

# IMPACT OF UNDERSEA CAPACITY IN EAST AFRICA

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# What I'll cover.....

- Regional undersea connectivity before 2009 and as at the end of 2009
- What connectivity for the region may look like by the end of 2010 and beyond
- East African NREN status
- UbuntuNet
- Q&A

# CONNECTIVITY IN EAST AFRICA BEFORE 2009 AND AS OF THE END OF 2009



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# Pre 2009

- 100% satellite connectivity
- Very expensive – prices starting from \$2,000 per Mb (Megabit) up to \$7,000 per Mb
- In country fiber was available but expensive local loop and not far reaching
- In Kenya, only one strong PDNO (KDN) and UTL for Uganda
- In Tanzania, Tanesco (Power company) and TTCL but not much presence, several small ISPs with own fiber

# Pre-2009 connectivity

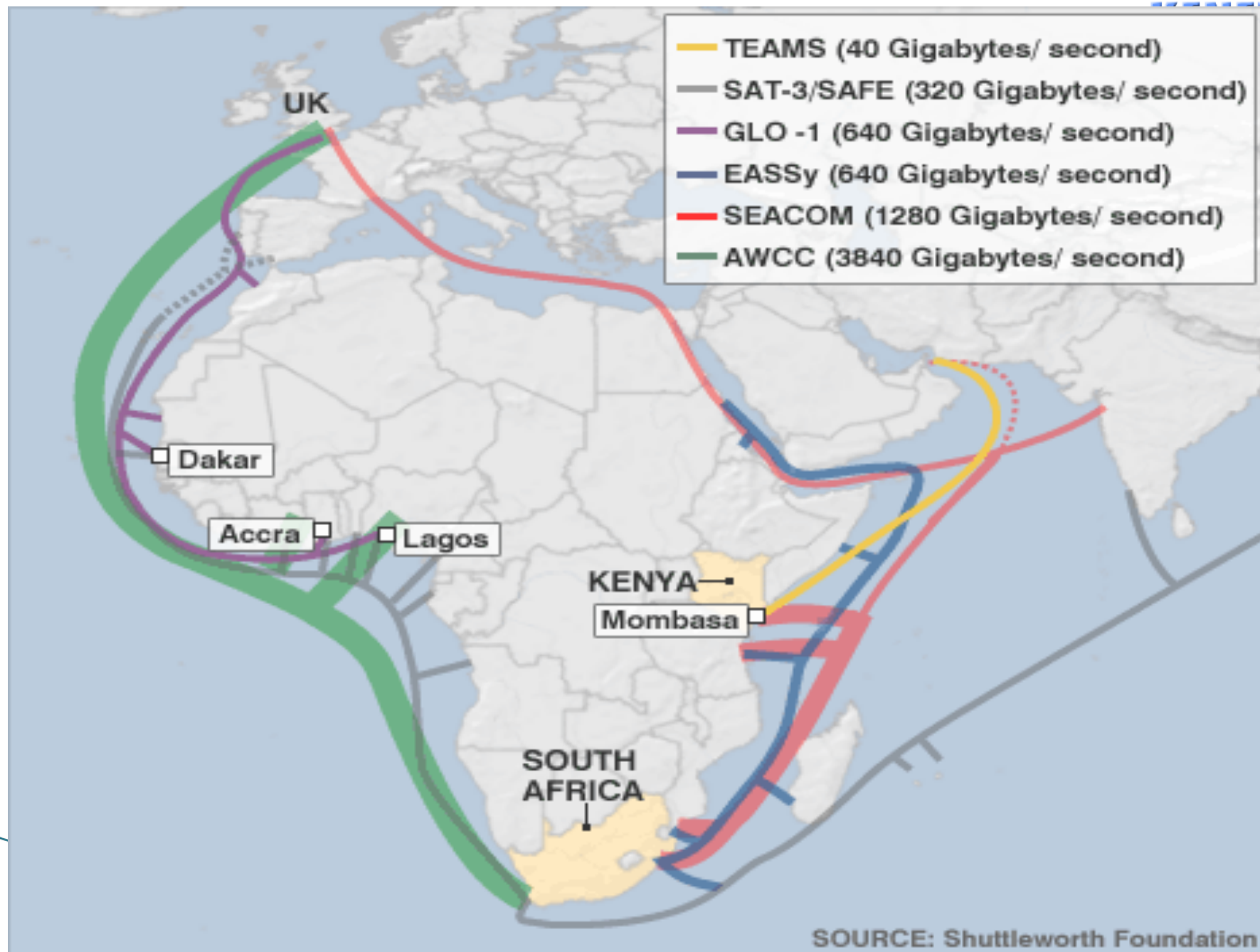
- Undersea connectivity was coming but many in the region were skeptical
- The three main cables on the way were: SEACOM, TEAMS and EASSy
- SEACOM to connect East Africa to London
- TEAMS to connect Kenya to UAE (Fujairah)
- EASSy focusing on inter-Africa connectivity to the rest of the world





SOURCE: <http://www.habari.co.tz/node/bulletins/agm2005/eascs.html>







# Cables completed in 2009

- SEACOM reaches Kenyan port of Mombasa and activates in June 2009
- TEAMS completes link from Kenya to Fujairah and activates in July 2009
- For Kenya, a lot of excitement especially in regards to drop in bandwidth prices
- Seacom is more favoured, lands in Europe where prices are cheaper and has a contract in Kenya with provider to distribute its capacity in country and to Uganda

# SEACOM vs TEAMS

- SEACOM cheaper per Megabit for the ISPs
- TEAMS is more expensive, because of monopoly prices in UAE, took time to take off but is currently in use
- TEAMS encountered some problems in Kenya
- Some of its shareholders were unable to pay up and went to court to challenge their being thrown out with their shares being distributed among the larger shareholders.

