

Cape Town GOLE and Africa-Europe connectivity

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Introduction

Orientation:

- ▶ SANReN Network = TENET (AS2018) + SANReN CA.
- ▶ Simeon = SANReN CA engineering team leader.



Agenda:

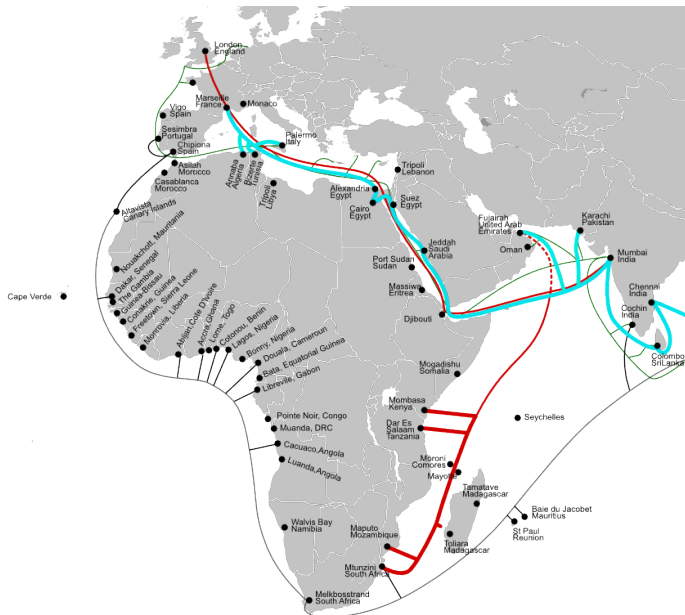
- ▶ Africa-Europe connectivity.
- ▶ SKA-MID (SA part).
- ▶ Cape Town GOLE.

