

AFRICA & THE MIDDLE EAST | 2018

Connect-World

The Magazine that Provides Thought Leadership for ICT Decision Makers

www.connect-world.com

Network Challenges in Africa, including Disaster Management

Jassem Nasser, Chief Strategy Officer,
Thuraya





Optical fiber is not optional

by Scott Wilkinson, Senior Director, Portfolio Marketing ECI

For any country or community that wants to expand its economy and provide more opportunities to its citizens, optical fiber networks are the standard. The undersea optical cables that surround Africa are a resource as valuable as any natural resource and one that more and more governments and organizations are figuring out how to use. And unlike natural resources, the undersea cable resources are growing as more cables are installed and improved technologies eke more and more bandwidth out of them. These optical fibers are connecting to terrestrial networks that, as can be seen on the map, are moving in from the coastlines to the heart of Africa,

lighting the way for more and more people to access the benefits that optical fiber can provide.

Scott Wilkinson, Senior Director, Portfolio Marketing ECI

Dr. Wilkinson has deep experience in the telecommunications and technical startup fields, with positions held ranging from deeply technical systems engineering to entirely customer-focused marketing leads. A recognized public speaker and writer as well as a detail-oriented team leader, Dr. Wilkinson has been successful in companies ranging from Fortune 100 to small startups with less than 50 employees. Dr. Wilkinson's career includes significant interaction with major carriers in the United States as well as experience with rural telcos, utilities, and municipalities.

Recently a picture of an enormous telecommunications cable full of 1,200 copper pairs that had been cut in half was posted on Reddit, the very popular internet message board website. The picture was posted in the “mildly interesting” subreddit group, but spawned much more than mildly interesting discussions about the current state of telecommunications, especially when one user asked if 1200 copper pairs was equivalent to one fiber. The reality is that one fiber pair can carry significantly more bandwidth than 1200 copper pairs in a much smaller space, a fact that was fascinating to many readers and questioners who had no experience in telecommunications. Telecommunications experts (myself included) waded in to answer questions about DWDM, coherent receivers, ROADMs, fiber profiles, and more. The point was made that, in a modern telecommunications environment, optical fiber is no longer an option. Optical fiber is the standard.

In early 2017, I was introduced to the interactive NSRC map of African Undersea and Terrestrial Fibre Optic Cables (<https://afterfibre.nsrc.org>). This online project is attempting to map out all of the major optical fiber deployments in and around the continent. I like to visit the site occasionally to watch the map grow and the blank spots fill in as more fiber is deployed

and/or mapped. This map also makes the case that optical fiber is not optional.



Source: <https://afterfibre.nsrc.org>

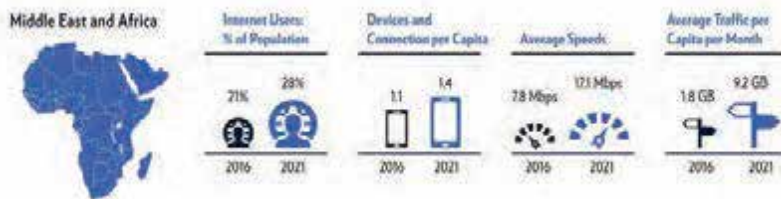
For any country or community that wants to expand its economy and provide more opportunities to its citizens, optical fiber networks are the standard. The undersea optical cables that surround Africa are a resource as valuable as any natural resource and one that more and more governments and organizations are figuring out how to use. And unlike natural resources, the undersea cable resources are growing as more cables are installed and improved technologies eke more and more bandwidth out of them. These optical fibers are connecting to terrestrial networks that, as can be seen on the map, are moving in from the coastlines to the heart of Africa, lighting

the way for more and more people to access the benefits that optical fiber can provide.

The bandwidth that optical fiber can carry is nearly limitless. Undersea fiber optical backbones carry terabits per second of information around the world. While not every optical fiber needs to carry that much data (fiber to the home cables carry significantly less), the point is that optical

fiber is a very deep resource that has a long lifetime. Installing fiber optics in a municipality, community, town, or industrial park means that the bandwidth demands of that area will be met for years to come. Unlike that 1200 pair copper cable, fiber will last well beyond the lifetimes of those who plan for and install it. The technology on the ends of the optical fiber that send the information can start small and grow as needs grow and as technology improves. Whereas a ten gigabit per second signal used to be an expensive option, now equipment regularly sends 100 gigabit per second signals for prices that are comparable – all over the same fiber infrastructure.

Fixed and Mobile Traffic in MEA



Source: Cisco VNI, 2018

Those who are less familiar with the telecommunications infrastructure will sometimes ask why we can't just install wireless everywhere to meet the need for more bandwidth. Wireless is getting faster and more capable every year. 5G networks are being trialed now that will offer bandwidth that rivals fiber for many applications (gigabits or tens of gigabits per second). In regions where it can be hard to install fiber, a wireless 5G/4G/LTE infrastructure is vital to enable access to information. However, all of that wireless capability must at some point come back to the optical fiber networks that connect the datacenters and internet exchange points that comprise the modern internet. It is the optical networks that move the big data connections around, and it is the optical networks that connect the larger networks together. Even in a wireless world, optical fiber is not optional.