# As at end of 2009....

- SEACOM and TEAMS completed but EASSy still in progress, estimated completion is mid 2010
- SEACOM Fiber in Uganda is available to commercial ISPs via UTL
- Same story in Tanzania available via TTCL
- Rwanda also served by SEACOM via RTL from September 2009

# CURRENT CONNECTIVITY – 2010

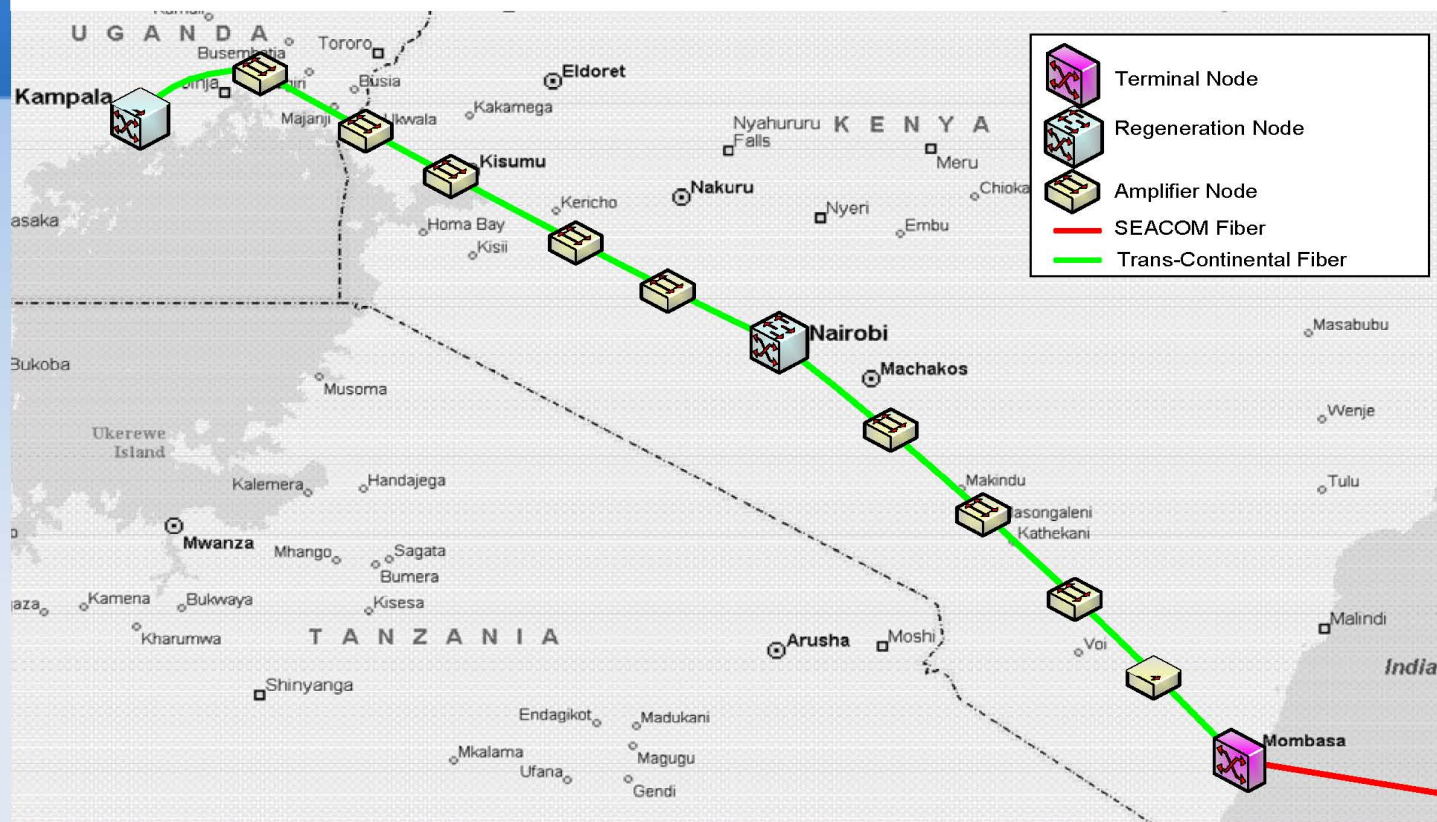


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# Uganda

- There is undersea capacity but no redundancy
- Still maintain VSAT for backup
- Traffic passing via Kenya and the stiff competition in Kenya sometimes leads to inter ISP sabotage and Uganda and Rwanda unfortunately suffer
- Route is via Kenya ending up in Mombasa

