Nigeria 2012

Introdudction

Hansen, Jerrod E <HansenJE@state.gov> sent email 12/5/2012 requesting:

> *My name is Jerrod Hansen. I am an economic officer at the US Embassy in Abuja, Nigeria. I cover several portfolios, including Information and Communication Technology (ICT). I'm working on a project looking at the growth in ICT in Nigeria over the last decade and am including regional and continental trends as well. I found some of the work you're associated via the IEPM PingER case studies and was wondering if there is anything more recent than what's on the website at https://confluence.slac.stanford.edu /display/IEPM/PingER+Case+Studies. If you have any information, reports, studies, references or just general encouragement on this, I'd be very grateful if you could find a few moments to send it out to me.*

### Newer data on Nigeria

PingER monitors 3 hosts in Nigeria:

Site	Host	Location	PingER Alias
American University of Nigeria	www.aun.edu.ng	Yola Adamawa State	NG.AUN.EDU
Government of Benue State of Nigeria	www.benuestate.gov. ng	Makurdi, Benue State	NG.BENUESTATE. GOV
University of Lagos	www.unilag.edu.ng	Akoka, Yaba, lagos	NG.UNILAG.EDU.N1

Their locations are shown in the map below:
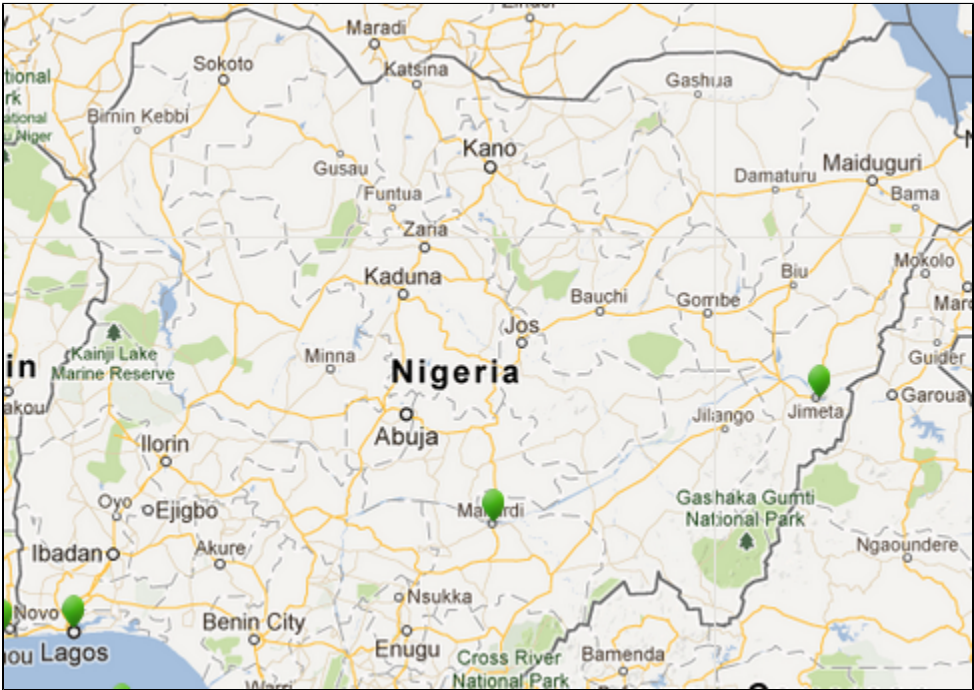