The technology that runs optical networks is improving every year, with increasing capacity, lower costs, and improved ease of use. Perhaps the most striking advancements in optical technology are in the area of software control, with technologies like software defined networking (SDN) and intelligent hardware making the networks much simpler to operate and maintain. Optical networks can grow, change, and shift as demands migrate, with minimal effort required to make the changes. Individual wavelengths can be routed flexibly or broken into small pieces that are rerouted to other wavelengths. Advanced network resiliency ensures fast recovery from events ranging from simple fiber cuts to major natural disasters. Networks built in Africa rival those built anywhere in the world in taking advantage of these emerging technologies, often because they are not burdened by in-place obsolete technology. The advanced universities in Africa and research sites such as the Square Kilometer Array radio telescope are taking advantage of these cutting edge networks to enable their breakthrough as well as providing pull-through requirements for even more fiber optics technology on the continent.

OPTICAL TRANSPORT LAYER



One key upside of all of this new fiber deployment is a network that is significantly more resilient to disasters, natural or otherwise. Not only is it much simpler to patch a single optical fiber pair than it would be to repair the 1200 count copper cable, but the technology supporting fiber networks makes them able to adapt more quickly even before repairs are made. Due to the bandwidth capacity of fiber optics, a robust fiber network can reroute traffic efficiently around network breaks automatically. Excess capacity on one line can be used to back up another line or prioritization decisions can be made to ensure that the most important traffic always gets through. I spoke recently with a customer in Southeast Asia who has tens of fiber cuts in his optical network every week, primarily due to a hot construction market in his region. Backhoes are the biggest foe for communications networks. This customer's optical network is designed to operate flawlessly even when multiple network failures occur simultaneously. And patching up a few fibers is much faster than trying to identify and reconnect 1200 copper lines, meaning that his network can come back up to its original state much more quickly.

A geographical area that has built a resilient fiber-based network can much more quickly recover from localized disasters by bringing in bandwidth – either fixed or mobile – from redundant routes. There have been several recent examples in areas with strong optical network deployments (e.g. the southeastern US) where mobile bandwidth was able to be deployed rapidly in areas hit by natural disasters due to the

ability to quickly tap into the unaffected parts of the existing network. Providing more and larger connections to the backbone networks and fibers that interconnect the world results in a stronger and more capable network. For a truly resilient telecommunications infrastructure, optics are not optional.

There is one thing that the 12 pair copper cable can do that optical fiber cannot. One writer on the Reddit post pointed out that turning the colorful plastic-clad copper cables into art is a profession in many parts of Africa, with amazing bowls and other displays being created by very talented artists. Fiber cable is simply not suited for that application. Perhaps repurposing copper cables as art represents a market for all of the old cables that will be eliminated in the move to advanced fiber optic networks.



Connect-World is celebrating its 21st Anniversary.

Through the years, Connect-World's authors have explained how new technology changes the way people live and do business. Recent topics have included: SDN, The Digital Divide, Convergence, Cyber Security, the Internet of Things (IOT), Transition from 4g to 5g, Fintech, the Future of Broadcasting and Smart Cities.

Our authors are ICT leaders of industry, governments, regulators, international organisations, legal experts, bankers and their advisors.

Web: www.connect-world.com,
 Twitter: [@connectworldict](https://twitter.com/connectworldict),
 Facebook: www.facebook.com/connectworld.ict




DOES YOUR NETWORK WORK FOR YOU?

OURS DOES....

Increased mobility, the move to cloud-based applications, and improved technologies all affect customer expectations. Your customers are undoubtedly demanding a wider range of services with higher bandwidth, more flexibility and better user experience. As a service provider, you need to constantly invest in your underlying network infrastructure just to keep up.

However, modern networks have unique requirements that make them more complex. As the number of services and the demand for bandwidth explode, you may find yourself asking how best to evolve your network economically for the new age.

ECI has designed its ELASTIC networks specifically to address the challenges of evolving society. Our ELASTIC Services Platform takes networking to the next level by allowing service providers, such as yourself, to concentrate on:

- Launching new services, and
- Driving new revenue streams.

By simplifying service delivery and automating network operations.

With a history of over 50 years' experience servicing some of the world's most demanding service providers in some of the world's harshest environments, you can rely on ECI to provide best-in-class solutions, tailored to YOUR needs. Strong networking solutions from concept to deployment and ongoing maintenance. Our networks are meant to work for YOU!

Robust Packet-Optical Portfolio



Scalable Access to Core Solutions



Pay As You Grow Expandability



Simplified Operations

Advanced Management Capabilities



Simplified Service Creation and Delivery



Automated Service and Network Lifecycle Management



Smooth Migration and Seamless Ecosystem Integration

SO DOES YOUR NETWORK WORK FOR YOU?

For more information download our brochure



Our experts will be at AfricaCom to discuss

Booth #E84