## Kenya/Uganda Fiber Route



Source: RENU



# Kenya

- The best served in terms of bandwidth and reach of the three countries
- Prices have reduced but not to expected levels because ISPs still have Satellite contracts
- Best current price per Megabit around \$120 per Mb with a buy one get 4 arrangement
- Mainly because in country infrastructure is not really ready to absorb all the bandwidth, ISPs have much more than they can sell but can't really reduce cost very much due to VSAT contracts
- ISP market is highly competitive, vandalism and sabotage is common

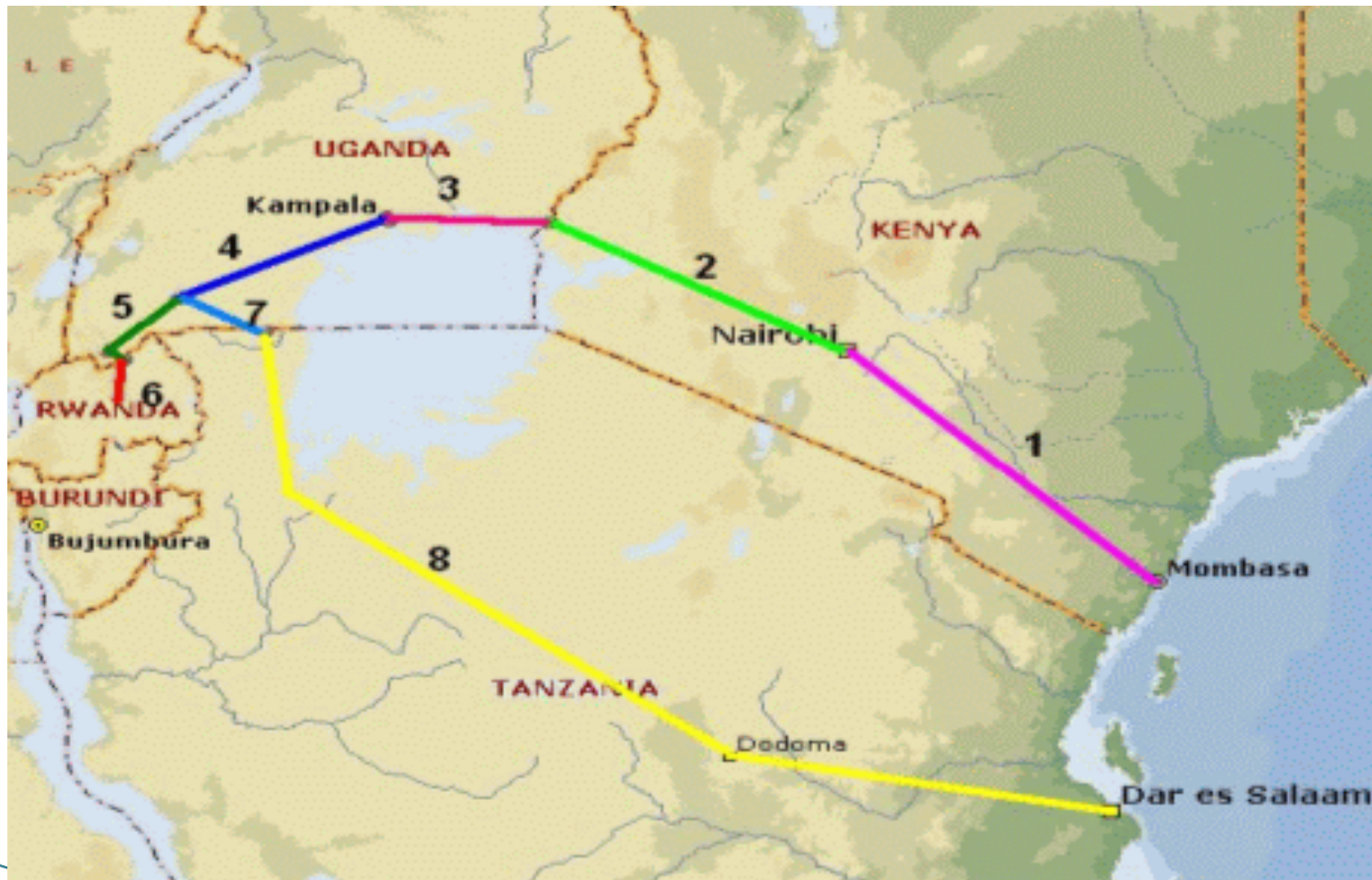
# Tanzania

- SEACOM capacity is available via TTCL
- No other planned under sea cables at the moment apart from EASSy
- EASSy completed connectivity in mid 2010