Nigeria Minimum RTT

The minimum RTT measured from SLAC to the Nigerian hosts are seen below:
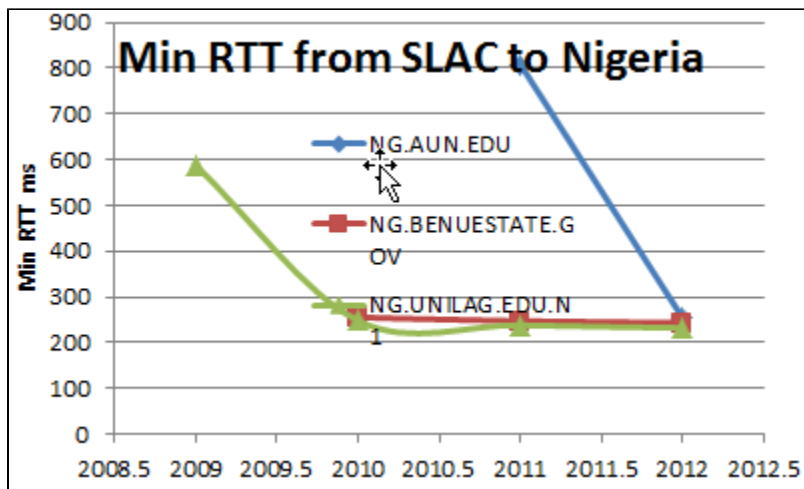
Minimum RTTs > 450ms usually indicates taht the link went via Geostationary Satellite. It is seen that NG.AUN.EDU transitioned to a terrestrial link in 2012, while NG.BENUESTATE.GOV transitioned in 2010.
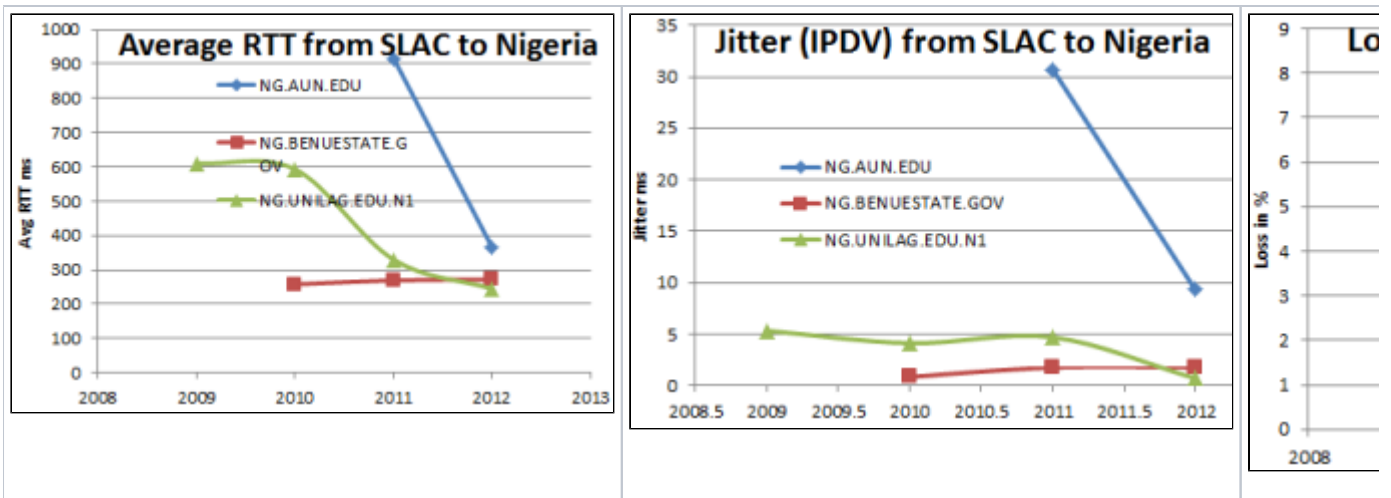
Nigeria Throughput

The maximum TCP throughput can be roughly estimated from the loss and average RTT using the Mathis formula. the three metrics are seen in the table below:

Average RTT	Loss	Derived throu
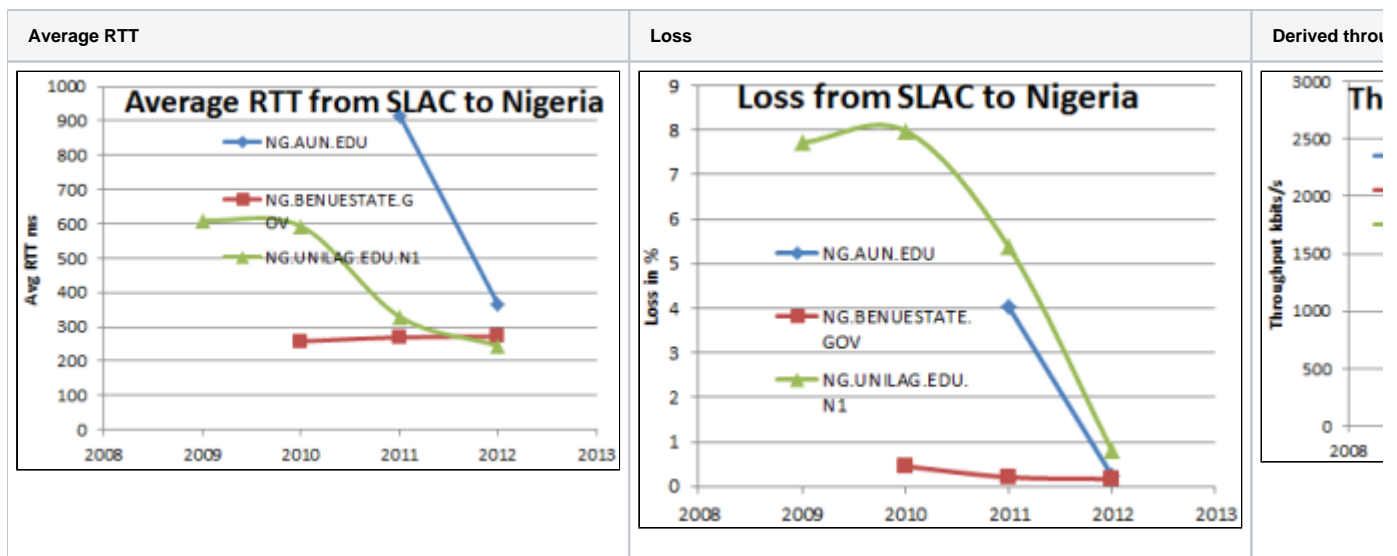
Nigeria Mean Opinion Score (MOS)