Africa-Europe connectivity

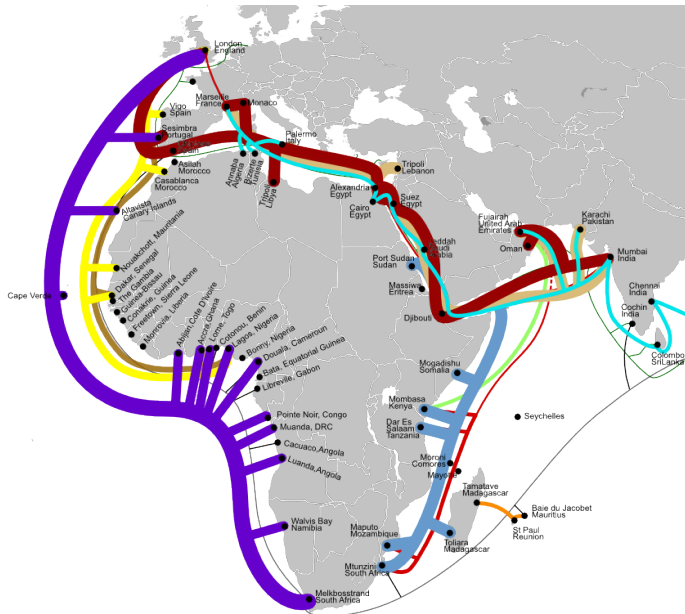
African undersea cables: 1999



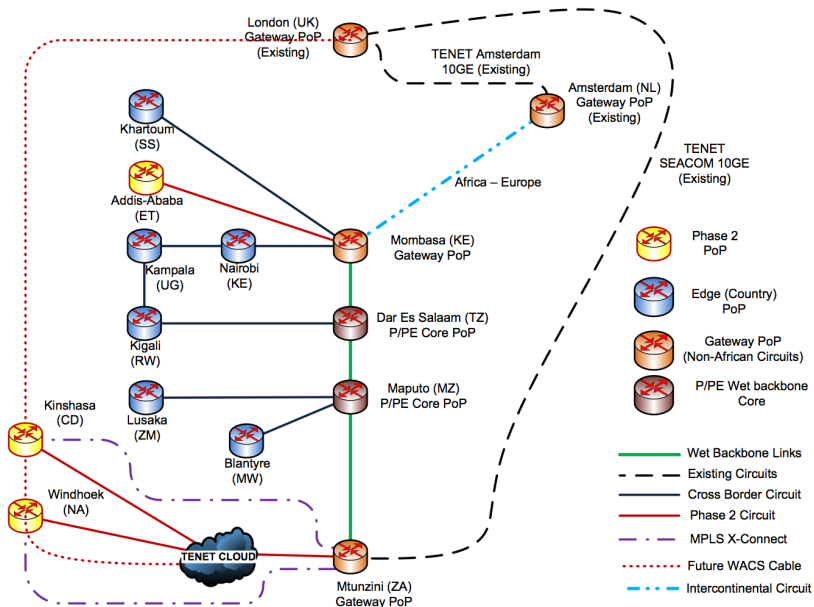
African undersea cables: 2009



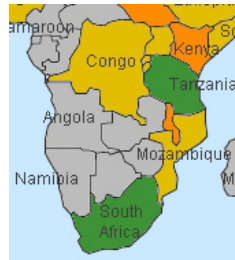
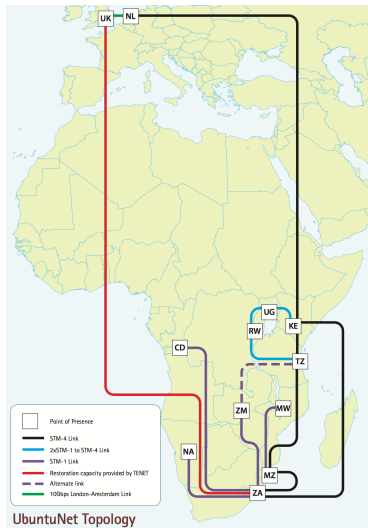
African undersea cables: 2011



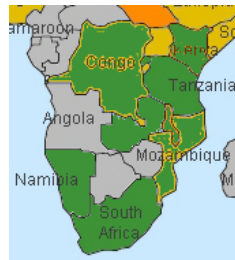
Africa Connect: design



Africa Connect: progress



Then:



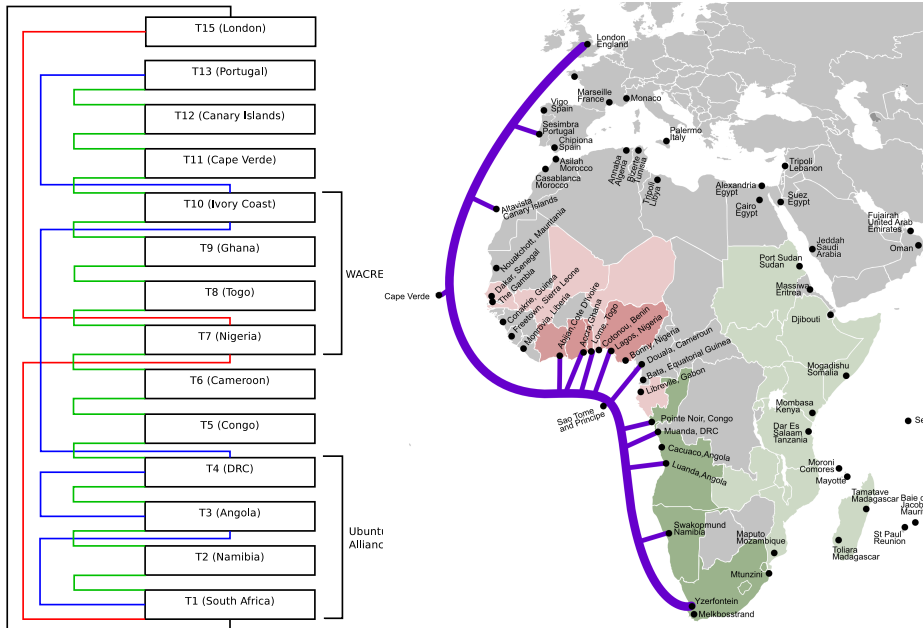
Now:

WACS: SANReN capacity acquisition

- ▶ Ministry of Science's funding: US\$54.9 Million
- ▶ Back-to-back with Broadband Infraco (consortium member)
- ▶ Initial design capacity entitlement: 3,094,461 STM-1*km
 - ▶ Cape Town → London = 10,843 km
 - ▶ If activated on this route \sim 44Gbps today
 - ▶ Upgrades planned for x10 capacity over 5yrs, but with 100G...
- ▶ 2x10G activated Cape Town → London on 1 April
 - ▶ 10G for IP transit via UA, 10G for light-paths 😊
 - ▶ Future possibilities...