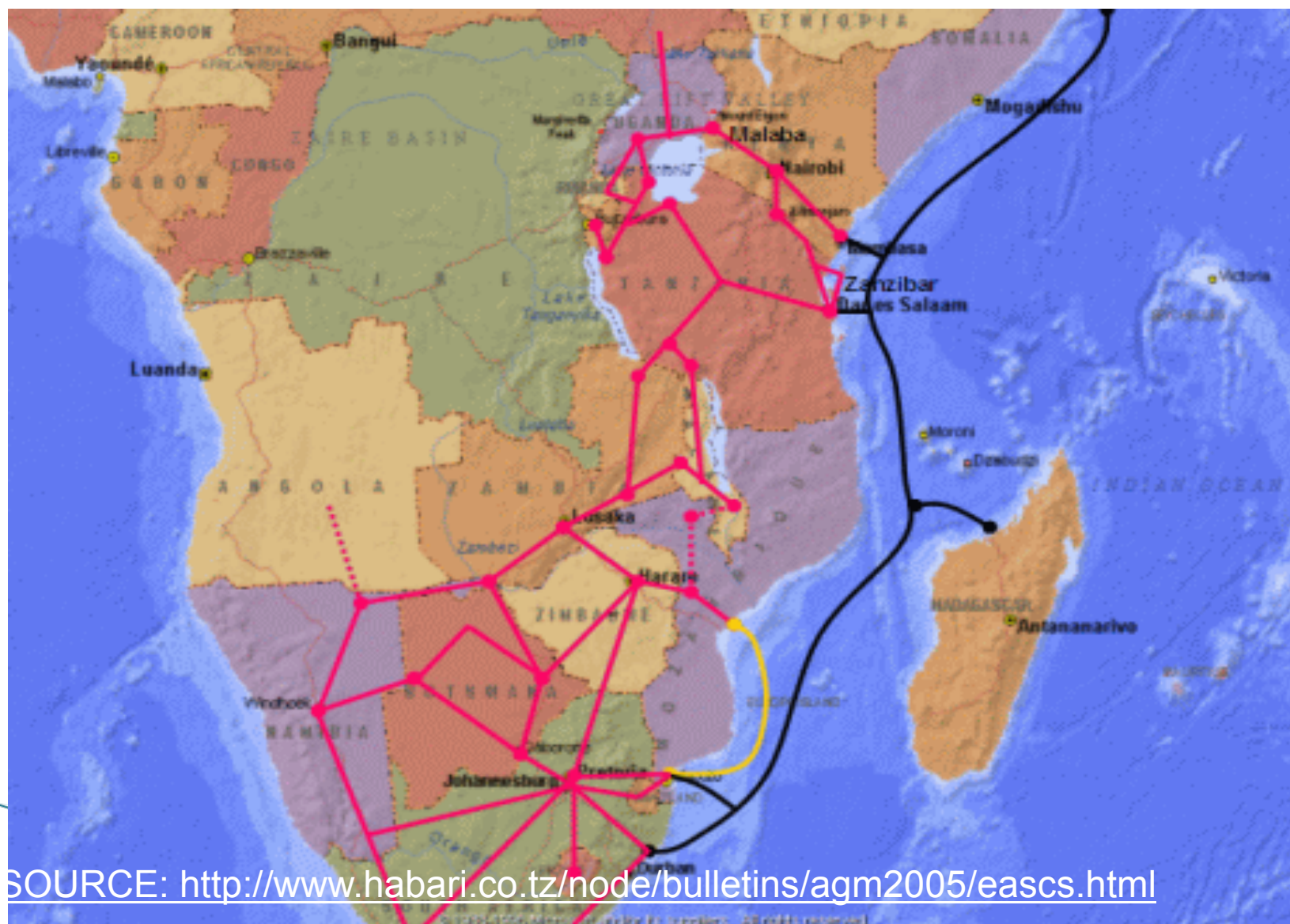
# EASSy design for East Africa..

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SOURCE: <http://www.habari.co.tz/node/bulletins/agm2005/eascs.html>

# NRENS IN THE REGION AND THEIR CONNECTIVITY



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# Uganda – RENU

- RENU is not yet active, is participating in a project in collaboration with IEEAF to acquire under sea capacity at 10G
- Have partnered with UTL to use its existing infrastructure to reach member universities
- Their equipment was to be provided by USAID but has been delayed for sometime
- No permanent staff as yet, mainly volunteers but have established their structures
- Have ASN and / 18 IP space from Afrinic



# Tanzania – TERNET

- TERNET also not active but SEACOM is terminated at University of Dar Es Salam
- The SEACOM cable was ready around the same time as Kenya's but there have been delays mainly in purchasing fiber equipment and signing up to SEACOM
- However, as of mid Jan 2010, an agreement with SEACOM was reached
- Will probably lease capacity from existing provider, have acquired own IP space

# Kenya

- KENET has undersea capacity via KDN (SEACOM partner) and as of 28<sup>th</sup> January 2010, direct connectivity to London via acquired STM 1 IRU (20 year NREN price)
- KENET has been active for a number of years and has grown from having lease line copper to lease line fiber charged at \$16 per 10Mb (Megabit) local loop
- 77 connected sites mostly on fiber
- Enjoys massive support from large Universities – free DC hosting!