The MOS is a subjectiveness of the quality of speech developed by the Telecommunications industry. 5 is perfect HiFi, 1 is can't hear anything useful. Above ~3.6. is usable. The MOS can be derived from the RTT, jitter and loss.
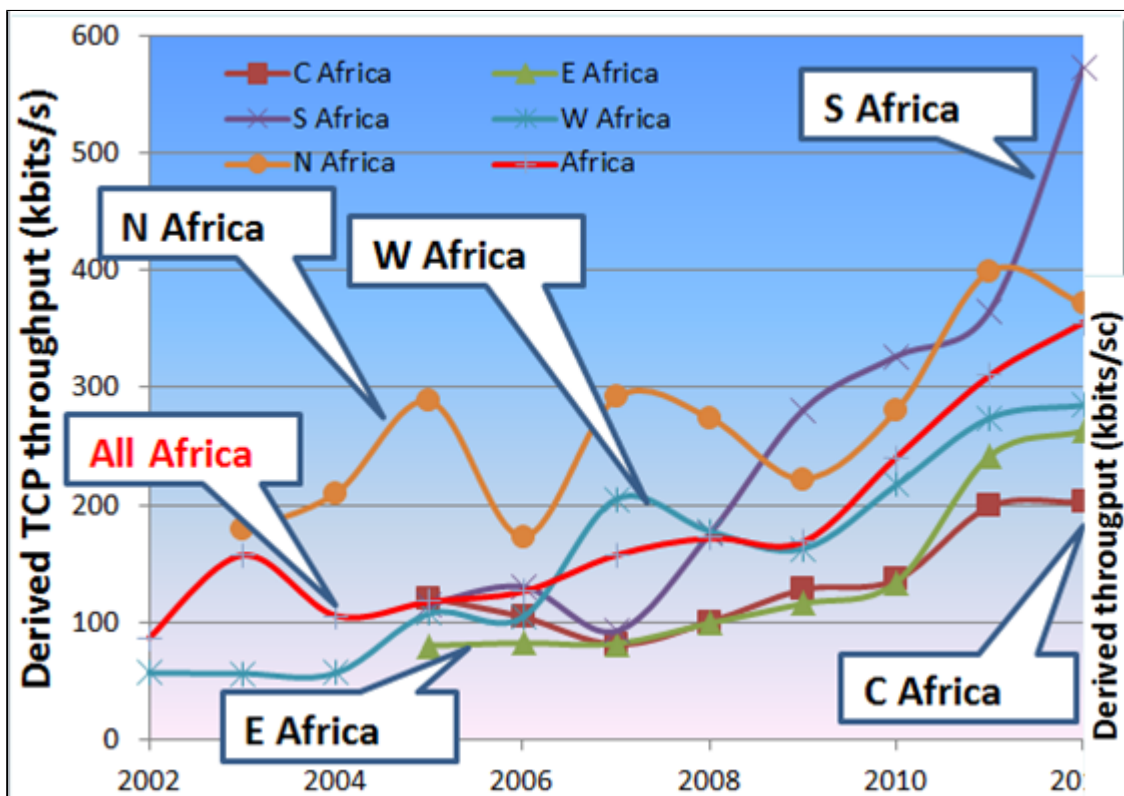
It is seen that VoIP calls from SLAC (Stanford University, California, USA) became feasible in 2012 to NG.AUN.EDU and NG.BENUESTATE.GOV.

Nigeria vs. the rest of Africa

The chart below (and spreadsheet here) shows the derived throughput for the various African regions.

Comparing the median throughput seen from SLAC for W. Africa with that for Nigeria in the table above, it is seen that NG.AUN.EDU is worse off, NG. UNLILAG.EDU is slightly better off, and NG.BENUESTATE.GOV is much better off.