WACS: cable layout



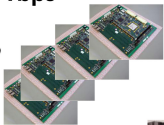
Square Kilometre Array

SKA SA: simplified data transport



Many dishes looking at the stars

**Raw ADC voltages
Many Tbps**



Correlator

~27Tbps



Science data processor

**Astronomy output
~2Tbps**



SKA SA: global data transport

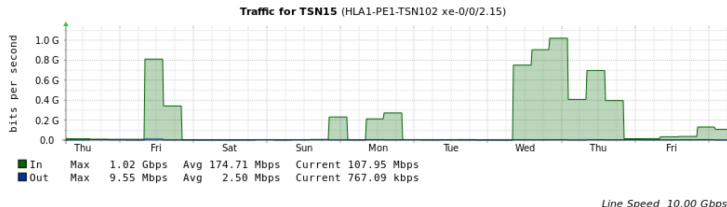


- ▶ SADT consortium: TX of SKA-MID data beyond Cape Town not in SKA-1 scope/budget.
- ▶ Baseline design due 2015 (how much data? to where?)
- ▶ SDP.Deliv concerned with data delivery:
 - ▶ *Regional archives* seems to be implied
 - ▶ Locations: Europe and *North America*
- ▶ SANReN WACS capacity purchase includes portion reserved for SKA lightpaths.

Plans for Cape Town GOLE

Lightpaths on SANReN

- ▶ HartRAO (ZA) → JIVE (NL) - e-VLBI
- ▶ UCT → CERN (evolution to ZA-CERN LHCONE)
- ▶ Treehouse link CSIR → ESNet (hi guys!)



Cape Town GOLE: what do we have?

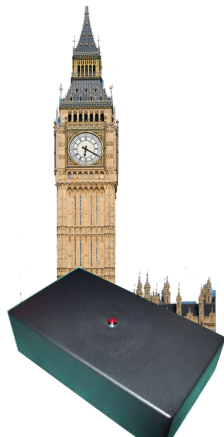
- ▶ Internal consensus (NREN) about the value: 100%.
- ▶ Owner/operator would be TENET (private and non-profit).
- ▶ Some interest in interconnection!
 - ▶ SA Universities uptake of Public Cloud
 - ▶ SKA lightpaths

Cape Town GOLE: SKA lightpaths

Disclaimer: own opinion - not of SANReN or SKA-SA

- ▶ "The Internet" is in London?
- ▶ Africa and the content dilemma.

Transit networks also pose a political and policy problem for governments at multiple levels. A new generation of research intensive economies is developing in China, Brazil, India, South Africa, etc. who will not be satisfied with data transit policies and services unilaterally decided by Europe or America. Open Exchanges can defuse this situation.¹



Cape Town GOLE: location

- ▶ Why Cape Town?
- ▶ Preferred data centre: Teraco Rondebosch
 - ▶ Robust infrastructure, remote hands, carrier neutral.
 - ▶ Major providers present (including dark fibre).
 - ▶ Viable for WACS/SAT-3 capacity (or EASSy/SEACOM).
 - ▶ On SANReN DF ring (adding DWDM node soon).



Cape Town GOLE: what is missing?

- ▶ A good name, and a web-site.
- ▶ Connection policy, pricing.
- ▶ The switch itself:
 - ▶ We have equipment available, but...
 - ▶ What about rolling SDN GOLE?
- ▶ The GLIF community, connecting there... 😊

End

- ▶ Questions and discussion
 - ▶ Contact: smiteff@csir.co.za
 - ▶ Thank you for listening!
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- ▶ African Cable Map (also adapted for WACS diagram):
 - ▶ Steve Song
 - ▶ AfricaConnect diagrams:
 - ▶ Ubuntunet Alliance, esp. Joe Kimaili
 - ▶ "REANNZ International Connectivity"
 - ▶ REANNZ News 2012
 - ▶ Photograph: "Cape Town Bo-Kaap and City Bowl"
 - ▶ Damien du Toit
 - ▶ Meerkat dish image:
 - ▶ Square Kilometre Array South Africa