# A bit on the consumption in KENET...

- Made the big leap from VSAT to Fiber
- Member campus networks were not ready – were only absorbing <10Mbps each
- Even on VSAT, campuses were poorly designed and equipped
- KENET distributed switches donated by NSRC to help mitigate this, were a big success allowing students to be reached better
- Campuses still poorly designed, trainings done in March with NSRC and UoO

# More on KENET

- Run a training program and mailing list called Bandwidth Management and Optimisation and has grown to include members from Malawi, Zambia, Sudan, Tanzania and Rwanda
- Focuses on teaching net admins to monitor, manage and optimise their links
- Has carried out E-Readiness surveys in the region to evaluate how prepared the countries are to absorb capacity – <http://eready.kenet.or.ke>

# Even more on KENET....

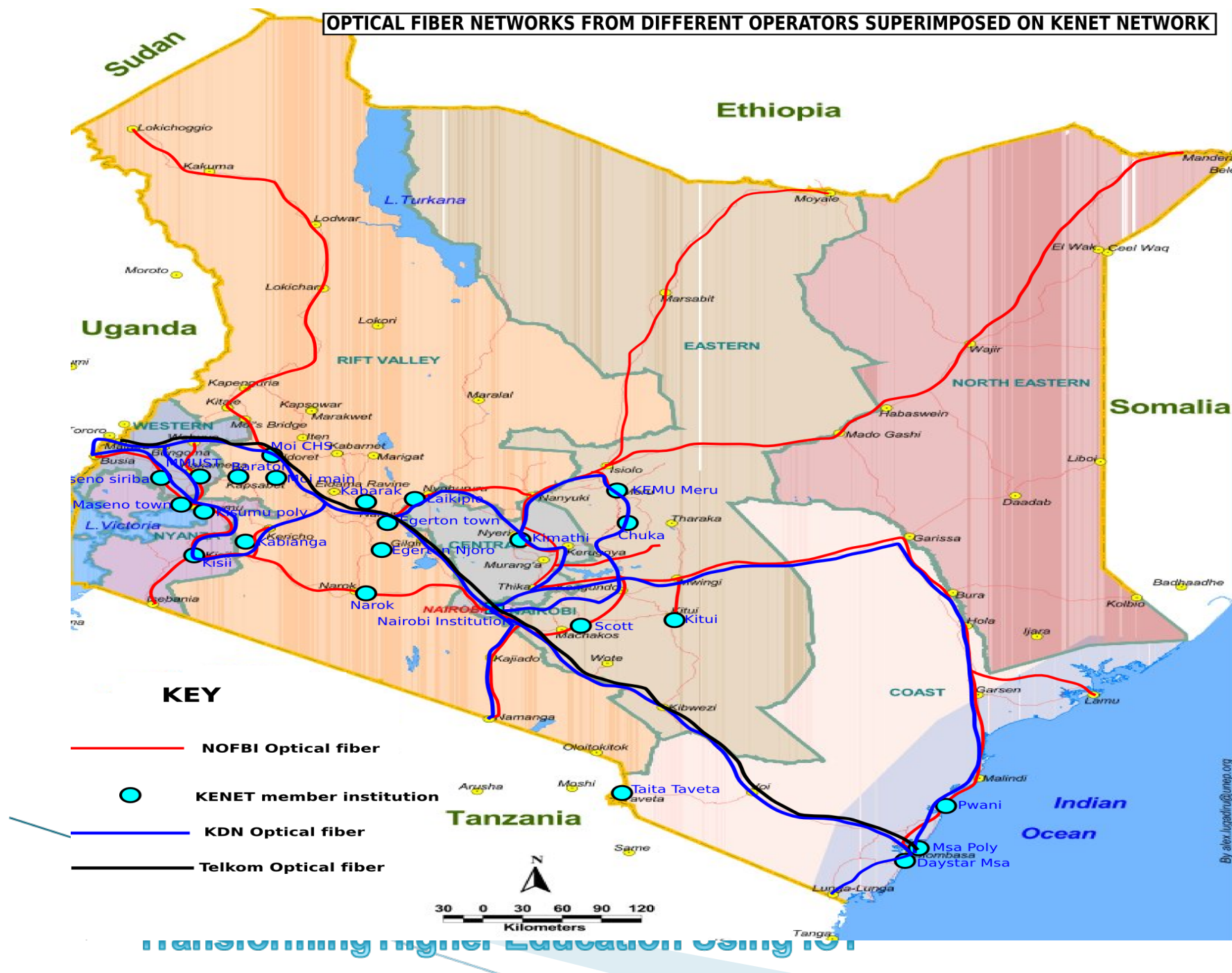
- Using leased lines to reach members
- Government has donated its TEAMS capacity to Fujairah – STM 4 but not activating this soon
- Will also benefit from National Fiber Optic Backbone Infrastructure NOFBI project
- Currently only HEIs but may expand to include schools
- Also have 200Mbps VSAT till Jan 2011 but will retain some capacity for redundancy