Africa vs the rest of the world

Comparing the through put of African regions with the rest of the world, one gets the chart below:

Throughput trendlines for SLAC to world regions
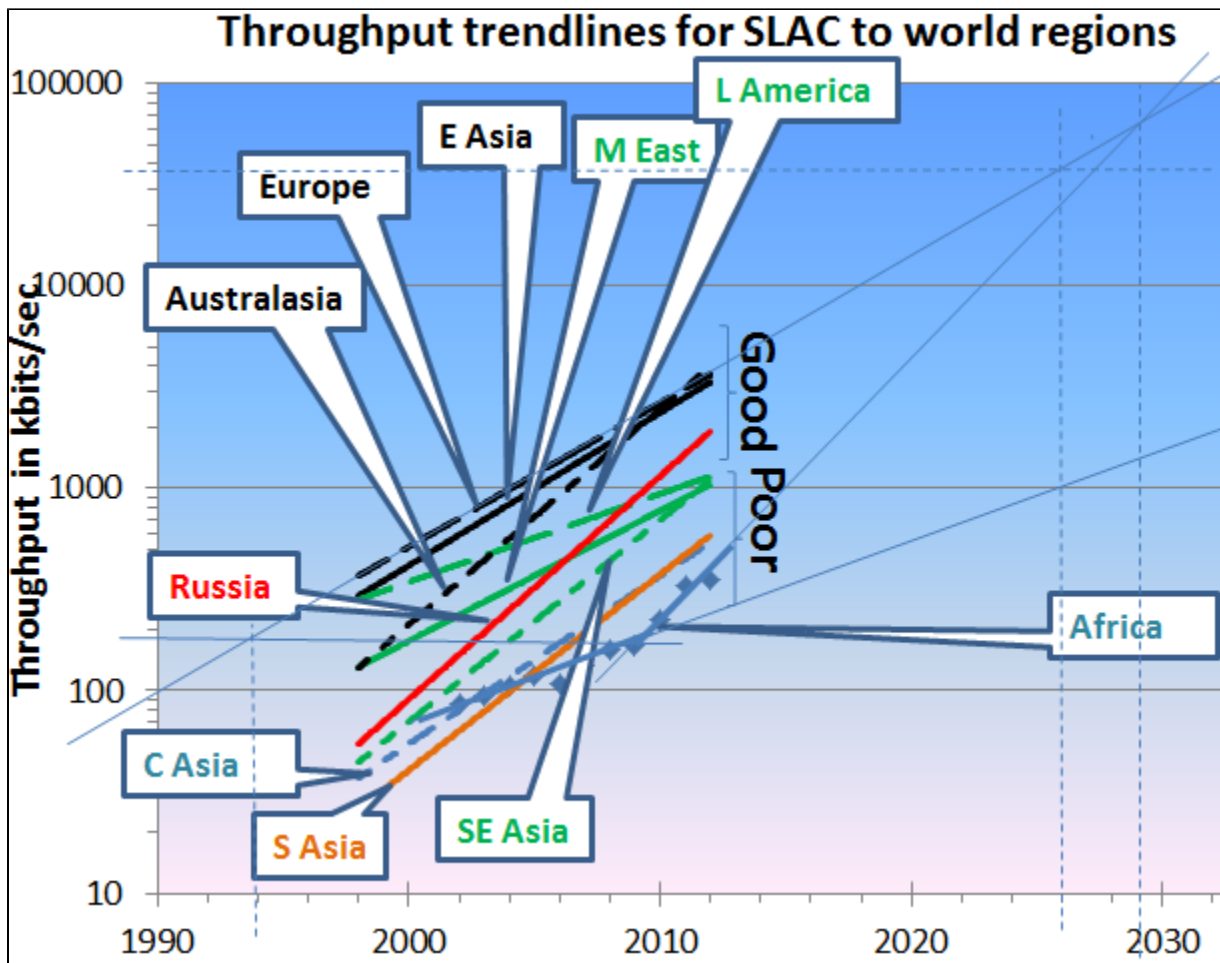
It is seen that Africa is much worse than the rest of the world. If one extrapolates back in time from where Africa was in in 2008 (before the world cup and the installation of multiple subsea fibre optic cables to Sub-Saharan Africa) then one see African performance was roughly equivalent to that of Europe in 1994. Not only was Africa behind Europe by 14 years, but it was falling further behind year by year, such that by 2026 it would have been almost 40 times worse than Europe. On the other hand if one assumes the trend in African throughput since 2008 continues, then Africa could catch up with Europe by by 2028.