



TENET Network – An revolution in progress

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A bit about TENET

- TENET is a non profit, non governmental organization, owned by its members, being the higher education and research institutions within South Africa.
- All operational expenditure is recovered from the institutions, with no government subsidies.
- TENET has also run, and continues to run various capacity development programs, these are funded by generous donor organizations.
- The entire network was originally outsourced to the South African incumbent, with TENET merely as an agent

The TENET Network – Some history

- Originally the entire network was outsourced to the incumbent
- In 2007, after two generations of an outsourced network, TENET went out on its first open tender for a new network – the key point being that control of the network moved back to TENET
- In parallel, negotiations with SEACOM started for TENET's own international capacity.
- Tender was awarded to a combination of Internet Solutions for pre-SEACOM international capacity, and Neotel for national backhaul. TENET at the same time began to actively peer

Breakthroughs that changed the landscape

- SEACOM's special 10gig deal for TENET
 - Financed by 27 University and Research Councils
 - Deal concluded in November 2007, Commissioned in July 2009
 - Was the first 10gig international circuit ever commissioned in South Africa
- DST's SANReN Initiatives (2007+)
 - First dark fiber ring commissioned in Johannesburg in 2008
 - Backbone ring commissioned in December 2009
 - Pretoria dark fiber ring completed – currently undergoing testing
 - Durban, Cape Town and other metro centers due for completion during this year

A brief look at bandwidth costs

Start Date	Platform	Charge per Mbps	Bandwidth ratio
2001-03-01	Satellite	R 52,425	0.29
2003-08-25	SAT-3	R 60,545	0.25
2005-08-25	SAT-3	R 21,428	0.70
2006-08-10	SAT-3	R 20,184	0.75
2007-04-01	SAT-3	R 21,025	0.72
2008-01-01	SAT-3	R 15,045	1.00
2008-06-01	SAT-3	R 14,245	1.06
2009-10-01	SAT-3	R 13,375	1,12
2010-01-01	SEACOM	R 1,380	10.9

The effect of lower prices...

Quarter	Mbps ordered by institutions
2008 Q3	228
2008 Q4	241
2009 Q1	246
2009 Q2	247
2009 Q3	254
2009 Q4	329
2010 Q1	427
2010 Q2	1,907
2010 Q3	2,020
2010 Q4	2,330
2011 Q1	2,402

The current network

- 7 Major backbone point of presence, connected via a 10 gigabit Ethernet ring
- Connected at 10 gigabit to both JINX and CINX
- 10 gigabit of International Capacity on the SEACOM cable to the Ubutunet Alliance PoP in London
- Peering established with every major South African provider other than the incumbent
- A total aggregate circuit bandwidth of over 200gigabit/second on the national network – due to expand to almost 2 terabit in the next 24 months
- Network is designed with redundancy in mind – ring topologies rule the day
- Dark Fiber is the rule where economics allows

Where to from here?

- Currently negotiating for large capacity on the soon to be commissioned WACS cable system (10 gig initial capacity, expanding to 40+ gigabit over the next few years in a single deal)
- Examining the possibilities of a long haul dark fiber network, removing a potential future bottleneck
- Metropolitan fiber rollouts continue, with 50+ additional sites expected to be reached by TENET operated fiber in the next 12 months

How the user experience changed

- Universities are no longer blocking high bandwidth content
- Large science requiring high bandwidth has become a reality – thanks to the new bandwidth things like EVLBI experiments are happening on a regular basis
- Datasets which were previously impossible to bring into the country are now being brought into the country without the aid of DVD's and courier companies!