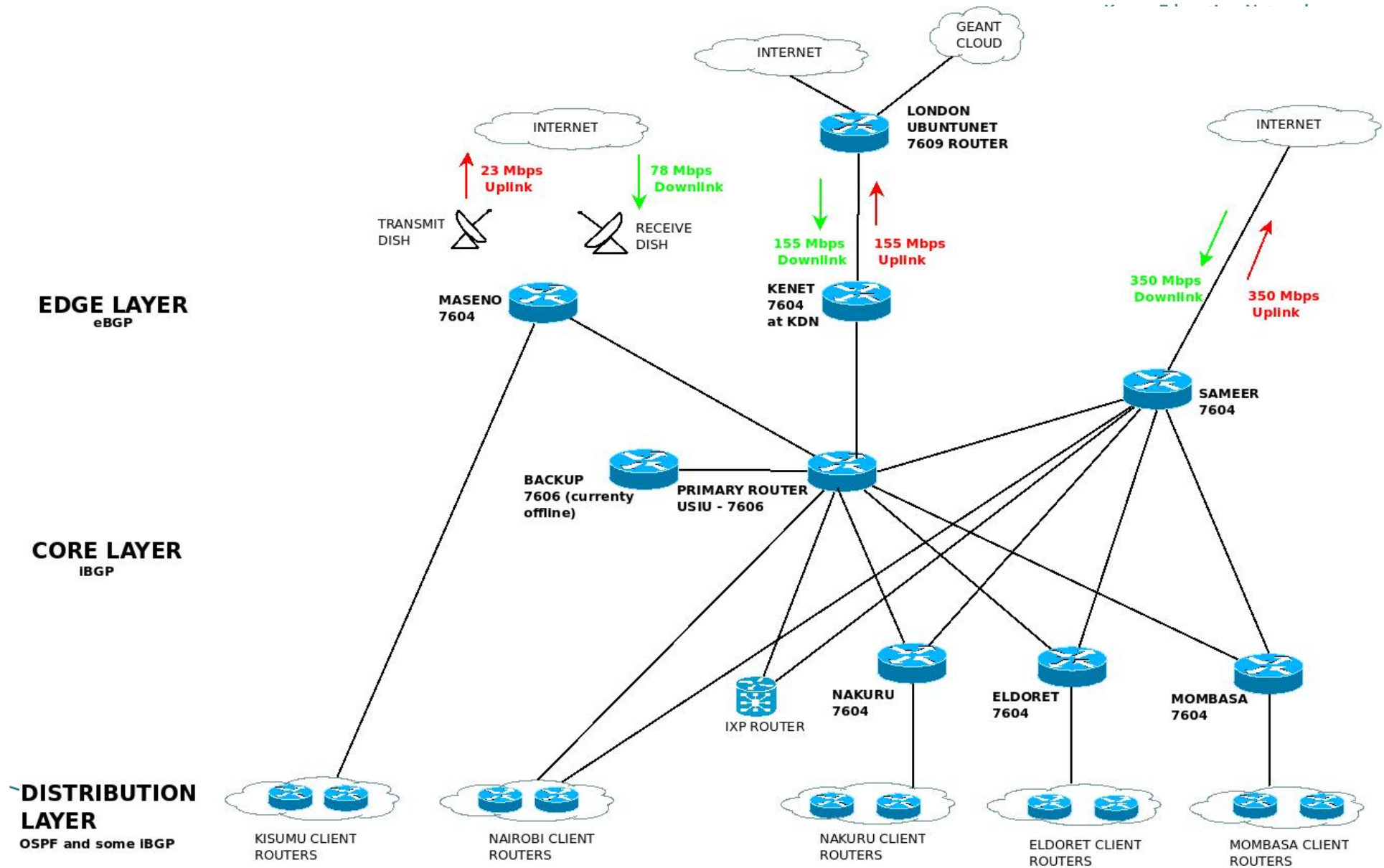
# KENET Network

- IPv4 /16 and /19
- Ipv6 /32
- ASN 36914
- Network migration to /16 underway, IPv6 also being introduced. Will be complete once DNS transitioned to BIND9
- Previously did only OSPF with Universities but network became unstable
- BGP for traffic and OSPF for infrastructure now in place and Network is much more manageable



