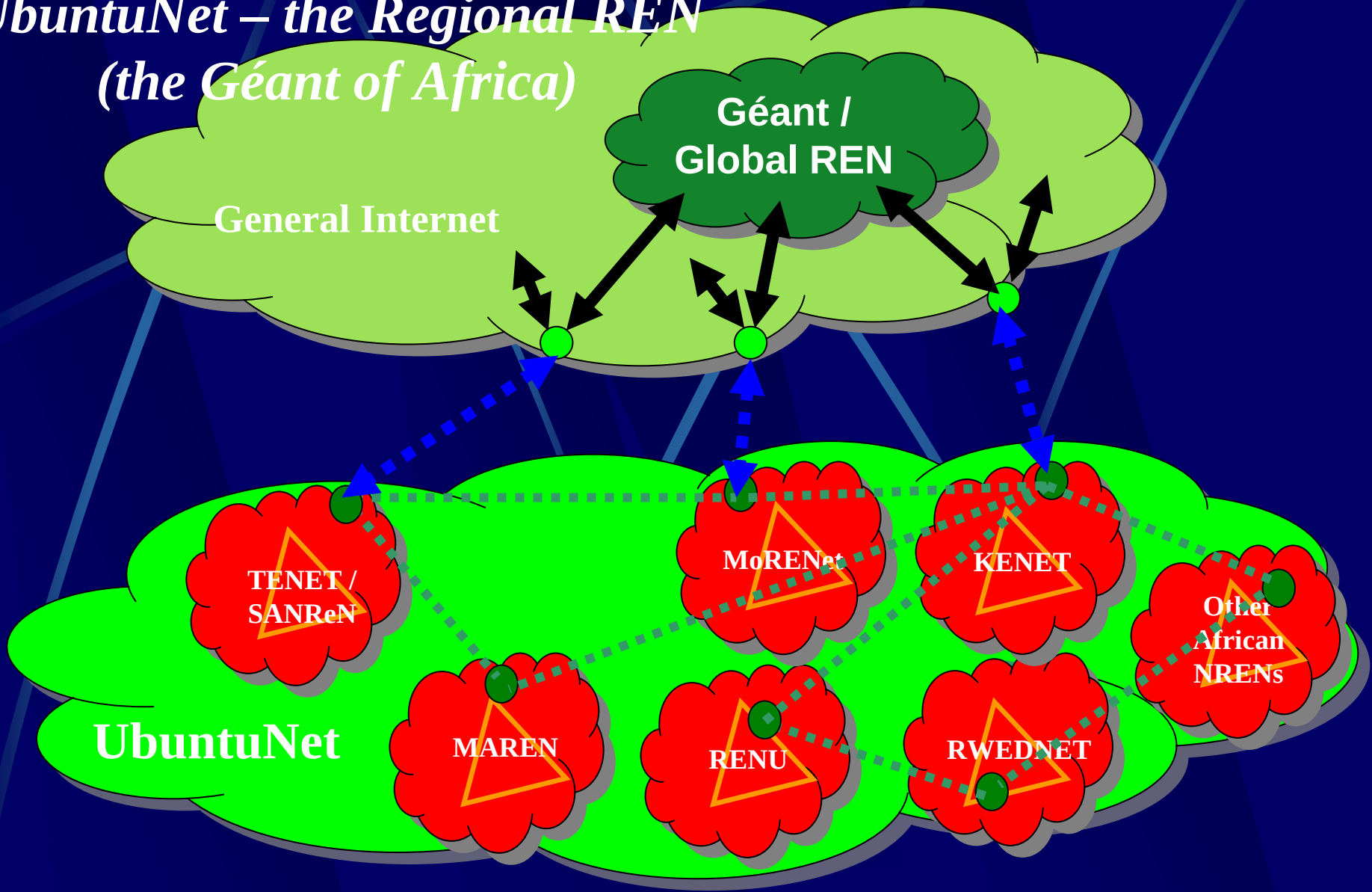


A patchwork regional backbone for UbuntuNet?

- Some 15 countries in the region
- Each determines its own regulatory regime; issues its own licenses
- Cross-border tariff barriers
- NRENs will need to transit each others' traffic
- UbuntuNet contracts and manages



UbuntuNet – the Regional REN (the Géant of Africa)



Thanks for listening!