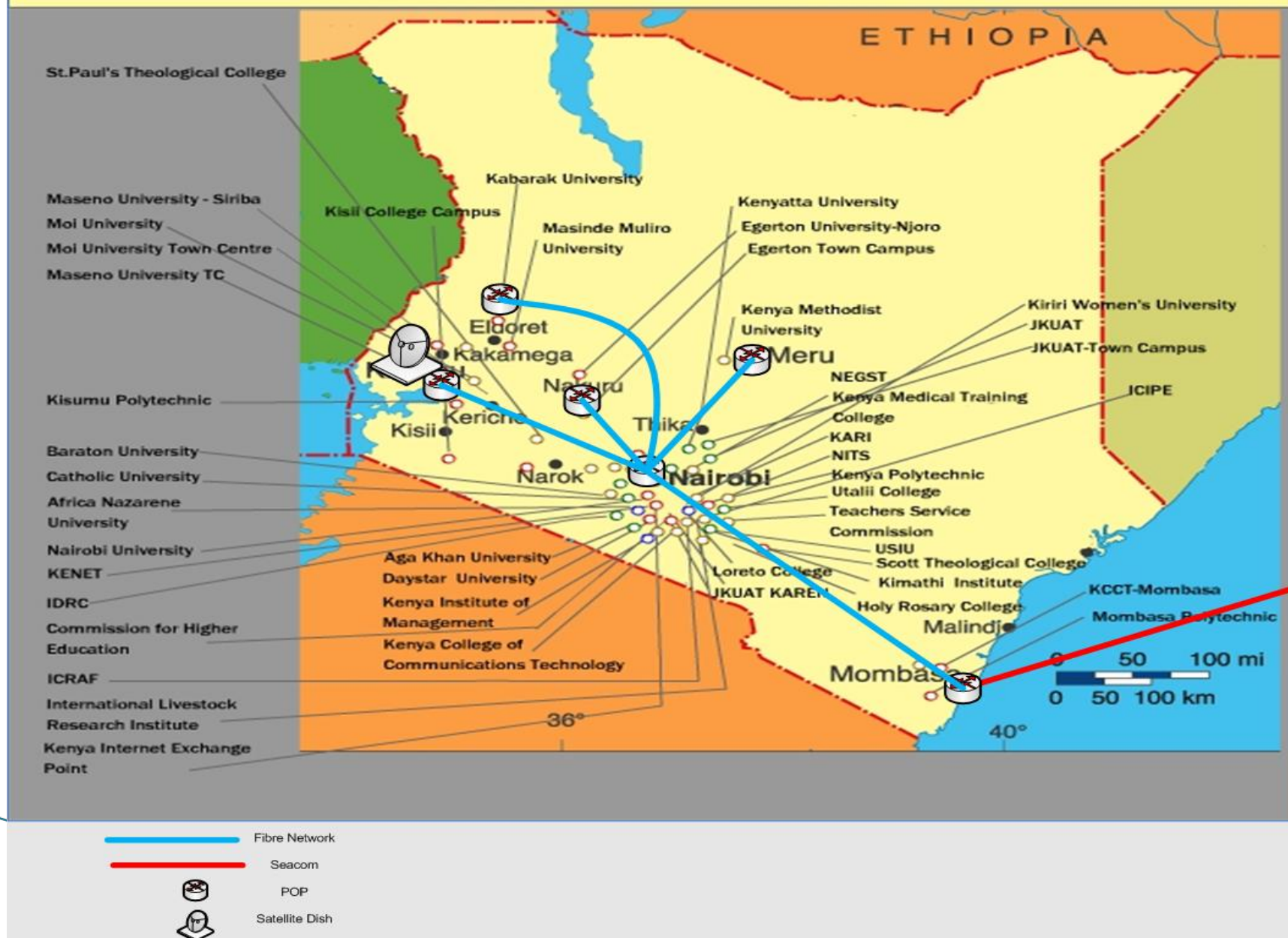
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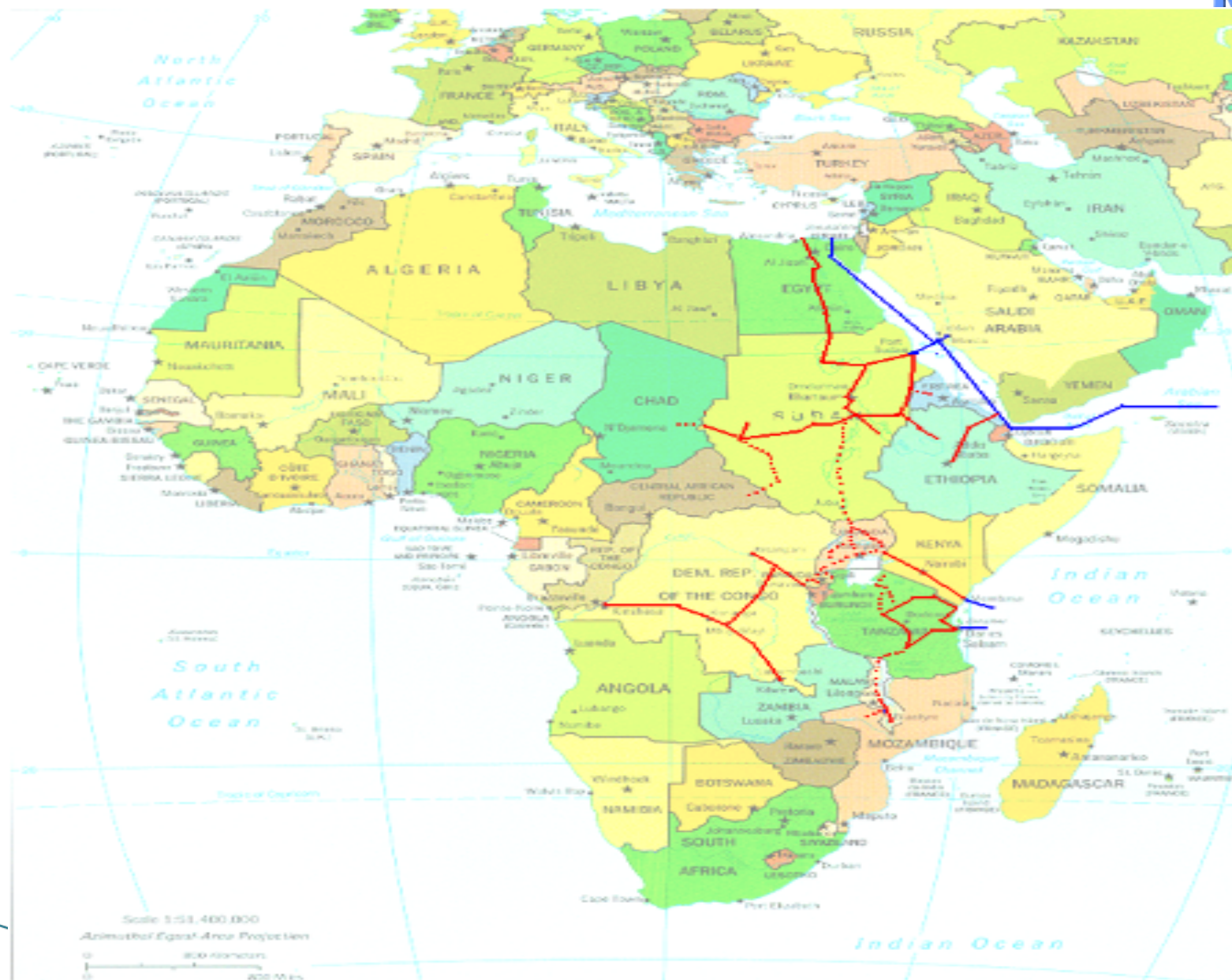
# KENYA EDUCATION NETWORK INSTITUTIONAL COVERAGE MAP





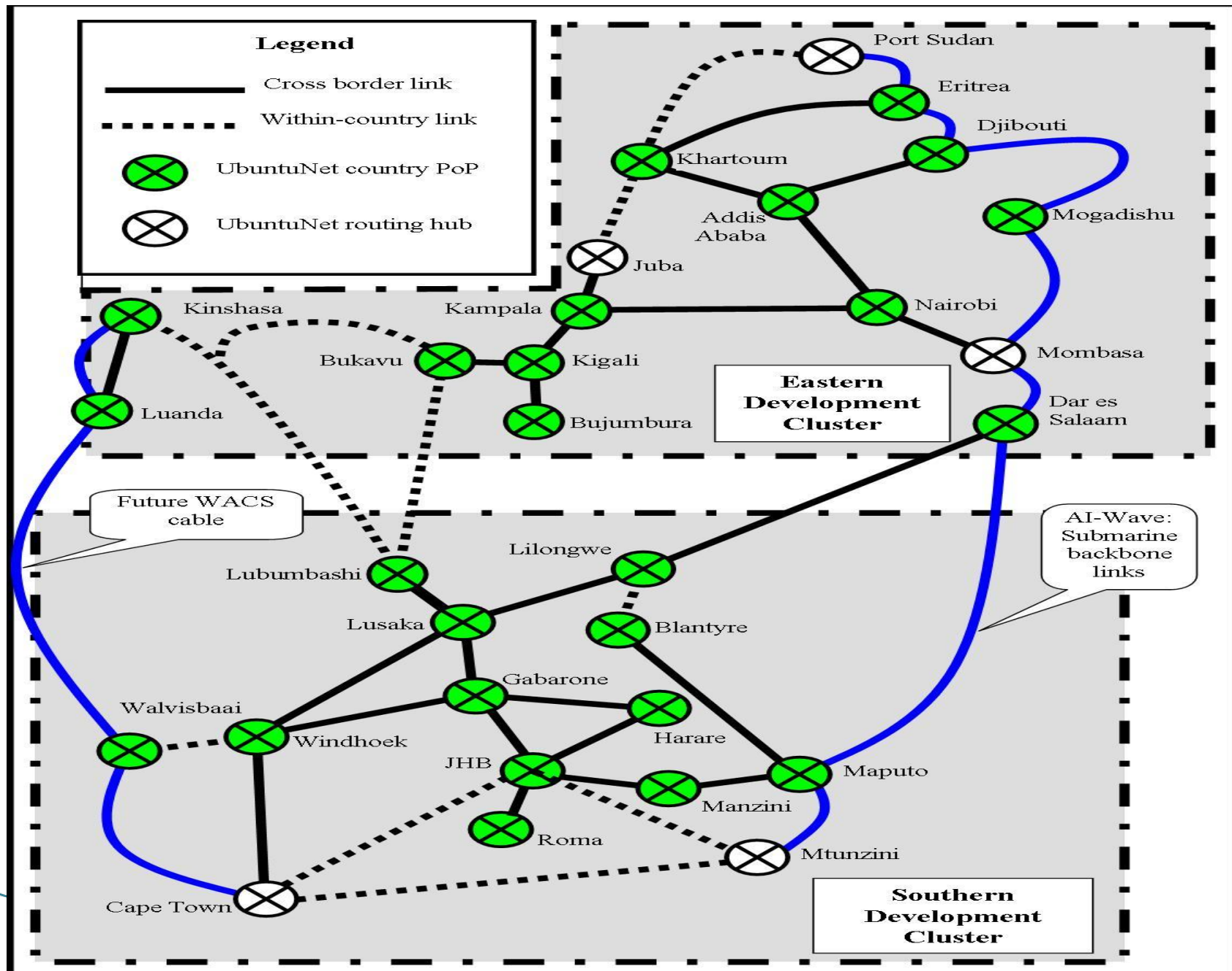
# NREN conclusion

- Uganda are very close and will be active as soon as their equipment arrives. The delay has been more than a year and it is difficult to say when their equipment will arrive.
- Tanzania are also close and SEACOM have terminated. Once internal issues are sorted, they should come up before the end of 2010
- KENET is up and could function as the regional NREN. UbuntuNet has contracted KENET to this end and this could be a reality soon
- National backbones being dug in all countries and will be completed soon and NRENs to benefit



SOURCE: <https://wiki.cac.washington.edu/display/ieeaf/Nairobi+Workshop+October+2008>

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Source: <http://www.ubuntu.net>



Thank you!

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Q&A

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